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Tactics of Change

*Researching the employment of actor
tactics in initiatives towards the
Circular Economy transition*



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Preface

With pride and relief, I present to you my master thesis '*Tactics of Change*', as completion of my Master's degree in Environment and Society Studies at the Radboud University in Nijmegen. This thesis came about through a six-month research internship at the PBL Netherlands Environmental Assessment Agency and in the months thereafter. It is a research into Circular Economy initiatives and the role of their actors' tactics in triggering institutional change towards transition. It combines the three core elements of the Master programme: environment, society and sustainability.

Writing this thesis was an intensive and lengthy process, but it taught me a lot. Not only did I gain a lot of new knowledge, by diving into the topics of Circular Economy, transition and innovation that were still new to me. I also learned an important lesson: that research philosophy is in fact a big deal. This research process confronted me with my (unconscious) research philosophy in the post-positivist tradition, by engaging in the opposite: a social-constructivist research. Completely outside of my comfort zone, but it did teach me what other research possibilities there are. And that, no matter how difficult it may be, it can actually be quite fun. At least, I realise that now.

I would like to express my gratitude to those without whom I could not have produced this thesis. First of all, I would like to thank my supervisor Sietske Veenman. From the start she pushed me to take on a challenge and supported me to make it through. She provided useful feedback on the research, as well as renewed motivation when I needed it. And valuable advice whenever I felt like a fish on dry land, for which I am grateful. Secondly, I would like to thank the PBL Environmental Assessment Agency for hosting my internship. And particularly my advisor at the internship, Marloes Dignum. For offering me the chance to be a part of her research team, for sharing her expertise in the field we studied, and for her patience and feedback throughout the process. Thirdly, gratitude goes out to all the interviewees for their time and effort, without whom this research would not have been possible. And finally, I am grateful to my family and friends for their support as well as distractions, to keep me motivated these past months.

Enjoy reading my thesis.

Vera Kusters

Nijmegen, December 19th 2018

Summary

With the current growing world population, increasing material use and environmental degradation, the prevailing linear economy is an unsustainable system that creates the need for a transition to a circular economy (CE). This socio-technical transition requires a change of the prevalent institutional logic. For the Netherlands this is a relevant sustainability transition and policy aims for a circular economy by 2050. However, this transition is still in its formative phase, in which experimentation is needed to test and learn from innovations. In order to stimulate the early steps of this CE transition, it is useful to know how initiatives around CE innovation trigger institutional change through actors' strategic work. To gain this insight, this research answers the following question: *What is the role of actor tactics in triggering institutional change, surrounding local Circular Economy initiatives in Amsterdam and Rotterdam?* The relevance of the knowledge gathered from this research lies in informing the strategies towards institutional change of both innovation practice and the policy to facilitate this.

In this qualitative multiple-case study research, six cases of CE innovation – specifically a macro-, meso- and micro-initiative in each city – are studied. Circular Buiksloterham, De Ceugel and New Sanitation in Amsterdam, and the Port of Rotterdam, BlueCity and Ioniqa Circular in Rotterdam. They are analysed with regard to a theoretical framework of actor tactics that can be employed to trigger change in institutionalised ways of doing, thinking and organising. This framework departs from earlier literature on actor tactics and adds to it with other theories on transition and institutional change and improves the operationalisation of tactics. Through the research methods of document analysis and interviews, the development of these CE initiatives was traced (from getting started, to furthering and to recent and upcoming endeavours). Thereby shedding light on which tactics were employed when and how by actors involved in the initiative, to alter the institutionalised selection environment and promote their circular alternative. Despite some extensive changes that had to be made to the research set-up late in process – as it was explorative research in progress – this research still led to detailed studies of the cases, from which a number of conclusions could be drawn to answer the research question.

The research question could be answered by synthesising and comparing the findings from all six cases, which presented various patterns in actor tactic employment. These patterns come down to two elements which characterise the role of actor tactics in triggering institutional change: phasing and orientation. Phasing refers to the insight that, in contrast to the conceptual framework where the actor tactics are presented in one list without a time element, there is in fact a phasing (or succession) in the employment of tactics that is significant for their role in triggering institutional change. For instance, theorising and defining are generally employed early in an initiative's development and advocacy later on. But most important here is that narrative work and networking are essential 'pre-tactics': having a good story and the right partners as prerequisites for getting started as well as allowing engagement in other actor tactics. Orientation refers to the insight that actor tactic employment can have various purposes. Whether a CE initiative has an internal orientation at promoting new ways of doing, or an external orientation at altering ways of thinking and organising, effects which tactics are employed when and how. Combining these insights to answer the research question, it is concluded that the role of actor tactics in triggering institutional change lies in the *phasing* of actor tactics and the *orientation* with which they are employed. Variance on these elements means variance in the extent and kind of impact that the CE initiative may have on institutional change. This has implications for both innovation practice and policy. For CE initiatives to prioritise networking and narrative work, to draw from general phasing patterns and to be aware of (and when appropriate switch) their orientation. And for policy to for instance support CE initiatives in their actor tactic employment and engage in tactics of their own. This thesis ends by presenting several avenues for research to take these insights further.

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1. Introduction

1.1 Topic and research problem

The circular economy

The twentieth century was characterised by a significant growth of the world population, paired with a growing welfare in large parts of the world. This development continued into the twenty-first century and is expected to continue at impressive rates in the near future (Bastein, Roelofs, Rietveld & Hoogendoorn, 2013, p.6). This same period is also characterised by a growing usage of material resources, minerals, fossil fuels and biomass. However these materials are not unlimited. As a result of material resource inefficiency, they are or will become scarce resources in the current world economy (Social and Economic Council, 2016, 31). A final characteristic of this time is the worldwide environmental damage, biodiversity loss and climate change of the last decades. One cause for these developments is the negative environmental impact of extracting, processing and disposing of material resources (Bastein et al., 2013, p.6-7). This development will also continue into the future, unless fundamental sustainability transitions are successfully embarked upon worldwide.

The relevance of these three developments is that combined they form an unsustainable process that has created the need for a transition from a *linear economy* to a *circular economy* (Social and Economic Council, 2016, p.31). The increasing demand for raw materials arising out of population growth and economic development cannot be sustained in a linear economy. In this take-make-waste system, the continuous recourse extraction, production processes and streams of waste exacerbate issues of resource scarcity and environmental damage (Remmerswaal, Hanemaaijer & Kishna, 2017). In contrast, a circular economy is an economic and industrial system in which the renewability of materials and products, and the prevention of waste, are central. ‘Circular’ refers to the closing of cycles – preventing resource exhaustion, waste, emissions, and transitioning to complete renewability (Bastein et al., 2013, p.7). Strategies to close loops revolve around useful application of materials (e.g. recycle), extending lifespan of products and its parts (e.g. reuse or refurbish) and smarter product use and manufacture (e.g. reduce or rethink) (Potting, Hekkert, Worrell & Hanemaaijer, 2017). There are many definitions of the circular economy, which Kirchherr, Reike & Hekkert (2017) demarcate into one:

“A circular economy describes an economic system that is based on business models which replace the ‘end-of-life’ concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes, thus operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations.” (Kirchherr et al., 2017, p.224-225)

The circular economy transition

A circular economy is not easily reached, as linear economic processes are dominant. It requires a transition process – a complicated process to which a broad field of research is devoted. The literature on sustainability transitions in particular focusses on the challenge of transforming existing, highly institutionalised social structures and technologies (i.e. the socio-technical system). What follows is a common understanding of sustainability transition as a change of the prevailing institutional configurations of the socio-technical system (Geels, 2004; 2011; Fuenfschilling, 2014; Fuenfschilling & Truffer, 2014; 2016). In the case of the circular economy, transition is then a change in the institutional logics surrounding economic activity (from linear to circular logics).

Such a transition process requires innovation, to test and learn from alternative institutional configurations. Actors such as public administrators, entrepreneurs, citizens and research institutes increasingly set up and collaborate around experimental innovation projects. In the realm of sustainability transitions, this means promoting system innovation through learning from practice-based, inclusive and challenge-led initiatives (Raven et al., 2017, p.2-3). Although such initiatives are not as well-planned and consensus-oriented as the transition literature suggests (particularly in urban contexts), they are important learning processes in furthering a sustainability transition (Raven et al., 2017, p.3). Often arising locally, these initiatives tend to explore technological, organisational and social innovations and thereby aim to drive transformative change towards sustainability (Barnes, Durrant, Kern & MacKerron, 2018, p.3-4).

However, these innovations tend to face barriers, as their institutional logic (circular) clashes with the dominant institutional logic of the current socio-technical regime (linear). Hence the ability of innovations and their alternative practices to become mainstream is constrained by institutional arrangements (Barnes et al., 2018, p.1). As well as other elements of the context (or selection environment) in which initiatives are embedded, such as actor networks, regional-specific resources, power relations and cultural preferences (Raven et al., 2017, p.3). By themselves, “*path-breaking innovations fail to successfully compete within selection environments embodied in incumbent socio-technical regimes*” (Smith & Raven, 2012, p.1025). They require strategic support in becoming mainstream and triggering a broader transitions (Smith & Raven, 2012).

The circular economy transition in the Netherlands

This thesis focusses on this dynamic between innovations and the socio-technical regime, specifically in the CE transition in the Netherlands. Reaching a circular economy is relevant for the Netherlands. Not only because its energy and material intensive and export-oriented economy is resource-dependent – making it vulnerable to the issues sketched above – (Social and Economic Council, 2016, p.12), but also in light of its environmental policies and signed international agreements (Ministry of Infrastructure and the Environment & Ministry of Economic Affairs, 2016, p.9-10).

The vision for a more sustainable economy, combined with the positive results of a detailed analysis of the (economic) impact that this circular economy would have on the country (Bastein et al., 2013), culminated in the ‘Government-wide Programme for a Circular Economy’ (Ministry of Infrastructure and the Environment & Ministry of Economic Affairs, 2016). This long-term programme was set up to facilitate and enhance this transition. Departing from the goal to develop a circular economy in the Netherlands by 2050, the programme sets out a course for the steps to be taken to achieve this ambition. These focus on longer use and better recycling of existing products, more renewable materials and the introduction of circular products, production and consumption. The interim objective is a 50% reduction in the use of primary raw materials (minerals, fossil and metals) by 2030 (Ministry of Infrastructure and the Environment & Ministry of Economic Affairs, 2016, p.5).

Research problem : triggering institutional change

The long-term strategy is there, but the transition is still in its formative stage. Whereas the Dutch transition is quite advanced at the end of the production chain – in the form of concrete waste policy – particularly innovation aimed at the beginning of the chain – in the form of for instance circular design and business models to reduce material use, reform production designs and prolong the durability and use of products – is still a search and poses the main transition challenge (PBL Netherlands Environmental Assessment Agency, 2017, p.4; p.7). There are many initiatives in progress to develop such innovations. However, as elaborated above, constraints from the dominant socio-technical system make it challenging for innovations to become mainstream (i.e. institutionalise). This poses the question of how these initiatives can be facilitated in their attempts at triggering institutional change.

In light of the policy goal to reach a circular economy in the Netherlands by 2050, and the early stage this is currently in, more knowledge is needed on how initiatives towards this transition goal develop and their impact on the institutionalised system. This knowledge can help CE initiatives as well as further inform the policy to facilitate the development of circular economy innovations, and accelerate the transition to a circular economy in the Netherlands.

To arrive at such insights, this thesis combines structure and agency by employing an actor perspective to study how CE initiatives trigger institutional change. On the one hand, an institutional lens sheds light on the barriers that these initiatives face. And on the other, an actor lens sheds light on how the initiatives' actors work strategically (through tactics) to overcome these barriers. This combination of lenses helps to understand the role of actor tactics in institutional change (transition) processes. Thereby focussing specifically on local initiatives, because according to transitions literature these are common sites for early experimentation and hence seen as promising sources of change for the reconfiguration of unsustainable systems (Barnes et al., 2018, p.4). Amsterdam and Rotterdam are selected as urban contexts in which local initiatives are studied, which is elaborated in chapter 3.

1.2 Problem statement: research aim and questions

The introduction to the research topic pointed to the core elements of this research: circular economy transition initiatives, institutional change and actor tactics. To gain more understanding of how CE initiatives employ actor tactics towards institutional change, and how this may be supported, these elements are combined into exploratory research on the development of six CE innovation cases from both institutional and actor perspectives. Therefore the research aim is formulated as follows:

Gain insight into the role of actor tactics in triggering institutional change, in order to inform the strategies of both Circular Economy initiatives themselves and the policy to facilitate them.

The central research question that follows from this aim is:

What is the role of actor tactics in triggering institutional change, surrounding local Circular Economy initiatives in Amsterdam and Rotterdam?

This research question will be answered by exploring the following sub-questions:

1. In what ways can Circular Economy innovation actors push for institutional change?
2. Which actor tactics are employed when and how in Circular Economy initiatives in Amsterdam and Rotterdam?
3. What are the patterns in actor tactic employment and their impact on institutional change?

1.3 Scientific and societal relevance

The scientific relevance of this research lies in the contribution it makes to the body of literature around the topic addressed, with knowledge that may still be missing from or may be useful additions to this. Firstly the relevance lies in the fact this research employs an 'insider' actor perspective rather than an 'outsider' perspective. Transition literature often looks mainly at structure; the institutions of socio-technical systems and their change processes (for instance with the Multi-Level Perspective elaborated in paragraph 2.1) (Geels, 2011). This research instead focusses on the role of agency (actors' strategic

action) in transition. Specifically by looking at the interplay between structure and agency. This contributes to literature developing more recently, which addresses “*socio-technical transitions as an interplay between institutions, actors and technologies*” (Fuenfschilling & Truffer, 2016, p.310). Secondly, by looking at the role of actor tactics in triggering institutional change, this research refines the emerging theory around actor tactics. The theory developed from various works (Lawrence & Suddaby, 2006; Fuenfschilling & Truffer, 2016; Barnes et al., 2018) and its application in transition studies is still new and thus being explored. This research presents a follow-up on this, by adding to the study of actor tactics in local innovation contexts as well as taking this a step further by looking at CE innovation cases at multiple levels (for instance including innovation hubs) (Barnes et al., 2018, p.11). Moreover it improves operationalisations and adds more detailed knowledge on actor tactic employment. Finally, the scientific relevance lies in applying this emerging field of research to specifically the Circular Economy transition. Most prior studies focus on sustainability innovations more generally (Fuenfschilling & Truffer, 2016; Barnes et al., 2018). This research specifies the existing knowledge to the case of the CE transition and generates new knowledge for this context.

The societal relevance lies in the practical contribution of this research, i.e. the relevance of the findings in practice. For this research, the societal relevance is argued from the research aim of supporting initiatives for the Circular Economy transition. “*With increasing emphasis placed on how to speed up or accelerate contemporary transition processes it is increasingly important to investigate how actors attempt and in some cases succeed in reconfiguring selection environments to favour sustainability*” (Barnes et al., 2018, p.12). In a way, that is what this research does. The insights gathered through this research create a fuller appreciation of transition processes, specifically providing useful insights for both innovation practice and policy. Thus it is relevant for actors involved in CE innovation projects (particularly those engaging in actor tactics) as well as for policy-makers. For innovation practice (other CE initiatives), the knowledge of general actor tactic employment patterns can further inform their own strategy towards triggering institutional change. Similarly, the knowledge on the role of actor tactics in institutional change can inform policies that aim to facilitate the CE transition by supporting such initiatives in triggering change.

2. Theoretical framework

This chapter reviews the relevant literature for answering the research question and thereby builds the theoretical framework. The framework departs from transition studies, specifically the Multi-Level Perspective (§2.1), and elaborates this with insights from institutional theory to explain transition as institutional reconfiguration (§2.2). Then an actor perspective is developed (§2.3) to understand how actor tactics may trigger this institutional change in favour of niche innovations.

2.1 Transition studies: the Multi-Level Perspective

The Circular Economy is one of multiple so-called sustainability transitions, aimed at transforming unsustainable socio-technical systems. “*Sustainability transitions are long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption*” (Markard, Raven & Truffer, 2012, p.956). There is a large body of literature on these sustainability transitions and how shifts in socio-technical systems (should) come about. This literature can be captured in three approaches to the more general field of transition studies: *Technological Innovation Systems* (TIS), *Transition Management* (TM) and the *Multi-Level Perspective* (MLP) with its complementary *Strategic Niche Management* (SNM). Although these approaches are all concerned with transition studies, they have developed from different origins and therefore differ in their conceptualisations. The most commonly used approach, however, is the Multi-Level Perspective. As core framework it underpins most transition studies (Rosenbloom, Berton & Meadowcroft, 2016, p.1275). Compared to the other approaches, the MLP focuses more on the early stage of transition. As the Circular Economy transition is still in a very early stage, the MLP would appear the most suitable approach here. Hence it will be elaborated below.

The MLP provides an overall view of the multi-dimensional complexity of changes in socio-technical systems, by distinguishing three analytical levels: 1) niches (loci for radical innovations), 2) socio-technical regimes (loci of path-dependent, locked-in and stabilised practices and associated rules), and 3) the exogenous socio-technical landscape. More specifically, the regime concept refers to the stable set of rules that orient and coordinate actors to reproduce the socio-technical system. The landscape and niche levels are defined in relation to the regime, as ‘nested’ concepts. The niche concept refers to practices or technologies that deviate substantially from the existing regime. The landscape concept refers to the external environment that influences the interactions between these niche(s) and regimes (Geels, 2011, p.26-27). “*The MLP proposes that transitions, which are defined as regime shifts, come about through interacting processes within and between these levels*” (Geels, 2010, p.495).

In this dynamic, the *regime* level is of primary interest. It is the ‘deep structure’ that accounts for the stability of the existing socio-technical system. Dimensions of this structure include technology, policy, markets and user preferences, industry and culture. Changes occur only incrementally along stable trajectories, because the regime is path-dependent and locked in (Geels, 2004). The actor behaviour within the system is constrained and enabled by the regime’s dominant configuration of rules and institutions, lifestyles and practices, competences and capabilities, shared beliefs and cognitive routines, technologies and infrastructures, meanings and logics (Geels, 2011, p.27).

