

Unravelling the Discourse of the Circular Economy

An explorative research on
niche-actor's theory of change

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Colophon

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Summary

The discourse on the Circular Economy has gained considerable momentum in recent years and has been promoted as a pathway towards sustainability by academics, policy makers and practitioners alike. Despite its national and international popularity, CE has come under criticism for its conceptual weakness as it leaves room for varied interpretations and contested frames. Yet, the literature review revealed a lack of analytical attention for the role of discursive practices with regard to sustainability transformations and CE in particular. This research lack served as a motivation for this thesis.

This qualitative case-study research combines insights from the literature on transition management and discourse analysis to explore the ‘theory of change’ (frames) of Dutch niche-actors operating in the field of the Circular Economy (CE), in particular within the national network ‘Cirkelstad’. By analysing the various frames through the lens of discourse analysis, underlying assumptions, power structures and links to related discourses could be detected and reflected upon based on the existing literature. The research hereby fills a current research gap and contributes to the understanding of discourses and their implications for the concept of CE. It furthermore provides insights into the role of discourses and frames within the broader research field of sustainability transformation.

The analysis revealed insights into the ontologies, assumptions and strategic theories of niche-actors as well as on actors who are perceived as relevant for the transformation towards CE. The findings show that niche-actors from the case study frame CE from an anthropocentric and eco-modernist position where technological progress is believed to be crucial for societal change. The imminent danger of resource depletion and the negative environmental impacts caused by linear modes of operation were named as the main reasons that necessitate change.

Interpretations of CE were somewhat vague but seemed to be generally inspired by a systemic perspective in which the closing of production loops and the value retention of resources through prolonged circulation and regenerative product design stand central. At the same time, the focus seems to lie on material aspects (material footprint) rather than the energy aspect (energetic footprint) of production methods. It can be argued that the parallel running discourse on ‘energy transition’ plays a role in this regard.

In the systemic perspective of closed loops and circulating materials nature is mainly perceived in its instrumental value as an input to human operations. The ‘social aspect of circularity’ refers – according to respondents – to personal development and the active inclusion of people who are currently at the distance from the Dutch job market or who want to be actively engaged in the field of CE. Although the

link between CE and sustainability is not entirely clear, respondents generally established a conceptually beneficial relationship but also reported trade-offs between both concepts in practice.

Since the industry operates for a large part with standards, norms and impact assessments, there is the need for an operational terminology which focuses on the measurability of circularity. It can be suggested that this kind of terminology will have significant impact on the discourse and the implementation of CE in practice. The same holds true for the social constructs of 'waste' and 'value' which are central to the discourse and which require a (normative) re-definition in order for a successful implementation of CE.

Regarding relevant stakeholders and their responsibilities, the market is generally seen as the main driver for CE-related technological progress whereas individual consumers are of marginal importance. At the same time, there seems to be a high dependency on governmental institutions and their function as public contractors (public procurement). Due to this power position, municipalities, in particular, are supposed to lead the discourse and function as a role model by setting terms that support CE-ambitions. Yet, it seems that competing frames on risk aversion and uncertainty are barriers in this regard.

Overall, the discourse seems to be based on an economic rationale which offers the prospect of economic growth without resource dependency and environmental degradation. Yet, respondents also call for a normative change – a shift in mindsets which is seen as essential for a successful transition towards more sustainability.

Preface and Acknowledgements

This thesis marks the end of my Master studies at Radboud University Nijmegen and the start of a new chapter. Two and a half years ago, my curiosity and sincere desire for knowledge persuaded me to trade the towering mountains of Austria for the sprawling polders of the Netherlands, leading to – well, a surprising change of perspective. This shift not only evoked new insights but also led to enriching encounters and memorable friendships. At this point, I would like to thank everyone who supported, inspired and challenged me along the way.

My special gratitude goes to my thesis supervisor and lecturer Prof. dr. Pieter Leroy who did all of these things with admirable ‘Fingerspitzengefühl’. I am very grateful for his critical feedback, thought provoking lectures and excellent supervision throughout this process.

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“Ever since the Cognitive Revolution, Sapiens have been living in a dual reality. On the one hand, the objective reality of rivers, trees and lions; and on the other hand, the imagined reality of gods, nations and corporations. As time went by, the imagined reality became ever more powerful, so that today the very survival of rivers, trees and lions depends on the grace of imagined entities such as the United States and Google.”

— Yuval Noah Harari, *Sapiens: A Brief History of Humankind*

1 Introduction to the research

Over the last decades, an ever-growing number of environmental issues have come to the fore generating upheaval among environmental scientists; from early concerns about the depletion of the ozone layer, pollution and the scarcity of natural resources to current fears regarding climate change, fossil-fuel dependency, the loss of biodiversity and the transgression of planetary boundaries (Dryzek, 2013). Whilst more substantial evidence emerges which identifies human activities as the root cause for the deteriorating state of the earth (e.g. Steffen et al., 2015; IPCC, 2018), the call for societal change and a transition towards more sustainable modes of operation becomes louder (e.g. Raworth, 2017).

However, with the vital and intrinsic value of the ecological system on one side and social and economic welfare on the other, the stage is set for heated discussions and disputes among citizens, policy makers, academics and business professionals alike (Dryzek, 2013). In order to provide ‘terms and concepts to be discussed’, nature and environmental issues must be rendered in a ‘linguistically intelligible’ fashion (Hajer & Versteeg, 2005, p. 177). At the same time, such terms are inherently subjects to interpretation, or in other words to discursive practices in which meaning is socially constructed and ascribed to certain phenomena (Hajer, 2002).

The way we think about an issue or concept cannot only change significantly over time but has also major consequences for what Dryzek (2013) calls ‘the politics of the Earth’. He suggests that the way we deal with an issue of interest largely depends on the balance of competing discourses. Hajer (1995) defines discourse as “an ensemble of ideas, concepts and categories through which meaning is given to social and physical phenomena, and which is produced and reproduced through an identifiable set of practices” (Hajer & Versteeg, 2005, p. 175). Hence, discourses reflect how we frame our reality and what we define as common sense and legitimate knowledge (Dryzek, 2013); hereby turning them into fundamentally political devices (Meadowcroft, 2011).

In the context of transition management, discourses are said to have both performative and structuring quality (e.g. Berkhout, 2006; Foucault, 1972; Smith & Raven, 2012) and can hence be applied

by actors to resist or facilitate transformative processes. Hajer and Versteeg (2005, p. 177), for instance, state that “environmental discussion can lead to the revision of rules, the enactment of laws or the creation of institutions”. At the same time, much of the transition management literature proceeds from the concept of agency and focuses on the steering role of innovative niche-actors (e.g. Fischer & Newig, 2016).

One of the discourses in the field of ‘sustainability transition’ that has gradually taken hold and found wide-spread attention is ‘the Circular Economy’ (CE). On a general level, CE aims at the decoupling of economic growth from resource dependency and environmental degradation. The Ellen MacArthur Foundation (EMF) – one of its early advocates – defines the concept as “an economic and industrial system that is restorative and regenerative by design and which aims to keep products, components, and materials at their highest utility and value at all times” (EMF, 2015, p. 22). The Circular Economy is broadly being framed as a promising alternative to the current linear economic model and has been adopted as the ‘way to go’ by European institutions and a growing number of national governments, including the Netherlands (Geisendorf & Pietrulla, 2018).

1.1 Problem statement, research objective and research questions

Although the discourse on CE increasingly gains momentum and finds its way into policies and strategic frameworks, the concept itself remains vague and lacks consensus with regard to its practical implications. Given more than 100 definitions of the term (Kirchherr, Reike & Hekkert, 2017), it has been suggested that this conceptual weakness provides fertile ground for different interpretations and contesting frames (Korhonen, Nuur, Feldmann, & Birkie, 2018), hereby turning it into an interesting subject of analysis. Yet, the literature review revealed a lack of analytical attention for the role of discourses in relation to the Circular Economy concept, with the majority of studies focusing either on its conceptualization or on feasibility and implementation issues.

This thesis is taking the current research gap as a motivation to explore the discursive practices of niche-actors operating in the field of Circular Economy. The main objectives of this thesis are to:

- describe how CE is being framed by niche-actors working in the field of CE
- understand the ‘theory of change’ of such frames by unravelling and analysing the perceived relationships and change dynamics that substantiate these change theories
- explore some of the resulting practical implications with regard to discourses and frames related to ‘sustainability transformations’
- encourage greater attention to the structures of power and politics in discourses

In order to reach the aforementioned objectives, the following main research question as well as a set of sub-questions are formulated:

What are the elements that substantiate the ‘theories of change’ (frames) applied by niche-actors in the field of CE and how can these theories be linked to broader discourses and the literature?

Sub-questions:

- What role do discourses and frames play in sustainability transitions according to the literature and how are they conceptualized?
- What does the notion of CE entail according to the literature?
- What fundamental problems, drivers and barriers do niche-actors perceive with regard to the transition towards CE?
- How could these perceptions be explained based on the scientific literature?
- What broader discourses come to the fore and which role do they play?

1.2 Scientific and societal relevance of the research

Analysing CE through the lens of discourses represents a journey into a field that has – to the best of the author’s knowledge – not yet been explored. Yet, “without discourse, there is no social reality, and without understanding discourse, we cannot understand our reality, our experience, or ourselves’ (Phillips & Hardy, 2002, p. 2). The adoption of the CE discourse in national and international policies and business plans suggests a cross-party consensus which presents CE as a suitable transformation pathway to solve the issues caused by the current take-make-dispose model. Nevertheless, scholars stress that the concept does not only entail a number of challenges and barriers regarding its practical implementation, but also allows for various interpretations and contesting frames due to its weak conceptualization (Korhonen et. al, 2018; Araujo Galvão, Nadae et al., 2018). By deconstructing these various frames produced by CE practitioners, this research aims to reveal the elements that contribute to its normative, cognitive and cultural legitimacy (or the lack thereof) (Geels & Verhees, 2011). In doing so, this thesis can help to fill the current research gap and can provide valuable insights on the discursive practices of niche-actors in the emerging field of the Circular Economy.

Secondly, according to Geels et. al (2014), discourses are embedded in and shape social and political practices. As such they can be seen as powerful entities which have great implications for the dynamics of sustainability transitions. This research provides insights into the assumptions, ontological

positions and suggested solutions of pioneers operating in the field of CE. Understanding whether a certain frame (and its underlying rationale) might contribute to the resistance or facilitation of a transformation is believed to be of great relevance to everyone who advocates for societal change.

The construction sector in the Netherlands has been declared one out of 5 priority sectors for the transformation towards a Circular Economy (Dutch Government, 2016). This case study research addresses current developments and pays special attention to the peculiarities and structures of this sector. As such, it attempts to reflect on current developments and modes of operations while providing indications for areas of discursive struggles.

1.3 Thesis outline

Having outlined the starting point for this thesis, chapter 2 proceeds by providing the theoretical framework and by presenting relevant concepts and theories from the literature. These theoretical insights lay the basis for the conceptual model and its operationalization at the end of chapter 2. Chapter 3 presents the methodology to this research and discusses ontological and epistemological considerations, the research strategy and its design. Moreover, research methods and the approach to data collection and data analysis are explained. Considerations regarding the validity and reliability of this research are discussed at the end of chapter 3. The findings from the case study 'Cirkelstad' are presented and discussed in chapter 4. Last but not least, chapter 5 concludes by discussing the practical implications derived from the findings and by providing recommendations for future research.

2 Theoretical framework

By bringing together insights from the literature on transitions, CE and discourses, this research sets out to analyse how pioneers currently engaged in the discourse on CE make sense of the concept, and to explore their underlying rationale ('theory of change'). The theoretical findings in this chapter serve as a reference point for the analysis and present the theoretical framework for this thesis.

With CE generally being framed by many national governments and EU institutions as a transition pathway towards a sustainable economic system, it becomes necessary to, first of all, understand what the concept of CE entails and how it is being framed on the national level (section 2.1). In order to analyse how and why niche-actors might frame CE in a certain way, it is also crucial to understand the peculiarities and dynamics of sustainability transitions (section 2.2). Lessons from history give valuable insights in this respect. The multi-level perspective is presented as a general analytical framework for this research which takes into account both, the multi-dimensional nature and the dynamics of structural transformations and has hereby proven especially suitable for the analysis of sustainability transitions (Geels, 2011; WBGU, 2011).

After having tackled questions on the context, the general direction and underlying dynamics of sustainability transformations, the third section takes a closer look at the role of discourses, narratives and frames within such transitions.

2.1 Conceptualizing the Circular Economy

Along with the quest to incite and to understand societal change emerges the question: 'Where are we heading and what should our ideal 'planet-proof' future look like?' This fundamental question has given rise to colourful discourses on alternative economic models. One that has in particular attracted attention in the last couple of years is the notion of a Circular Economy (CE).

In its core, the concept aims to decouple economic growth and production from the dependency on raw materials through maximizing the efficiency of existing materials and enhancing the 'restorative use' of natural resources with the aid of regenerative system and product design (Best, Duin, & Chelminska, 2018; Esposito, Tse, & Soufani, 2018, p. 727; Geisendorf & Pietrulla, 2018, p. 771).

More than 100 definitions emerged over the years (Kirchherr et. al., 2017). The most cited one was put forth by the Ellen MacArthur Foundation (EMF) – a pioneer in the field of CE and one of its most visible advocates (EMF, 2015, p. 22). EMF defines a Circular Economy as "an economic and industrial system that is restorative and regenerative by design and which aims to keep products, components, and

materials at their highest utility and value at all times, distinguishing between technical and biological cycles”. Based on their definition, EMF identifies three fundamental principles which describe the actions necessary for the realization of CE (2015, p.5):

1. Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows.
2. Optimise resource yields by circulating products, components, and materials at the highest utility at all times in both technical and biological cycles.
3. Foster system effectiveness by revealing and designing out negative externalities.

The technical and biological circle are illustrated in the butterfly diagram below which also shows the different sources for value creation and preservation within a Circular Economy (sharing, maintaining, re-using, refurbishing, cascading down etc.) (Ellen MacArthur Foundation, 2015, p. 6).

OUTLINE OF A CIRCULAR ECONOMY

PRINCIPLE

1

Preserve and enhance natural capital by controlling finite stocks and balancing renewable resource flows
ReSOLVE levers: regenerate, virtualise, exchange

PRINCIPLE

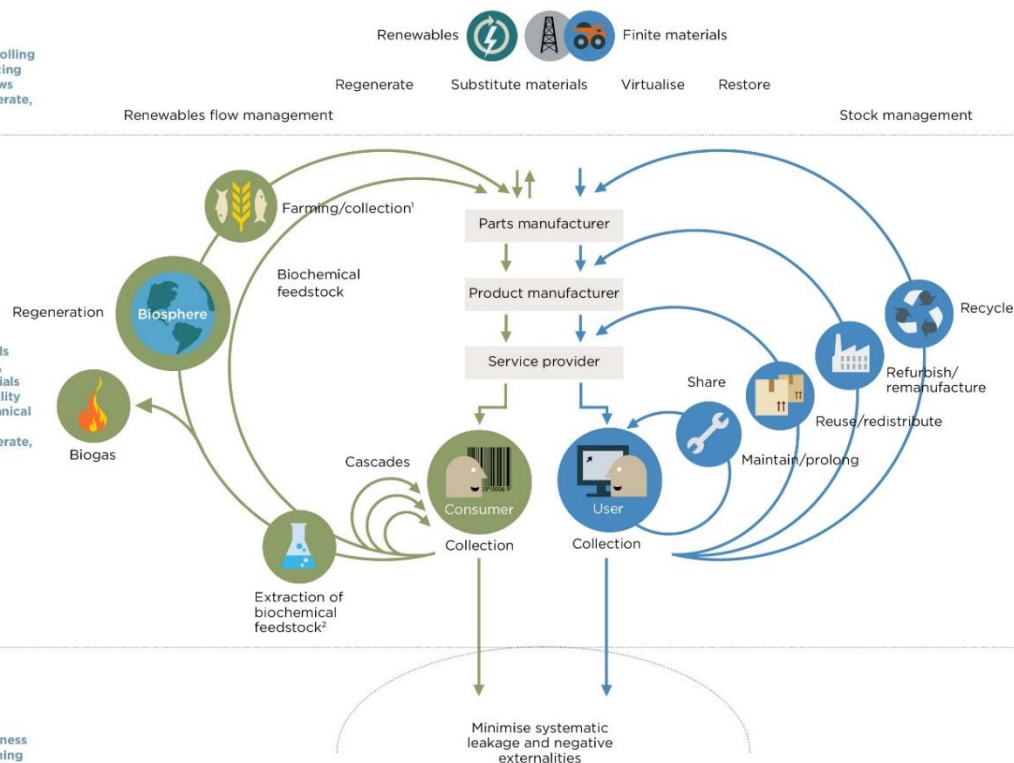
2

Optimise resource yields by circulating products, components and materials in use at the highest utility at all times in both technical and biological cycles
ReSOLVE levers: regenerate, share, optimise, loop

PRINCIPLE

3

Foster system effectiveness by revealing and designing out negative externalities
All ReSOLVE levers



1. Hunting and fishing
2. Can take both post-harvest and post-consumer waste as an input
Source: Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Braungart & McDonough, Cradle to Cradle (C2C).