Increasing structuration
of activities in local practices

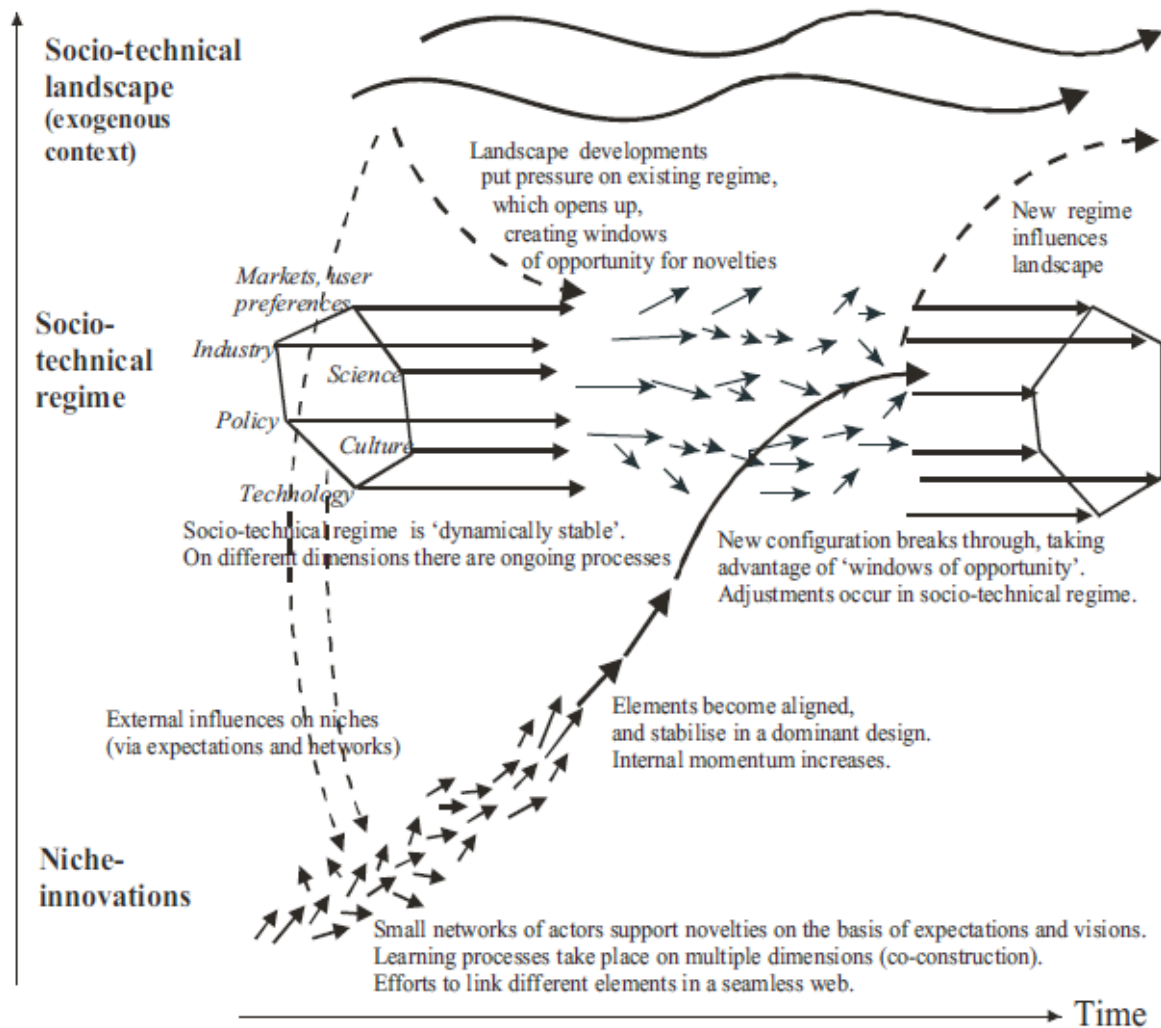


Figure 1. Multi-level perspective on transition (Geels, 2011, p.28)

A *transition* is then a shift from one configuration of these regime elements to another. Although transitions do not come about easily, the alignment of processes within and between the multiple levels may allow for a transition of the socio-technical regime (Geels, 2018, p.225). As illustrated by figure 1: if landscape pressures culminate with problems in the regime and (radical) niche innovations jumping in these windows of opportunity, the incumbent socio-technical configuration may be displaced and transition may be the result (Rosenbloom et al., 2016, p.1277).

This depends firstly on the *landscape*, which embodies the broad demographic, technological, environmental, economic and political patterns that make up the external context for the niche and regime levels. Therefore this landscape level influences the dynamics between niche and regime. Developments in the landscape, for instance climate change or exogenous shocks, create pressure on the established regime (Geels, 2011, p.28). These landscape pressures cause destabilisation of the regime, for example because it erodes the regime's legitimacy (Rosenbloom et al., 2016, p.1277). The resulting 'cracks' and tensions in the destabilised regime create windows of opportunity for niche innovation to break through more widely (Geels, 2010, p.495).

Besides external windows of opportunity created by the landscape, this breakthrough also depends on the *niche* level itself. For instance, niche-internal drivers such as price-performance improvements, positive cultural discourses, powerful actor support and development of complementary infrastructures increase the likelihood of an innovation to further develop and diffuse (Geels, 2018, p.225). The difficulty of reaching such competitive advantages, given the dominance of the socio-technical regime, is the reason why radical innovations are conceptualised as taking place in niches. These are protective spaces within which niche actors experiment with varying novel technologies, user practices and regulatory structures (Schot & Geels, 2008, p.537). In this environment, concrete and real-life experimental projects can develop advantages, allowing the novelty to further develop.

How this takes place is more closely studied by scholars of *Strategic Niche Management* (SNM), an approach complementary to the MLP. It explains how innovations in niches are shielded from the mainstream selection pressures of the regime. In these shielded niches, innovations can then be nurtured (i.e. processes that support the innovation's development) and empowered (i.e. processes that make the innovation either more competitive within the regime or contribute to changing this regime to be more favourable to the innovation) (Smith & Raven, 2012). Niche-internal nurturing processes to support the development of an innovation include assisting learning processes, articulating and adjusting visions and expectations, and facilitating social networking dynamics (Schot & Geels, 2008, p.537).

In sum, the MLP is an extensive analytical framework for understanding transition dynamics. Nevertheless there were several bottlenecks to this framework that have been constructively criticised over the past years (Geels, 2011). A core element of the MLP is that transition is explained as regime change. However, the operationalisation of this regime concept has been criticised to be unclear on multiple aspects, resulting in difficulties in empirical applications, by various scholars (Berkhout, Smith & Stirling, 2004; Smith, Stirling & Berkhout, 2005; Markard & Truffer, 2008; Fuenfschilling & Truffer, 2014). Additionally, the MLP has been criticised for underplaying the role of agency in transitions (Smith et al., 2005; 2010; Genus & Coles, 2008). Particularly power struggles and discursive activity, are types of agency that still warrant greater attention (Geels, 2011, p.29-30).

Even though MLP proponents argue that there are enough operationalisations of the regime concept which can be fruitfully combined, and that agency is accommodated in the framework as the structural levels and trajectories are enacted and reproduced by actors' activities (Geels, 2011; Fuenfschilling, 2014, p.35), the MLP framework can be improved by inducing a further institutional turn in MLP thinking. This means drawing on institutional theory to present a clear operationalisation of the regime concept (operationalising regimes as institutions in §2.2), which is an approach that simultaneously paves the way to addressing how actors can push for change in these regime institutions (theorising this in §2.3) (Fuenfschilling, 2014, p.35).

2.2 Transition as institutional change

Scholars have drawn on concepts from institutional theory to describe the stability of sociotechnical regimes. When it became apparent that what is called 'regime' in the MLP is mostly called 'institution' in sociology, several theoretical extensions were made (Fuenfschilling, 2014, p.30-31). One of these is describing the regime in terms of institutions, which is argued from the concept of institutionalisation. The MLP explains the stability of sociotechnical regimes using the concept of 'structuration': as can be seen in figure 1, the regime level is explained as more structured than the niche level (Geels, 2011). This 'structuration' can also be conceptualised as the process of 'institutionalisation': the regime level is highly institutionalised, explaining its stability and structuring effect on actors (Fuenfschilling & Truffer, 2014). To institutionalise a niche innovation then means to diffuse it from the niche to the regime level of structuration (Barnes et al., 2018).

Though there are different options for the operationalisation of regimes in institutions (e.g. ‘institutional logics’ used by Fuenfschilling & Truffer, 2014), the transition literature mainly describes the regime as consisting of highly institutionalised regulative, normative and cognitive structures (Fuenfschilling, 2014). This is based on the *Institutional Pillars framework* by Scott (2014). According to Scott’s most recent conceptualisation, there are regulative, normative and cultural-cognitive elements (or pillars) to institutional structures.

Regulative institutions refer to explicit regulatory processes, which involve the establishment of rules, inspection of conformity to them and imposition of sanctions to influence future behaviour. Regulative systems include for instance formal rules, laws, policies, protocols and standards. Legal sanctions can be applied in case of non-compliance, aimed at inducing for instance guilt. In sum, the regulative element of institutions constitutes “*a stable system of rules, whether formal or informal, backed by surveillance and sanctioning power affecting actors’ interests that is accompanied by feelings of guilt or innocence*” (Scott, 2014, p.64).

Normative institutions refer to normative rules, internalised in actors’ behaviour through socialisation, that introduce prescriptive, evaluative and obligatory pressures towards ‘appropriate behaviour’. Normative systems include for instance values (i.e. conceptions of the desirable, with associated behavioural standards), social norms (i.e. legitimate means to pursue valued ends), role expectations (i.e. prescriptive conceptions of appropriate positions and behaviour for certain individuals), privileges and duties, and rights and responsibilities. Non-compliance with this normative element also evokes emotional responses such as feelings of shame or disgrace (and in contrast possibly pride or honour in case of compliance). Like in the regulative pillar, this emotional aspect provides powerful inducements to comply with the prevailing institutions.

Cultural-cognitive institutions stress the central role of the socially mediated construction of a common framework of meanings. It refers to implicit ‘cultural reservoirs’ or ‘cognitive logics’ for action and routine behaviour. These consist of shared conceptions and frames through which meaning is given and the world is interpreted. “*Meanings arise in interaction and are maintained and transform as they are employed to make sense of the ongoing stream of happenings*” (Scott, 2014, p.67). Action is understood not only by the objective conditions but by the actor’s subjective interpretation of them. These interpretation patterns are shaped by external cultural frameworks. All in all cognitive structures include for instance symbols, discourse and cultural categories. Conformity arises from orthodoxy, because the ideas underlying action are seen as correct and sound. Therefore compliance to the cognitive institution occurs because other types of behaviour are inconceivable or confusing. Whereas compliance evokes certitude and confidence, non-compliance evokes confusion or disorientation.

In practice these institutional elements appear in varying combinations, creating an institutional arrangement. When they are aligned, their combined forces can be strong. When they are misaligned, supporting and motivating differing behaviours, conditions are provided in which institutional change may occur (Scott, 2014, p.70-71). This has been incorporated into the MLP, in which institutional elements are seen as rule systems, by stating that it is the alignment between rules that gives a regime stability and ‘strength’ to coordinate activities (Geels, 2004, p.904).

Turning back from the operationalisation of regimes to the study of transitions, the MLP explained transition as a regime shift (Geels, 2004). In line with the institutional conceptualisation of regimes above, transitions can now more specifically be understood as processes of institutional change through deinstitutionalisation of formerly dominant regimes and the institutionalisation of new socio-technical configurations (Fuenfschilling & Truffer, 2016, p.298). A transition is then an institutional reconfiguration: a shift in the regime’s institutions.

But to study this kind of transition, only looking at the institutions does not suffice. Building on the argument of ‘duality of structure’, looking at agency is essential to understand institutional change. Institutions are socially constructed rules; these rules exist only through their use and reproduction in practice (Geels & Schot, 2007, p.403). On the one hand, actors are embedded in rule structures. Individual behaviour is co-determined by the structures in which one operates. On the other hand, and at the same time, actors reproduce these rules through their actions, thereby closing the cycle of structuration (Hermwille, 2016, p.239). Thus actors are simultaneously active rule users and rule makers (i.e. ‘duality of structure’, see Giddens, 1984). This interaction between agency and structure is seen as one of the central mechanisms for change in socio-technical systems (Fuenfschilling, 2014, p.31).

In transition dynamics, the highly institutionalised regime has strong constraining influence on niche innovations (Geels & Schot, 2007, p.403). To understand how niche innovations do manage to break through to regime level, one needs to look at the strategic, purposive work of actors to reconfigure these constraining institutions. Because institutions do not only steer actions, actions also have consequences for institutions (‘structure-agency interplay’) (Fuenfschilling, 2014, p.38). The next paragraph develops an actor perspective on transition, to capture the ways in which actors may push for institutional change.

2.3 Actor perspective on transition: literature review

The institutions that constitute the regime, create a selection environment for niches. This selection environment is generally constraining towards innovations that do not fit the institutional configuration of that regime. In an actor perspective on transition, the role of agency in triggering institutional change is studied. More specifically, the actor perspective developed here looks at the actions taken by actors aimed at the reconfiguration of institutions, in order to create a more favourable selection environment and promote the niche innovation they support (Barnes et al., 2018; Fuenfschilling & Truffer, 2016).

2.3.1 Core concept: Institutional work

One of the central approaches in conceptualising the role of agency in institutional change has been labelled *institutional work*. In short, institutional work as an approach “*analyses and categorizes actions by actors that aim at the creation, maintenance or disruption of institutions [...] and thus shows how processes of (de-)institutionalization unfold*” (Fuenfschilling & Truffer, 2016, p.299). It highlights the intentional, purposive actions taken by actors in relation to institutions: not only the highly visible and dramatic actions, but also the nearly invisible and often mundane actions of day-to-day adjustments, adaptations and compromises (Lawrence & Suddaby, 2006). This approach takes the study of institutional change beyond focusing on the effect of external developments (‘exogenous approach’) and looks instead at the significance and influence of ‘internal’ agency in constructing triggers of change (‘endogenous approach’) (Fuenfschilling & Truffer, 2016, p.299).

Lawrence and Suddaby (2006) first developed the concept of institutional work in the field of organisation studies. They provided a first overview of different forms of institutional work, catalogued under the headings of creating, maintaining and disrupting institutions. Though this overview is neither exhaustive nor definitive, it helps researchers of institutional work in their inquiries. Studying institutional work also proved relevant in the field of transition studies. Whereas before, institutional theory in transition studies was primarily used to conceptualise the *stability* of socio-technical regimes, the approach of institutional work allows the study of institutional *change* in socio-technical regimes and the role of agency therein. Socio-technical transition from this perspective revolves not only around the co-evolution of technology and institutions, but it is conceptualised as an interplay of materiality

(technologies), institutions *and* actors (Fuenfschilling & Truffer, 2016, p.301-302). Studying this interplay helps to explain how and why certain niches manage to diffuse to the regime level, highlighting the forms of institutional work employed by actors to achieve this (Fuenfschilling & Truffer, 2016).

2.3.2 Framework: Transition elements & actor tactics

The notion of institutional work thus provides the ground for an actor perspective on institutional change: how actors intentionally push for change in the institutions that compromise a regime, in order to allow a breakthrough of a niche innovation. In related literature, many such ‘actor tactics’ to shape the course of institutional change have been identified (e.g. in the work of Lawrence & Suddaby (2006)). Here, the approach presented by Barnes et al. (2018) – which entails a conceptualisation of actor tactics aimed at changing elements of the selection environment around local initiatives – is seen as most relevant and will therefore be drawn upon in this theoretical framework.

Compared to the organisational studies conceptualisation by Lawrence & Suddaby (2006), Barnes et al. (2018) is more relevant in this research because it accentuates the knowledge on institutional work towards the field of *socio-technical transitions* (specifying institutional change as changing selection environments). Although there are other studies of institutional work in socio-technical transitions, including that of Fuenfschilling & Truffer (2016), these are empirically focussed on the national level (e.g. a country’s entire urban water sector) with less attention to local dynamics. Considering this research studies the development of local initiatives within a city’s context, this requires an approach that places more emphasis on these local dynamics. That provides a second reason why the approach of Barnes et al. (2018) is more suitable, as it highlights these *local processes*.

Barnes et al. (2018, p.1) observed that how actors reconfigure selection environments (institutional change) to be more favourable to local initiatives is not well studied yet. Hence they set out to develop an approach specifically focussing on the local level: the institutionalisation of sustainable practices in cities. In short, Barnes et al. (2018) conceptualise and apply an understanding of the role of agency around local transition initiatives in institutionalising sustainable practices. Specifically they present the actor tactics employed to strategically shape and reconfigure selection environments in favour of their preferred practice or technology. ‘Actor tactics’ therefore strongly relates to the concept of ‘forms of institutional work’ discussed earlier, referring to actors’ strategic actions to create, maintain or disrupt institutions. Their approach draws on this institutional work literature, but also adds complementary insights from other studies – such as the role of networking and narrative work as central actor tactics in understanding agency for change (Smith & Raven, 2012) – and specifies the collection of actor tactics towards what is relevant in local dynamics (Barnes et al., 2018, p.3). The selected actor tactics are then categorised not according to their kind of effect on institutions – creating, maintaining or disrupting them, as done by Lawrence and Suddaby (2006) – but according to which institutions they affect. Specifically, which ‘transition element’ they contribute to. Building on Frantzeskaki and De Haan (2009, p.599), transition elements refers to the three institutionalised components of a socio-technical system:

- 1) *Ways of doing*
(materiality, in terms of technology and infrastructures, and the practices that these enable)
- 2) *Ways of thinking*
(culture, conventions, values and perceptions that underpin and proceed rules and constitutions)
- 3) *Ways of organising*.
(structures or institutions that compromise the ground that enables, legitimises and constrains human action and interaction)

Aligning the actor tactics with this categorisation led them to the following analytical framework:

Transition elements	Actor tactics
New ways of doing	Theorising, defining and educating about new practices
	(De)routinising behaviours
	Mimicry
New ways of thinking	Work to shape or undermine cognitive or normative institutions
	Political advocacy
	Narrative work
New ways of organising	Work to expand or deepen the network of actors
	Regulatory advocacy

Table 1. Transition elements and actor tactics (adapted from Barnes et al., 2018, p.4)

2.3.3 Advantages and drawbacks

An advantage to the framework of Barnes et al. (2018) is that the categorisation of actor tactics according to three transition elements (ways of doing, thinking and organising) makes the concepts of regulative, normative and cultural-cognitive institutions more practicable in the study of actor tactics. Paragraph 2.2 operationalised the regime level according to these three institutions and then explained transition (regime shift) as institutional change. In this paragraph, an actor perspective on transition is being constructed, which reflects on how actor tactics trigger this institutional change. Thus how actor tactics change regulative, normative and cultural-cognitive institutions. However, these institutions often cannot be separated in practice: they tend to occur in combinations in practice (Scott, 2014). And actor tactics tend to be aimed not at one institution but at a combination thereof. Therefore a way to be able to link actor tactics to institutions in empirical study, is by presenting the ways of doing, thinking and organising as the components that make up the socio-technical regime. The regulative, normative and cultural-cognitive institutions together are underlying to these components, as is reflected in their operationalisations (e.g. values (normative) and perceptions (cognitive) in the operationalisation of the way of thinking). While institutions remain implicit, these ‘ways’ are what actors aim their actions at.

Another advantage of this framework is that it contains a range of actor tactics collected from multiple strands of literature, building not only on the study of institutional work but also including relevant insights from other research (e.g. Elzen, Van Mierlo & Leeuwis, 2012). The majority of the actor tactics in table 1 come from the institutional work literature (Lawrence & Suddaby, 2006; Fuenfschilling & Truffer, 2016). Either directly, such as *mimicry*, split into multiple tactics, such as *political advocacy* and *regulative advocacy*, or multiple condensed into one tactic, such as *theorising, defining and educating about new practices* and *work to shape or undermine cognitive or normative institutions*.

While the institutional work literature indirectly recognises the relevance of *narrative work* (Lawrence & Suddaby, 2006, p.239-241; Fuenfschilling & Truffer, 2016, p.300), it is not included as concrete actor tactic. In the framework presented by Barnes et al. (2018), it is included as such. The same is done for the tactic of *networking* (expanding and/or deepening the actor network), which builds on Smith & Raven (2012) who emphasise the role of not only individual actor tactics but also collective action in local initiatives (Barnes et al., 2018, p.3). Including *networking* attends to the argument that for institutionalisation to occur, a sufficiently powerful coalition or actor network is needed, which is

capable of bringing about change (Smith & Raven, 2012, p.1030). And including *narrative work* attends to the important role of ‘what is said’, and by whom, in the outcome of change (Barnes et al., 2018, p.3).

Despite these advantages, there is a major drawback to this framework: namely its operationalisation. The actor tactics that Barnes et al. (2018) collected from literature are only fleetingly summed up, thereby lacking a (clear) explanation of what they entail. Particularly *narrative work* and *networking* are rich actor tactics but remain rather shallow in this framework. Moreover, there is little argument in their article as to why the actor tactics they draw from other literature are in their framework either joined together or split up. As a result there is no defence for the actor tactics that can be criticised as being too broad and thus vague (e.g. *work to shape or undermine cognitive and normative institutions*) or as being overlapping (e.g. *regulative advocacy* and *political advocacy*).

Thus, in order to use this framework, adaptations are required to reach a better operationalisation. These adaptations can be filled in using other literature, such as the preceding work of Lawrence and Suddaby (2006) and more detailed studies of specific actor tactics (such as the literature around narrative work). Building on the literature review and explication of the decisions made in this paragraph, the next paragraph presents the analytical framework and its operationalisation for this research.

2.4 Analytical framework and operationalisation

2.4.1 Analytical framework

The analytical framework explicates the approach to studying the role of actor tactics in triggering institutional change by altering ways of doing, thinking and organising. Though this framework departs from the work of Barnes et al. (2018), it goes further by incorporating additional literature and theories of socio-technical transition (MLP), institutions and institutional change processes. With this, various adaptations are made to the framework of Barnes et al. (2018) to create a more practicable framework of actor tactics (as argued in paragraph 2.3). The operationalisation follows in paragraph 2.4.2.

The first adaptation regards the actor tactic of *theorising, defining and educating about new practices*. While these three activities all revolve around building new practices, they are significantly different actor tactics. While *theorising* is about naming and developing new practices conceptually (Lawrence & Suddaby, 2006, p.222), *defining* is about further specifying the (technical) details of these theorised new practices (Elzen et al., 2012, p.4). And where these two still have the similar goal of developing new knowledge, *educating* on the other hand has a different goal; namely the diffusion of this knowledge (Fuenfschilling & Truffer, 2016, p.300). That requires different effort on the part of actors than theorising or defining. Therefore, following the institutional work literature, it is proposed here to take these apart as three separate actor tactics (while all remaining in the category of *way of doing*).

The next adaptation is another split, regarding *work to shape or undermine cognitive or normative institutions*. This is such a broad actor tactic that it is difficult to properly operationalise. All the while there are more specified examples of this work available in related literature, such as in Lawrence & Suddaby (2006). Therefore, in order to make the operationalisation of this actor tactic more practicable, it is proposed here to split this category up in two actor tactics: *shaping cognitive foundations* and *shaping normative foundations*. The term ‘shaping’ includes the efforts of undermining. And the term ‘foundations’ refers more specifically to the elements of institutions, such as identities, beliefs and assumptions for cognitive and morals, norms and values for normative (Lawrence & Suddaby, 2006).

The last adaptation is, in contrast to the others, a merge of two actor tactics in the table of Barnes et al. (2018). Their framework includes the actor tactic of advocacy, which is in literature generally seen as the mobilisation of both regulative and political support (e.g. Lawrence & Suddaby, 2006). They decided to split this up in regulative advocacy towards the way of organising and political advocacy towards the way of thinking. However this decision to separate them is not explained. Moreover, as interpreted from literature, political advocacy would seem more related to changing the ‘political way of organising’ (e.g. attract political capital) than a tactic to change people’s way of thinking (Lawrence & Suddaby, 2006, p.221-222). Hence it is proposed here to bring regulative advocacy and political advocacy back together under one header of *advocacy*, categorised into the way of organising. The operationalisation however still highlights the differentiation between advocacy aimed at mobilising political or regulative support.

These adaptations result in the following overview of transition elements and corresponding actor tactics, capturing the analytical framework for this research (table 2). This table already includes brief descriptions of what the actor tactics entail, which is further elaborated in the operationalisation below.

Transition elements	Actor tactics	Description
New ways of doing (materiality and the practices this enables)	Theorising	Naming and developing new concepts (and corresponding assumptions) to be considered as alternative
	Defining	Process of specifying the technical details of the novelty
	Educating	Providing others with the knowledge and skills necessary to engage in the novel practice
	(De)routinising	Opening up room for deviation from common (routine) behaviour and/or embed alternative practice in new routine
	Mimicry	Associating the new (novelty) with the old (existing institutions, technologies or practices), to make innovations more accessible and demonstrate problems with the existing systems
New ways of thinking (cultures, values and perceptions that underpin rules)	Shaping cognitive foundations	Undermining institutionalised assumptions, beliefs and/or identities, and reorienting these to construct new such cognitive foundations that support the novelty
	Shaping normative foundations	Disassociating unwanted practices from their normative foundations (morals, values, (in)formal rules, expectations) and remaking these associations with the desired alternative
	Narrative work	Eroding and creating legitimacy, by developing arguments that frame socio-technical features of an innovation (content) in light of relevant developments or issues in the landscape or regime (context)
New ways of organising (structures that enable, legitimise and constrain human (inter)action)	Networking	Expanding and/or deepening the network that carries the novelty with the ‘right’ partners, to mobilise resources and achieve impact outside local contexts
	Advocacy	Employ resources and persuasion to mobilise political and regulatory support for a novelty and the changes in ways of organising (e.g. policy, regulation) that this requires

Table 2. Revised actor tactics framework

In addition to the adaptations to the list of tactics, they are also given more detailed operationalisations by drawing on additional literature. Particularly the depth of *narrative work* and *networking* is further explored. These and other elaborations will show in the next paragraph, which operationalises the actor tactics individually in order to be able to apply them in the empirical part of this research.

2.4.2 Operationalisation

Each actor tactic is operationalised separately, following the categorisation and order in table 2. Nevertheless it is important to keep in mind that there may still be overlap between tactics, for many of them do not function completely separately in practice. This is not considered problematic but logical. To deal with this, the operationalisation emphasises rather than averts such overlap. In the analysis (chapters 4 and 5) the overlap is accommodated by presenting case development as holistic stories rather than listing actor tactics separately and out of their empirical context.

'Way of doing'

Theorising. Institutional change is “*often based on new knowledge, i.e. novel assumptions of cause and effect. Acquiring new knowledge and diffusing are thus central to the process*” (Fuenfschilling & Truffer, 2016, p.300). In order to acquire innovative knowledge, theorising about new technologies or practices is important. As an actor tactic to achieve institutional change, theorising about new practices refers to actors naming and developing concepts and the corresponding beliefs that can support this new practice (Lawrence & Suddaby, 2006, p.226-227).

A critical first step in theorising is the naming of new concepts, so that they might become considered as a possible alternative. This naming then provides the foundation for further developing the concept. It also allows the communication of the concept and its elaboration. Actors tend to articulate for instance abstract categories of the concept or the assumptions on causal relationships (Lawrence & Suddaby, 2006, p.226-227).

Theorising is a tactic that helps to promote alternative practices by developing specific names, concepts and categories that enable a common language and which puts this on the radar (Fuenfschilling & Truffer, 2016, p.300). However, theorising does not necessarily indicate agreement. There may be differing preferences for practices at the technical level (Lawrence & Suddaby, 2006, p.226-227).

Defining. The elaboration of new practices at the technical level takes place through the actor tactic of defining. The operationalisation of Lawrence & Suddaby (2006, p.222) regarding this actor tactic is very specific to the field of organisational studies – referring for instance to accreditation, contract standards and membership – and is consequently limited in its applicability here. Instead the operationalisation of defining draws on Elzen et al. (2012) and their elaboration of technological anchoring, i.e. actors specifying the technical characteristics of the novelty they are involved in (e.g. new technical concepts that have been theorised). Defining is an on-going process from an initial few (general) technical characteristics to further and more detailed specification (Elzen et al., 2012, p.4-5).

Educating. Where naming new concepts, elaborating them and defining their (technical) characteristics primarily contributes to acquiring knowledge around a new practice, the actor tactic of educating contributes to the diffusion thereof (Fuenfschilling & Truffer, 2016, p.300). This tactic refers to educating others in skills and knowledge necessary for the new practice.

Lawrence and Suddaby (2006, p.227) provide some examples of educating around the case of institutionalising recycling in universities, including hosting conferences, workshops and training, building a network of experience and providing the information and evidence to help shape arguments. A main strategy in educating work is creating templates that provide other actors with an outline for action (Lawrence & Suddaby, 2006, p.227). Fuenfschilling and Truffer (2016, p.300) also mention as examples scientific training to operate specific technology, or ‘softer’ forms of knowledge such as environmentally sustainable behaviour.

Regardless of the form, educating provides actors with the knowledge and skills necessary to engage in a new practice (Lawrence & Suddaby, 2006, p.227). The diffusion of knowledge and skills is necessary to support and sustain the new practice (Fuenfschilling & Truffer, 2016, p.300).

(De)routinising. Institutions are maintained and reproduced through the stabilising influence of routines, making routines important reasons for why institutionalised systems persist. Routines are day-to-day repetitive practices (Lawrence & Suddaby, 2006, p.233). They are often highly embedded within culture and a certain knowledge basis. Routines ensure that deviation from institutions is kept automatically little (Fuenfschilling & Truffer, 2016, p.302). Therefore, an actor tactic to alter a selection environment and promote an alternative practice is the (de)routinisation of behaviour. *Deroutinising* behaviour common in the selection environment opens up room for deviation (towards an alternative). And *routinising* the behaviour for the alternative practice (i.e. embedding this practice in a routine by actively infusing its foundations into day-to-day behaviour), promotes the increasing reproduction of this practice and so its institutionalisation.

Mimicry. The actor tactic of mimicry refers to connecting the new to the old, the novel to the institutionalised. More specifically, it refers to associating new practices with existing institutions (and their rules), existing technologies (and their design or functions) and/or existing practices (and their patterns of action). This association, where elements of the new are similar to the old and the gap between them is lessened, makes innovations more accessible and understandable, thereby enhancing the chances of its acceptance and easing its adoption (Lawrence & Suddaby, 2006 p.225; Fuenfschilling & Truffer, 2016, p.300; Barnes et al., 2018, p.3).

Not only does mimicry help to promote a new practice, it also contributes to deinstitutionalising the existing system by demonstrating its efficiency problems. *“Part of the success of mimicry in creating new institutional structures is that the juxtaposition of old and new templates can simultaneously make the new structure understandable and accessible, while pointing to potential problems or shortcomings of past practices”* (Lawrence & Suddaby, 2006, p.226). This technique of juxtaposing the old and the new can delegitimise the existing practice and legitimise the alternative.

‘Way of thinking’

Shaping cognitive foundations. The foundations of institutionalised systems consist partly of cognitive elements. The cognitive side of institutions is the beliefs, assumptions and frames that inform action (Lawrence & Suddaby, 2006). It relates to people’s way of thinking: how they make sense of themselves and of the world around them, using for instance causal beliefs, ascribed identities, visions and problem views (as related to social values and interests) to which they orient their behaviour and actions (Elzen et al., 2012, p.5-6). Thus cognitive foundations refers to the perception of oneself and the world around them. And shaping cognitive foundations – as actor tactic towards institutional change – refers to 1) undermining assumptions, beliefs and identities (to disrupt the institutionalised system) and 2) reorienting these to construct new assumptions, beliefs and identities (facilitating new practices).

The existing cognitive foundations can be undermined by actors in two ways: by providing innovation that directly breaks these foundations, or gradual undermining through continued contrary practice. When existing cognitive foundations are undermined there is room to reorient these, as the perceived risk of moving to alternatives has lessened (Lawrence & Suddaby, 2006, p.237-238). A strategy could for instance be to reorient problem views through framing.

Shaping normative foundations. Besides cognitive elements, the foundation of institutionalised systems is also partly normative. Lawrence and Suddaby (2006) refer for instance to morals as normative

foundations for institutionalised practices, rules and technologies. But normative foundations include more than morals. They refer to societal values and their translation into normative rules and expectations (i.e. (in)formal rules about what is desirable or not) which may be embedded into laws and regulations, policies and ethical standards (Elzen et al., 2012, p.5). These normative elements co-determine the institutionalised way of thinking.

An actor tactic that can be used to alter this way of thinking and promote the institutionalisation of an alternative practice, is the shaping of such normative foundations. This means disassociating ‘unwanted’ practices from their normative foundations and ‘re-making’ the associations between normative foundations and the alternative ‘wanted’ practices (Lawrence & Suddaby, 2006, p.236-237). *Disassociating* means gradually undermining the existing practices by making them less attractive and delegitimising their normative foundations as appropriate (Fuenfschilling & Truffer, 2016, p.301). *Changing* normative foundations means re-making the connections with normative foundations, this time to the new practices. It results in a new practice being associated with a certain normative basis and so legitimacy. “*An example is the emergence of environmental movements that has changed people's associations with certain technologies (e.g. nuclear energy production), actors (e.g. multi-national companies) or practices (e.g. driving SUVs)*” (Fuenfschilling & Truffer, 2016, p.300). Remaking such associations does not even necessarily require a major change in the way of thinking: existing logics or assumptions, interpreted from an alternative normative perspective, can be enough to incorporate a new understanding (Lawrence & Suddaby, 2006, p.224).

Narrative work. Where the status quo is often maintained through keeping certain practices, technologies and values accepted, similarly alternatives can become accepted through legitimisation efforts (Fuenfschilling & Truffer, 2016, p.302). The two previous tactics constitute actors creating legitimacy by shaping cognitive and normative foundations. The tactic operationalised here presents how actors employ narrative work to create and erode legitimacy of both the novelty and the institutionalised system.

Narrative work refers to actors developing arguments about the socio-technical features of an innovation. Arguments about the past performance of the niche, its current reality and future possibilities can be used to positively frame the novelty (Smith, Kern, Raven & Verhees, 2014). Arguments can also focus on promoting more suitable selection environments, for instance by highlighting contradictions within them (Smith & Raven, 2012, p.1032-1033). However narrative work as actor tactic requires more than such arguments. Narrative work is able to build (or erode) legitimacy specifically if it links the content of the innovation (i.e. the claims about its socio-technical features such as efficiency and performance) with the context of this innovation (i.e. relevant landscape factors and developments or issues in the regime). Thereby narrative work presents the novelty as the solution (content) to a problem (context) (Rosenbloom et al., 2016) and promotes changes needed to allow further pursuit of this solution (Smith & Raven, 2012).

Framing an innovation, and the issue this relates to, is thus a discursive strategy to direct transition along a preferred pathway (Rosenbloom et al., 2016, p.1276). Moreover it allows advocates to build support for the innovation, attract attention and material resources and create (more) protective space to further develop the innovation (Smith et al., 2014). However these aspired effects of narrative work are generally not achieved easily. As the preferred course of action may vary among actors, innovation debates reflect framing struggles. Thus the construction of narratives “*is a dynamic process as actors respond to competing narratives by actively modifying and integrating claims about content and context*” (Rosenbloom et al., 2016, p.1278). This competition, for instance by countering anti-narratives, is therefore also part of narrative work (Smith et al., 2014, p.126).

'Way of organising'

Networking. The actor tactic of networking refers to expanding and/or deepening the network of actors that 'carries' the novelty (Barnes et al., 2018, p.4; Elzen et al., 2012, p.6). *Network expansion* can take place for instance through the produce, use and further development of the novelty, due to which more actors become involved. *Network deepening* can take place for instance through "*intensified contact and exchange among actors within the network involved, increasing interdependence and/or a strengthening of the coalition which is supporting the innovation process*" (Elzen et al., 2012, p.6). A network that is broad (plural perspectives) and deep (substantial resource commitments by members) can contribute to furthering a novelty (Smith & Raven, 2012, p.1028).