Figure 1: The butterfly diagram of a circular economy. Reprinted from *'Towards a circular economy: Business rationale for an accelerated transition'* by Ellen MacArthur Foundation, 2015, p.6. Copyright 2019 by EMF.

Albeit this way of 'systems-thinking' allows for the conceptualization of complex issues and can highlight global interconnectedness, it does not account for the social, cultural, political or discursive context of these issues. That means that questions of governance, social interaction and decision making are being neglected entirely.

2.1.1 Circular Economy as a conceptual master blend

Despite its increasing popularity, the concept lacks conceptual clarity and leaves room for different interpretations which might, in fact, be part of its success (Korhonen, Nuur et al., 2018). This is partly due to its origins as the notion draws on a variety of concepts; some of which have already been developed decades ago and are now being re-discovered as part of the discourse around the 'Circular Economy'.

The work by Boulding (1966), *The Economics of the Coming Spaceship Earth*, has been pivotal for the idea of 'circular systems'. He emphasizes that humankind is not living in a 'illimitable plane' but in a 'closed sphere' (a spaceship) in which "the outputs of all parts of the system are linked to the inputs of other parts" (Boulding, 1966, p. 2). Hence, he claims that future economic principles must reflect this realization and support the paradigm shift from what he calls a 'cowboy economy' (open system) to the 'spaceman economy' (closed system). This idea has since been taken up and extended by other pioneers, e.g. with the *Limits to Growth* and its *30-Year update* (Meadows, 1974; Meadows, 2014), the *Planetary Boundaries* (Rockström et al., 2009 & Steffen et al., 2015) and more recently by Kate Raworth (2017) in her popular book *Doughnut Economics*.

While the 'closed loop system' is certainly an essential element, CE can in fact be described as a conceptual master blend rooted in many different schools of thought. Examples include the performance economy (Stahel, 2010), the 'cradle to cradle' design approach (McDonough & Braungart, 2009), industrial ecology (Lifset & Graedel, 2002) as well as biomimicry (e.g. Benyus, 2008) and blue economy (Pauli, 2010). Korhonen, Honkasalo and Seppälä (2018, p. 45), in fact, suggest that "there is quite little that is truly new in the CE concept in terms of sustainability science research".

2.1.2 CE being framed as a promising 'way out'

Closing production loops, extending product lifecycles and efficiency as well as reframing waste as a basic raw material seem to be compelling strategies to tackle current environmental issues – which might be

one of the reasons for the overall popularity of the concept. Other reasons might be grounded in its reassuring narrative regarding new business opportunities, job creation and CE's compatibility with emerging trends and technologies (Esposito et al., 2018).

For instance, in a communication paper from the European Commission (EC, 2014, p.3) it is estimated that "waste prevention, eco-design, reuse and similar measures could bring net savings of €600 billion, or 8% of annual turnover, for businesses in the EU, while reducing total annual greenhouse gas emissions by 2-4%". The document further states that a transition towards a CE could boost GDP by almost 1%, "while creating over two million jobs more than under a business-as-usual scenario" (EC, 2014, p.3). Yet, it must be stated that such findings are rather speculative given the conceptual vagueness of the concept.

Not least because of such auspicious outlooks has CE appeared as a hot topic on political agendas, business plans and scientific research programmes in recent years (Geisendorf & Pietrulla, 2018). In fact, it is currently one of the most discussed terms within the field of environmental economics and is being promoted by a number of national governments, including China, Japan, Canada, Sweden, Finland, France, the UK and the Netherlands (Korhonen, Nuur et al., 2018). In 2015, the European Commission committed to an ambitious Circular Economy Action Plan (EC, 2019) which introduced 54 measures to "accelerate Europe's transition towards a circular economy, boost global competitiveness, promote sustainable economic growth and generate new jobs".

2.1.3 CE in the Netherlands

The same optimism is palpable in the Netherlands where the potential benefits of CE have been estimated to amount to €7.3 billion a year in extra turnover accounting for 54,000 new jobs (TNO, 2013) along with an "extra growth in GDP ranging from 1.5 billion euros (in a business-as-usual scenario) to 8.4 billion euros (in the most circular economic scenario)" (Dutch Government, 2016, p. 11).

Following the EU's example, the Netherlands has set a high bar with its *government-wide programme for a Circular Economy by 2050*. This transition agenda addresses actors from the public, private and civil society sphere and identifies five priority sectors and supply chains with large impact on the environment (Dutch Government, 2016, p. 21): from Biomass and food (1), plastics (2) and the manufacturing industry (3) to the construction sector (4) and consumer goods (5). By implementing strategies geared towards each of these priorities, the Dutch government aims to become a circular economy by 2050 and to halve the amount of primary resources by 2030.

Meanwhile, the promises and virtues of CE have also aroused attention among the private sector, not least because of the increasing number of studies and publications on new business models and corporate strategies (e.g. Jonker, 2015, 2016).

2.1.4 Current Challenges and limitations

While studies suggest that a successful CE contributes to all dimensions of sustainable development (e.g. Korhonen et al., 2018), the literature review also revealed a number of challenges and limitations to CE and to sustainability transitions in general.

Commonly mentioned shortcomings relate to thermodynamic limits (e.g. issue of entropy), spatial and temporal boundaries (e.g. issue of system complexity, problem shifting, displacement, and long-term uncertainties), limits posed by economic growth (e.g. Rebound effect, Jevon's Paradox and the Boomerang Effect), path-dependencies and lock-ins, managerial challenges (e.g. regarding CSR and transparency) as well as social and cultural challenges (such as the social construct of waste, consumer behavior, consumerism etc.) (Araujo Galvão, Nadae, Clemente, Chinen, & Carvalho, 2018; Korhonen, Honkasalo et al., 2018).

Whilst the aforementioned challenges particularly refer to the feasibility and implementation of CE, one of its major critiques is of more fundamental nature. Opponents claim that the conceptual diversity illustrated earlier and the fuzziness that results from it (Geisendorf & Pietrulla, 2018; Lazarevic & Valve, 2017) is especially problematic as it leaves plenty of room for different interpretations and contested discourses (Best et al., 2018; Lazarevic & Valve, 2017). At the same time, questions of governance and power relations have not yet been discussed.

2.2 On transformations and the need for societal change

Over the last decade, a growing number of scholars set up the research field on transition and system change. The rapidly growing body of literature draws from various disciplines and schools of thought, such as complex system theory, innovation and technology studies, governance literature and the broader social sciences (Farla, Markard, Raven, & Coenen, 2012; Wittmayer, Avelino, van Steenberghe, & Loorbach, 2017). Theoretical and empirical research in this field engages with a variety of different topics, including the historic analysis and direction of change (e.g. Haan & Rotmans, 2011; Kanger & Schot, 2018) and its different stages (e.g. Grin, Rotmans, Schot, & Geels, 2010), the actors involved (Farla et al., 2012; Geels,

2011) and the broader determining factors, such as complexity and uncertainty (Rotmans & Loorbach, 2009).

Transitions vs. Transformation – What do we mean by societal change?

While the call for systemic change increasingly resonates throughout political and scientific discourses, the terms ‘transition’ and ‘transformation’ have become metaphorical buzzwords that are often used interchangeably and lack conceptual clarity (Hölscher, Wittmayer, & Loorbach, 2018). In an attempt to elucidate the differences/similarities between the two concepts, Hölscher et al. (2018, p. 1) conducted a scientific literature review and found that “‘transition’ is especially used by the sustainability transitions research community to denote fundamental social, technological, institutional and economic change from one societal regime or dynamic equilibrium to another.”

Whereas ‘transition’ focuses on the changes within socio-technical sub-systems (Rotmans & Loorbach, 2009), ‘transformation’, on the other hand, is particularly used to describe substantial change processes within the wider society - for instance on global, regional, local level - with a focus on interactions between human and ecological systems (Hölscher et al., 2018). Despite this conceptual distinction, it is rather a matter of duality than dualism as the concepts are not mutually exclusive but can, in fact, enrich each other (Stirling, 2014). Hölscher et al. (2018) presume that the distinction stems from the different research communities and their epistemological positions which led to the development of diverging vocabularies.

In this research, preference is given to the term ‘transformation’ to describe an all-encompassing societal change process. However, transition and transformation might be used synonymously in their broader metaphorical sense.

2.2.1 Sustainability transformations – What kind of transformation are we talking about?

Given the contemporary environmental problems and related societal challenges (e.g. water and air pollution, climate change, loss of biodiversity etc.), this research focuses on ‘sustainability transformations’ which differ from most historical transformations in several aspects (Geels, 2011). Whilst great transformations from the past usually ‘emerged’ over time and are of autonomous quality (e.g. digitalization and the creation of new markets through novel technologies), sustainability transformations are – as the term implies – target-oriented and stem from the necessity to tackle persistent environmental issues (Smith, Stirling, & Berkhout, 2005).

A second unique aspect of sustainability transformations lies in the intrinsic value of sustainability which often clashes with the prevailing paradigms of performance and benefit maximization on the one hand, and cost reduction on the other. Since natural resources (and nature as such) have previously been seen as collective ‘taken-for-granted’ goods, the benefits of more sustainable products and services are not always obvious. Even more though, when their perceived functional quality lags behind established products and still comes at a higher cost (Geels, 2011).

Above all, sustainability transitions are inherently political (Meadowcroft, 2011). The normative goal of sustainability requires changes in all societal sub-systems and is hence about the interconnections and interactions between institutional (public, private, civil society) and social spheres (culture, discourses, paradigms) (Geels, 2011; WBGU, 2011). According to Meadowcroft (2011, p. 71) such all-encompassing and multi-level changes “can only be engineered through political processes and legitimised and enforced through the institutions of the state”.

2.2.2 Transition theories and lessons from history – What do we know about transformation processes?

Discussions about the governance and acceleration of sustainability transformations have led to the development of various conceptual frameworks to better comprehend transition dynamics and to advice policy makers on how to facilitate change processes.

The notion of ‘transition management’ (Rotmans, Kemp, & van Asselt, 2001) received much attention, especially in the Netherlands. Developed by Kemp and Rotmans (2005, p. 42), transition management is defined as “a deliberate attempt to bring about structural change in a stepwise manner”. The approach substantially contributed to questions revolving around the governance of large-scale societal changes and is now increasingly applied to sustainability transformations (Farla et al., 2012). Lessons from history have shown that transformational processes are either triggered by crises, the vision for a better or fairer future or by emerging knowledge (e.g. see case of the ozone layer) and technologies (WBGU, 2011). In many cases, change processes start with experimental-explorative action which, later on, leads to (wide-spread) cognitive realization (Epstein, 1994) and, subsequently, to political organization. As for the current moment, it is the perils of climate change (IPPC, 2018) that put pressure on the standard operation of governments and our current democratic system as a whole. Governments across the globe are facing numerous challenges, from matters of urgency, the need for trans-border cooperation and high levels of uncertainties to the rationalization of policies with immediate costs but only long-term benefits that exceed legislation periods (Leggewie, 2010).

Having analysed 6 cases of transitions from contemporary history (e.g. abolitionism -18th/19th century, European Integration - 1950s, the protection of the ozone layer – 1985 onwards, IT revolution and World Wide Web - 1990s), the German Advisory Council on Global Change (WBGU,2011, p.106) drew the following lessons:

- Transformations can be described as ‘open-ended processes’, the speed of which can vary significantly. Although some past transformations took hold rather quickly (e.g. World Wide Web), it usually takes decades to establish the basic structures that can facilitate long-term dynamics. For example, the European Integration process has been ongoing for the past 70 years and is still meeting resistance (see Brexit) while the abolition of slavery took over 250 years. Even despite a defined goal, the results of transformational processes are never certain, difficult to predict and not directly manageable. “Exactly how a transformative world will look like at the end of this ‘possibility path of many possibilities’ cannot be predetermined. Today, the focus must above all be on providing the impetus for a change of course towards the right direction” (p. 107).
- All transformations under investigation are seen as “collective acts of anticipatory change agents” (p. 106) which have been successful in their relation and communication with politicians and the broader public.
- Legitimacy and support of public actors has been essential for the success of transformative processes. Hence, states and citizens alike must ‘join in the cause’ towards societal change.
- The role of the state is particularly decisive, as the challenges we are facing today require “measures of unprecedented dimensions and profundity”. Implementing such measures necessitates a pro-active state, “which creates and actively promotes the appropriate room to manoeuvre and overcomes the high-carbon economy’s framework conditions to develop a climate friendly system” (p. 107).
- Transformations must always be understood as embedded in a broader landscape, since other megatrends and their respective dynamics are likely to have significant influence.
- Given the global nature of current environmental and social issues, transformative processes require international cooperation as well as the “establishment of supporting global governance structures as an indispensable driving force for gaining the envisaged transformation momentum” (p. 107).

Whilst the call for societal change gets louder, the WBGU (2011, p. 241) sees the big challenge in “turning awareness into action, as path dependencies, barriers to innovation, and institutional routines [...] stand in the way of the insights already gained, and paralyse the impulse to act”.

Challenging global framework conditions, (perceived) shortage of time, overambitious goals and a lack of collaboration can cause resignation and apathy. Hence, the question arises 'How and by whom can such a challenging process be initiated and facilitated?' The following section approaches this question from the popular concept of the multi-level perspective.

The multi-level-perspective on sustainability transformations

In recent years, the multi-level perspective (MLP) has increasingly grown in appeal among transformation scholars. The popularity of the concept, which has been significantly shaped by Grin et al. (2010) and Geels (2002), is partly due to its ability to illustrate the interrelations between technological, economic, political and cultural change processes. Based on a combination of evolutionary economics, technology studies and structuration theory, the MLP offers an 'appreciative theory' (Nelson & Winter, 1994) and a research framework to analyse long-term transformational processes. Whereas its initial focus was on technological innovation processes (e.g. land transport and shipping, see Geels, 2005 and Geels, 2002 respectively), it has recently been adopted to analyse social innovations and broader socio-economic developments (e.g. WBGU, 2011; Geels, 2011; Smith, 2007).

MLP proceeds from the assumption that radical innovations are developed in *niches* beyond the mainstream and carried out by a small number of individual actors and pioneer networks. The mainstream, in this sense, is understood as *socio-technical regimes* which are stabilized (locked-in) through market and user preferences, technological infrastructure, culture and science as well as through economic and political conventions, rules and norms. Such regimes are, in turn, embedded in a *landscape* of boundary conditions, megatrends and dynamics that cannot be directly influenced by individual actors in the short run (e.g. societal values and demographic trends). Exogenous developments on the landscape level (for instance climate change or globalization) can put pressure on the regime and, hereby, create 'windows of opportunities' for the breakthrough of niche innovations (Geels, 2002, 2010, 2011). Over time the new 'dominant design' (Geels, 2011, p. 28) leads to changes in the socio-technical regime and eventually influences the landscape level.

The MLP sketches a comprehensible picture of transition dynamics over time. Yet, it has been criticized in the past for disregarding the role of agency while, at the same time, lacking attention for structures of power, politics and governance (Genus & Coles, 2008; Meadowcroft, 2011; Smith et al., 2005). Such critiques sparked a vivid debate and led to further developments and clarifications of the concept.

For instance, Geels' (2011) revised MLP model grants a pivotal role to 'niche-actors' and their discursive practices - a view that is generally recognized in transition, innovation and diffusion literature, where such actors are commonly referred to as 'change agents' (e.g. Grin et al., 2010; Kristof, 2010). The term encompasses individual actors, groups and networks with a pioneering spirit that "have a convincing idea for change, and an initial concept for its realisation" (WBGU, 2011, p.243).

Meadowcroft (2011) further adds to the MLP model by exploring the role of politics in transitions. He finds that politics penetrates all three levels of MLP by "serving alternatively (and often simultaneously) as context, arena, obstacle, enabler, arbiter, and manager of repercussions (p. 71)." By analysing barriers to transition processes, a number of scholars recognize mutual dependencies between policymakers and incumbent market actors (Geels, Tyfield, & Urry, 2014). While governments set the general 'rules of the game' and influence the economic climate for businesses (through rights, obligations, norms as well as through incentives, loans, R&D investments etc.), they also depend on the 'structural power' of the business sector which provides jobs, tax income and economic growth – the latter representing the leading paradigm of contemporary capitalist societies (Geels et al., 2014; Newell & Paterson, 1998). In the context of sustainability transitions, various forms of power and resistance can be distinguished and roughly categorized in instrumental, institutional, material and discursive (Geels et al., 2014).