A distinction can be made between local and global networks. Locally, networks of actors are involved in socio-technical experimentation with alternative practices in specific project locations, where they negotiate the design and outcomes of their project(s) and produce and make sense of locally applicable lessons (Smith & Raven, 2012, p.1029). Global networks are networks of actors concerned with knowledge exchange and resource flows transcending these local contexts, supporting the exchange and interpretation of specific lessons and experiences across local projects. In these global networks industrial, administrative and grassroots advocates (such as industry platforms, user-groups and other intermediary organisations) come together to convert and institutionalise local experience into more generic, mobile processes and norms, and to contest the existing socio-technical configuration (Smith & Raven, 2012, p.1029-1031). The activities of global networks add to the impact of local networks by codifying and standardising their knowledge and securing a flow of resources that underpins the local-global processes (Smith & Raven, 2012, p.1031).

This distinction helps to see that networking is aimed not only at engaging with the right people or organisations but also with their resources, as "*the mobilization of resources in order to push the diffusion of a new socio-technical configuration might depend on the construction of [...] networks with allies*" (Fuenfschilling & Truffer, 2016, p.302). Thus networking can be used to mobilise the resources necessary to further develop a novelty and promote wider institutional change in favour it. And gaining these resources may require generating commitments from actors outside the local contexts (Smith & Raven, 2012, p.1031). Although actors have varying interests in and varying significant resources for niche development. The influence of actors in negotiating the niche development depends on their resource attributes, experience, institutional positions and connections with other influential actors, all relative to the task at hand (Smith & Raven, 2012, p.1032).

Additionally it helps to see that networking as an actor tactic allows not only inward-oriented activities, i.e. the practical development of an alternative sociotechnical practice, but also outward-oriented activities (particularly when a global network is formed) of representing and gaining support for that development (Smith & Raven, 2012, p.1031).

Advocacy. Another actor tactic that can be employed to trigger changes in the way of organising is advocacy. This tactic links to the outward-orienting activities of actor networks to gain support, as mentioned above. Advocacy refers specifically to mobilising political and regulatory support through persuasion (Barnes et al., 2018, p.3) and direct and deliberate techniques of social suasion (Lawrence & Suddaby, 2006, p.221). This is one of the most common actor tactics and presents an umbrella term for actions that represent the interests of certain actor groups (Fuenfschilling & Truffer, 2016, p.300). Examples of actors employing advocacy include lobbying (e.g. for resources), promoting agendas, proposing new or attacking existing legislation, advertising and litigation. This is similar to the work of for example political regimes, industry associations and social movements (Lawrence & Suddaby, 2006, p.221-222; Fuenfschilling & Truffer, 2016, p.300).

The goal of advocacy is usually “to mobilise financial and political resources or social capital to support one's cause, e.g. influence policymaking, create new standards or change regulation that is in place” (Fuenfschilling & Truffer, 2016, p.300). A redefinition of material resources and social or political capital tends to be needed to structurally change the way of organising towards a favourable selection environment for a novel (sociotechnical) practice (Lawrence & Suddaby, 2006, p.222).

2.4.3 Summary: Conceptual framework

Based on the research question and theoretical framework, the concepts and the relationships between them that will be studied in this research are visualised in figure 2 below: the conceptual framework.

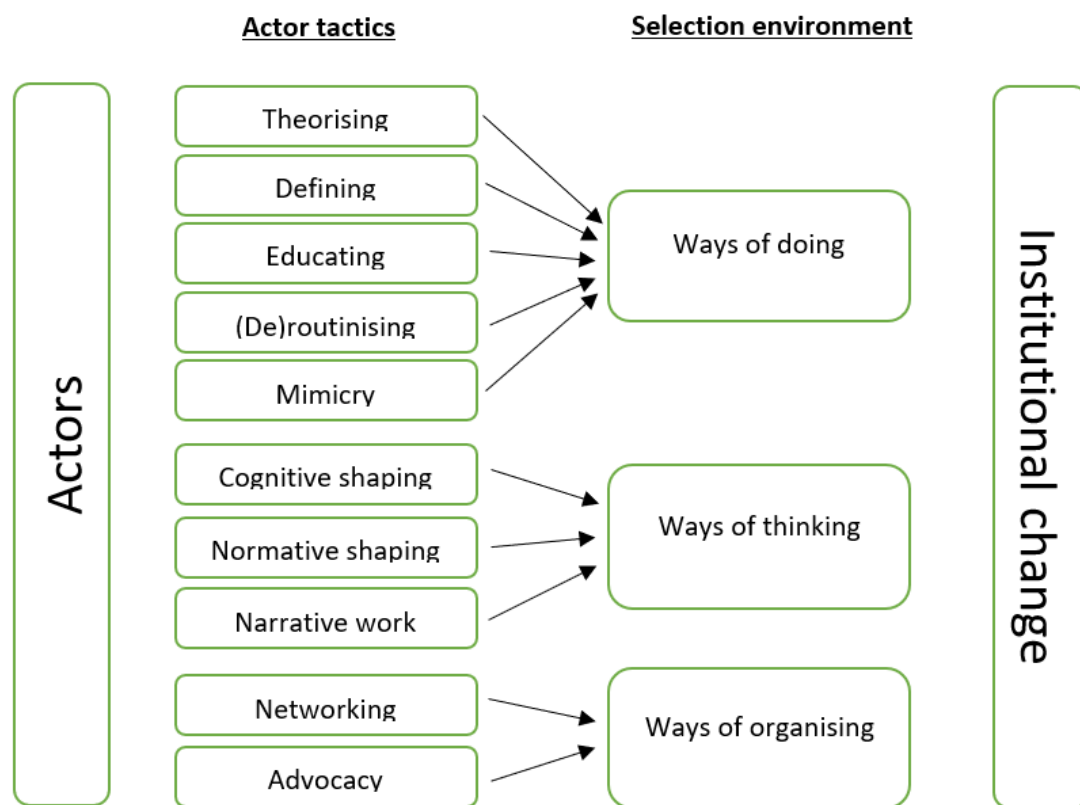


Figure 2. Conceptual framework

Institutional change refers to the reconfiguration of the institutional arrangement (which consists of regulative, normative and cultural-cognitive institutions). Viewed from the actor perspective, such institutional change can be triggered when the *actors* involved in niche innovations manage to employ *actor tactics*. These tactics are aimed at altering the *selection environment* hampering the innovation. Components of this selection environment are the institutionalised *ways of doing, thinking and organising*. They reflect the institutional arrangement (Barnes et al., 2018, p.1).

Important to take into account is that this conceptual framework visualises possible processes of ‘soft change’, i.e. the way actor tactics put pressure on the institutions to trigger their change early on in a transition. Altering ways of doing, thinking and organising, even at a small scale, can put pressure on the institutional arrangement. This may not lead directly to hard change, but it does put into motion (i.e. trigger) an institutional change process.

3. Methodology

This chapter elaborates on the research methodology. Departing from a reflection on the underlying research philosophy (3.1), an explanation of and argumentation for the chosen strategy and research design follows (3.2). Then the case selection is presented (3.3), followed by an elaboration of the research methods (3.4) and a discussion of a number of research quality criteria (3.5).

3.1 Research philosophy

“Questions of social ontology cannot be divorced from issues concerning the conduct of social research. Ontological assumptions and commitments will feed into the ways in which research questions are formulated and research is carried out” (Bryman, 2012, p.34). Hence, before going deeper into the research methodology, the underlying research philosophy in terms of ontological and epistemological assumptions is reflected upon in order to provide background to the methodological choices made.

Ontology is concerned with the nature of social entities: whether they are regarded as objective entities that have a reality external to social actors (objectivism) or as social constructions built up from the perceptions and actions of social actors (constructivism) (Bryman, 2012, p.32). This research follows a constructivist ontology, which is reflected in both the formulation of and the approach to answering the research question. In the study of the early phases of (socio-technical) transition and innovation processes, which are characterised by uncertainty and ‘interpretative flexibility’ (Geels, 2010, p.500), social phenomena and their meanings are ‘under construction’ by social actors. In other words, they are produced through social interaction and therefore in a constant state of change (Bryman, 2012, p.33). Even though social entities are not seen as an external objective reality, it is nevertheless recognised that there are pre-existing structures that shape people’s perspectives and actions. However there is *“an intellectual predilection for stressing the active role of individuals in the social construction of social reality”* (Bryman, 2012, p.34). Thus taking an actor perspective, as is done in this research.

In line with this ontological stance, this research takes the epistemological stance – that is, what is regarded as the appropriate way to study the social world (Bryman, 2012, p.19) – of the interpretative researcher. Interpretivism holds the view that social research should – in contrast to the positivist epistemology that follows the natural sciences’ scientific model – be conducted with respect to the differences between people and the objects of study. It requires social researchers to grasp the subjective meaning of social action in order to understand the social world (*Verstehen*) (Bryman, 2012, p.28-30). From this interpretative stance, socio-technical transition is studied with attention to people’s differing perceptions and interpretations of the uncertain and innovative early stages of transition.

These ontological and epistemological considerations form the underlying research philosophy that shaped the research process; influencing the formulation of research questions, the choice of methods and the iterative nature of the process. It also has consequences for the criteria by which to judge the quality of this research. This is reflected upon in paragraph 3.5.

3.2 Strategy and research design

Against the background of the research philosophy sketched above, methodological choices were made regarding the research strategy and design suitable to answer the research question. *Strategy* refers to the general approach to social investigation, which tends to be captured in the distinction between qualitative and quantitative strategies (although these can be combined in a mixed methods design) (Bryman, 2012, p.35). These strategies differ regarding not only their emphasis on words versus

numbers, but also their ontological orientation, epistemological orientation and orientation to the role of theory. For instance the qualitative strategy tends to subscribe to the features of constructivism (ontology), interpretivism (epistemology) and inductivism (generating theory out of research) (Bryman, 2012, p.380). *Design* then refers to the structure or framework that guides the collection and analysis of data. Different designs are for example experimental, cross-sectional, longitudinal, case study and comparative designs. The choice of research design reflects the priority given to certain dimensions of the research process, namely; expressing causal connections between variables; generalizing to larger groups; understanding behaviour and the meaning thereof in its specific social context; and having a temporal appreciation of social phenomena and their interactions (Bryman, 2012, p.46).

The research question, posed in the Introduction chapter, guides this research towards exploring the role of actor tactics in triggering institutional change in the socio-technical transition towards a circular economy. Answering this question requires the study of both institutional configurations and the positions, perspectives and actions of involved actors. In light of the nature of these objects of study, and the fact that these institutional and agency elements are specific to context and thus different across certain cases, a *qualitative* strategy and a *case study* design are chosen as most suitable for this research. The qualitative strategy fits the ontological and epistemological orientations of this research. As does the choice for case study as research design, which prioritises the dimensions of understanding behaviour and meaning in specific social contexts and a temporal appreciation of social phenomena over finding causal connections and generalising.

In a case study design, the case is an object of interest in its own right. The focus is not on generating knowledge that applies regardless of time and place, but rather on providing an in-depth elucidation of the case and its unique features (Bryman, 2012, p.69). Choosing a case study design brings two main advantages: “*the closeness of the case study to real-life situations and its multiple wealth of details*” (Flyvbjerg, 2006, p.6). In this research, the qualitative case study design allows zooming in on CE innovation projects, as specific cases in which actors employ tactics to trigger institutional change, and studying them in their everyday, real-life setting. Each of such cases is a unique project, making it important to study it holistically in its environment. Moreover, a qualitative case study allows these CE initiatives to be studied in great detail, making it possible to consider the institutional factors of relevance as well as the (sometimes implicit) actor tactics and their influence (Van Thiel, 2014, p.86; Yin, 2014, p.11). Specifically in the case of CE innovation, a qualitative case study is suitable because it brings to the fore the concrete and at the same time context-dependent participation in change processes. This research strategy and design are common in transition studies (Smith et al., 2014).

In order to strengthen the analytical value of the research, more than one case is studied, making it a *multiple-case design*. A methodological argument for this choice is that a multiple-case design improves the ability to find and substantiate analytical patterns. The comparison of multiple cases provides stronger ground for establishing the circumstances in which certain analytical patterns will (not) hold (Bryman, 201, p.74). Additionally, an empirical argument for this choice is that the phenomenon under study, circular economy innovation, is not limited to a single scale but instead takes place on multiple inter-connected levels. As reflected in the definition of CE presented in the Introduction, CE operates at three levels: “*the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond)*” (Kirchherr et al., 2017, p.224-225). Taking this into account in this research requires a multiple-case design. More specifically, this research employs an *embedded case study* design, as conceptualised by Yin (2014), in order to not only study CE innovation at multiple levels but also reflect on their cross-case interconnections within their urban contexts (cities).

The qualitative strategy and multiple-case study design guide this research, which follows a ‘zooming in and zooming out’ approach. This means departing from theoretical starting points, as it helps to have an explicit focus at the outset when studying and comparing multiple cases (Bryman, 2012, p.75). Then, zooming in on the empirical cases and studying them in detail. Followed by a zooming out, synthesising the cases to find connections and patterns (Nicolini, 2009). This approach thus combines deduction (starting from a theoretical framework) and induction (looking for new theoretical insights) in order to both test and add to the theoretical framework. Moreover, this approach provides a structure for conducting the analysis.

However, this research has turned out to be a strongly iterative process. “[R]esearch is full of false starts, blind alleys, mistakes, and enforced changes to research plans” (Bryman, 2012, p.15). Before going further into the processes of case selection (§3.3), data collection and data analysis (§3.4), a reflection is needed on an extensive change made to the research.

This thesis was conducted with a dual purpose: to collect data for the internship organisation that facilitated this research, and to conduct a Master thesis research. In serving both of these purposes, this research selected cases and collected data with a different outset and perspective than what turned out to be the focus of the research presented here. When starting the first analyses of the data collected for the internship project, an approach was found that would allow better utilisation of this data in the Master thesis than initially planned. Hence at this point the research perspective was changed, altering the original research question and the main part of the theoretical framework. Where the original research was meant to dive deep into the role of actors’ narrative work in overcoming hampering institutions, the new approach instead looks at a variety of actor tactics more broadly (narrative work being only one of them) and their role in institutional change.

The alteration is important to highlight as it took place rather late in the research process (after data collection and initial analyses). Hence it explains for instance why certain interview questions were (not) asked (see Appendices 1, 2 and 3) and why the codes used to analyse the data do not coincide directly with the (new) theoretical framework (see Appendix 4). Nevertheless, since it is an explorative research, this change is not seen as problematic but as part of the iterative process. This thesis may have turned out differently than originally set out, but that is only for the better as it allowed an improvement.

3.3 Case selection

To study the role of actor tactics employed by CE initiatives to trigger institutional change, cases need to be selected. Rather than a random selection, an information-oriented selection is employed. This means that the cases are selected based on expectations about their information content, allowing the maximisation of the utility of information from cases (Flyvbjerg, 2011, p.307). Building on this, there are different types of cases that can be selected: extreme or deviant cases, maximum variation cases, critical cases and paradigmatic cases. Each type serves a certain function, i.e. allows the obtaining of certain information. For this research, cases of the paradigmatic type are selected. These highlight more general characteristics of the social entities in question and are therefore helpful to operate as a reference point for studying the domain that the case concerns (Flyvbjerg, 2011, p.307-308).

Paradigmatic cases are carefully selected examples of the phenomenon under study, which have metaphorical or prototypical value (Flyvbjerg, 2011, p.307). In this study, therefore, the cases are paradigmatic because of their role as exemplar of the dynamics between actors and institutional change as elaborated in the theoretical framework. They can provide insight into this process in practice. Paradigmatic cases have been used in this context before, as Smith et al. (2014) – who similarly studied the development of sustainable innovation niches and the role of actors therein – conducted a case study of a paradigmatic case.

There are no standard criteria for the selection of paradigmatic cases, but this does not mean that their selection is based solely on intuition without justification of this (Flyvbjerg, 2011, p.308). Accounting for the selection of paradigmatic cases often builds on key elements of the phenomenon under consideration. In this research several relevant aspects of CE innovation were taken into account that led to the selection of the cases. In addition, the preferences of the internship organisation regarding which cases were interesting for their research project were taken into account in this selection.

The case selection began based on the criterion of *location*. This research focusses on the CE transition in the Netherlands, which is still in an early phase and hence primarily still concentrated in local innovation projects within urban contexts (Barnes et al., 2018). Therefore a first step is selecting these urban contexts, i.e. cities that host relevant local initiatives. Amsterdam and Rotterdam are chosen here, because they are leading cities in two of the main fields of circular practices – based on the five Transition Agendas that prioritise the foci for the Dutch CE transition (Meijer, Nelissen, Rakhorst, Keurentjes & Kaanen (2018) – namely circular built environment and circular manufacturing industry. Moreover they are two of the cities with the highest concentration of CE initiatives, according to the inventory of PBL (internship organisation). These cities being highly innovative and leading in priority fields of the transition makes them rich in experience and thus information, and appropriate urban contexts in which to further search for paradigmatic cases of innovation projects. They can be seen as two overarching contexts in which CE innovation cases are embedded, as conceptualised by Yin (2014).

The second step in selecting cases is based on the criterion of *scale*. As mentioned in the previous paragraph (3.2), when arguing for the multiple-case study design, CE innovation takes place at multiple levels: “*the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond)*” (Kirchherr et al., 2017, p.224-225). These levels harbour different types of innovations. Therefore, in order to gain broad enough insight into CE innovation in both Amsterdam and Rotterdam, this research will zoom in on one project at each of the three levels in each of the two cities. Thus selecting in total six (embedded) cases of CE innovation: within both cities an exemplary case of CE innovation at the level of an area (macro), in an innovation hub (meso) and as a concrete project (micro). They were chosen through a snowballing technique (Bryman, 2012, p.202-203), where the initial investigation of a first case led to potential additional cases to select alongside it. For instance looking into the macro-level cases to be studied for the internship project led to related meso and micro level cases to reach a balanced selection for the Master thesis research. This technique simultaneously enhanced the interconnectedness between the embedded cases.

The third and final criterion for case selection is the extent to which the cases are *developed*. This is based on the assumption that the further an innovation project has developed, the more experience this project has collected and thus the more insights it can provide into actor tactics employed towards institutional change. However this is not only a matter of time, i.e. how long the project has been running for, but also a matter of how innovative a project is. Highly innovative projects, thus facing stronger institutional resistance, are expected to also provide much relevant insight even if they started more recently. Thus both longer-running cases and more recent but highly innovative cases can be exemplary in the sense that they are iconic cases of CE innovation which possess much valuable information.