2.3 The role of narratives, frames and discourses in sustainability transformations

As suggested in the previous section, discursive practices are found to play an important role in the context of sustainability transformations and have recently been explored through the lens of MLP (Geels et al., 2014; Hermwille, 2016; Smith and Raven, 2012). This body of literature usually approaches the concept of discourses from a Foucauldian point of view where discourse analysis tries to "overcome the traditional distinction between what one says (language) and what one does (practice)" (Hall, 2001, p. 72).

Foucault understands discourses as the ongoing production and circulation of bodies of knowledge that, in turn, define and limit that what is knowable. Power, in the Foucauldian sense, expresses itself through discourses, for it generates social constructs based on a social order and the historical epoch in which they emerge ('episteme'). Norms and regulations but also concepts such as 'citizenship', 'the market' or 'capitalism' are - according to Foucault - objectified discourses which now constitute 'the social' (Shankar, Cherrier & Canniford, 2006). Discourses can shape not only our values but also influence the way we communicate with each other. "In short, if we understand discourse, we understand its authors' values, what they aspire to and the (taken for granted) assumptions they make revealing any unacknowledged political or ideological agenda in the discourse (Rooney, 2005, p.407)."

Hajer and Versteeg define discourse as “an ensemble of ideas, concepts and categories through which meaning is given to social and physical phenomena, and which is produced and reproduced through an identifiable set of practices” (Hajer & Versteeg, 2005, p. 175). Discourse is embedded in language and can be understood as a way to apprehend the world as it defines ‘common sense and legitimate knowledge’. “Each discourse rests on assumptions, judgements, and contentions that provide the basic terms for analysis, debates, agreements and disagreements (Dryzek, 2013, p. 9)”. Conferences, governmental hearings, the (social) media, trade shows and other events (e.g. the EU consultation on the Circular Economy package) as well as everyday conversations serve as settings to communicate, debate, produce and consume such discourses and narratives (Veland et al., 2018).

Whereas some scholars highlight the transformational potential of discourses and narratives (e.g. Hajer, 2002; Berkhout, 2006; Smith & Raven, 2012), others stress that discursive practices reproduce existing structures and, in fact, contribute to and maintain the stability of the current regime (Foucault, 1972). These seemingly contrasting views reflect a debate that has been central in the history of social and political thought. Since the time of Aristotle, questions about human agency and people’s capability to influence their own environment have occupied the minds of countless philosophers and scholars:

Do our actions, intentional or not, bear upon our destiny? Or are we simply creatures of habit, blind followers of cultural and linguistic orders too large and too powerful to be swayed? [...] Who or what shapes the course of social dynamics in the late modern world, an epoqe of rapid change and blurring boundaries between nations, cultures, knowledges, realities? Can shifting social designs and their designers be discerned at all? (Bleiker, 2003, p. 25)

Hence, analysing discourses cannot be done without engaging oneself to some extent in the structure-agency debate. Given the extensive body of literature and the limited scope of this thesis, I refrain from a profound review and, instead, follow authors such as Bleiker (2003), Bourdieu (1977) and Giddens (1984) for whom the ‘seductive dichotomy’ of either/or extremes is greatly misleading. In applying discourse to the MLP perspective, the dual nature of discourse can be illustrated: first, as a constituting aspect of all social, technical and political structures throughout the three levels and second, as social and political practices (in the sense of agency) which shape the dynamics of niche-innovation and regime re-production.

Geels (2014), for instance, found that discursive practices can serve regime actors to resist transitions by channelling what and how something is being discussed. Such ‘dominant discourses’ can shape the organizational and political agenda of regime actors, in turn influencing the framework conditions for niche-innovations. This phenomenon has been especially linked to policymakers and

incumbent business actors which form, what Hajer (1995) terms, a 'discourse coalition' , in other words an alliance which "can turn into a stable and hegemonic 'historical bloc' if it also achieves consensual legitimacy in civil society via widely accepted discourses" (Geels et al., 2014, p. 27, 2014).

In previous attempts to analysing discourses related to sustainable development, a number of constitutive elements have been identified (Dryzek, 2013, pp. 17-18):

- basic entities whose existence is recognized or constructed ('ontology' of a discourse)
- assumptions about natural relationships (perceived causal relationships)
- agents and their motives (stereotypes, roles and motives of perceived actors), and
- metaphors and other rhetorical devices (e.g. 'spaceship Earth')

Other approaches to analysing discourses introduced 'frames' and 'narratives' as the most commonly applied units of analysis (Eames, Mcdowall, Hodson, & Marvin, 2006; Lazarevic & Valve, 2017). The nuances between both concepts are difficult to distinguish as they overlap in some and diverge in other cases (Olsen, 2014). Olsen (2014, p. 250) explains the difference between narratives and frames as follows:

While frames specify a diagnosis and prognosis of a problem, narrative draws the audience in with the features of emplotment and temporality, which require the interpretive participation of listeners as they are engaged in an unfolding sequence of events that contains moral or practical consequences.

Thus, narratives are more about storytelling and the recitation of an event with beginning, middle and end (Hermwille, 2016) whereas framing is seen as a "deliberative, communicative process through which actors seek to mobilize a consensus and collective action around a given issue" (Martin, 2016, p. 150). Consequently, frames can be understood as "schemata of interpretation [which enable actors] to locate, perceive, identify and label" phenomena and events around them (Goffman, 1974, p.21). Although both concepts have been adopted to analyse discourses, transition scholars seem to give preference to 'framing' and have, in this respect, already established links to MLP (e.g. 'the energy regime' by Geels, 2014). It is due to this reason that the concept of 'framing' is the preferred unit of analysis for this thesis.

As for the link between 'discourses' and 'frames', Geels and Verhees (2011) suggest that discourses are more general and include various specific frames which are accepted by a broader public (e.g. the energy transition) whereas frames are more about the sense-making and interpretation of particular issues (e.g. the effects/ impacts of windmills). Yet, both discourses and frames relate in a recursive manner: "Existing discourses enable and constrain how actors can frame specific issues, but

framing struggles can also influence broader discourses if particular frames become salient and influence broader ways of talking and thinking; certain elements of frames may thus find their way into discourses (Geels & Verhees, 2011, p. 914).” Analysing the role of frames in transition, Geels (2014, p.29) draws on previous research by Snow and Benford (1988) and distinguishes between “*diagnostic framing*, which identifies and defines problems; *prognostic framing*, which advances solutions to problems and *motivational framing*, which provides a rationale for action and serves as a ‘call to arms’”.

2.4 Conceptual framework and operationalization

The Circular Economy has recently been framed as a promising alternative to the linear economic model from the past (EC, 2015; Dutch Government, 2016). By looking at this suggested transition through the lens of MLP, the current linear economy can be understood as the *prevailing regime* which has been stabilized through consumption and production patterns, infrastructure as well as social, cultural and scientific practices. Megatrends and manifested patterns on the landscape level (e.g. globalization, consumerism, economic growth, population growth) put pressure on the regime in the form of climate change and related environmental issues. This, in turn, creates tensions and opens up the regime for new innovations and alternative modes of operations – in this context for the *new regime* of a circular economy (see figure 2).

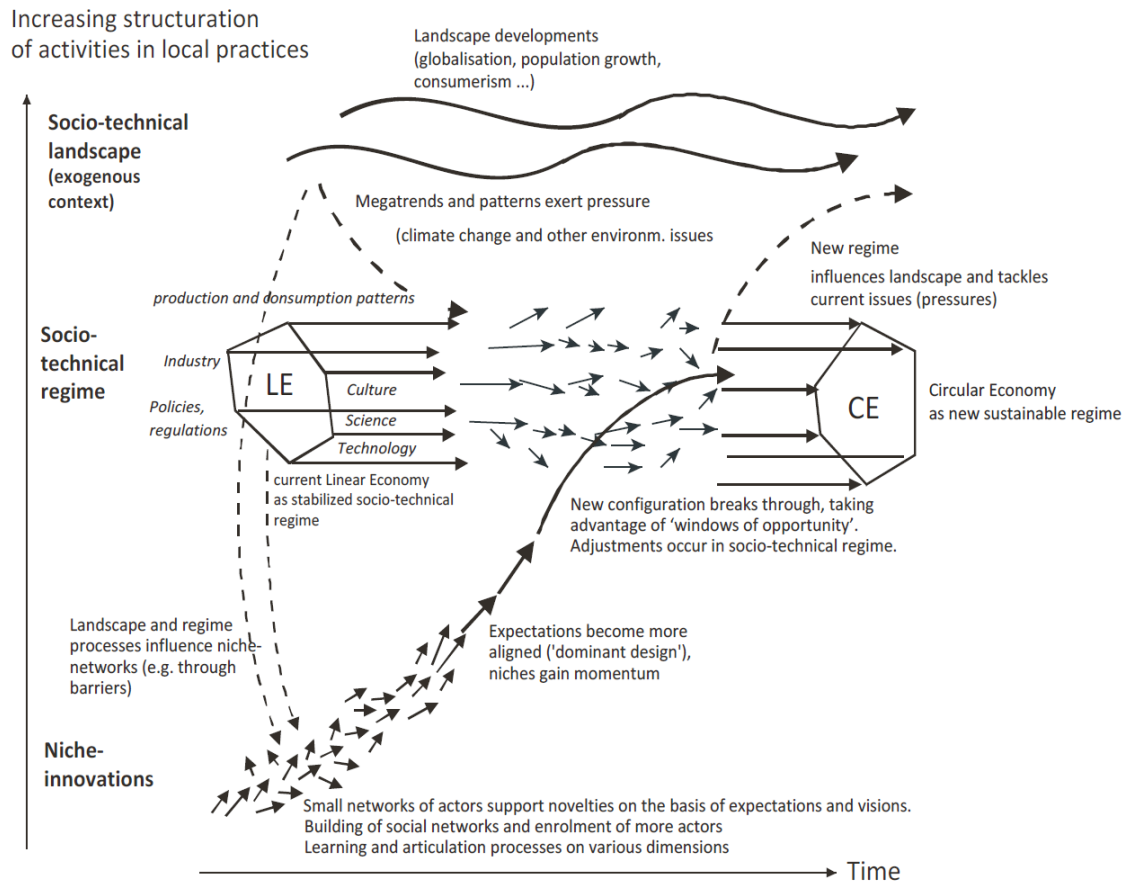


Figure 2: The multi-level perspective on the transition towards CE, adapted from 'The multi-level perspective on sustainability transitions: Responses to seven criticisms' by F. W. Geels, 2011, Environmental Innovation and Societal Transitions, p. 28. Copyright 2011 by Elsevier B.V.

According to the literature, discursive practices are embedded in all structures and dynamics of MLP. They are employed by niche and regime actors to either support (Smith and Raven, 2012) or resist (Geels, 2014) change processes as actors draw upon existing (dominant) discourses or produce contrasting frames that lead to 'discursive cracks' and 'windows of opportunity'. It can be suggested that the conceptual vagueness of CE allows for a variety of different interpretations which, in turn, draw upon and contribute to other discourses (recursive dynamic).

The following model illustrates the underlying assumptions and conceptual relationships with regard to discourses and frames through the lens of MLP:

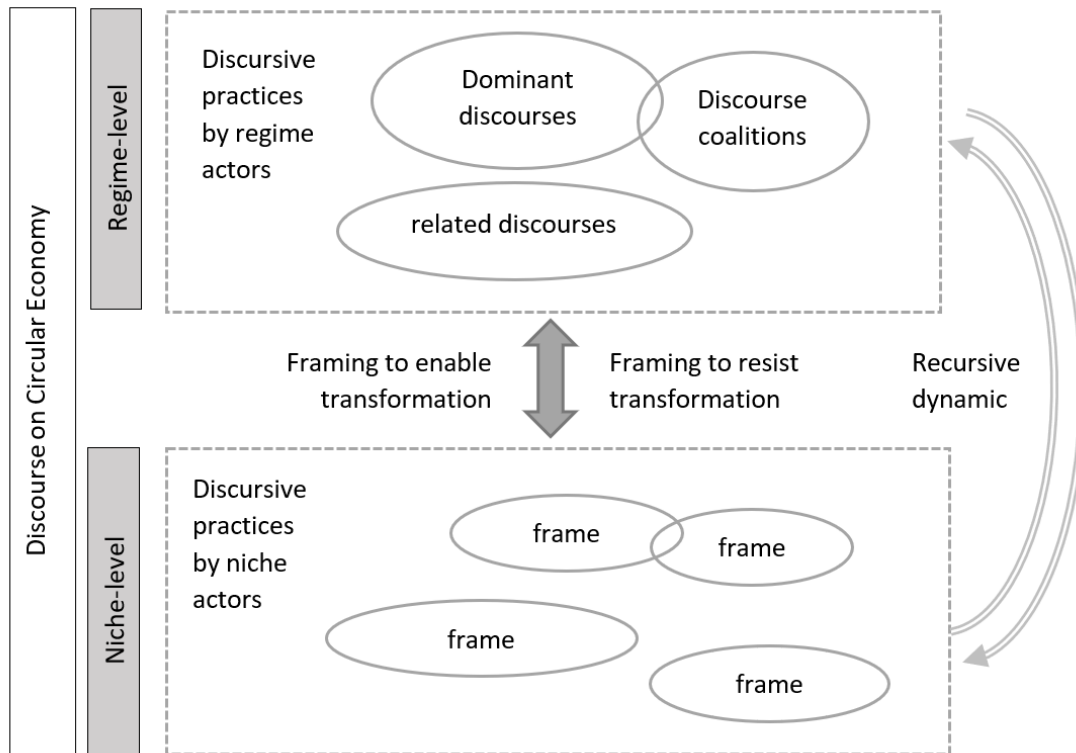


Figure 3: conceptual model, source: author

Based on arguments already discussed, the concept of ‘frames and framing’ will serve as an approach to reflect these presumably diverging interpretations. Depending on their dominance, such frames can have performative (e.g. slow down, divert, accelerate a transition) as well as structuring quality (e.g. by influencing the framework conditions for niche-innovations). Borrowing from Geels (2014), Benford (1988) and Dryzek (2005), the different frames under investigation will be analysed based on a combination of suggested substantive elements and discursive dimensions, namely:

- basic entities and ontology - How is CE and circularity understood?
- agents and their motives - Who are relevant actors and what are their roles and motives?
- assumptions about natural relationships – What are the causal theories of niche-actors?
 - setting and problem statement - What is/are the underlying problem(s)?
 - dynamics and links - What are perceived drivers and barriers?
- suggested solutions – What are the strategic theories of niche-actors?
- metaphors and other rhetorical devices - Which metaphor, analogies etc. are used to constitute the framing process?

3 Methodology

This chapter gives insights into the overall methodology of the research and presents ontological and epistemological considerations. Furthermore, the research strategy, case selection, available data sources as well as the approach to data analysis are presented and discussed.

3.1 Ontological and epistemological considerations

This research proceeds from the ontological position of *constructionism* in which the meaning of a social phenomenon is continuously ascribed by the participating social actors (Bryman, 2012). Discourse analysis, as applied in this context, is essentially based on a constructionist orientation with discourses being understood as ‘schemata of interpretation’ (Goffman, 1974, p.21). This research thus proceeds from the idea that various versions of reality are legitimate and that meaning is socially constructed through the discursive practices of social actors (words, speech, sounds, images etc.) (Smith & Bell, 2008).

As frames and discourses are by definition subject matter of the social world and hereby distinctively different to entities from the natural sciences, an interpretative approach is being adopted. This epistemological view challenges the social scientist to base her rationale on the constructed ‘thought objects’ of the social actors under investigation (Schutz, 1962) and to recognize that any attempt of causal explanation is “undertaken with reference to the ‘interpretive understanding of social action’ rather than to external forces that have no meaning for those involved in that social action” (Bryman, 2012, p. 30).

3.2 Research Strategy and Research Design

The research is guided by the main research question: *What are constitutive elements that substantiate the ‘theories of change’ (frames) applied by niche-actors in the field of CE and how can these theories be linked to broader discourses and the literature?*

The discursive practices related to Circular Economy appear to be understudied and the respective literature provides little theoretical resources in form of analytical frameworks. Due to this reason, an explorative in-depth case study methodology based on qualitative data is being chosen. A qualitative research strategy is best suited when the focus is put on linguistics rather than quantifications. This being the case, another emphasis of this research lies on its inductive orientation which allows for concepts and theories to emerge from the data (Bryman, 2012). To clarify, the purpose of this thesis is not to explain how social actors come to frame CE in a certain way as this would require thorough considerations of

cognitive and psychological processes. The focus rather lies on the way CE is being framed and on the exploration of the constitutive elements of such frames by taking broader discourses as well as social and political structures into account.

A case study research design is especially suitable as it facilitates exploration into new topics (Stake, 2010), in this case with reference to the recently popularized concept of a Circular Economy. Case studies are furthermore appropriate “when it is necessary to understand parts of a case within the context of the whole” (Vaus, 2001, p.231). As suggested by the literature, frames and discourses pervade all aspects of social life and require a cohesive way of thinking. At the same time, discursive practices must be studied in-context with reference to their situational setting. Yin (2009) suggest that a case study approach allows for such an in-context and in-depth understanding of a given phenomenon which is bounded (to a certain extent) by the case; hereby allowing for a documented account on what has been discovered.

3.3 Case selection and sampling method

This research is conducted in conjunction with *Diep* and *Cirkelstad*; the latter being a Dutch nation-wide network of professionals operating in the field of CE. *Diep* is a consultancy firm located in the Dutch city of Apeldoorn which kindly agreed to provide professional and personal guidance by facilitating the internship required for this Master certification. *Diep* and *Cirkelstad* recently started to collaborate with *Diep* becoming an official member of the network.

Cirkelstad offers a platform for private and public stakeholders within the construction industry. Following the motto ‘no waste, no drop out’ [geen afval, geen uitval] the network aims at the transition towards a circular and inclusive system approach. Launched in 2006, the network is now active in more than 16 cities and regions throughout the Netherlands while running a diverse array of projects (> 200) (personal communication, January 24, 2019; Cirkelstad, 2018). It is this variety of projects - ranging from the development of standards/norms, policies and instruments to project realization and consultations - as well as the diversity of its members (including actors from private, public and scientific sphere) which makes the case particularly interesting for studying the adoption and production of frames among niche-actors. Based on this argument, *Cirkelstad* serves as a case study for this research.

With the research objective in mind, potential interviewees were selected with a focus on diversity to mirror a broad range of frames on the Circular Economy. Hence, preference has been given to respondents that occupy different positions and play different roles within the network. This approach of

choosing participants based on a strategic purpose is referred to as 'purposive sampling' (Bryman, 2012). As a non-probability form of sampling, it does, however, not allow for generalization of the research findings. In addition, the process of 'snowball sampling' has proved useful, especially at the beginning of the research in order to gain access to the network (Bryman, 2012). The so-called spinners (networkers) from various Cirkelstad regions represented a good starting point as their connections within the network were helpful for identifying suitable interview partners. For a list of all interviewees see Annex 1.

3.4 Research methods, data collection and data analysis

The data for this research has been collected from both primary and secondary sources, including literature review, desk research, unstructured and semi-structured interviews as well as observations and field-notes from event participation. The qualitative research method of semi-structured interviewing enables the analyst to "keep more of an open mind about the contours of what he or she needs to know about, so that concepts and theories can emerge out of the data", hereby following an inductive approach (Bryman, 2012, p.12). A semi-structured interview guide containing a list of topics and open-ended questions were prepared in advance which led through the process while leaving enough room for open questions and further probing (see Annex 3). The structure of each interview and the phrasing of the questions thus varied from interview to interview (Bryman, 2012).

An emphasis was put on the in-depth quality of the interviewing process with the quantity of interviews being of secondary priority. In total, 7 interviews were conducted, two of which with the same interviewee. The first interview was done with one of the founders of Cirkelstad (Respondent 1). Here, the focus was to gain insights into the network, its mode of operation and to obtain access to Cirkelstad meetings and events as well as to potential interview partners. In expecting that the founder of the network is likely to have a clear idea on the topic of CE and could provide valuable insights, a second interview was then planned and conducted. To prevent confusion, data from both of these interviews is ascribed to respondent 1 (R1).

As discussed during the literature review, frames cannot be analysed without taking their broader context as well as related discourses into account. This presupposes that the researcher pays attention to her surrounding and the larger environment of the case. As indicated earlier, meetings, conferences, trade shows and other events serve as settings to communicate, debate, produce and consume different discourses and narratives (Veland et al., 2018). Engaging oneself in the 'working field of the case' by participating in and observing such events is a good way to extend one's understanding of broader

dynamics and “is viewed as particularly helpful in the generation of an intensive, detailed examination of a case” (Bryman, 2012, p. 68). Hence, special focus was put on the observation of ‘discursive negotiations’ situated in the contextual playing field of participants. The two national spinner meetings (O2 & O4) gave valuable insights into the operations of the network, currently running projects, ambitions and their strategic orientation. During the observations 1, 3 and 5 Cirkelstad introduced itself to potential partners, namely a knowledge institute (NRP), a large construction group (Roelofs) and a related network (CIRCLES) which focuses on CE trainings. These meetings gave a good impression on how Cirkelstad associates frame CE and how they attempt to convince third parties of their cause. Last but not least, an entire day was spent at the annual building and construction fair ‘Building Holland’ in Amsterdam. This event serves as a major platform for the production, communication and negotiations of different frames. This year the event featured various thematic islands with circularity being one of it. The podium on circularity was hosted by Cirkelstad and facilitated a great number of speakers to express their views on the topic. Observations from this day included presentations on the following topics: (1) How can I reach a Circular Economy? (2) How can I realise a circular project? (3) national circular working agreements [nationale circulaire werkafspraken], (4) How does a marketplace support circular projects? And (5) How do we manage to transform big supply chain in a circular fashion? All observations from this day are summarized under ‘Observation BH’ [BH for Building Holland]. For a full list of all observations see Annex 2.

3.4.1 Data collection:

A literature review served as a first step in the data collection process and provides the context and the theoretical frame of reference for the forthcoming study. In a second stage the focus was put on the collection of primary data with semi-structured interviews and observations as the main research method. All of the seven interviews were recorded and digitally transcribed. Complementing background information about the case *Cirkelstad* was gathered by means of desk research, including online sources, documents, reports as well as personal communication (via email and phone). As suggested by Bryman (2012), participant observations were documented in form of field notes as quickly as possible after the event, including general information on setting, location, participants, date/time as well as personal reflections and analytical thoughts. Before the start of the observation, approval was asked for by all participants and the purpose of the observations, including the background to this research, was explained. During the observations, the author restrained from any participation in the discussions in order not to influence the framing process. Special emphasis was put on the identification of rhetoric advices, buzzwords and general framing practices based on the operational model.

3.4.2 Data analysis

Having gathered data from interviews and observations in step two, a first review of the acquired information was done to gain a general overview and to detect areas which might require further theoretical insights in order to comprehend and interpret the data. This iterative strategy “involves a weaving back and forth between data and theory” and approaches the research as an ongoing process (Bryman, 2012, p. 26).

The acquired qualitative data from interviews and observations were analysed and coded with the aid of Atlas.ti software with reference to the conceptual model. In the process of coding data is “broken down, conceptualized, and put back together in new ways” (Flick, 2006, p.296). Open coding was used as a first step in order to identify segments of the text (word or sentences in a transcript) and to attach them to annotations, eventually resulting in a list of conceptual ‘codes’ and categories of meaning. Secondly, categories most relevant to the research questions were examined and further specified through sub-categories while trying to establish possible relations between such categories. Selective coding, as a last step, continued the process of axial coding on a higher level. This refers to the selection of core categories which are essential in the web of data and which unravel ‘the theory of change’ in this case or in other words the substantive framing elements applied by the participants. Following an iterative approach, these findings were continuously reflected upon and – where possible – linked back to the literature and broader discourses.

Since the interviews were conducted in Dutch, quotes used for the findings section were translated to English while staying as close to the original text as possible. Parts of the Dutch text which were difficult to translate, or which might convey a slightly different connotation in its original language were put in square brackets. Given the fact that the author’s mother tongue is neither English nor Dutch, this process of analysis and interpretation reflects a weakness to this research.

The results and the lessons learned are presented in the finding section of this thesis; followed by the implications for the network, further research recommendations as well as shortcomings and limitations to this study. The stepwise research process based on the overall research design is illustrated on page 25 (fig. 3).

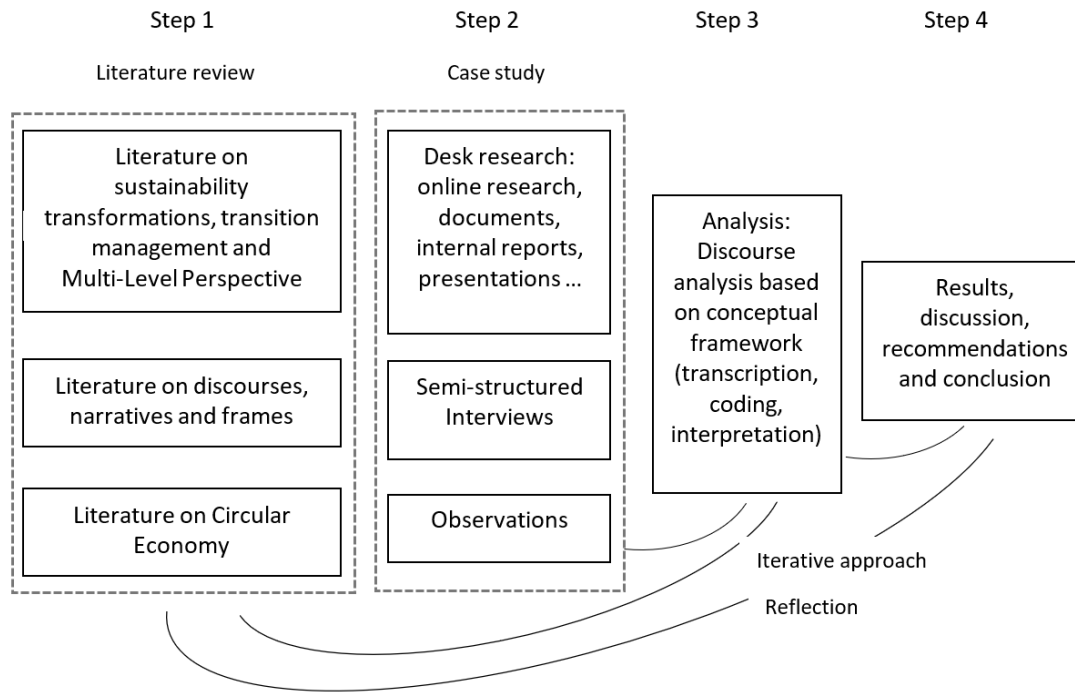


Figure 4: Research design and steps in the research process, source: author

3.5 Validity and reliability of the research

Yin (2009) suggests that case studies must be designed in a way that maximizes construct validity, internal validity, external validity as well as reliability. The requirement of *construct validity* in the context of case study research is seen as problematic with critics questioning the objective judgement regarding the data collection. However, preliminary considerations with regard the case selection and sampling methods for this study are in line with Yin's (2009, p.35) suggestion to test construct validity, namely:

1. To select a specific phenomenon (discursive practices within the Cirkelstad network) and to relate them to the main objective of the research (unravelling frames and discourses produced by niche-actors operating in the field of CE)
2. To demonstrate that the selection reflects the phenomenon under investigation (see arguments on diversity and situational context)

Internal validity refers to the issue of causality and tests whether an explanation presented by the researcher is logical and correct and whether "there is a good match between researchers' observations

and the theoretical ideas they develop (Bryman, 2012, p. 390)". With the case study at hand being of exploratory and descriptive rather than explanatory nature, the question of internal validity is less of an issue (Yin, 2003).

The third test on *external validity* deals with the question to what extent findings of the study can be generalized to a broader population (Bryman, 2013). As mentioned earlier, this aspect is problematic in the sense that the data is of qualitative rather than quantitative nature and is being derived from a small sample. In recognizing this shortcoming, the focus of this research lies on analytical exploration rather than statistical generalization.

For a study to demonstrate *external reliability* it must be repeatable, replicable and traceable at a later time or by a different investigator (Bryman, 2012). Hence, "the goal of reliability is to minimize the errors and biases in a study" (Yin, 2003, p.37). This was achieved by providing a detailed and transparent account of the procedures and methods applied for the research at hand. A research diary was used to reflect on the research process and to collect field notes for the observations. These field notes were later on digitalized and included in the coding process. The analytical processes (such as the procedure of coding) were documented in atlas.ti (e.g. with the aid of memes) which contributed significantly to meeting this criterium.

4 Analysis

The first section provides the situational context for the case and sets the scene for the construction sector. Subsequently, the case of Cirkelstad is being introduced in more detail. From point 4.2 onwards, insights from the case are being presented. They are structured along the lines of the conceptual model and give insights into the ontologies, assumptions about natural relationships, agents and their perceived roles as well as on the suggested solutions and rhetorical devices which constitute the various frames and which contribute to the shaping of the broader discourse on the Circular Economy.

4.1 Setting the scene

4.1.1 Industry profile

As one of the fastest growing industries in the Netherlands, the construction sector provides for more than 500.000 jobs (including self-employed) and recorded with 12% the highest increase in turnover in the last 10 years (CBS, 2019a; CBS, 2019b). The forecast for future developments remains positive with a predicted annual growth rate of 3.6% until 2021 (European Commission, 2018).

The construction industry is divided in (1) Residential and non-residential (commercial) Building [Burgelijke en Utiliteitsbouw] and (2) Civil Engineering [Grond-, Weg- en Waterbouw] which both differ significantly in structure and stakeholder constellation (Dutch Government, 2016). Much of the Dutch infrastructure (Civil Engineering) has been built between 1950 and 1980 with technical life spans ranging between 70 to 100 years. Consequently, a steep increase in maintenance costs is expected for the coming years, especially with regards to hydraulic assets. TNO, a Dutch innovation and knowledge institute, states that the current costs of ca. 6 billion per year are about to multiply in the next decades (Miedema, Tielemans, & Linde, 2014; Ministry of Infrastructure and Water Management, 2018). As for Residential and Non-residential building, the majority of the building stock stems from the post-war era which was characterized by an economic upswing and the need to build high quantities at low costs. Now, much of the building stock is becoming obsolete due to outdated installations and functionalities as well as demographic changes. As a result, the focus shifted from new constructions to the maintenance and renovation of existing premises (Miedema et al., 2014).

One respondent (R2) working for a recognized research institute in the field describes the sector as 'somewhat old-fashioned' with operations being 'doltish' and 'not very professional'. Another respondent (R5) who has years of experience in project development and consultancy in construction, refers to the industry as a 'hokjesdenken' branch which literally translates to 'pigeonholing'. In a later request for clarification she refers to the segmentation of the industry and states that some people

working in this field find it difficult to look or think beyond their own 'cubicle' ('hokje') (personal communication, 5 July 2019). The following quote by respondent 4 provides a similar indication:

At the moment it is very compartmentalised. The BAM want to be better than DURA... all of it is nit-picking in the margins. While together they could be creating the new norm. They find this scary. It still is: "you ask for it, we deliver it", that's still the norm. If you ask for this, you will get this.

Environmental impact of the construction sector

Similar to other European countries, the Dutch construction sector has a high environmental impact and accounts for about 35% of energy consumption, 50% of primary resource consumption and 30% of the total water consumption according to a study from the independent Dutch research institute TNO (Miedema et al., 2014). In addition, it has been estimated that 35% of CO₂ emissions can be ascribed to the industry which is also responsible for a large share of the total waste produced in the Netherlands (ca. 40%). In recent years, an 11% increase of demolition and construction waste (C&D) has been reported with about 3-6% being of hazardous nature (Dutch Government, 2016). Yet, C&D waste is already being re-used on a large scale, albeit on a lower value level (e.g. granulated construction rubble being used as foundation materials) (Dutch government, 2016).

4.1.2 The players

'Residential and Non-residential Building' consists of a large and diverse group of stakeholders and operates mainly on private funding. Here, residential building represents the larger segment with 57,4% compared to 42,6% of non-residential constructions (MarketLine, 2017). An industry profile report (MarketLine, 2017, p.13) found that rivalry "tends to be accumulated in segments and niche markets, in which players' operations are similar. The industry is mainly fragmented in the residential construction segment, while a few large players dominate in the non-residential segment." Soil and Civil Engineering on the other hand is represented by a smaller and more homogeneous set of actors which is mainly depending on public procurement (Dutch Government, 2016).

The supply side is composed of numerous sub-contractors which offer specialized competencies as well as a smaller number of construction material providers. The sub-market for construction materials is especially sensitive to global price developments with little to no substitution options, e.g. with regard to steel, iron or aluminum. At the same time most construction materials are commoditized, forcing companies to follow an economy of scale strategy (MarketLine, 2017).