In sum, the empirical part of this research focusses on two leading cities (Amsterdam and Rotterdam) and therein six local initiatives – selected with a snowballing technique on the criteria of *location*, *scale* and *development*, and to a justifiable extent accommodating preferences of the internship organisation – which are paradigmatic for CE innovation towards institutional change. The cases are selected to achieve both purposiveness (answering the research questions) and representativeness (Bryman, 2012, p.428). The selected cases are valuable not for generalisability but for how they exemplify (as paradigmatic cases) the development towards a circular economy and thereby the insight into the role of actor tactics in triggering institutional change.

As a result of this process, the following cases have been chosen:

	Amsterdam	Rotterdam
Macro level (area)	Circular Buiksloterham	Port of Rotterdam
Meso level (innovation hub)	De Ceuvel	BlueCity
Micro level (concrete project)	New Sanitation	Ioniqa Circular

Table 3. Case selection

To sketch a context for the Amsterdam cases, the municipality of Amsterdam launched its new Sustainability Agenda in 2015 (Municipality of Amsterdam, 2015b). In this the circular economy was presented as the leading transition pathway (Eveline Jonkhoff, personal communication, 22 May 2018). In the same year, Amsterdam explored its opportunities for a circular city and based on this a vision and roadmap (Municipality of Amsterdam, 2015a). This was followed up with two project programmes. In 2017 over 70 projects were realised, ranging from municipal activities such as circular area development and procurement, to innovation projects in cooperation with market parties and research institutes (Municipality of Amsterdam, 2016a; 2016b). These programmes were evaluated in 2018, resulting in positive feedback combined with important lessons learned and guidelines for the years to follow in the transition to circularity (Municipality of Amsterdam, 2018).

This circularity is formed through various CE initiatives across multiple levels, including those selected for this research. Meso-level initiative De Ceuvel started when it won a tender for the temporary and sustainable use of a polluted patch of land in Amsterdam North, and has now developed into an innovation hub or ‘Clean Tech Playground’ working on circular technologies and practices. Macro-level initiative Circular Buiksloterham gained momentum from De Ceuvel and started when a group of stakeholders in this area signed a manifest to commit to the circular development of the area. Micro-level initiative New Sanitation is one specific project being realised in the Buiksloterham area, connecting hundreds of homes to a new and circular sanitation system.

To sketch a context for the Rotterdam cases, the circular economy ambitions started out under the flag of sustainability in Rotterdam as well: CE became one of many aspects in the 2015-2018 Sustainability Programme (Municipality of Rotterdam, 2015). Motivated by both the national and regional CE policies set up in 2016, Rotterdam came with more concrete local CE policy in 2017 in the form of the Rotterdam Circular programme. Therein ambitions and plans were formulated and a structure was set up to further connect and support CE developments in Rotterdam. The Municipality of Rotterdam also took on projects themselves and created a Roadmap for the CE transition in 2016-2019 (Municipality of Rotterdam, 2017a; 2017b). In 2018 a research was conducted into the circular opportunities in the city, similar to Amsterdam. This helped the Municipality to focus their efforts (such as campaigns, licensing and procurement) on the most promising further steps in their CE transition (Metabolic, Circle Economy, BlueCity & Spring Associations, 2018; Ingeborg Berger, personal communication, 7 May 2018).

Rotterdam’s policy is mainly focussed on supporting circular entrepreneurs in the city, regarding upscaling, subsidies and hampering laws and regulations (Ingeborg Berger, personal communication, 7 May 2018). Meso-level initiative BlueCity is one such circular entrepreneur, or rather a hub of entrepreneurship. This initiative is about housing, connecting and supporting start-ups in their circular

endeavours, while engaging in circular renovations and promotion of CE as well. Macro-level circular developments are taking place in the Port of Rotterdam, which works towards its CE ambitions through managing circular industry in the area and through circular area development. Micro-level initiative Ioniqa Circular is one concrete circular activity currently located in the Port area, further developing a circular plastic recycling technology and working towards the commercialisation thereof.

3.4 Research methods

Within this research, several methods for data collection and analysis are employed and triangulated in order to answer the research question. Given this research question and the research design chosen to answer it, data is collected and analysed on six local CE initiatives, regarding the tactics employed by the actors involved in these initiatives to alter the selection environment and trigger institutional change.

Various research methods are possible in qualitative research, the main ones being ethnography or participant observation, qualitative interviewing, focus groups, language-based approaches and the collection and qualitative analysis of texts and documents (Bryman, 2012, p.383). In this research, two research methods are employed and combined, namely *desk research* (i.e. the collection and qualitative analysis of documents) and *qualitative interviewing* (and the analysis of their transcripts).

The desk research was started before the first interviews, to help understand the cases and to be an informed interviewer, and continued throughout and after the interview period, to validate, deepen and add to the insights gathered from the interviews. However, the interviews proved the main research method – that is, it provided the most data and insights – because available documentation around local projects in-progress turned out to be limited. The interviewing method in particular provided valuable primary data on how the processes under study unfolded and shed light on the various perspectives and actions of involved actors, which could be expected of this research method (Creswell, 2009). Overall, the process of collecting and analysing data in this research is generally similar to the methodology of other research studying the same or related topics (e.g. Barnes et al., 2018; Smith et al., 2014; Fuenfschilling & Truffer, 2016). For example, Fuenfschilling and Truffer (2016, p.303) also researched the employment of actor tactics in a specific case through both secondary data (documents) and conducting, transcribing and coding interviews.

Important to note is that the research methods did not take place in consecutive phases, nor did the processes of data collection and analysis. Instead, the two methods occurred in this research process simultaneously (i.e. working with documents and interviews at the same time). Similarly, data collection and data analysis were conducted iteratively (i.e. some data was already analysed while other data still needed to be collected). This is not uncommon in a qualitative research strategy (Bryman, 2012, p.386).

3.4.1 Data collection

Data collection for the desk research took place using two sampling techniques to select relevant documents. First of all through purposive sampling, selecting documents “*in terms of criteria that will allow the research questions to be answered*” (Bryman, 2012, p.418). For this research (both the old and new set-up), a first requirement was to have knowledge of the context in which the cases under study are embedded. Hence the data collection started with policy contexts, selecting documents around both Amsterdam and Rotterdam’s sustainability and circular economy municipal policies. Besides this context, the collection of secondary data also focussed on gathering documents on the CE initiatives themselves, to shed light on actor networks, progress and plans. These turned out difficult to find.

Therefore the second sampling technique proved especially useful, namely snowball sampling. Building on the initial selection of documents from purposive sampling, this collection was expanded based on references found in these initial documents and - throughout the research process - with the help of (in)direct suggestions from respondents in interviews (Bryman, 2012, p.424). Snowballing was the main technique for sampling documents, which means many documents are not necessarily directly related to the research question but rather selected in order to add to the interview insights.

Data collection continued until a certain ‘stopping criterion’ was reached, in this case saturation. This means a number of documents that is enough for a reliable insight into the object of study (Bryman, 2012, p.426). Here, saturation in documents is relative to the insights from the interviews collected simultaneously. In the end, this culminated into the sets of documents presented in tables 4 and 5 below.

Amsterdam (14)
Amsterdam Economic Board. (2016). <i>Roadmap Circulaire Economie</i> . Amsterdam: Amsterdam Economic Board.
Delva, S., Wijnakker, R., Jorritsma, J., Pisiariu, C.S., Herder, A., Pieroth, M., Behm, M. & Van Odijk, S. (2016). <i>Buiksloterham Circulair. Ontwerpen aan de postindustriële stad</i> . Amsterdam: DELVA Landscape Architects
Municipality of Amsterdam. (2015a). <i>Amsterdam Circulair: Visie en routekaart</i> . Amsterdam: Municipality of Amsterdam.
Municipality of Amsterdam. (2015b). <i>Duurzaam Amsterdam. Agenda voor duurzame energie, schone lucht, een circulaire economie en een klimaatbestendige stad</i> . Amsterdam: Municipality of Amsterdam.
Municipality of Amsterdam. (2016a). <i>Amsterdam Circulair: Leren door te doen</i> . Amsterdam: Municipality of Amsterdam.
Municipality of Amsterdam. (2016b). <i>Circulair Innovatieprogramma 2016-2018. Met een doorkijk naar 2015</i> . Amsterdam: Municipality of Amsterdam.
Municipality of Amsterdam. (2016c). <i>Uitvoeringsplan Afval. Grondstoffen uit Amsterdam</i> . Amsterdam: Municipality of Amsterdam.
Municipality of Amsterdam. (2018). <i>Amsterdam Circulair: Evaluatie en Handelingsperspectieven</i> . Amsterdam: Municipality of Amsterdam.
Municipality of Amsterdam. (z.j.). <i>Circulaire Economie</i> . Consulted 24 May 2018, at https://www.amsterdam.nl/wonen-leefomgeving/amsterdam-innovatie/circulaire-economie/ .
Metabolic, Studioninedots & DELVA Landscape Architects. (2014a). <i>Een living lab voor circulaire gebiedsontwikkeling. Circulair Buiksloterham: Visie en Ambitie</i> . Amsterdam: Metabolic
Metabolic, Studioninedots & DELVA Landscape Architects. (2014b). <i>Transitioning Amsterdam to a Circular City. Circular Buiksloterham: Vision & Ambition</i> . Amsterdam: Metabolic.
Roemers, G. & Faes, K. (2017). <i>Roadmap Circulaire Gronduitgifte</i> . Amsterdam: Gemeente Amsterdam.
Steen, K. & Van Bueren, E. (2017). <i>Urban Living Labs. A living lab way of working</i> . Amsterdam: Amsterdam Institute for Advanced Metropolitan Solutions.
Van Ratingen, D. & Cramer, J. (2016). <i>Uitvoeringsprogramma 2016-2018. Grondstoffen Transitieprogramma: De Metropoolregio Amsterdam als Circulaire Grondstoffen Hub</i> . Amsterdam: Amsterdam Economic Board.

Table 4. Selected documents Amsterdam

Rotterdam (14)
AgendaStad. (n.d.). <i>Circulaire stad</i> . Consulted 3 August 2028, at https://agendastad.nl/citydeal/circulaire-stad/ .
Municipality of Rotterdam. (2015). <i>Duurzaam dichterbij de Rotterdammer. Programma Duurzaam 2015-2018</i> . Rotterdam: Municipality of Rotterdam.
Municipality of Rotterdam. (2016). <i>Eerste rapportage voortgang programma Duurzaam 2015-2018</i> . Rotterdam: Municipality of Rotterdam.
Municipality of Rotterdam. (2017a). <i>Roadmap Circular Economy Rotterdam</i> . Rotterdam: Municipality of Rotterdam.
Municipality of Rotterdam. (2017b). <i>Rotterdam gaat voor circulair. Visie en aanpak 2017</i> . Rotterdam: Municipality of Rotterdam.

Municipality of Rotterdam. (2017c). <i>Struisenburg. Ontwerpbestemmingsplan</i> . Consulted 27 August 2018, at https://rotterdam.raadsinformatie.nl/document/6345590/1/18bb2532 .
Municipality of Rotterdam. (2017d). <i>Tweede rapportage voortgang programma Duurzaam 2015-2018</i> . Rotterdam: Municipality of Rotterdam.
Port Authority Rotterdam. (2011). <i>Havenvisie 2030: Port Compass</i> . Rotterdam: Port Authority Rotterdam.
Port Authority Rotterdam. (2015). <i>Voortgangsrapportage 2015: Havenvisie 2030</i> . Rotterdam: Port Authority Rotterdam
Port Authority Rotterdam. (2016). <i>Voortgangsrapportage 2016: Havenvisie 2030</i> . Rotterdam: Port Authority Rotterdam.
Port Authority Rotterdam. (2017). <i>Voortgangsrapportage 2017: Havenvisie 2030</i> . Rotterdam: Port Authority Rotterdam.
Metabolic, Circle Economy, BlueCity & Spring Associations. (2018). <i>Circulair Rotterdam: Kansen voor nieuwe banen in een afvalvrije economie</i> . Amsterdam: Metabolic.
Port of Business. (2018). <i>Samenwerking gemeente en BlueCity</i> . Consulted 6 August 2018, at https://portofbusiness.nl/samenwerking-gemeente-en-bluecity/ .
Rotterdam Makers District. (2017). <i>Visie en Strategie</i> . Rotterdam: Rotterdam Makers District

Table 5. Selected documents Rotterdam

Interview data was collected through interviews with both experts and respondents (actors involved in cases). First, three experts were selected by the internship organisation to provide further knowledge into CE transition processes (e.g. circular area development). These interviews were primarily conducted for the internship project, but were also useful for background knowledge in this thesis. Second, the respondents were selected using the same two sampling techniques as for the selection of documents: purposive and snowball sampling. However, here purposive sampling was the main technique. With the aim in mind to gain insight into both policy contexts (role of municipalities) and the development process of the cases, involved actors who were expected to possess the most knowledge were requested to participate in an interview. The preferred respondents were those people who are closely involved in the projects and thus have insight into the actor tactics employed (by themselves and others in the actor network whom could not be interviewed). In the case of Amsterdam, such respondents were found for example by attending a meeting for updating stakeholders and interested parties on the progress in Buiksloterham. Here the actor network could be explored and contacts made with possible interview respondents for multiple Amsterdam cases and the municipal context.

Not all preferred respondents, selected through purposive sampling, were able or willing to participate. For instance due to a lack of time, lack of interest or no response to the interview request. Snowball sampling was required to come up with additional options. For example, some of whom declined an interview request suggested a colleague that was comparable to them (e.g. Peter Dortwegt). Or throughout the interview period, new names would come up in interviews (e.g. Pim de Wit). Though not all suggestions could be followed up due to limits to the number of interviews, the snowballing technique was nevertheless helpful and applicable in this kind of research where actor networks play an important role (Bryman, 2012, p.424).

The mentioned limits, specifically in time and capacity (to process the interviews), formed the stopping criterion for data collection regarding the interviews. As a result, the selection of respondents is of minimal but adequate saturation. Although a larger number of interviews would have increased the reliability, it is still enough interviews to get gain deep enough insight into the object of study to conduct the analysis. Also, the achieved selection of respondents reflects the desired representation of the cases (the same number of respondents and comparable types of respondents regarding their roles in the cases).

The data collection resulted in the lists of interview respondents presented tables 6, 7 and 8 (with behind their names their initials, which is how they will be references in the analysis chapters):

Name	Organisation & function	Relevance
1. Paola Huijding (PH)	Platform 31 – Senior project leader	Expert in circular area development
2. Ellen van Bueren (EvB)	TU Delft – Professor Urban Development Management	Expert in circular area development
3. Heleen Lobbe (HL)	Municipality of Rotterdam – Legal team Public Affairs	Expert in CE law and regulation

Table 6. Expert interviews

Name	Organisation & function	Relevance
4. Eveline Jonkhoff (EJ)	Municipality – Senior advisor sustainable strategy and CE	Policy context
5. Renate Heppener (RH)	Municipality – Program manager Circular BSH	Policy context & Circular BSH (macro)
6. Peter Dortwegt (PD)	Stichting Stadslab – “Quartermaster”	Circular BSH (macro)
7. Eva Gladek (EG)	Metabolic – Founder & CEO	Circular BSH (macro) & De Ceuvel (meso)
8. Chandar van der Zande (CvdZ)	Metabolic – Sustainability consultant & board member DC	De Ceuvel (meso)
9. Mark Wets (MW)	Waternet – Project manager Nieuwe Sanitatie	New Sanitation (micro)
10. Jürgen Klaassen (JK)	De Alliantie – Area developer, involved in NS project	New Sanitation (micro)

Table 7. Interview respondents Amsterdam

Name	Organisation & function	Relevance
11. Koen de Kruif (KdK)	DCMR – Senior advisor sustainable development	Context
12. Ingeborg Berger (IB)	Municipality – Program manager Rotterdam Circular	Policy context
13. Janneke Pors (JP)	Port – Advisor on CE	Port (macro)
14. Pim de Wit (PdW)	Port – Project manager and advisor sustainable development	Port (macro)
15. Sabine Biesheuvel (SB)	BlueCity – Co-founder	BlueCity (meso)
16. Casper van der Meer (CvdM)	Better Future Factory – CEO	BlueCity (meso)
17. Tonnis Hooghoudt (TH)	Ioniqa – CEO	Ioniqa Circular (micro)

Table 8. Interview respondents Rotterdam

The interview period lasted from mid-April until mid-June 2018. The interviews were all in-depth and semi-structured. Half of the interviews were conducted together with the researcher from the internship project, but that did not affect the data collection since the interview guides were drawn up together and both interviewers followed this questioning. The content of the interviews centred around encouraging the respondents to tell their story of how the CE initiative they are involved in developed. This with the theoretical framework of the previous research set-up in mind (see paragraph 3.2), which focussed specifically on identifying hampering institutions. Deepening questions were posed throughout this

story, by asking how they handled institutional struggles to further the initiative (thus indirectly shedding light on actor tactics). This strategy – letting the respondent’s story be centre and hooking questions onto this – was supposed to draw the necessary data from respondents in an unforced and unbiased way.

Conducting the interviews in this way is similar to how other researchers conducted their interviews in research on the same or similar phenomenon (e.g. Smith et al., 2014; Fuenfschilling & Truffer, 2016; Barnes et al., 2018). An interview guide was used each time to support questioning (hence semi-structured interviews). Given the large variety in respondents and their roles in the studies cases, this interview guide was slightly altered for each interview to suit the specific respondent. The general interview guides for experts, project actors and municipal actors are included in appendixes 1, 2 and 3 (in Dutch, the language in which interviews were conducted).

3.4.2 Data analysis

In the qualitative analysis of both primary interview data and secondary data from documents, three steps were undertaken: data managing (transcribing interviews), data analysis (coding transcripts and documents) and data interpretation (sense-making) (Bryman, 2013, p.13). As for data managing, the interviews were recorded and then fully transcribed. All but one, as the recording failed for one expert interview, which was then processed into a report based on notes taken immediately. Both the interview transcripts and the selected documents were uploaded into qualitative analysis software (ATLAS.ti).