Buyers range from government agencies, property developers and large private-sector corporations to individuals. The Dutch government, for instance, typically commissions infrastructure projects, such as bridges, dams, channels, road or railway constructions. Such publicly assigned projects have to follow a tendering process in which market players are invited to tender for contracts. This process generally puts the commissioning party in a powerful position as it can set its own terms, for instance regarding a 'circular approach' to the project. Individuals, on the other hand, have much less influence over market developments (MarketLine, 2017).

Entrance barriers to the construction market are relatively high. "For competing with incumbents as prime contractors on large infrastructure and commercial projects, a new entrant must be able to achieve large economies of scale, as well as offering a wide range of competencies, such as design, procurement, and project management, which reduces the risk of new entrants (MarketLine, 2017, p.13)." In order to compete in an economy of scale, considerable capital outlay is required (MarketLine, 2017). Consequently, access to finances poses a major challenge with 70% of businesses relying partially or fully on loan financing (European Commission, 2018). Despite positive developments in recent years and optimistic future financial outlooks (CBS, 2019a; CBS, 2019b), margins remain low and are likely leading to increasing competition and further consolidations (European Commission, 2018).

4.1.3 Rules of the game: current environmental policies and ambitions

Given the high environmental impact of the construction sector, the Dutch government has increasingly been promoting measures to reduce energy consumption, stimulate the use of renewable resources, close production loops and lower overall CO₂ emissions.

In 2016, a government-wide programme has been introduced, entailing the ambitious goal to reach 'climate neutrality' and full circularity by 2050. The programme gives special attention to the construction sector as one out of five priority industries to reach the following objective (Dutch Government, 2016, p.59:

By 2050, the construction industry will be organised in such a way, with respect to the design, development, operation, management, and disassembly of buildings, as to ensure the sustainable construction, use, reuse, maintenance, and dismantling of these objects. Sustainable materials will be used in the construction process, and designs will be geared to the dynamic wishes of the users. The aim is for the built-up environment to be energy-neutral by 2050, in keeping with the European agreements. Buildings will utilise eco system services wherever possible (natural capital, such as the water storage capacity of the sub-soil).

The document is based on previous policy programmes such as 'VANG', the Waste to Resources programme for more sustainable use of raw materials, as well as 'Biobased Economy' which focuses on biomass as a renewable resource to substitute fossil fuels (Dutch Government, 2016). As a starting point, more than 300 public, private and civil society actors signed the 'resource agreement' [Grondstoffenakkoord] – a 'letter of intent to develop transition agendas for the Circular Economy'. By signing, participants of each priority sector pledged to contribute to the transition towards a circular economy by 2050, to work on a transition agenda and to come to agreements, e.g. with regard to the course of action, long- and short-term innovation projects, knowledge transfer, social implications and investment options (Grondstoffenakkoord, 2017, p.2).

When asked about current legislation with the highest impact on sustainability in the construction sector, one respondent (R2) refers to the requirement of energy efficiency for new buildings as defined in the building act [bouwbesluit] from 2012 and the new BENG norm standard 'almost energy efficient buildings' [Bijna energieneutrale gebouwen]. The BENG standard comes into effect as per 1st July 2020; governmental buildings already have to conform since January 2019 (RVO, n.d.-a).

Two respondents (R2, R5) also mention the 'Environmental performance index for buildings and civil engineering' [MilieuPrestatie Gebouwen en gww-werken, MPG] which indicates the environmental footprint of a construction and is based on Life Cycle Assessments for the materials used. This method is based on 11 environmental impact categories, including for instance global warming potential, deterioration of the ozone layer, marine and fresh water ecotoxicity (Stichting Bouwkwaliiteit, 2019). It's an assessment method commonly used and well known throughout the industry (R2) and mandatory for all residential and office buildings larger than 100m². Since January 2018, it dictates a maximum value of €1 per square meter gross floor surface per year. This value is the sum of all so-called 'shadow costs' which represent the necessary costs to (hypothetically) undo the inflicted damage to the environment (RVO, n.d.-b). These legislations apply to newly constructed buildings.

For existing constructions, the focus lies mainly on the improvement of energy efficiency, e.g. through means of isolation techniques. Here, proprietors are being encouraged to prove the energy efficiency of a building, e.g. with the aid of energy indices and labels. For instance, office buildings larger than 100m² need to possess at least energy label C by 2023 (RVO, 2018).

Up to date, there is little 'hard' legislation with an exclusive focus on circularity. Yet, the topic is directly or indirectly integrated or referred to in a number of policies, for instance in the national waste management plan, VANG, the 'concrete agreement' [betonakkoord] and the public procurement rules (RWS, 2018;

‘Betonakkoord voor duurzame groei’, 2018). The MPG calculation method mentioned above also indirectly includes some of the circularity aspects as formulated by the Ellen MacArthur Foundation (see point 2.3), e.g. by taking into account the lifespan of materials, their maintenance and the use of recycled alternatives. However, this method was designed to measure the environmental impact of the materials used in the construction process. According to respondent 2, the method does not fully account for the circularity of a building or material.

To solve this problem a working group consisting of stakeholders from the public, private and scientific sphere (including respondent 2) are currently working on a new assessment method for circularity. The working group is part of Platform CB’23 and initiated and financed by the *Central Government Real Estate Agency* [Rijksvastgoedbedrijf] and Rijkswaterstaat, the executive agency of the Ministry of Infrastructure and Water Management (R2; Platform CB’23, n.d.).

4.2 Introducing the case: Cirkelstad

What started as a project collaboration between Roteb [former city cleaning company], Oranje [construction firm], Den Boer beton and Woonbron [housing association] in 2006, is now a nation-wide, membership-based cooperative which connects private and public stakeholders on the subject of circularity, operating under the name Cirkelstad [literal translation: Circle City]. With a focus on the construction industry, the network strives for urban landscapes ‘without waste nor drop-outs’ [steden zonder afval, zonder uitval] (personal communication, January 24, 2019).

To date, Cirkelstad is active in 17 Dutch cities and regions (see figure 5). Members of the respective regions shape what is being called *the Communities of Practice [CoPs]*. During a number of annual meetings, participating parties discuss their current issues, exchange knowledge and form solution-oriented partnerships to increase their competencies. Insights from regional projects are being shared via Cirkelstad’s media channels and on their national knowledge platform (Cirkelstad academy). Turning practical and local expertise into collective knowledge is one of the



Figure 5: Cirkelsteden (Circle Cities) in 6 regions as of June 2019. Reprinted from Cirkelstad.nl, 2019. Retrieved from <https://www.cirkelstad.nl/cirkelsteden/>. Copyright 2019 by Cirkelstad

objectives of the network as well as translating this knowledge into cross-sectoral standards and accelerating the transition towards circular building practices (R1; Cirkelstad, n.d.-a).

In order to participate in one of the six Cirkelstad regions, members must pay an annual membership fee with the amount depending on their yearly turnover, their form of organization and the kind of partnership they want to enter. A network of regional partners can receive 'town privilege' and act as a full 'Cirkelstad' [Circle city] as soon as the respective partners can collectively provide 30.000 Euros per year. Every Cirkelstad is being coordinated by a so-called 'spinner' who seeks new partnerships, cultivates and expands contacts, initiates activities and hosts Cirkelstad meetings (Cirkelstad, n.d.-b; personal communication, January 24, 2019). Over the course of this research it became evident that the network is in a period of rapid growth, propelled by the ambition to expand the network to 30 Circle cities by 2020 (Cirkelstad, 2017).

4.2.1 Insights from the case: Framing CE

With all interviewees being actively and professionally engaged in the field of circularity, it does not come as a surprise that the notion is being framed to some extent as a holy grail. Yet, as suggested by the literature, respondent's interpretations of CE are diverse and somewhat vague. Asking one of the Cirkelstad spinners (R3) how she would explain the concept to potential members or project partners, she answers:

I don't have the feeling that I need to explain circularity since most [of them] are already dealing with the topic. More often, I rather experience it as a conversation, an exploration as in 'What does it mean to you?' Because, during every conversation it becomes evident that there is no perfect definition of circularity. But everybody, within their own work environment, has an opinion about it and finds an ambition or a goal within it. And I guess that's just fine. (R3)

The quote illustrates the elasticity of the concept which might well be a catalyst for its success. Interestingly, the term 'circularity' [circulariteit] has strong preference among the practitioners as compared to 'Circular Economy' [circulaire economie] which dominates the scientific literature. In fact, 'Circular Economy' is only used as a counterpart to 'Linear Economy' or in connection with the government-wide programme ('A Circular Economy in the Netherlands by 2050') (R1-R6). However, circularity - as free-standing noun - lacks a clear reference point and conveys the impression of a self-qualified state of being; bearing resemblance with the discursive shift from sustainable development to sustainability over time.

When being asked directly about their personal understanding of circularity, most respondents establish a strong link with sustainability or even equate both terms, for instance:

Circular is sustainable. Because you are decreasing the [negative] impact on the planet. You are re-using materials at a high value in the supply chain, you are using stones as stones and not as rubble for under the road. Thus, circular is definitely sustainable (R5).

Circularity is a form of sustainability. Energy transition is a form of sustainability, climate adaptation is a form of sustainability. If you are talking about sustainability, then it's for the long-term, in my view. To keep it manageable and tenable for us as humans on this earth (R6).

It is also being defined as a 'design principle' and a 'philosophy' (R2) as well as a 'solution-oriented pathway to preserve and optimally deploy that what is of value' (R4). At other points, respondents perceive circularity as a component of sustainability (R2, R3, R4) or as its further development (R6). In this sense the discourse on circularity seems to both contribute to and supersede the discourse on 'sustainability'.

The fuzziness between both concepts has recently incited a growing number of scholars to aim for clarification. Geissdoerfer and colleagues (2017, p.767), for instance, examined 67 scientific journal articles with a clear link to both, CE and sustainability and found that "Circular Economy is viewed as a condition for sustainability, a beneficial relation, or a trade-off in literature". Borrowing from Geissdoerfer et al. (2017, p.766), it can be stated that all interviewees establish at some point a beneficial relation between CE and sustainability, hence assuming that CE is beneficial in terms of sustainability (+A → +B). Yet, while talking about their practical experience in the field of CE (e.g. with regard to projects) respondents (R2, R3, R4, R5) also note discrepancies between circularity and sustainability and refer to certain trade-offs (see barriers).

Respondent 2 has his own theory why circularity might be gaining more traction among practitioners as compared to sustainability:

Circularity obviously sounds very appealing. I believe that it holds, to some extent, the promise of economic efficiency. Maybe it is also more efficient regarding costs. [...] People perceive circularity as a more promising perspective than what sustainability used to be in the past. Sustainability was rather seen as the duty to save the planet. However, that always hurt, it was always unpleasant and always expensive. And it seems that circularity holds a different promise.

As suggested by respondent 2, it is possible that the discourse on sustainability has lost its appeal and has become an unpleasant imperative rather than a 'manageable' pathway. Contrary to this, the alleged promise of economic efficiency and profitability of CE seems to have taken hold on the regime-level as it is currently emphasized by the European Commission and the Dutch Government (see point 2.1.2 & 2.1.3).

It illustrates how CE is framed as “a model that stimulates growth with negligible environmental damage” creating a “win-win” for both the economy and the environment (Millar, McLaughlin & Börger, 2019, p.15).

Perceived aspects of circularity

Over the course of the interviews, many aspects and principles are being directly or indirectly ascribed to the concept of CE. The closing of production loops, resource efficiency and the re-use and recycling of materials seem to be generally accepted elements. The regenerative and adaptable design of constructions is also being emphasized.

Two respondents, who cooperate closely in the same regional programme, both immediately relate circularity to the topic of energy efficiency:

Circularity is the sustainable handling of resources and [! - emphasis] energy. These are the basics things we use from the earth. We use resources – here you can think of anything – and energy. Hence, sustainable energy consumption is yet another component of circularity (R6).

How am I seeing the link between circularity and energy? They go hand in hand. I think that you have to consider the entire lifecycle of the materials in your construction, in your construction process, how you are going to build it, and in the future – how you are going to manage the energy of the building. If this is in line, then you are working sustainably. If you forgot about this part [energy], it's incomplete (R5).

One of them is working for an energy management firm whereas the other assumes the position of a wethouder¹. This might indicate that both developed a shared vision of circularity due to their close collaboration.

The ‘spinners’ (R3, R4, R5) as well as Cirkelstad’s founder and current ‘city manager’ (R1) put special emphasis on the ‘human side’ (R1) or ‘social aspect’ (R3) of circularity with reference to the network’s official motto ‘no waste, no drop-outs’. In this context, ‘no drop-outs’ [geen uitval] is seen as the ambition to actively ‘search for talents’ in proximity to a given project. According to the network’s mission statement, this is done in three ways: First, by connecting people who are currently at a distance from the job market to the executive parties of the respective ‘circular’ project. Second, by supporting people who want to get engaged and create initiatives for and with local residents and third, by facilitating

¹ Wethouder is sometimes being translated as ‘alderman’ and refers to the position of a Dutch public administrator. He or she is a member of the executive committee [dagelijks bestuur] of a municipality and is charged with a certain portfolio (e.g. education, ICT or sustainability). (Dutch Law Encyclopedic Dictionary, 2018)

citizen participation, e.g. in the form of public consultation (Cirkelstad, n.d.-c). The city manager of Cirkelstad (R1) formulates it as follows:

Appreciate what is. Think in circles with regard to materials [...] but also with regard to people. Maybe they can't do certain things anymore. But every individual has talent. Go look for these talents and find out how to use them for the things you are doing. That is the human side of circularity.

Whilst this 'social aspect of circularity' is seen as an official objective, it currently proves challenging, according to two respondents:

I am always getting enthusiastic about it, but I do have to add: circularity in general received much more attention than the social component. It has been a struggle the last couple of years. What used to be 'no waste, no drop-outs' [Steden zonder afval, zonder uitval] is now called 'circular economy and inclusive societies' – we didn't have these words back then. Circularity gained much more momentum and we want to take advantage of it. And regarding the projects we are doing, we do check how to implement the social component. It has kind of a sequential logic to it. (R1)

I am noticing that the focus lies more on the technical and process related aspect and less on the social aspect. [...] I guess that's not bad at all and I think that other [social] projects will turn up because they are needed. But it apparently there is no time nor futile ground to get it off the ground. (R3)

The statements above are being confirmed by the findings from the observations during which little to no attention was given to the 'social aspect' as understood in this context (O1-O5, O-BH). Reflecting on the distinction between the material/technical vs. the social/ human aspect and the earlier established link to sustainability, it doesn't go unnoticed that 'the social' or the 'P from People' is indeed being neglected in the current discourse. As noble as the ambition for 'no drop-outs' might be, it only covers a small fraction of 'the social' as intended in the sustainable development goals; let alone does it account for 'the human' on the 'other side' of the world. Questions about equality, work conditions or justice beyond the realm of the Dutch construction sector are not considered.

CE vs. energy transition?

At some point, almost all participants (R2, R3, R4, R5, R6) bring up 'the energy transition' [energietransitie] and discuss its link with CE. The term refers to a parallel discourse which aims at the transition towards a sustainable energy system by 2050. Based on the Paris climate agreement from 2015, this national

ambition is now being included in a number of Dutch policies (e.g. energy agreement, new gas law, offsetting regulation for solar panels) (RVO, n.d.-d; PBL, n.d.).

It is evident that the discourses on energy transition and circularity are being separately discussed despite their strong contextual connections, especially with regard to the construction industry. Observations from meetings and the national construction fair in Amsterdam [Building Holland] support this impression. The fair, for instance, organized presentations and discussions around four thematic islands (stages) which were spread throughout the location, namely (1) circular constructions, (2) digitalization in the construction sector, (3) energy transition and (4) renovation and transformation.

The Dutch government has set the target to switch the energy supply of 7 million existing residential buildings from natural gas to renewables by 2050 (Klimaatakkoord, n.d.). This has direct influence on the construction and civil engineering sector in their function as executive party. Still, respondents (R2, R5, R6) observe that the energy aspect is either being neglected or is leading to clashes with the discourse on circularity and sustainability.

One respondent (R4) states, for instance, that the discourse on circularity seems to focus on the 'material footprint' rather than the 'energetic footprint' of materials (e.g. with regard to global production and transportation patterns). Moreover, energy efficient buildings must fulfil certain conditions, e.g. with regard to isolation and installations. Choosing materials with these properties can apparently lead to compromises in relation to the sustainable or circular features of such materials (R2, R5, R3). In this context, respondent 5 sees issues on various fronts:

We can see it with the houses from the 1960's – the social residential development in the Netherlands. These are actually really bad houses. Now we are going to wrap them in a mantle to make them more sustainable whereas you actually have to take them apart and build a better house in the first place. But that is very expensive. Well, creating a surrounding structure is also expensive. So, these are very difficult considerations. And you often cannot do anything with the old materials due to asbestos. It's all endlessly glued, gummed up and everything falls to pieces if you want to take it out. It's all very difficult.