The analysis of interview transcripts started with a coding scheme (Appendix 4) based on the theoretical framework (of the previous research set-up, see paragraph 3.2). It contained codes on the various institutions, their indicators and enabling or hampering effects, codes with which to identify narratives and additional broader codes regarding networks, governance and the CE transition. Moreover, this coding scheme was constantly refined and complemented with codes on emerging insights that arose throughout the data analysis. Thus the coding of interview transcripts consisted of theoretical background as well as open coding based on inductively refining empirical insights into codes.

The analysis of documents took place before, during and after the interview period. Before in order to understand the policy context and have prior knowledge about the cases to be an informed interviewer. During and after because the main contribution of reviewing documents was to be complementary to the interview data. Not only to corroborate, but also to deepen and question interview findings and interpretations. Thus the coding of documents was based not only upon theoretical insights but also upon their connection to interview findings, which was when the coding scheme was not applied thoroughly.

Data interpretation (sense-making) also consisted of several steps. While still working from the previous research set-up (paragraph 3.2), the interview transcripts and documents were initially being coded in the computer software. However a preference for manual analysis took over – selecting, categorising and interpreting data right away and in a preferred way – and that is where the first step in data interpretation took place. More specifically, the data fragments regarding institutional struggles were captured into extensive tables for each case, elaborating what exactly these struggles entail and how the involved actors dealt with them. They present regulative, normative and cognitive institutions as well as all data regarding networks, cooperation and relevant contextual factors. The second step took place after the shift to the new (current) research set-up. This step concerns extracting from these extensive tables the information on actors handling institutional struggles with actor tactics. Of course this was not yet enough information to really substantiate findings around actor tactics. Therefore a third step followed, in which the interview transcripts and documents were revisited for additional information around these initial interpretations and to identify possible additional actor tactics. In the end, these steps culminated into the analyses presented in chapters 4 and 5.

3.5 Research quality

The most prominent criteria for the evaluation of research quality are reliability, replication and internal and external validity. However, as this thesis is not quantitative research and has a social constructivist orientation, alternative criteria would be more suitable. Common in methodological literature is to assess the quality of this kind of research on the issue of trustworthiness instead (Bryman, 2012, p.45-46; Yanow & Schwartz-Shea, 2009). There are four aspects to trustworthiness, each of which parallels with the quantitative research criteria. They are credibility (believable findings), transferability (findings apply to other contexts), dependability (findings are likely to apply at other times) and confirmability (the investigator has not allowed his or her values to intrude to a high degree) (Bryman, 2012, p.49).

Throughout the research process – and in order to prevent possible negative impact of the changes made to the research reflected upon in paragraph 3.2 – several techniques were employed to keep up the research quality. Methodological literature identified such techniques in relation to the various aspects of trustworthiness. To uphold credibility, for instance, respondent validation (member check) and triangulation are suggested. As for transferability, thick description is important. Dependability is improved with proper audit in the research report and documentation. And finally confirmability requires reflexivity of the researcher (Bryman, 2012, p.390; Schwartz-Shea, 2015, p.131).

Firstly, this research engages in thick description. In other words, the analysis chapters contain enough descriptive detail on what happens in the cases, in order to capture the relevant context-specific nuances to substantiate interpretations (Schwartz-Shea, 2015, p.59). Secondly, this thick description is based on a triangulation of data from multiple sources (documents and interviews). Combining data sources and data collection methods was helpful to check for inconsistencies in data as well as reduce the likelihood of interpretations based on misunderstandings (Bryman, 2012, p.392). Thirdly, research quality is also improved through audit. In terms of documentation, for instance through the extensive analysis tables and interview transcripts. But also in terms of transparency on the research process in order to make it retraceable. For instance with the reflection on changes made to the research and by providing clarity on the research steps taken and the reasons behind them (Schwartz-Shea, 2015, p.136-138).

Finally, reflexivity played a role in all phases of the research process through consciousness of my role as researcher (Yanow & Schwartz-Shea, 2009, p.60). Three points are most relevant regarding this. One is that I am trained in more positivist research tradition and was initially unaware that this research turned out more constructivist. And once aware, unsure how to go about it. This may have influenced decisions made. Another point is that interview respondents may provide different information if directly asked by a researcher what hampered them in their endeavours. Awareness of this possibility was one of the motivations to conduct the interviews as they were, centring the respondent and their storytelling. A last point, which I have taken into account in the formulations of analyses and findings, concerns the awareness that my account of the cases studied is just one of multiple possible interpretations.

4. Analysis: Amsterdam

This first analysis chapter revolves around the circular initiatives under study in Amsterdam. It starts with De Ceuvel (meso), followed by Circular Buiksloterham (macro) and then New Sanitation (micro). This sequence reflects the order in which they were initiated, as their developments are generally related to each other. The discussion of each case starts with an introduction to case and context, followed by the analysis of development and actor tactics. This analysis is structured roughly chronologically, clustering the actor tactics into three general development phases (labelled ‘getting started’, ‘furthering’ and ‘recent and upcoming’). Each case is then summarised and visualised, with references (cf.) to which cases present similar findings. Where the discussion of all three cases is a zooming in on details, this is followed up with a zooming out: a synthesis of the main insights and discussion of the patterns found.

4.1 De Ceuvel

In 2012, a piece of polluted land was tendered by the municipality of Amsterdam to a sustainable initiative. The winning idea, which came from a consortium of architects, was a hub for circular economy innovation. Eventually in 2014 De Ceuvel (DC) opened: a ‘Clean Tech Playground’. This is a so-called ‘breeding ground’ for testing sustainable innovations and applying circular principles. It mainly focuses on circularity in the built environment: exploring and showing alternative ways to use waste streams within a local area. Old houseboats were pulled onto the land to serve as offices and the ground was covered with vegetation to gradually cleanse the pollution. Since then De Ceuvel has mainly been a circular office park where a tight community has developed. Entrepreneurs are located here, working on their sustainable and circular innovations (Steen & Van Bueren, 2017). Many projects have been realised, ranging from local wastewater processing to a solar energy sharing system. These are the kind of circular practices that De Ceuvel aims to promote and institutionalise. De Ceuvel itself is not an ultimate end model to replicate, but instead it is the place for testing, learning and showcasing circular practices (EG r.65). Through its work, De Ceuvel learns about the CE, teaches, inspires and activates others, and proves that circular principles can be included in the built environment (CvdZ r.92).

The context in which De Ceuvel was initiated, is comprised of several favourable conditions. First of all, the initiation took place in times of financial crisis. Where municipal plans for area development were put on hold, room opened up for experimenting with alternative development ideas. Secondly, the Municipality of Amsterdam was already before the crisis engaged in sustainably oriented policy. Part of their efforts in the field of sustainability was tendering for sustainable projects, including the tender which resulted in De Ceuvel. And thirdly the land that was tendered was an empty lot, with little regulation on how to develop it, which gave room for creativity to the initiators of this initiative.

Despite these favourable conditions in the initiation of De Ceuvel, there have been challenges along the way since De Ceuvel opened and started its activities. These are grounded for instance in the linear practices in the built environment and the cultures of traditional stakeholders. In this context agency has played an important role in the development of De Ceuvel. Numerous actor tactics have been employed throughout the process of this initiative, to promote circular practices and change the ways of doing, thinking and organising in the built environment.

4.1.1 Getting started : Realising projects and influencing partners

One of the first steps undertaken by the initiators of De Ceuvel was *networking* efforts, to deepen the core network and expand with additional partners. The ‘core’ that initiated De Ceuvel consists of a

number of companies, including DELVA Landscape Architects and Metabolic. Although they divided their tasks based on their expertise, they worked together intensively and shared the same vision. Soon enough they, along with committed users and local volunteers, had formed a tight community (CvdZ r. 125; r.130; Steen & Van Bueren, 2017, p.17).

Besides this core network, the Municipality of Amsterdam (and their Environmental Service) became an involved partner early in the process. They supported De Ceuvel with a variety of resources. This varies from financial support, in the form of subsidies, to practical guidance regarding regulations and permits, and simply thinking along with their ideas and how they may be helpful (CvdZ r.360).

Although De Ceuvel started with a relatively small group, they soon needed to expand this network as the additional expertise of others was needed to realise their aspired projects (EG r.83). They had to point their networking efforts at forging external partnerships around experiments to take place at De Ceuvel. Over time they built such partnerships with relevant organisations. Besides the Municipality and their Environmental Service, who were around from the start, partnerships were made with local water utility Waternet, research organisations, housing corporations and innovative companies that needed a testing ground. This was beneficial for De Ceuvel, especially in this phase of development, for several reasons. Firstly, it brought them much needed investments. Subsidies, loans and donations were crucial in realising De Ceuvel (Steen & Van Bueren, 2017, p.17). These came from partners such as Waternet, Triodos bank and Stichting DOEN (CvdZ r.289). Secondly, partnerships with for instance Amsterdam University of Applied Sciences and research institute KWR helped De Ceuvel in attracting research projects to be conducted here (CvdZ r.333). And finally, these partnerships and the continuous network expansion allowed De Ceuvel to maintain its relevance and start new projects (CvdZ, r.318).

Particularly this networking with external partners was difficult, however, and posed a challenge for De Ceuvel already early in their development. Much effort went into convincing ‘outsiders’ of their breeding ground concept and ideas for experiments. Because while De Ceuvel is comprised of young and daring entrepreneurs working on circular innovation, many other organisations are not like that. Especially larger and more traditional organisations (such as utility companies) have a culture of thoroughly regulating and avoiding risk. They prefer to stick to doing things the way they are routinely used to doing them (according to their way of thinking) (CvdZ r.220). Though this is generally seen as understandable and important – as it often concerns fundamental aspects of life such as health, safety or energy supply – it does hamper experimentation and upscaling of innovations (CvdZ r.214).

In response, De Ceuvel actors engaged in *narrative work* in order to legitimise and promote their experiments and convince the necessary partners to join in realising them. In this early phase, their narrative work was mainly aimed at those organisations and companies that already have some innovative motivation. The narrative then appealed to their need for a place to test their innovative ideas (context), and presents De Ceuvel as the solution which provides this opportunity (content). “*A physical place to test things, is what many people are missing. So the fact you have a physical place like De Ceuvel [...] speeds up your innovation process*” (CvdZ r.216). This legitimises the breeding ground concept, with the aim of attracting attention, support and resources to further their work.

Through convincing external partners and expanding the network of actors around De Ceuvel, changes could be set in motion and also other actor tactics could be employed. Specifically, it allowed the joint theorising and defining of circular practices, and paved the way to deroutinising their non-innovative behaviour and challenging the cognitive and normative foundations underlying this.

With more partners, more experiments with circular practices could be conducted as more knowledge was brought in. This experimentation promotes new ways of doing, which benefits from the actor tactics of *theorising* and *defining*. De Ceuvel had already theorised some practices from their own ideas, which could then, with the help of the relevant actors, be further defined at the technical level. A

specific example of this is the water sanitation system on sight at De Ceuvel. Together with Waternet and their expertise, experimenting with local wastewater processing became possible. For instance conducting water quality tests helped them further define the technical details of this new way of managing wastewater locally (CvdZ r.172). Other examples reflect partnerships which engaged in joint theorising efforts and led to coming up with new ideas. For instance stakeholder sessions and workshops helped to bring relevant parties together and jointly theorise on broad themes such as special planning but also go into defining detail regarding technology and designs (CvdZ r.118). Thus De Ceuvel and its partners are involved in both theorising the Circular Economy and further defining technologies and circular practices, to explore and test new ways of doing.

In this cooperation, an additional effect has been a form of *deroutinisation* among the external partners of De Ceuvel who are involved in joint experiments and activities. Particularly the more traditional partners, in cooperating with the young innovative people at De Ceuvel around experiments, are stimulated to lessen in their embedded routines (characterised by avoidance of risk) and become more entrepreneurial and innovative themselves. They are encouraged to open up to alternatives, to take a risk and engage in experiment, and learn from this with regard to their own work (CvdZ r.220, r.239). Though an extensive effect on the ways of doing of these organisations may be difficult, De Ceuvel has managed to fundamentally affect the way of thinking of some of them with this actor tactic, making them consider what they can do to contribute to the CE transition (CvdZ r.227).

This suggests that their deliberate actor tactic to deroutinise also had an effect in terms of *shaping normative foundations* underlying the way of thinking of these external partners. Seeing examples and learning from the activities at De Ceuvel challenges their existing understanding of the built environment and supports the normative view that circular practices are possible and desirable (CvdZ r.214). This can for example be seen with the Environmental Service. They are an organisation with little room to change their way of doing, as they are expected to keep a steady role as licencing and supervision authority in which innovation generally does not fit. However, they do show a will to contribute (a normative consideration) and think in an innovative way, giving De Ceuvel slightly more experimenting space (CvdZ r.250). Thus while this effect was not a deliberate tactic, it does benefit De Ceuvel.

4.1.2 Furthering : Inspiring, educating and activating society

As more and more projects were realised and showcased, De Ceuvel could start to focus more on another part of their ambition: inspiring, educating and activating society to change their way of thinking. These are activities that strongly depend on efforts of the actors at De Ceuvel.

The effect of De Ceuvel on society is that “*it inspires, it educates and it activates. [...] we show that it can be done differently, [...] we explain how that works [...] and we challenge people to take it up themselves*” (CvdZ r.102). The actor tactic *educating* is thus an explicit part of De Ceuvel’s mission. Visitors are provided with knowledge about how the circular projects at De Ceuvel work, and where possible skills on how to take this up yourself. An example of this tactic in practice is workshops about the aquaponics system in the greenhouse. While this system was being built, workshops were organised to include visitors in this process, “*so that people could learn about the principles*” (CvdZ r.327).

The three-fold strategy of showing that a circular practice is possible (inspiring), explaining how that works (educating) and challenging people to work on this themselves (activating), is also the basis for De Ceuvel’s actor tactic of *shaping both cognitive and normative foundations* underlying society’s way of thinking. The people at De Ceuvel aim to promote circularity in the perceptions and values of their visitors. To show that it is actually possible to adopt circular principles in design and development (cognitive perceptions) and that it is desirable given the positive effects (normative values) (EG r.49; CvdZ r.107). Existing foundations are thus undermined and reoriented by presenting the success of circular alternatives. In practice this take place for instance through the explanatory tours around the

area. As the entire area is a showcase which provides evidence of working circular practices and contributes to awareness (CvdZ r.100; EG r.66). Especially since more recently De Ceuvel has increased her efforts on publicity, drawing a lot of visitors (CvdZ r.358).

In this promotion of circular practices through inspiring, educating and activating, it is important to have a good story. Actors involved at De Ceuvel have contributed to this through *narrative work*. Where the narrative meant to convince partners to join in projects appealed to the need for a place to experiment (context) and De Ceuvel as offering this (content), the narrative aimed at society in general is different. It appeals more broadly to the need for sustainability and a circular economy transition (context) and presents the socio-technical merits of what De Ceuvel does (content).

Regarding context, the narrative claims that a change in the current (institutionalised) patterns of urban development is needed, towards more circularity. This is specified by distinguishing seven pillars for CE, consisting of for instance materials, water management, renewable energy, biodiversity and an overall resilience (CvdZ r.45). High ambitions were formulated on each of these themes (Metabolic et al., 2014b, p.91). Regarding content, the narrative advocates how De Ceuvel pursues those ambitions: through developing circular technologies and practices and showcasing a circular built environment at small scale. The legitimacy of the experiments conducted at De Ceuvel is thus argued from their socio-technical contributions to one (or more) of these seven pillars of the envisioned new system. Thereby De Ceuvel is “*setting a new pattern for urban development*” (Metabolic et al., 2014b, p.91).

4.1.3 Recent and upcoming : Upscaling ‘lab’ knowledge

An important focus for De Ceuvel more recently is the upscaling of what has been learned so far in this living lab. For the efforts at De Ceuvel to have an effect and promote circular practices in the built environment, they need to make a change in the way of organising locally and possibly beyond. A couple of actor tactics are being employed to stimulate this upscaling.

The partnerships that were made and deepened through *networking* efforts are important because these tend to be the partners that can make a difference outside of De Ceuvel (such as Waternet and Alliander). This allows the experiments at De Ceuvel and the innovations of small entrepreneurs there to be taken to a higher level (for instance a larger scale). So that they are not just experiments that remain in this area, but that the knowledge gained from this is brought to the key stakeholders who can follow up on this (CvdZ r.201). A concrete example is that the experimentation with wastewater processing at De Ceuvel was taken on by partner Waternet, who created a New Sanitation programme and is setting up multiple pilots throughout Amsterdam (for example in Buiksloterham) with this new system (MW; EG r.88). Another example is the energy exchange system developed with energy company Alliander, who can take the lessons learned from the experiment at De Ceuvel further (CvdZ r.193).

Another tactic (to be) employed by the actors at De Ceuvel to upscale their work and knowledge, is *advocacy*. Over the years De Ceuvel has not only shown that certain circular practices work, but has also gained experience with and learned lessons about the challenges that such practices face, including hampering laws and regulations. Through regulative advocacy, in the form of policy advice, De Ceuvel aims to explain why certain regulations are hampering and how they can be changed based on their experience (CvdZ r.273). In addition to this regulative advocacy, though not actively advocated, De Ceuvel sees an important role for the government in upscaling the lessons learned. Particularly in the face of the current economic upturn, which is allowing a return to linear business-as-usual in area development, it would be helpful if the government (for instance the Municipality of Amsterdam) actively includes circular criteria in their own activities.