On the development of the discourse: from experimentation to a measurable score

According to the city manager of CS who has been involved in the network for more than 8 years (R1), the discourse on circularity has not only gained considerable momentum but also changed its connotation. Whereas the focus initially was on experimentation and exploration, it now becomes necessary to align the various understandings and to come to an industry-wide standard:

The last couple of years I especially liked the fact that there were actors who took the initiative. There was no benchmark, there was no yardstick. I think that all undertakings that brought us one step closer to circularity were good. One is concerned with the use of bio-based materials, the other one looks at renovations instead of demolition [...]. I believe that all of this brought us to the stage we are at right now. And now we want to reach unity in thinking and doing. Therefore, it is becoming important to develop a definition as in 'What do we understand by circularity?' (R1)

As mentioned earlier, a new assessment method for circularity is currently being developed by one of the action teams (1- Measuring circularity) of Platform CB'23 – an initiative of the governmental bodies for real estate, infrastructure and water management. According to respondent 2, member of the action team, it is crucial to come to a coherent, standardized visualization of circularity by means of quantitative methods. Even more so as the market is currently using a variety of incomparable indicators and measurement tools which can lead to bad decision making (R2).

Two other 'action teams' are charged to develop (2) a general framework to negotiate a common language for circularity (Framework circular constructions) as well as (3) a harmonized and standardized format for 'material passports' (Passports for the construction sector).

It is evident that current assessment methods use a very technical and economic language which also finds its way into professional conversations. This language includes terms such as 'environmental performance', 'environmental Euro' [milieu-euro], 'shadow costs', 'sustainability instruments' and 'MPG credits' (RVO, n.d.-b). The following quote, in which respondent 5 speaks about a future pilot-project, serves as good example:

They are going to build a new headquarter and that's going to be sustainable, green, BREEAM outstanding [$\geq 85\%$ score in BBREAM sustainability assessment], and circular. They are also going to do the 'Wearthy scan' [MPG optimization scan]. That means they are searching for sustainable building materials and dismountable options. [...] So, we are going to connect them to the Dutch Green Building Council to check together with a BIM expert (Building Information Modelling) whether we can build dismountable and circular to score some more points for BREEAM.

Based on observations and insights from the interviews, the adjective 'circular' is used extensively to refer, first, to everything directly related to the broader subject of CE – from circular frameworks to circular project management – and, second, serves as a marketing term to advertise materials, products or entire constructions which are allegedly based on certain aspects of CE or which 'scored high' on the assessments. In its original sense, the term 'circular' describes the nature or quality of something that is 'shaped like a circle' (Cambridge Dictionary, 2019a). Yet, without any distinction on the level of circularity, the term implies the possibility of full circularity and thereby compresses a highly complex issue into a

marketable catch-all term. Using such an absolute term should be done with caution as it can easily convey misleading claims and involves the danger of ‘greenwashing’. In fact, respondent 2 reports a number of challenges which stand in the way to measure ‘full circularity’ (CB’23) and hereby illustrates the need for differentiation. Some of the question currently discussed in his working group include:

- How to deal with renewable resources and their possible depletion potential? (e.g. with regard to biomass)
- How to deal with scarcity? (e.g. copper, zinc or other scarce metals)
- How to deal with adaptive building structures with multiple functionalities and extended lifecycle periods (e.g. demountable, modular structures)?
- How to evaluate the efficiency of the production process? (the adequacy of total materials used)
- How to deal with toxic or impure materials which have limited re-use potential?
- How to quantify the value, loss of value or value retention of a product or material? (example low- vs. high-value recycling streams)

To abide to current rules, regulations and intentions, the industry relies heavily on standards, norms (e.g. NEN, ISO) and quantitative assessment models which address various concerns, ranging for instance from energy efficiency, resource efficiency and human health to safety and quality (Rijksoverheid, 2019). Due to this dependence, the *operational framing* of CE is of great significance for the *strategic framing* deployed by niche- and regime actors. In *Seeing like a State*, James Scott (1998) illustrates this relationship with the historic anecdote of the ‘standard tree’ (der Normalbaum) in Germany. Originating from the need to increase the yield of woods in a given plot of land, people set out to inventory current stocks and calculate their yield capacity. Along the way, the idea of the perfect tree evolved which would increase harvests and facilitate forestry management – der Normalbaum was born. The same idea allowed for a synoptic view in which the forest and all its ecosystem services were reduced to commercial wood. Over time German forests came to resemble the uniformity of the calculation tables as interfering elements (including all those unprofitable and non-conform bushes, plants and trees) were increasingly removed. Scott (1998, p. 87) uses the example to stress the structuring nature of normalization and standardization procedures:

Those who gather and interpret such aggregate data understand that there is a certain fictional and arbitrary quality to their categories and that they hide a wealth of problematic variation. Once set, however, these thin categories operate unavoidably as if all similarly classified cases were in fact homogeneous and uniform.

Although scores, ratings (e.g. 5-star BREEAM rating) and categorizations (e.g. linear vs. circular) are without doubt beneficial for operational processes and communication purposes, one must also be aware of their deceptive nature, regarding the complexity of current issues and the uncertainties that come with them.

4.2.2 Insights from the case: assumptions about natural relationships (causal theories)

While talking with respondents, it seems that the need for change is implicitly acknowledged. ‘Anders doen’, ‘anders denken’ [think and act differently] and ‘re-think’ were used as buzzwords not only during the interviews (R1-R5) but also during most of the observations (O1, O2, O5, O-BH). As for the reasons which necessitate such change, the imminent danger of resource scarcity caused by linear modes of operations is mentioned as one of the main reasons. The emphasis on ‘circular’ as opposed to ‘linear’ is a critical aspect of the discursive construction of CE as the distinction indicates both a problem statement (‘linear is problematic’) as well as a solution (‘circular is the solution’).

Other problem statements relate to waste creation and the loss of value over the lifespan of a given material or product (R1- R6). In addition, all interviewees acknowledge the increasing environmental and social impacts (with regard to health and toxic materials) of current production patterns (R1-R6). For instance, respondent 4 and 6 observe the following:

The way we design has a very linear aspect to it. We extract a resource, we make something of it and when it's done, it's done. But that's only important the moment something is being delivered. Then it has a value – the value that you and I are willing to pay for it. What's happening to it after the utilization phase and with regard to its quality has been pushed to the background. Now we are gradually discovering – with climate, toxicity in materials, health – that this is also relevant for our own wellbeing (R4).

... Because we now have to face that resources and energy are running out. And now we come up with something that simply allows us to re-use resources and energy at any time – that's circularity (R6).

Given the high import rate of raw materials for the industry and the globally increasing demand, it does not come as a surprise that the risk of depletion (often coupled with population growth) served as a general introduction during presentations held at the Building Holland fair in Amsterdam (O-BH). Yet, what seems to be a concern for the carrying capacity of the earth, is also related to the geopolitical discourse on critical materials and the dependency on other countries (import) (PBL, 2019).

CE exemplifies the expectation that the closing of production loops and the perpetual circulation of resources at their highest value can contribute to solving current environmental issues. The following two quotes serve well to illustrate this expectation:

Circularity, in my view, has always to do with 'rethink' – before you begin to do anything, keep the value that is already there. Keep as much value as possible. That means don't immediately start to dismantle, destroy or to throw away. [...] So, first, value retention is an important aspect. Second, deal consciously with material streams. Make sure that extracted materials are being reintroduced in a similar application area. So, if you are taking out the curtains, get on with them and try to put them into the new or a different building. Let it circulate. And third, invest into the future. Think now, create now something that can have a second, third or fourth life by making sure that a construction can have a different function. Make sure that it's built in a modular fashion so that you can take it apart later on (R1).

What you see is that companies are buying resources and turn them into stuff. Hereby, waste is released as a by-product. But waste – that's of course simply value. Value that you are simply throwing away. So, if you can make sure that waste is no waste no more but a resource for something else, then the value remains within your company. That's why I am thinking that circularity is not only good for the environment, but it is also good for your wallet because it prevents the loss of value. And if something is good for the wallet, an entrepreneur will always be interested (R6).

By looking at these statements through the lens of discourse analysis, a number of assumptions can be revealed: **(1)** waste is identified as a resource which can be **(2)** re-introduced into the production process. **(3)** The value of the resource/waste can be retained by circulating it as long as possible on a high level.

The second quote also highlights the assumption that circularity can be achieved in a profitable fashion, hereby linking once more to the alleged promise of economic profitability (see 4.2.1). The four assumptions recur throughout all interviews (R1-R6) and were also taken up in presentations at the Building Holland fair. Hence, the following section will explore these assumptions in more detail.

(1) Waste as resource

With Cirkelstad's slogan 'geen afval, geen uitval', the topic of waste gains centre stage. Although the term has been used continuously throughout the observations and interviews (R1-R6, O1, O3, O5, O-BH), little has been said about its connotation.

Why the construction sector? I think it is generally known that the construction sector is the biggest waste producer, that is to say that 40% of the total waste comes from the construction industry.

And that's where the focus is put; parties start to deal with it, they hear about it and they start to think about it (R4).

A possible explanation can be provided by considering 'waste' as a prime example for a social construct. The term officially translates to "unwanted matter or material of any type, especially what is left after useful substances or parts have been removed" (Cambridge Dictionary, 2019c). This definition leaves plenty of room for interpretation, yet it explicitly emphasizes 'the unwanted' and 'the useless'. The theoretical concept of CE aims to re-define waste in such a way that the 'unwanted' becomes 'wanted', or in other words, that waste translates to value (see also sub-section value retention).

The transition is moving into a direction where we won't have any waste. (R6)
We keep moving on until there is no waste anymore. (R1)

However, any attempt to re-define what we perceive as waste must take into account both its technical/legal definitions (based on national/ international norms and regulations) as well as its culturally constructed meaning. With regard to the latter, Korhonen et al. (2018) stress that the concept of waste is always constructed in a "certain cultural, social and temporal context" which is both "dynamic and changing". They illustrate this point as follows:

In developing countries people literally eat societal and residential wastes. Therefore, in these cultures, waste equals nutrient value for humans. [...] The physical flows cross man-made, administrative and organizational boundaries and borders. Therefore, a consensus on what is usable and what is not is very important for the ideals of circular economy to contribute to global sustainability.

A recent PBL report (2019, p.38) found that the use of certain (a)biotic residual streams is hampered by national and European legislation and their definition of 'waste'. Companies who want to process such residual streams are obliged to apply for a 'waste process permit' [afvalverwerkingsvergunning] which, in turn, entails administrative duties and further costs. Respondent 6 makes a similar observation:

Respondent: If you really commit to circularity, it can be that you run up against certain regulations. That things might or might not be possible.

Interviewer: Because of the term waste?

Respondent: Yes, because of the term 'waste.' For example, if you want to use certain materials you have to conform with certain quality standards. That means, it could happen that re-used materials don't meet the quality standards because they are re-used. Well, these are things you have to consider, whether it is possible or not.

(2) re-introduction of waste streams into the supply chain

This idea is often being conveyed with expressions such as ‘closing the loop’ [het sluiten van kringlopen] (Observation BH), ‘think in circles’ (R1), ‘make the circle round’ (R1, R3, R4), ‘cradle to cradle’ (R2, Observation BH), the ‘reutilization of materials and waste streams’ (R1-R6) or as ‘harvest of materials’ [het oogsten van materialen] e.g. in the context of the demolition of constructions (Observation BH).

Being one of the key principles of CE, the idea of closed material cycles is much debated in the literature. As Georgescu-Roegen (1971) suggested decades ago, recycling practices will everlastingly require energy and continuously produce side-products because of increasing entropy (2nd law of thermodynamics); rendering the concept of closed material loops practically and theoretically unattainable. Based on this, Korhonen et al. (2018, p.42) stress that a Circular Economy could lead to “unsustainable levels of resource depletion, pollution and waste generation if the growth of the *physical scale* of the total economy is not checked”; hereby putting a special emphasis on the long-term effects.

Translating this argument to the Dutch construction sector, the energetic footprint of reutilization strategies (re-use, repair, renovate, refurbish, recycle, recover etc.) becomes of increasing significance. Cullen (2017, p. 483), for instance, found that “in practice, the material losses and energy inputs associated with recycling can usurp many of its environmental benefits.” He further illustrates his standpoint by pointing at the ‘most abundant industrial material’, namely concrete (Cullen, 2017, p. 483): “*Recycling concrete, by crushing it to use as aggregate in new concrete, often consumes more virgin cement than using traditional aggregates; some of which come ready-crushed. The perceived resource savings from recycling are off-set by the extra energy required to process a lower quality starting material.*” Despite its significance, the energy dimension of CE is - according to respondents (R2, R5 & R6) - often left out of the current discourse and seems to be mainly associated with the parallel running discourse on energy transition (see section on drivers and barriers).

Coming back to the argument by Korhonen et al. (2018), the crux lies in the *physical scale of the economy* and the negative impacts of its extension, hinting at the link between economic growth and resource depletion – the very link that CE aims to break. Assuming that ‘closed loops’ were possible, it would require the full replacement of virgin materials by secondary materials, that is materials that are already circulating in the current economy. However, the construction industry quite literally ‘carves materials in stone’ for usually more than 50 years (R2; RVO, n.d.-b); hereby posing a number of challenges, e.g. with respect to demand and supply ratio’s (temporal lag) or the storage of released materials (Cullen, 2017). As long as there will be a demand for new constructions, virgin materials are likely to remain

indispensable. When asked about the ratio between demand and the supply of re-used materials, respondent 4 supports this argument:

It's not in proportion. What is about to be regained is but a fraction of what we need. [...] In Utrecht, we mapped how many materials are about to be released and which could actually be replaced – it is called 'projectenkalender'. And that's just a fraction of the amount we need. (R4)

Indeed, the report mentioned by respondent 4 found that the demand for (currently) primary materials is 20 times higher than the supply regained from construction and demolition waste (Blok & Faes, 2018).

The idea of a closed-loop system stems from Industrial Ecology (IE) which has been defined as “the study of material and energy flows resulting from human activities” offering “the basis for developing approaches to close cycles in such a way that the ecological impact of these activities is minimized” (Boons & Howard-Grenville, 2009, p. 13). According to scholars in the field of IE, industrial systems ought to resemble biological systems and their metabolic cycles (Lazarevic & Valve, 2017). The EMF model presented in the theoretical chapter of this thesis (see 2.1), illustrates this idea with the two wings of ‘the butterfly’ (‘technical’ and ‘biological’ cycle). Albeit this way of ‘systems-thinking’ allows for the conceptualization of complex issues and can highlight global interconnectedness, it often does not account for the social, cultural, political or discursive context of these issues. Meaning that questions of governance, social interaction and decision making seem to be forced into the background.

(3) Value retention (and value definition)

Central to the concept of CE is the idea of value retention of materials over multiple lifecycles, as exemplified by the ‘loops’ of the butterfly model (EMF, 2015). Yet, the previous section on ‘waste as a resource’ has shown that the ‘value of something’ is bounded by its cultural, social, political and economic context. So, what is value and what is being valued? Respondent 4 recognizes this question as essential for the transition towards CE:

We are on a very crucial link where we can learn a lot also with regard to valuation [waardering]. That's actually the biggest quest with regard to circularity – the valuation, the recognition of value in everything we did, and we are going to do in the future (R4).

However, respondents (R1-5) also recognize that value is, in our current capitalist market, above all determined by price and the market mechanisms of supply and demand, as illustrated by the following quote:

The value of the building is measured thinking about the short term, not considering a lifespan of 100 years. Maybe the qualification that it remains standing 100 years, this I can imagine. But not

with the quality that is necessary for people to be able to function inside the building, that's a whole different story. So yes, it does not collapse... that's correct. That, you can in building claims, but it says nothing about the value. It's all intangible value, whatever someone is willing to pay for it [wat de gek er voor geeft]. How speculations go, what the level of scarcity is – that is the value. But not at all in quality for users. That is where the disconnect in the design is, the developing, the using and possibly the period after that. They are not linked together, so that is not how development is done. Development is on basis of: I have a property, I have a tenant, and what the tenant pays is the value of the property and the rent says nothing about the quality of the property (R4).

This quote also hints at a trade-off between the market value of a building and its value with respect to quality, function, re-usability (use-values) and its 'future value' (potential for lifecycle extension; optional value). In addition, this 'future value' of a given construction can apparently be at the expense of present environmental impacts:

What I told you here at Rijkswaterstaat, that example of choices – it was about a circular bridge, which is - looking at environmental costs - 1,5 times as bad as a normal bridge and then you can 'earn it back' after a certain amount of time. Well, that 'earning back' is something I don't believe in very much. I am not a big fan. I would rather not increase the environmental costs for something to last longer in the future and then getting these costs returned. I would rather not do that. I would rather have solutions that do the same or better than the ones of today and [!] last longer [laughs]. Then I would rather keep searching a little longer for solutions better than that. Because causing more now, just to save later – for me the environmental costs hurt now more than in 20 or 30 years (R2).

The statement illustrates how the duration of the amortization period of a project can, in fact, lead to trade-offs between CE ambitions (extended lifespans for longest circulation) and sustainability ambitions (prevention of negative impacts) – or, more precisely between economic and ecological rationale (Ruijgrok, Vellinga & Goosen, 1999). It reminds of the 'Normalbaum' anecdote (p. 42) in which the economic objective - translated into monetarized values – prevails.

Considering previous remarks, it also becomes obvious that both economic and ecological rationale proceed here from an anthropocentric stance with nature solely being perceived in its instrumental value. The 'intrinsic value', on the other hand, seems to be dismissed:

You keep hearing more often: 'What are we actually doing? This planet [dit bolletje] will make it'. You know, in the end this system is so big and so strong that – if we really screw it up as humans – this planet will pull through over the course of millions of years. This planet will continue to exist. Only we, as people, won't find it that pleasant anymore. So, what are we doing? We stay busy to ensure that it remains manageable and endurable for us as humans – for our own species. (R3)

We are not going to save nature for the sake of nature – I don't believe this. I don't think we are going to do this. I think it is simply not encoded in humankind to do so. Some people want this really badly and we want this really badly, but the majority of people just don't want it. They say, 'well, I am not going to save nature just because it is nature', you know? They just don't do this. We are only going to save nature when we realize that it will cause us great inconvenience when she is gone. Then we are going to save her and then we are willing to pay for it and make the effort. But the environment doesn't have a wallet. So, she can't pay for things and she doesn't have a voice, she can't speak for herself. So, we will have to do this for her, the people need to do that. And that is not working well. At this moment, it is not very successful. (R6)

4.2.3 Insights from the case: agents and their motives

On the role of frontrunners and change agents

Based on observations (O1-O3, O-BH), interviews (1-6) and governmental reports (e.g. Dutch Government, 2018; PBL, 2019) there seems to be a general acceptance that the transition towards CE can be guided by frontrunners. Here, the term frontrunner [koploper] refers to actors who pave the path for the broader majority by investing in new technologies, exploring alternative materials (e.g. bio-based) and taking financial and organizational risks to push the transition into a certain direction. This or similar terms are mainly used with respect to corporate actors (R2, R6) but have also been ascribed to individuals from the public sphere (R1, R5).

For instance, when asked what is necessary to upscale the current discourse, respondent 5 states:

Frontrunners, 'kartrekkers'. As we have here [states name] – a wethouder 'with guts' who is simply saying 'that's my vision and that's how I want to do it. And he is also in a position at the municipality to say 'that's how we are going to do it. That's what we do.' Then you see that people join the cause.

This idea of visionary '*change agents*' has found increasing attention in transition management theory (e.g. Loorbach & Rotmans, 2019). Rooted in diffusion theory and business-oriented change management, it is currently used across disciplines (Bedehäsing & Padberg, 2017). According to the WBGU (2011), change agents are believed to play a crucial role in transformational processes and can be identified based on certain characteristics, e.g. with regard to their vision, social competencies, multiplication skills or their knowledge on change processes (Kristof, 2010). Speaking in terms of the multi-level perspective, change agents represent the individuals or small groups of innovative niche-actors which recognize tension on the regime-level and utilize windows of opportunities (Geels, 2002). The concept of change agents in the

context of transitions puts an explicit focus on agency and conveys the idea that transformational processes can be managed and steered into a certain direction (e.g. Rotmans & Loorbach, 2009).

Two respondents (R2, R6) believe that the pivotal role of pioneers should be supported financially by the government. Respondent 2 states the following:

I think it's still good to stimulate frontrunners, but they should be pulled forward by means of incentives and not by means of punishment. Rijkswaterstaat is doing a great job in this regard. All their contracts contain kind of a small financial bonus if you are ahead on the sustainability trajectory. Thus, there are contractors who are really going for it, they are trying to be awarded (R2).

On the role of the market

Based on the interviews, the discourse within Cirkelstad seems to be particularly market-oriented with the market commonly being framed as the 'driving force for innovation'. When asked about corporate actors who are currently pushing the topic, one respondent (R1) emphasizes the role of individuals over organizations, once more linking to the topic of change agents:

I believe we are still in the phase where everything is personally rather than party related. [...] It's more the small creative actors who are fully committed. And then you got the very big parties that want to make kind of a statement, to realize a pilot-project. But that doesn't say anything about the whole organization. [...] It's the individual person who makes the difference.

Bringing big players on board is, nevertheless, important as they not only increase the 'visibility' of the discourse, but also give access to finances and competencies, especially when they become part of a 'Community of practice' or a strategic partnership (R1). In this sense, incumbent firms seem to function as multipliers who can significantly contribute to the shaping of the discourse. The same respondent did not only observe a shift regarding the connotation of the discourse in recent years but is currently also noticing a change of the relationships between parties. While the focus used to lie on non-binding experimentation, there are now an increasing number of parties who are joining 'the cause' for more commercial purposes.

On the role of local and national government

With regard to the *central government*, Rijksvastgoedbedrijf and Rijkswaterstaat seem to be the most visible public bodies in the playing field. Rijksvastgoedbedrijf administers, maintains and develops real estates and is the biggest property manager in the Netherlands. The Rijkswaterstaat, on the other hand, is the executive ministry for water management and infrastructure. They are representing two of the

biggest contractors on the market and have both, the function of knowledge broker and exemplary model (Rijkswaterstaat, n.d.; Rijkswaterstaat, 2018). Respondents refer to them either as contracting parties or in association with the initiative 'Platform CB'23'.

When asked about the government-wide program 'CE in the Netherlands by 2050' (Dutch Government, 2016) none of the respondents believes in the achievement of the national objective (100% circular by 2050) in the given timeframe. Instead, it is generally acknowledged as a more long-term process. At the same time, the opinions about the usefulness of the framework differ considerably. One respondent (R4) refers to a statement from architect Thomas Rau:

If your relationship isn't going well and you are being asked what you will do to change it and your answer would be 'I'll stop with drinking in 2030 and in 2035, I'll stop with smoking and in 2040, I'll stop with cheating' – I don't think your wife is going to say 'that's a good deal'. (R4)

On the contrary, respondent 5 believes that the central government has to set a general framework to stimulate both municipalities and businesses to get started.

*The ambition of 2050 – 100% circular is fantastic. That's what the government must do. That's where they have to be a good example. [...]
I believe that the government must set the framework to use the innovative power of the market. [...] Set the frameworks in such a way so that municipalities take us, as entrepreneurs, on board to innovate, for real. Because there is a lot of innovative power in Dutch SME's. But we don't really dare to. We keep waiting for each other. I believe that the government can play an important role to set long-term frameworks. (R5)*

On the role of municipalities

The interviews also gave insights into the role of municipalities which are perceived as the most visible level of governance with a high degree of autonomy. One of the interviewees who is holding the position of wethouder in the Dutch municipality of Veenendaal summarizes the responsibilities as follows:

As a municipality you can fulfil various roles: you can set frameworks and rules for the local community, you can act as a role model and you can assume the leadership by initiating collaborations (R6).

Yet, the interviews revealed another aspect which places the municipality on the demand side of the market, namely as public contractor. According to a report from the economic institute for the construction sector (EIB, 2013), municipalities are responsible for about 60% of all procurements made by public parties. The procurement (or tendering) process regulates how public bodies place orders in the

market and is to guarantee transparency and the best price-performance ratio. The procurement law [Aanbestedingswet] from 2012 dictates procurement based on thresholds for the central government, municipalities, provinces, water boards [waterschappen] and other public bodies such as universities and schools as well as for certain sector specific organisations (e.g. water or energy supply) (Rijksoverheid, n.d.). Besides official guidelines, the contracting parties still have relative freedom to set their own terms and priorities (R6; VNG, 2016). Municipalities can, for instance, include (aspects of) circularity as part of the permit criteria (R6) and hereby stimulate certain developments. The procurement amendment from 2016, for instance, opened up new possibilities by introducing procedures for ‘innovation partnerships’ which focus on the development of novel products or services (ARW, 2016).

A good, open and pro-active relationship with municipalities is generally seen as crucial for the success of innovation projects. Risk aversion, fragmentation [hokjesdenken - R5], and inflexible bureaucratic structures and attitudes, on the other hand, are perceived as obstacles by respondents with a corporate background.

I am seeing a lot of fear on the local level because the local government is thinking in hokjes [compartments] as in ‘This is how you must do it’ (R5).

This becomes especially clear with regard to the procurement process. Whereas the public administrator does not see the process as a hindrance to innovation, three respondents with experience in this field suggest otherwise.

As an example: you want to develop a circular building with circularity as a priority. Then you have to sit down together at the very beginning of the process and discuss ‘What is good, what is smart?’ because you cannot define circularity in the contract specifications. So, you have to come right to the front, you have to develop, to innovate. But then, after all that time, the municipality is saying ‘Yes, but we do have to tender. We do have to enter the market and the provider with the lowest price will get it.’ The entrepreneur will say ‘I won’t innovate with you ever again because there is always someone who can do it cheaper’ (R5).

Although this is certainly not always the case, the quote still hints at a conflict of interest between the need for cost reduction and ‘circular’ ambitions. Accordingly, the responsiveness of current procurement processes to sustainable and circular ambitions can play a crucial role in transformative change processes. Another interviewee also observes discrepancy in a municipality’s interests, however in a different sense:

It’s great if a municipality wants to realize a circular project and yes, they can apply a procurement policy, but they are also a licensing authority with a clear positioning. Hence, they are always ambivalent: If they set stricter rules, e.g. with regard to construction, the building firm might go

and build in the neighbouring municipality. But then there is the fear that they miss out on the opportunity for employment and citizens might start to leave. (R4)

The relatively strong power position of municipalities as reported by respondents corresponds to the Dutch decentralized unitary governance style and its area- and participation-oriented policy integration approach (Groenleer & Hendriks, 2018; Simeonova & van der Valk, 2010).

On the lack of consumer power

With regard to the demand side of the market, the *lack of individual consumer power*, as indicated in the section ‘industry profile’, is being confirmed by most interviewees. The lack of consciousness for the topic and the structure of the industry’s supply side are given as reasons for this phenomenon. Respondent 2 phrases it as follows:

I’m always saying there is actually no consumer in the construction industry. We buy a house but we don’t think about where it comes from and we don’t really have a choice, do we? [...] Actually, you can only choose where you are going to live but you can’t choose who is going to build your house. Mostly not. In the special case you are building a house on your own – then you might have more control but otherwise, you don’t. [...] So, there is no such thing as a ‘construction consumer’. All of us live somewhere but we don’t have decision-making power.

The absence of ‘the construction consumer’ makes for an interesting stakeholder constellation and has likely influence on the nuancing and development of the CE discourse. However, ‘the consumer’ is yet another social construct of the market and is in this context mainly perceived as the buyer of property. According to Cambridge Dictionary (2019b) a consumer is “a person who buys goods or services for their own use”. Translating it to the construction sector, the following questions arise: “Who are the people that are using and paying for the properties out there? Isn’t the common resident the one who ‘consumes’ the structures by living in it? And if so, why are they excluded from the discourse?” According to Shankar, Cherrier and Canniford (2006, p. 1015), consumer power conflates “to a person’s ability to exercise choice in the marketplace by becoming or being a consumer.” As aptly named by respondent 2, there might be no real choice for individuals to opt for a more sustainable house due to reasons that need yet to be explored.

4.2.4 Transition dynamics and strategic theories

The discourse on CE has gained considerable momentum since the publication of the national programme with more public and private actors ‘getting on board’. Cirkelstad’s podium on the Building Holland fair, for instance, served as a platform to present a declaration of intent between the public contractors Rijkswastgoedbedrijf, the municipalities of Amsterdam, Rotterdam, Den Haag and Utrecht on the one hand, and incumbent firms, such as Dura Vermeer, Van Wijnen, VolkerWessels and BAM on the other (O-BH). Combined under the name ‘samen versnellen’, these parties intend to accelerate the transition towards CE by implementing 70 ‘projects with a circular ambition’ and by cooperating, e.g. with the Platform CB’23 as well as a number of consultancy firms and knowledge institutes (Cirkelstad, n.d.-d).

On technological progress

Respondents are overall optimistic with regard to technological progress and innovation and see it, in fact, as one of the main drivers for CE (R1 – R6):

It keeps being experimenting and innovating. You really have to look for new technologies and new methods of sustainability. I also think that wind energy and solar energy are not really the solutions. And that we have to continue to, for example hydrogen and possibly the use of nuclear energy. Because you do notice that solar and wind energy, in my opinion, don’t produce enough (R6).

Interviewer: What is your perspective on technological progress?

Respondent: Acceleration. Yes, I’m kind of a techno-optimist, you know. I believe in technology and when I see what is possible – already now – and what is not scaled-up yet but well operable on a pilot level, then I am thinking, yes, I am indeed optimistic about present possibilities (R2).

It is always a mix of things, but technological innovations are indeed very crucial (R3).

The Building Holland event painted a similar picture and was indeed dominated by new technologies, bio-based and circular product innovations and enhanced IT solutions (O-BH). Based on these findings, the discourse on CE seems to reflect an ecomodernist’s approach to societal change by strongly focusing on efficiency gains through technological advancements. Ecomodernism proceeds from the idea that “meaningful climate mitigation is fundamentally a technological challenge” (Asafu-Adjaye et al., 2015; Isenhour, 2016). According to the eco-modernist manifesto, “a good Anthropocene demands that humans use their growing social, economic, and technological powers to make life better for people, stabilize the climate, and protect the natural world (Asafu-Adjaye et al., 2015).”

On uncertainty and risk aversion

Uncertainty and risk aversion are recurring topics throughout all interviews and are generally seen as a barrier to the discourse on CE. Uncertainty with regard to political developments allegedly plays a crucial role. Arguments that undermine the current national strategy (CE in the Netherlands by 2050) or that are in general critical of the Netherlands' contribution to climate action seem to be particularly powerful. Especially so, as they might manifest during future legislation periods and contribute to the lock-in of the current regime (see Trump administration as an example).

There are a lot of discussions lately on whether our current democratic system is suited for the transition ahead. Because what do I do with a new government after Rutte [current prime minister of the Netherlands], where Thierry Baudet becomes popular who is saying 'climate agreement – off the table!'. Well, then the consumer will also say 'I'm going to wait'. People who have to replace a gas boiler right now are saying: 'I will still buy another gas boiler. I will see how it pans out. [het zal mijn tijd wel duren] because I don't know what is going to happen.' If the government had clearly indicated – across legislation periods – 'this is the way and that's what we are going to do', then people might choose for a heat pump instead. (R5)

The quote illustrates how contesting political discourses (even if not translated into action, yet) seem to cause hesitation among market players with regard to their investments and strategic orientation. Other forms of uncertainty concern the environmental impact of new innovations and their suitability for CE ambitions as well as future socio-technical developments. For instance, while talking about the calculation period for the new circularity measurement method, respondent 2 states:

If we would say: 'we are now going to build a viaduct, a bridge as robust as possible so that it can last for 300 years – it might well be that we won't need it anymore in 50 years. Or maybe we won't be driving there anymore. That means we also won't need this bridge anymore. And it would be a pity to cause now twice as much negative impacts on the environment, two produce twice as much CO2 just to make sure that this bridge will last 200 instead of 50 years. Hence, uncertainty is working against us [zit ons dwars]. (R2)

On economic rationality and normative shifts

As mentioned earlier, individual consumers are not visible as such on the playing field of the industry. Whilst this isn't necessarily a barrier to the development of the discourse, two respondents (R2, R6) offer

an interesting explanation by hinting at the *structure of ‘the financial system’* which, according to them, does not meet the needs for a circular economy.

If you are financing a house solely based on its cost, and not on its lifespan and all the housing costs that are related to it [...] then the consumer won’t ponder whether to build a house with lower maintenance costs or to use better materials to increase its value retention. The house is perceived as expensive – expensive with regard to its initial costs, not with regard to the maintenance costs over its lifespan (R2).