4.1.4 Summary

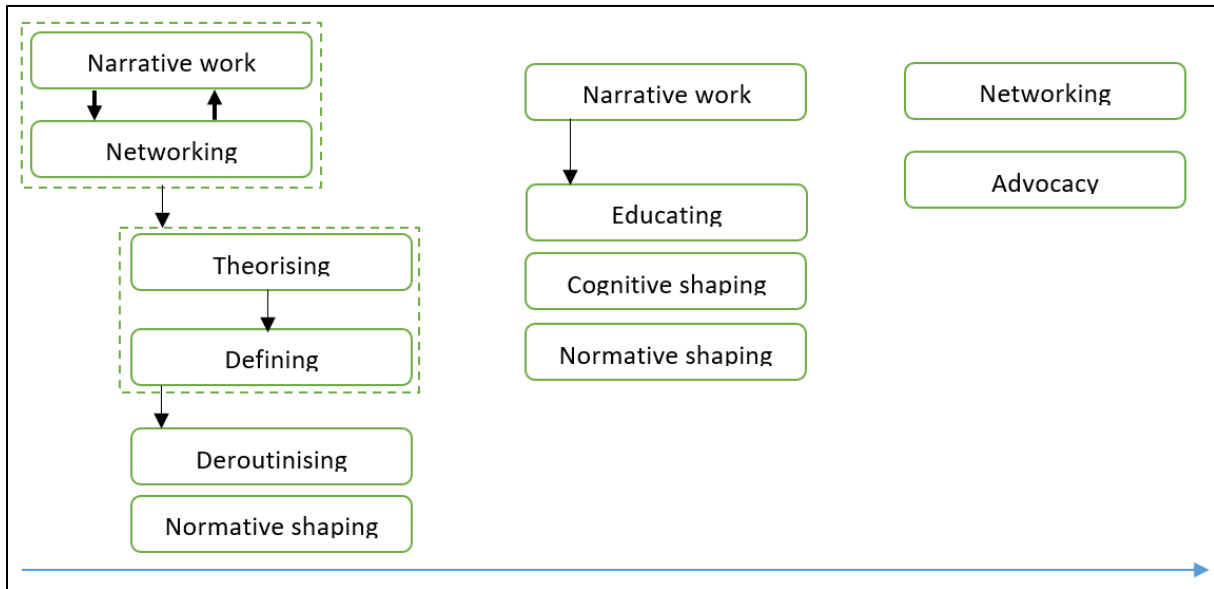


Figure 3. Visualisation case De Ceuvel

To conclude the analysis of De Ceuvel (DC), the main findings come down to the following. *Networking* and *narrative work* were essential first actor tactics, because together they allowed DC to start their experimentation. These two tactics have this effect together because they are mutually reinforcing: the narrative helped to convince external partners to join, and in return the projects realised with the networked partners allowed more positive framing of DC. Following these two tactics, experimentation could start in terms of *theorising* and *defining*. These two also appear together, but in successive order rather than simultaneously: DC and their partners think of new circular practices and then test them in practice. During their activities, some actor tactics are deliberately employed to push for institutional change whereas others are not. For instance the purpose behind *educating* and *cognitive and normative shaping* is to change the way of thinking in society, whereas the *deroutinising* and *normative shaping* among their partners was not a deliberate effect of joint experimentation.

Besides being the first, *networking* and *narrative work* were also employed later on. For instance there were different narratives, depending on who they were aimed at: partnerships (who need a testing ground) or society in general (and the need for CE transition). Also networking has different goals depending on the initiative's development phase: from gaining essential partnerships and mobilising their resources (early tactic) to gaining influential partners who are able to take their knowledge further beyond the local initiative (later tactic). This relates to the actor tactic of *advocacy*, also employed later on once DC had learned lessons and gained experience over time, and aimed at enabling the broader CE transition (through the influential partnerships forged by networking efforts).

4.2 Circular Buiksloterham

Buiksloterham (BSH) is a former industrial area in the north of Amsterdam, which was supposed to redevelop into a sustainable neighbourhood in which working and living come together. But when the crisis hit, all municipal and many private development plans were put on hold. Nevertheless, the redevelopment of the area was taken up, in a small-scale and bottom-up fashion, by the initial citizens and organisations in the area. They started what became Circular Buiksloterham. This initiative materialised into a Manifest to develop the area in a circular, bio-based and smart way, signed by 22 stakeholders in 2015.

In short, the initiative Circular Buiksloterham is a living lab for circular area development. “*The term [Urban Living Lab] is used to refer to a wide variety of local experimental projects of a participatory nature. The aim is to develop, try out and test innovative urban solutions in a real-life context*” (Steen & Van Bueren, 2017, p.5). The goal of the initiators of specifically this living lab is, “[...] with Buiksloterham as test case, to develop an exemplary approach to area development that shapes the transition towards a circular city” (Delva et al., 2016, p.13). Since its initiation, progress has been made on the themes of energy, materials, water and mobility. For instance through sustainable self-builders and experimentation with the waste system.

Circular Buiksloterham was initiated in quite a favourable context. Firstly the economic crisis, which meant that development plans were put on hold, created space for ambition and intrinsic motivation and allowed sustainable initiatives to flourish (PD r.56; JK r.3890. “*In the absence of large investments, bottom-up experiments, research, culture and innovation were actively encouraged*” (Steen & Van Bueren, 2017, p.20). Secondly, even before the crisis the former industrial area had already started to transform with the arrival of creative entrepreneurs and sustainable architects. Thus the area already had somewhat of a rough and creative identity, in which the motivated locals found each other (RH r.467). Finally, the initiation of Circular Buiksloterham gained momentum from De Ceuvel. Their success and exposure was stimulating to take the circular development further in the Buiksloterham area (EG r.53).

Despite these favourable contexts, challenges were also faced in setting up and developing Circular Buiksloterham. Such as the return of business-as-usual development with the economic upturn (EG r.208), the fragmented landholding in the area and (EG r.163; RH r.107) and the internal governance and commitment (RH r.476; PD r.710). And this continues, as there is much left to be done in the area to reach the ambitions, all the while the number of residents is growing rapidly. Many actor tactics have played and continue to play an important role in this development process.

4.2.1 Getting started : Committing to a Manifest

The idea for circular area development in Buiksloterham was already brewing in the minds of several sustainability initiatives in the area, such as sustainable start-up community New Energy Docks and the Clean Tech Playground De Ceuvel. This idea came off the ground when they put their heads together with larger organisations in the area (such as water authority Waternet and housing corporation De Alliantie), who were forced to look at alternative ways of development given the economic context and local characteristics (e.g. polluted land) (PD r.53; EG r.88). However, to actually get it materialised, the initiators needed to employ a number of actor tactics.

First of all, *narrative work* played a role in this phase, to convince key stakeholders to go beyond ideas and actually create a Circular Buiksloterham project. This narrative builds on the urgency for anticipating the CE transition in cities and urban development (context) and encourages to seize the opportunity of using Buiksloterham as testcase for circular area development (content).

Regarding context, this narrative draws not only on the contrasting of the benefits of a circular economy against the problems of the linear economy, but also on the complementarity between circularity and other goals such as smart and bio-based (Metabolic et al., 2014b, p.14). Thereby presenting the urgency and appropriateness of a CE transition. Then, referring closer to home, this urgency is enhanced by arguing the need to take matters into their own hands to anticipate this transition. Since the municipal approach to developing Buiksloterham was initially market-driven and bottom-up, there was no central sustainability plan and thus risk of sustainable development being de-prioritized (Metabolic et al., 2014b, p.13). If it is not coming from municipality or market, then change has to come from those initiatives in the area that do want to (PD r.56; r.79).

Regarding content, the narrative draws on a number of features of the area. These include the proximity to the centre (anticipating the Buiksloterham area will become valuable) (RH r.258); the polluted plots (requiring alternative ways of development); and the rapid development of new housing and increase in mobility and energy demand (presenting opportunities to try new circular technologies and practices) (Metabolic et al., 2014b, p.12; p.43). This is used in the narrative to legitimise Circular Buiksloterham; why the opportunity should be seized to use Buiksloterham as a testcase for circular area development and so contribute to the circular transition here. Much intrinsic motivation and sense of urgency was already there (JK r.511; PD r.710), but this narrative work directed the way of thinking of many stakeholders towards wanting to pursue this in the form of the Circular Buiksloterham initiative.

Simultaneously to this narrative work, *networking* efforts were employed aimed at expanding the group of stakeholders around the initiative. This was mainly done when the vision and action plan were being developed, which is when the build-up to the Manifest began. For this they wanted to get many key stakeholders involved in the network and to sign the Manifest (EG r.112). To create an enabling structure (in the way of organising) for this project.

With some stakeholders this was easier than with others. For instance, core parties such as Waternet (active in innovation) (PD r.241) and De Alliantie (with circular ambitions) (JK r.25) joined early on and co-financed the research towards the vision and roadmap (EG r.99). *“Recognizing the urgency for a clear strategy, stakeholders including [...] Waternet, and an important local developer, social housing corporation De Alliantie, pooled together resources to make the development of this vision and Action Plan for Buiksloterham possible”* (Metabolic et al., 2014b, p.13). However, this commitment was not shared among everyone in Buiksloterham, as was learned during the two stakeholder sessions held in 2014 as input for this vision and roadmap. Over 40 key stakeholders were selected for these sessions based on stakeholder analysis (Metabolic et al., 2014b, p.29). Many of them ended up not signing the Manifest, in some cases because they did not support the initiative. Resistance came for instance from (light) industrial companies, such as car repair, who see the area development as threat that restricts their business (RH r.216; Metabolic et al., 2014a, p.114).

Eventually 22 stakeholders signed the Manifest in 2015. However soon after, some pulled out already while newcomers were attracted and wanted in (RH r.476). In expanding the network with these new stakeholders, an important criterion was that the motivation for circularity and sustainable development is embedded in this party’s own agenda. That they embrace the circular mindset (PD r.134, r.856). This to stimulate projects coming from stakeholders’ own motivation and responsibility, which fits the organic development that Circular Buiksloterham departed from. They wanted to allow bottom-up development, without strict management (PD r.196; RH r.496). *“The starting point was: if we want to reach a new way of area development, we also have to look for a new way of cooperating and way of organising”* (PD r.194). The only concrete structure, to manage the vast network, is a network organisation (Stadslab) specifically aimed to stimulate and bring the right partners in the network together around innovative projects in the area (CvdZ r.373).

Although the Circular Buiksloterham initiative took off with an organic development approach, prior to its start one of the main initiators (Metabolic) did engage in *advocacy* for a more structured approach to the way of organising. They advocated for a number of systemic interventions which they argued were essential conditions for progress (EG r.121; Metabolic et al., 2014a, p.21). They include for instance a management structure with top-down development strategy (to support and steer otherwise messy bottom-up initiatives) and financial support structures (for the steering-group Stadslab and for projects) (EG r.126; Metabolic et al., 2014a, p.50-56). Most of these recommendations could not be implemented in practice and an organic approach followed. However, advocacy around one of the recommendations was successful, namely to designate Buiksloterham as an official experimental zone or Living Lab. That

is what the main advocacy efforts focussed on, because becoming an official living lab was essential to allow experimenting. “*The label ‘experimental zone’ can enable developers and residents to use new materials and clean technologies that are now being constrained by current regulations, [...] with support from the authorities and under guarantee of safety and health*” (Metabolic et al., 2014a, p.21). It enables actors to further define their theorised circular practices.

The goal of the first research conducted – which culminated into the vision and roadmap document and led up to the Manifest – was to explore, envision and plan the road towards a circular Buiksloterham in terms of the new ways of doing required for a circular city. Hence the tactic of *theorising* was employed by the actors conducting this research, naming and developing ideas for new circular practices in the area. With the help of certain frameworks regarding what is understood by Circular Economy in their situation – for instance Metabolic’s Circular City Model on how to apply CE objectives in cities (Metabolic et al., 2014b, p.15) – and based on an Urban Metabolism Scan, various concepts were theorised around for instance renewable energy supply, water innovation, alternative mobility and the polluted soil as natural capital (Metabolic et al., 2014b, p.20). By signing the Manifest, key stakeholders committed to further developing these envisioned circular practices in their projects. However, this theorising did not end there but continued. For instance through regular round table meetings on specific themes, in which stakeholders together think up fitting circular ways of doing to fill in the Manifest and to focus on in learning-by-doing projects (PD r.199).

4.2.2 Furthering : Boost from municipal support

Following the Manifest, in which they committed to its ambitions, the network partners got involved in *defining* efforts through various projects in Buiksloterham. Specifically it is about further developing the circular concepts theorised in the initial research and resulting Roadmap, as well as setting up new projects around ideas theorised in the regular round table meetings. Conducting experiments with new circular technology or practice in an area being redeveloped almost from scratch gives wide opportunity to discover the technical details of new ways of doing through learning-by-doing (RH r.171).

Nevertheless, this phase in the development saw various barriers to the defining activities. For instance in case of an unstable network: with some parties giving up when struggling (PD r.710), changing their minds on what they want (PD r.322), or having a short-term individual interest rather than long-term commitment to the initiative (PD r.498). Moreover, many efforts were hampered by difficulties with the experimentation regulation. While the status ‘experiment’ allows trying out circular alternatives outside of normal law, many who wanted this did not actually manage to get that status. Because the application procedure is difficult, causing unwanted delay, and there is uncertainty as to what happens to the development after granted the experimentation time (PD r.404). As a result of such barriers – and the private landownership – there are many developments in Buiksloterham which actually have very few circular and sustainable elements (RH r.290).

Their efforts got a boost when the Municipality of Amsterdam become more involved. Though they were a Manifest signatory, it took a while before the Municipality, “*besides with their signature, also embraced Circular Buiksloterham with their hearts*” (PD r.445). In 2017, they decided to put a municipal programme on this initiative and take an active steering role in the circular development of Buiksloterham. A programmatic approach was meant further concretise the Manifest, provide direction and help achieve more results rather than lingering in talk (RH r.81; EJ r.189). As the Municipality was too late in the spatial planning process to still include circular ambitions – and certain ‘linear choices’ were already made – their influence on the development of private landholdings in the Buiksloterham

area is limited (EJ r.197; EG r.166). Nevertheless there are other ways in which the Municipality made a difference with their programme. The following actor tactics proved helpful therein.

Firstly, the Municipality draws on the tactic of *mimicry* within their land tendering policy. Specifically, by conducting circular tenders on the municipally owned land in Buiksloterham, they incorporate ‘new’ circular principles and standards (as developed in their Roadmap Circular Land Tendering) into the ‘old’ and known tendering procedures (RH r.115; Roemers & Faes, 2017). Thereby possibly easing their adoption among developers. This approach provides them with a way of steering developers’ way of doing in the Buiksloterham area towards circularity (PD r.451). Circular tenders do not, however, provide a way to steer private landowners (who hold two-thirds of the land in Buiksloterham (RH r.108; EG r.163). For that another actor tactic is required.

Secondly, the Municipality’s actor tactic directed at these private landholders in Buiksloterham is the *shaping of normative foundations* to influence their way of thinking about what kind of development is right for the area. As the municipality has no say over how private lands are being developed (at least not until they include Circular Buiksloterham and its circular ambitions more firmly in municipal policy), all they can do is engage in conversations with these developers (RH r.134, r.292). To convince rather than coerce. This is attempted by appealing to the normative expectations for the area while discussing their development plans. By deliberately asking how they plan to include circularity, and by arguing that “*since you are part of Buiksloterham, surely you would want to contribute to this*” (RH r.134). Thereby the Municipality aims to direct private developments away from ‘unwanted’ unsustainable projects and towards the ‘desired’ kind of circular development. Which is important for Circular Buiksloterham, since the economic upturn is pushing these developers towards linear business-as-usual development. Their economic interests makes this tactic challenging (RH r.260).

Thirdly, the Municipality helps Circular Buiksloterham forward by engaging in *advocacy*, both political and regulative. The political advocacy refers to internal lobby from the sustainability and circularity team to secure and increase the weight of circularity principles compared to other tasks that the Municipality has in the development of Buiksloterham. For instance their attention also goes out to enabling business in the area and supporting vulnerable social groups. Since they can’t ask too much of developers, advocacy is needed to secure commitment to circular development (RH r.262). The regulative advocacy focusses on lobbying for more experimental space. Specifically by requesting an expansion of the experimental space offered under the ‘Crisis and Recovery Law’. This speeds up municipal procedures (PD r.443), allows the municipality to set stricter circular norms (EJ r.386) and allows experimental space in other areas of Amsterdam, which is helpful to Buiksloterham as well since not all circular ambitions can be realised at such a local scale (EG r.238).

4.2.3 Recent and upcoming : Upholding the progress

The Circular Buiksloterham initiative started out with a small community and in low economic times. More recently, however, this is changing and new challenges are forming that require attention now and in the coming years. Firstly the economic upturn presents a challenge because it makes the original linear ways of doing more appealing once again: to make fast money rather than research and try circular alternatives (EG r.399). And secondly the number of residents is growing increasingly rapid. In the first two years of the, they grew from 10 to 200, and they are now on the way to thousands of residents. This poses a challenge, because not all newcomers share that original Circular Buiksloterham way of thinking, with norms and values that create intrinsic motivation for circular development (PD r.303, r.847). Several actor tactics are employed to keep up the Circular Buiksloterham initiative’s progress.

To keep it up among residents, the focus is on *shaping normative foundations* among the newcomers. To inform them of the ‘mores of Buiksloterham’ and encourage them to conform to those and play their part. Because, as resident of Buiksloterham, they are expected to contribute to the initiative

(PD r.624). How residents wish to fill in this contribution remains up to them though, depending on what circularity and sustainability means to them (PD r.631). Hence there is no cognitive shaping or education of certain circular practices. Just an outspoken expectation to do your part.

To keep it up among the project partners, the focus is on *networking* in terms of deepening the network. For instance in early 2018, a new project portfolio was developed with these partners, coming up with 20 new projects for the coming two years (PD r.612). This portfolio may be followed up with a light form of covenant on what they will do (PD r.775). These efforts are reinforcing the commitment to the Manifest and help to continue Circular Buiksloterham progress in a programmatic way (PD r.752).

To keep it up within the municipality, the internal sustainability and circularity team is employing the tactic of *deroutinising*. This is important because, metaphorically speaking, it does not work if the municipality is “*applying a soot meter to an electric car*” (JK r.501). The municipality needs to adapt their routine way of working to the circular developments at Buiksloterham (JK r.465). Therefore the internal team is promoting this, for instance through a Chief Technology Office to stimulate innovative working across the organisation (EJ r.489) and through policy programmes on circularity engaging all (relevant) departments (EJ r.323). The first results of this effort can already be seen, as different municipal departments are increasingly search for ways to contribute (RH r.360).

Finally, the initiators of Circular Buiksloterham who are part of the coordinating Stadslab are looking ahead and anticipating the future way of organising suitable to keep up the progress. The Stadslab structure is only a temporary vehicle of the pioneers to get it up and running. However, to continue enabling the circular developments, further *networking* efforts will be required. This may lead to another group of committed professionals and stakeholders who can take over from the initiators and form a new neighbourhood organisation in which different working group further the various themes in circularly developing Buiksloterham over the next years (PD r.784).