Here, the speaker assumes that the need for cost-reduction is outweighing the need for ‘circularity’. Respondent 4 observes a similar phenomenon with regard to corporate players which seem to be mainly focused on cost-reduction and profit maximization:

Every industry has a certain kind of persistence to it – that holds true for the construction industry, the automotive industry... They think they can get away with bending the rules [gesjoemel]. It is still about the financial incentives, quickly earning money, not accounting for the negative impacts you are causing. That is how our system is organized. (R4)

Respondent 2 supports this argument by stating:

The willingness to invest into something, let’s say a new technology, is solely driven financially at the moment. And this makes me more pessimistic. Because that’s why certain technologies remain in storage [op de plank blijven liggen] that shouldn’t be hidden away. Because people think that they won’t be able to earn their money back fast enough. Even though these technologies might be very relevant from an ecological or societal perspective. (R2)

Later on, he provides the following example:

We don’t build as energy efficient as we would be able to. From a technical perspective we could reach much further than what we are doing right now. But we have found kind of a compromise – kind of a zero level [nul-niveau]. And that’s not that bad at all, but it also not great. It could be done much better. But there is kind of an economic optimum where you receive the most economic advantages with the least investments necessary (R2).

This example illustrates a discursive struggle between economic rationality and risk aversion on the one hand, and progressive CE ambitions on the other. This conflict of interest is also a recurrent theme in the literature. Whereas some scholars believe that profit-seeking is the main (or only) reason why companies would adapt sustainability practices (e.g. Gao and Bansal, 2013; Revell et al., 2010), others argue that it’s much more the reaction to societal pressure and the need to secure legitimacy which drives business operations (e.g. Cho, 2009; Milanés-Montero and Pérez-Calderón, 2011). According to Jenkins (1993), economic rationality clashes with sustainability efforts in two regards: first, an economic analysis cannot

fully account for, nor internalize negative externalities; that is the uncompensated environmental effects of a certain production process. “The second occurs when economic incentives are greater than environmental capacities. One instance of this is because economic evaluation discounts future benefits and costs. Short-term utilization is favoured over long-term resource use or environmental degradation (Jenkins, 1993, p.69).” It can be assumed that both conflicts also hold true with regard to CE. In fact, the quote from respondent 2 (page 49) on the amortization period of a circular project serves as a prime example.

Noticeably, all of the interviews (R1-R6) as well as the majority of the observations (O1, O2, O4 & O-BH) highlight the need for a change of mindset. Even though the nature of this change remains somewhat vague, the following quotes hint in the direction of a normative change, presumably away from economic rationality:

‘Why should I separate my waste if my neighbour makes a mess of it?’ – Well, in my opinion it ultimately comes down to our own personal responsibility. Maybe it’s just a tiny bit that I can contribute, but I am still responsible for it. (R6)

It’s always the mindset of people. ‘If I don’t have to, why should I?’ It’s always the mindset, always, always, always. (R1)

There is a desperate need for good people. A desperate need. And that’s not even about talent, it’s about attitude. (R4)

5 Conclusion and practical implications

By bringing together insights from the literature on transition management, CE and discourses, this research set out to analyse how pioneers currently working in the field of CE make sense of the concept, and to explore their underlying rationale (‘theory of change’). A focus was put on the Dutch construction sector, with the national network Cirkelstad serving as a case for this qualitative research. The case study was guided by the following research question:

What are elements that constitute the ‘theories of change’ (frames) applied by niche-actors in the field of CE and how can these theories be linked to broader discourses and the literature?

In order to understand the various frames surrounding the discourse of CE, a discourse analysis was performed which explored the ontological positions, assumptions about natural relationships, suggested solutions and perceived relevant actors of such frames. By reflecting on broader discourses and current developments in the construction industry, context was provided to the frames. Linking the findings back

to the literature allowed for an explanatory approach which detected possible power structures and indicated whether certain frames might facilitate or hamper transformational change processes. The following section summarizes the main elements that constitute the frames of niche-actors and that subsequently contribute to shaping the discourse on the Circular Economy.

The perceived aspects of CE resemble the conceptual model from the Ellen MacArthur foundation (2015) with a focus on the closing of production loops, regenerative product design and the increase of resource efficiency through value retention (prolonged circulation). Various value retention strategies are mentioned; in particular the re-use and recycling of materials. Accordingly, it can be suggested that the discourse is driven by a systems-thinking approach which puts special emphasis on supply chain management and the input and output of materials. At the same time, the focus seems to lie on material aspects (material footprint) rather than the energy aspect (energetic footprint) of production methods. It can be argued that the parallel running discourse on 'energy transition' plays a role in this regard. The clear separation of both discourses hints at an order of precedence (with the energy transition ranking first) which has likely an influence on political agenda-setting and the financial support that comes with it.

Along with the systems-thinking approach comes an ecomodernist perspective in which innovative technologies and product developments are seen as means to tackle current environmental issues and to increase efficiency gains (e.g. through bio-based substitutes).

Furthermore, it seems that the discourse is significantly being shaped by market actors as well as the central and regional government. Individual consumers, on the other hand, seem to be left out of the discourse entirely. Municipalities and central government institutions (Rijksvastgoedbedrijf, Rijkswaterstaat) hold a rather strong power position due to their dual function as contractors and policy makers. Thanks to this position, they could become a role model for the implementation of CE. Yet, the practice also indicates that decision-making is taking place in an area of conflict between CE ambitions, risk aversion, uncertainty and economic objectives. Speaking of the latter, it can be stated that there is a polarization towards the economic aspects of circularity which also find their way into national policy documents (see CE in the Netherlands by 2050).

Central to the CE discourse with regard to the construction sector is the need for operationalization. This leads to both, the emergence of an 'operational terminology' and the manifestation of standards, norms and calculation methods. Once set, such constructs will eventually influence decision-making and future modes of operation. Yet, the findings also showed that the formation of such constructs is negotiated by a limited number of stakeholders which have to deal with high levels of complexity and uncertainties. Hence, it can be suggested that the creation of instrumental constructs

(standards, norms, scores etc.) have significant influence on sustainability transformations and can either enhance or hamper change processes.

It became evident that actors have to fulfil their tasks under high uncertainties and risk. The discourse on CE led by politicians is especially crucial in this regard. Arguments that undermine the current national strategy (CE in the Netherlands by 2050) or that are in general critical of the Netherlands' contribution to climate action seem to be particularly powerful. Especially so, as they might manifest during future legislation periods and contribute to the lock-in of the current regime (see Trump administration as an example). Hence, contesting political discourses (even if not translated into action yet) seem to cause hesitation among market players with regard to their investments and strategic orientation.

As for the development of the discourse, the case study points out that the discourse on CE is not only gaining momentum among practitioners but is also increasingly being taken up by policy makers and officials. With the adoption on the regime level (national policies, normalization process), CE gains the impression of a national imperative by being declared the official 'alternative' (or 'the new normal'). With this declaration also comes the impression of a collective consensus on CE. However, both the literature as well as the findings from the interviews and observations highlight the elasticity of the concept and, with it, various (contesting) frames.

The findings have shown that the discourse on circularity seems to both contribute to and supersede the discourse on 'sustainability'. Yet, in practice, actors also observe certain trade-offs between both concepts, e.g. with regard to material choices. As a result, the relationship between both discourses remains ambiguous and requires further investigation.

Practical implications

The findings yielded valuable insights into some of the aspects that constitute the discourse on CE. Based on the results a number of practical implications and respective recommendations can be formulated:

- Special attention to the emerging technical terminology and the issue of value definition is needed to prevent utilitarian thinking (synoptic view narrowed down to economic rationale) and the discursive re-production of capitalist structures.
- This necessitates consciousness for discursive practices. CE in its current state is nowhere near a perfect state nor a perfect transition pathway. To maintain its credibility as an evolving process

(which is likely neither linear nor circular) one must avoid any idea of full attainability. This requires a nuancing in operational and strategic language.

- A network-wide, multi-stakeholder dialogue which allows for the negotiations of different frames could prevent CE from sharing the fate of sustainability, which has been rendered by scholars as a 'plastic term' stretched beyond credibility.
- As CE aims for a system-wide transition, it is crucial to not only think about the boundaries of such systems and how they are framed but also about who should be included or excluded. The systems-thinking approach which seems to prevail the discourse on CE must be complemented by considerations about flexible governance structures and social and environmental responsibilities.
- Giving the structuring nature of normalization and standardization processes in the construction industry, reflexivity and agility must become a key priority, not only in our thinking but also in our social, political and economic institutions. In this context, Dryzeck & Pickering (2018, p.1) suggest thinking of institutions as living frameworks which are "flexible enough to respond to changing social and ecological conditions but stable enough to provide a basis for long-term flourishing."
- Furthermore, the findings revealed the energy transition as a parallel discourse to CE. The findings give reason to believe that a merging of both discourses is crucial as they compete in certain aspects and overlap in others. In order to move towards more sustainability, both aspects must be considered in negotiation.

5.1 Reflection and Recommendations for further Research

The theoretical framework of this research set the stage for the subsequent analysis. It provided relevant insights into the dynamics of sustainability transformation, the conceptualization of CE and the role of discourses and frames within such transformations. The multi-level perspective served well to illustrate the link between all three strands of literature and offered a good basis for the conceptual model. Even though the MLP concept allows for the illustration of complex transformative processes, it can only represent a simplified version of reality. For instance, being based on systems-thinking, it does not account for questions concerning the role of governance, power and politics (Smith et al., 2005). In linking MLP to discourse analysis in the conceptual model, it was possible to incorporate this aspect (to some extent) by putting an emphasis on the performative and structuring qualities of discourses and frames.

The MLP-related distinction between niche-actors (“the locus for radical innovation”) and regime-actors (“the locus of established practices and associated rules that stabilize existing systems”) (Geels, 2011, p.26) appeared to be more problematic. MLP has a long history in technology studies and was initially applied to explain the diffusion and management of technological innovations (Genus & Coles, 2008). Yet, its systemic typology does not account for the dynamic nature of actor’s roles, responsibilities and dependencies over time and space. In fact, Fischer and Newig (2016) found that actor typologies in transition management range from systemic (MLP-related) and institutional (state, market, civil society) to governance-related clusters (local, regional, national, global), all of which are strongly interconnected and dynamic. They further state that “actors in transitions can be part of several different categories, which can change over the course of time” (Fischer & Newig, 2016, p.16). Future research might benefit from considering these dynamics.

The qualitative case study design allowed for the collection of detailed information while leaving enough room for exploration, so that relevant topics could emerge ‘from the data’. Weaving back and forth between the data analysis and the literature has been crucial to place certain findings in a wider context and to detect and understand possible coherences. The interviews yielded valuable insights into the discursive practices of pioneers while the observations helped to understand the negotiation and exchange of discourses in multi-actor settings. Yet, the explorative and qualitative nature of this research does not allow for generalization. Another weak point refers to the small sample size which resulted from time and resource constraints. Despite the diverse backgrounds of selected interviewees, it must be noted that certain stakeholder groups have not been included. Accordingly, this thesis would have benefitted from addressing more representatives from the central and regional governance as well as stakeholders with a background in financial management or functions regarding the execution of construction projects.

Recommendations for further research

The findings of this research highlight the importance of social constructs as part of discursive practices. It can be suggested that the transformation towards a sustainable society does not only require operational changes but also changes regarding the underlying values and norms of our socially constructed reality. As shown in this study, constructs, such as ‘waste’ or ‘value’, will require a normative re-definition in order to aid the transition towards more sustainability. Hence, further research is needed to analyse the temporal, special and cultural manifestations of such constructs and to explore the possibilities to induce normative change.

Moreover, the literature as well as the findings from this research suggest a strong link between CE and sustainability. Yet, due to the fuzziness of both concepts their similarities and differences remain ambiguous (Geissdoerfer et al., 2016). As the discourse on CE establishes a strong relation with sustainability, further research should address the conceptual and – even more importantly – the practical gap between both concepts.

Last but not least, the relationship between the discourse on CE and energy transition should be investigated in more detail to identify possible trade-offs and to explore potential synergies.

6 References

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Appendix 1: List of Interviewees

#	Name	Date Interview	Current Position(s)	Link with Cirkelstad
R1	Rutger Buch (2 Interviews)	21.02.2019 12.03.2019	-Independent program and change manager - 'City manager' Cirkelstad	Founder of the cooperative Cirkelstad
R2	Mantijn van Leeuwen	26.03.2019	-Managing Director at NIBE BV (Nederlands Instituut voor Bouwbiologie en Ecologie) -Director Leeuwen Management and Consultancy	-NIBE partner of Cirkelstad -Member of CB'23 action group 'Meten van circulariteit'
R3	Barbara Middelhoff	29.04.2019	-Founder and consultant at diep (focus on innovation, 'de nieuwe omgevingswet', energy transition and circularity) - process consultant and education coordinator at NRP and NRP Academy (platform for transformation and renovation) - Founder Plek (circular co-working space and future knowledge hub)	-Spinner Apeldoorn
R4	Wytze Kuijper	29.04.2019	-transition expert and program manager at ZOOOW! (Urban planning and city development) - visiting lecturer Master Urban & Area Development (Saxion DeHogeschool en Hogeschool Utrecht) - expert panel 'duurzaam gebouwd' - 'Aanjager' & program manager at Energiesprong - Platform 31	-Spinner Cirkelstad Utrecht -program and event organization
R5	Alexander van den Buuse	06.05.2019	- 'Verduurzamer' at INNAX (energy management) - board member 'Global Goals Oss'	- Spinner Veenendaal - Circular Food Valley – working group 'construction'
R6	Marco Verloop	06.06.2019	- Wethouder at municipality Veenendaal Portefeuille: Financiën en control, belastingen, control sociaal domein, informatiesamenleving/digitalisering/ICT, energietransitie/circulaire economie/duurzaamheid/milieu, onderwijs, privacy, bedrijfsvoering, vastgoed- en accommodatiebeleid. - board member VNG - member of regulatory council SSOGG - member of regulatory council COG	- initiating member of Circular Food Valley, focus on circularity - cooperation with Cirkelstad

Appendix 2: List of Observations

#	Date	Context	Location
O1	12.03.2019	Cirkelstad meets NRP academy Negotiation of possible partnership and joint projects	Apeldoorn
O2	14.03.2019	Spinnersbijeenkomst Cirkelstad #1 Quarterly meeting of all spinners, agenda-setting, update on running projects, strategic orientation, financial questions	Veenendaal
O3	18.03.2019	Cirkelstad meets CIRCLES Negotiation of possible partnership and joint projects	Apeldoorn
O-BH	09.04.2019	Building Holland Jaarbeurs typical fair experience (display of innovative products and services), observation focused on 'circularity podium', participation in various presentations concerning the following topics: <ul style="list-style-type: none"> • Hoe kom ik tot een circulaire economie (met Jacqueline Cramer, John Nederstigt, Ingrid Zeegers) • Hoe realiseer ik een circulair project? (Esther+Stan, DURA, Aendless) • Nationale Circulaire Werkafspraken (CB'23) • Hoe ondersteunt een marktplaats circulaire projecten? • Hoe krijgen we grote stofstromen circulair? (Bio-based) 	Amsterdam
O4	16.05.2019	Spinnersbijeenkomst Cirkelstad #2 Quarterly meeting of all spinners, agenda-setting, update on running projects, strategic orientation, financial questions	Arnhem
O5	22.05.2019	Roelofs meets Cirkelstad Negotiation of possible partnership and joint projects	Apeldoorn

Appendix 3: Interview Guide

Date, Location:

Start and end times:

Name, position of interviewee:

Link to/ responsibility within Cirkelstad:

Contact details of potential interviewees:

Note: Due to the design of this research (explorative, iterative), questions could vary between interviews

Introduction:

- Topic and frame of the research
- Purpose and duration of the interview
- Ask for preference privacy (name published vs. anonymous)
- Explain what will happen to the data
- Permission to record
- Questions on context:
 - Personal background, education, link to construction sector
 - Current position, responsibilities/ link to Cirkelstad
 - Current projects, ambitions, personal motivation for CE
- Questions regarding understanding of CE/ circularity:
 - Why is it necessary? What are underlying issues?
 - What are principles/ aspects of CE?
- Questions regarding the link between CE and sustainability
 - Possible trade-offs, similarities?
- Questions on peculiarities of construction sector (depending on profession), e.g.:
 - Stakeholder constellation
 - current standards, norms, quantification methods, legislation
 - procurement process
- Questions regarding agents and their responsibilities/ motives:
 - driving forces
 - Role of market
 - Role of the consumer
 - Role of government (centrals, municipality, province)
 - Role of EU
 - Role of regions and networks
- Questions on drivers and barriers
- Questions on energy transition and link to circularity
- Questions regarding transition dynamics (speed, duration, up-scaling)
- Questions on political climate in NL and its influence on CE