4.2.4 Summary

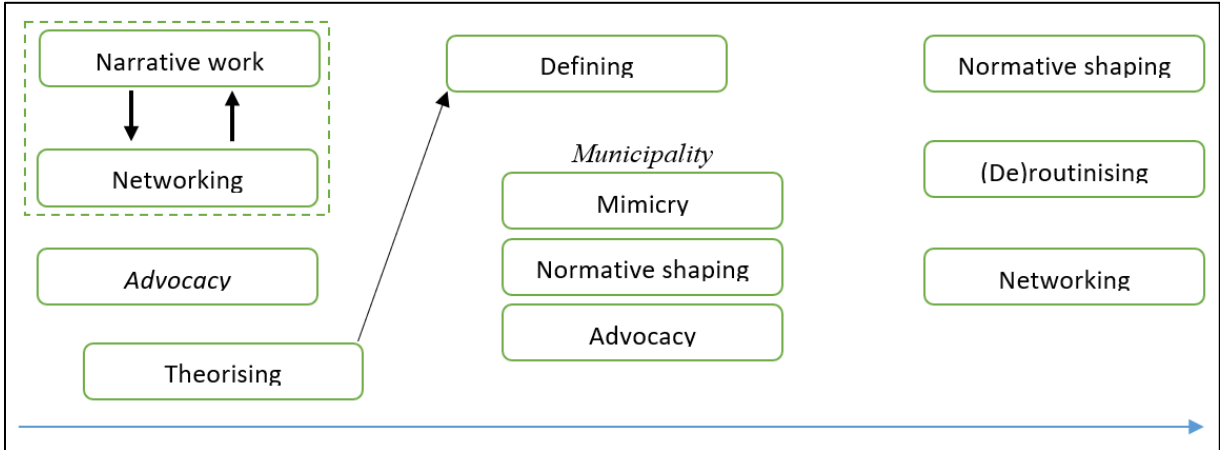


Figure 4. Visualisation case Circular Buiksloterham

To conclude the analysis of Circular Buiksloterham (BSH), the main findings come down to the following. *Networking* and *narrative work* were employed simultaneously in the beginning when starting up the initiative: positively framing the idea for Circular BSH (narrative) in order to get many stakeholders involved in the Manifest (network) (cf. DC). Following the initiation, the tactics of *theorising* and *defining* were employed. They appear together early in the process and following one another: theorising ideas for circular practices and then applying them in BSH to figure out how it works (cf. DC).

While this effort of BSH itself remains mainly local, focussing on promoting its initiative of circular area development, the later effort of the Municipality of Amsterdam is what gives BSH a broader influence and attempts at altering the selection environment beyond this local context (*cf. DC*). Through *advocating* commitment in and *deroutinising* the municipality, developing circular tenders with *mimicry*, and convincing private stakeholders (*normative shaping*). With this help of the municipality, BSH is looking ahead at keeping up its progress with various tactics. For instance with the municipality's *advocacy* for expanded experimental space, employed later in the process once the success of this space became apparent (*cf. DC*). And BSH's *networking* efforts to keep up their partners' commitment to further their work (*cf. DC*). These and other tactics should together ensure the progress of the BSH initiative.

4.3 New Sanitation

One concrete project being realised in the Buiksloterham area, and inspired by experimentation at De Ceuvel, is New Sanitation (NS). Two building blocks in Buiksloterham, together over 600 houses, will be connected to a new sanitation system. By collecting two separate wastewater streams, one can be used to generate energy (warmth) and the other will go to a decentral (local) processing facility to collect nutrients (MW r.168). It has been a long process to realise this, and the system was to become operational in October 2018 (MW r.707).

The New Sanitation pilot in Buiksloterham is the first realisation of this circular practice in Amsterdam. The system was previously tested in Sneek and the water executive organisation in Amsterdam, Waternet, had already been experimenting with new sanitation at De Ceuvel (JK r.562; PD r.211). The application of a full New Sanitation system in Amsterdam was already explored before when the plan was to apply it in the development of Centrumeiland, Amsterdam, two years ago. However this pilot was cancelled, and so Buiksloterham became the new location for this circular initiative (MW r.54).

This location was particularly chosen because of the developments here surrounding the Circular Buiksloterham initiative. Because of its Living Lab status and the Manifest, this area provides room for experimentation with circularity in the built environment. And New Sanitation is one such initiative benefiting from the room for experiment (MW r.213). But regardless of this favourable context, this initiative too employed actor tactics in order to further the development of their circular practice and put pressure on the institutionalised ways.

4.3.1 Getting started : Convincing partners

The Buiksloterham area provided a suitable pilot location for setting up the New Sanitation project, because of the innovative mindset of the people and the Circular Buiksloterham developments. However, even here, an initiative as radical as New Sanitation was still a challenge to get started. Mainly due to the difficulties in convincing the necessary partners of the concept and gaining their commitment.

The idea for the pilot was born in the innovation department of initiator Waternet. However, in order to realise this idea, several partners were needed. Hence they engaged in *networking* efforts to expand the network around the project. The main partnerships for Waternet to focus on, were the Municipality and Water Authority, housing corporation Alliantie (one of the housing blocks) and foundation SchoonSchip (the other housing block, a new-built floating house community) (MW r.126; Metabolic, 2014b, p.91).

Waternet is an organisation that is committed to innovation and has capacity allocated for that (JK r.562; PD r.251). However they are steered in their work by the fact that Waternet is the executive

organisation for the Municipality of Amsterdam and Water Authority AGV. Therefore it was important to have them on board. As the visions and policy agendas of both include seeing wastewater as a resource and utilising it to extract resources and energy, the way of thinking of these organisations was favourable for Waternet to take up the New Sanitation initiative (MW r.105). As a result this specific networking, which still took effort since the boards do remain critical on aspects such as finance and spatial fit (MW r.401), led to an action-enabling structure from the top. For instance, particularly the financial support from the municipality was important. Their investment, together with a European subsidy, allowed the pilot to be realised even though it did not yet have a closed and cost-efficient business case (MW r.542).

However for most other organisations whom Waternet approached in their networking efforts, seeing wastewater as resource was quite a significant change in their way of thinking (MW r.107). This goes mostly for De Alliantie, as SchoonSchip was set up with high sustainability ambitions from the start (Metabolic, 2014b, p.91). In order to legitimise the New Sanitation project in the eyes of these organisations, Waternet engaged in *narrative work* to appeal to the need for a circular transition (context) and convince them why New Sanitation is the solution (content).

From the beginning, Waternet had a clear narrative on how the system works and what its benefits will be: being able to extract nutrients and energy from wastewater. This explanation of the socio-technical features is linked to the context of the transition to the circular economy. “*Wastewater as a source of raw materials and energy, to contribute to the circular economy, that is actually the whole idea*” (MW r.117). New Sanitation is argued to be the future in the CE transition, which provides many opportunities (RH r.564; MW r.463). Urgency is also created by addressing that the choices made now regarding what kind of sewage infrastructure to build, are long-term decision. “*If you make the wrong choice now, then you are stuck with that for 80 years*” (MW r.193). Thus New Sanitation is legitimised as contribution to the future resilience of the city, in light of the circular economy (MW r.198).

Even though this narrative is strong in explaining the concept and its worth, a limitation is that in this early stage it is mostly ‘in theory’ arguments. As New Sanitation is such a new innovation, there is limited evidence on how the system works in practice. Therefore, despite Waternet having a clear story about the technology side, the overall narrative has a large dependence on guesses of how it will play out in practice (MW r.380; RH r.551). Nevertheless, the enticing prospects and experiences in the Sneek case proved enough to convince De Alliantie and SchoonSchip to commit their housing development projects to New Sanitation (thereby furthering the network expansion). While the Municipality remains reserved – she first wants to see how this pilot plays out – Waternet is fully committed to this technology and thus strongly wants to institutionalise this circular practice (RH r.654; MW r.193&r.463). To do so, a first step is making the Buiksloterham pilot a success.

4.3.2 Furthering : Preparing for usage & social challenge

The (institutionalised) sanitation system facilitates ‘linear’ ways of doing: the practice of “*flush and forget*” (MW r.571). This means not thinking about what happens to wastewater after it enters the sanitation system. And thus not contemplating the possibility of extracting resources and energy from the wastewater streams as a circular innovation. With the New Sanitation project, a new way of doing is laid out: both in terms of materiality (infrastructure) and practice (behaviour). As the initiator Waternet had, through narrative work and networking, managed to change stakeholders’ way of thinking favourably and convinced them to commit to the project, the construction of the New Sanitation infrastructure could begin¹. In furthering the project, the attention of Waternet turned to encouraging proper user behaviour among the future residents. “*The behaviour of residents is crucial*” (MW r.156).

¹ Completion in October 2018 (MW r.707)

For this initiative, the technology is not the challenge: not innovative but existing technology is used in this system (MW r.165). What is innovative and thus challenging, however, is the fact that this technology is being applied in the middle of a residential context. This means that not only the sanitation system comes closer to residents, but also contact with residents comes closer to the organisations behind the initiative (MW r.142). This poses challenges on the social side of realising this circular practice. And that is where actor tactics are needed mostly. These tactics are being employed by two main actors: Waternet and De Alliantie. De Alliantie is involved in this ‘social challenge’ because in their building block, social housing will be built and attached to the sanitation system. And their expectation of their tenants, based on experience, is that a number of them will not be using the system appropriately. Because they often have other problems on their mind, do not trust De Alliantie, or are not motivated (JK r.317, r.592). This in contrast to the future residents of the sustainable neighbourhood SchoonSchip, where intrinsically motivated people choose to live sustainably (RH r.580; MW r.561; JK r.646).

Anticipating that some of their tenants will not use the system appropriately, De Alliantie has joined Waternet in figuring out a communication strategy² towards future residents: the end users of the New Sanitation system. The communication strategy will firstly draw on *mimicry* to highlight that the new system is not that different from what they are used to. For instance with a demo of vacuum toilets, people can experience this, get used to it and realise that it is not as bad as they might have thought (MW r.572). This tactic, where the new is associated with the old, is meant to make the New Sanitation system understandable and seem less of a change, in order to enhance the chance of acceptance and proper use.

However the new system does requires residents to consciously think about their wastewater and change some of their routines. For example it requires a different type of cleaning agent and more caution regarding what is flushed down: some things may hamper the vacuum system or may not belong in the nutrient processor (JK r.548, r.587). To encourage them in this direction, the communication strategy will focus on *educating* future residents on how to use the system properly and stimulate them to do so. Through providing information, but possibly also a form of gamification, the knowledge and skills on proper use can be spread among the end users (JK r.592).

In general the idea behind this approach is to not impose a new way of doing upon future residents, but to involve them and encourage participation (MW r.568). Residents will have to adapt their behaviour to the system, so it is important they are involved in its development (PD r.624). The communication plan appears to be mostly focused on steering the user behaviour and thus the future resident’s way of doing. It does not seem to go as deep as attempting to shape the cognitive perceptions and normative values of future residents way of thinking, which is underlying to their behaviour in using the system.

4.3.3 Recent and upcoming : Requirements for upscaling

Even though its proponents are enthusiastic about this innovation and its future, other stakeholders (such as the Municipality of Amsterdam) are not that certain yet and still have many questions (RH r.564). Hence they see this pilot as a useful learning-by-doing project. In this context, an important goal of this initiative is to engage in the further *defining* of this circular technology and related practices. The system, in terms of its infrastructure and technology, was already extensively theorised. The point of this initiative is therefore to expand on this with actual defining of the details: “*by implementing it, we get data and we can move away from opinions a bit*” (RH r.576). Regarding not only how the system works, and what issues are faced with the infrastructure and the processing station, but also in social terms.

² During the interview period, this communication strategy was still being formed. There is no new information as to whether it is finished.

Thus defining what this innovation requires of its users and whether this works out in practice: for instance “*what will be the reaction of its users?*” (RH r.554). These are the kind of lessons (on technical and societal details) that will be learned from this initiative, once it is put into service.

Even though the pilot in Buiksloterham is still in an early phase, as the New Sanitation system has yet to be put into service³, Waternet is already looking ahead at upscaling the use of New Sanitation as a circular practice. Through the actor tactic of *advocacy*, they are trying to create new way of organising that is favourable for more of these systems to be realised (and New Sanitation to be institutionalised).

So far, this actor tactic is mainly taking the form of political advocacy, based on the thematic study that Waternet is conducting into ‘Space for New Sanitation’. This study explores how New Sanitation can be connected to other developments in Amsterdam. This will be used for municipal policy advice on supporting the New Sanitation initiative by including it for instance in the efforts on energy transition or the circular ambitions of the Municipality of Amsterdam. This is desired because there is an imbalance in the bottom-up and top-down efforts around New Sanitation. It would help the institutionalisation of this new circular practice if there were a stronger top-down support in the way of organising, for instance by including New Sanitation in the CE or sustainability programme, or simply by providing a formal assignment to execute this project (MW r.433).

The thematic study also reflects on what they learned in this pilot about the laws and regulations surrounding New Sanitation. Based on this, Waternet aspires to get involved in regulative advocacy for improvements that could be made, based on their experience. For instance, together with the Ministry of Infrastructure and Water Management, Waternet is going to look into the waste regulations that are hampering the New Sanitation concept (specifically the utilisation of leftover substance) (MW r.511).

4.3.4 Summary

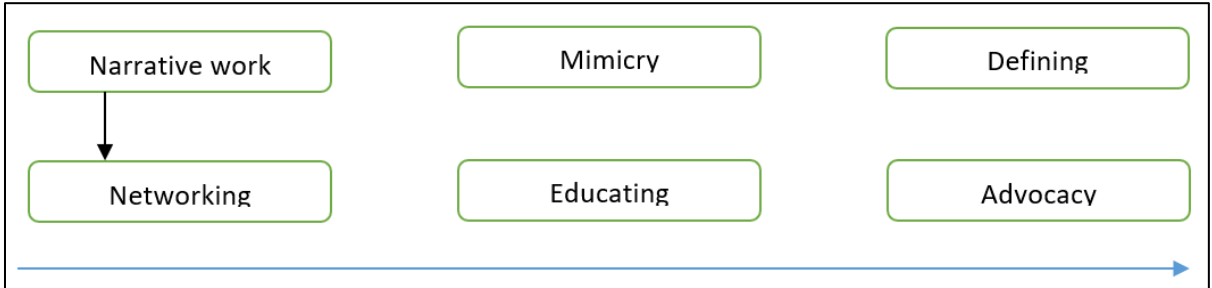


Figure 5. Visualisation case New Sanitation

To conclude the analysis of New Sanitation (NS), the main findings come down to the following. *Networking* and *narrative work* were essential first actor tactics to allow the pilot to be initiated. Some of the partners that were needed within the network, had to be convinced of the idea first. Hence narrative work helped this networking, through legitimising the concept (cf. DC and BSH). The narrative was not that strong yet in the beginning, trying to promote a radical innovation with little evidence but only enticing prospects to draw on. Hence the importance of this pilot initiative, to engage in *defining* to learn about technical details in practice. Other actor tactics were also employed, with both internal and external goals. For instance *mimicry* and *educating* are being employed to anticipate the social challenge of proper user behaviour among their future residents (internal). And *advocacy* in an attempt to push for a more favourable context for future expansion of this initiative (external) (cf. DC and BSH).

³ The system was supposedly completed in October 2018. No update has been found as to whether the system has been put into service yet (in December 2018).

4.4 Synthesis

Table 9 on the next page brings together the insights from all three cases in Amsterdam into a synthesis table. This is helpful because read vertically, it provides a summary of the actor tactics employed in each case, and horizontally it allows comparison between the three cases on each actor tactic. Nevertheless, this table does not present the details of, nuances in, contexts around and connections between what was done in each case when, why and how. Therefore, the patterns described here draw not exclusively from the brief summaries in the table but are insights gathered from the extensive study of the three cases and their thick descriptions in the analysis chapter.

Building on the analysis, table 9 and the summaries of main findings presented at the end of each case, this synthesis points out where there are patterns among the Amsterdam cases. Some relate to specific actor tactics and others to the ways of doing, thinking and organising more generally. Also insights regarding the macro-, meso- and micro-levels are presented, though these will become clearer once Amsterdam and Rotterdam are compared.

Firstly, *narrative work* and *networking* appear simultaneously as the first tactics in all three cases. They are employed to help start up the initiative, convincing partners to commit through positive framing. And vice versa more commitment helping to make the initiative more enticing and legitimate. Moreover they proved essential to allow further tactics. Not only in the beginning but also later on, as both tactics may come back individually later in the development as well. For instance continued networking at BSH to keep up progress, and a new narrative towards the broader society at DC.

Secondly, in DC (*meso*) and BSH (*macro*) *theorising* and *defining* also appear together, right after initiation and in successive order. They reflect innovation and experimentation: theorising circular alternatives, followed by applying them in practice to further define (technical) details. NS is an exception here. As a *micro-level* case, this initiative revolves around one concept already theorised prior to initiation. Hence theorising is not an actor tactic employed, only defining. Nevertheless this insight does not refute the pattern found at *macro- and meso-level*, because defining still comes after theorising.

Thirdly, *advocacy* appears generally later in the development process, once lessons have been learned that advocacy can draw upon. This advocacy can be employed in order to create a favourable context for the progress of the initiative (BSH and NS) as well as to encourage the broader CE transition beyond the local context (DC and BSH).

Fourthly, interesting insights are also found regarding specific ‘ways’. All three cases engage in altering the institutionalised *way of doing* (because with their initiative they create new circular technologies and practices), but no clear patterns exist in the tactics employed for this (educating, (de)routinising and mimicry). As for changing the *way of thinking*, narrative work is the ‘favourite’ tactic. Cognitive and normative shaping appear more challenging and is mainly pursued at *meso-level*, since this tends to be an explicit goal of an innovation hub. To alter the *way of organising*, advocacy is the major actor tactic used, since networking seems to be a more general tactic rather than solely connected to the way of organising.

Finally, viewing all three cases holistically, there seems to be a distinction in the orientations of actor tactics. Where some focus on the *internal* goal of organising the initiative (for example in early networking and narrative work at BSH), others focus at the *external* goal of broader impact by expanding the initiative (for example in advocacy for NS and DC). And where some focus on *promoting* their circular alternative (for example through educating and mimicry at NS), others focus more on *altering* the selection environment (for example through advocacy and shaping of normative and cognitive foundations at DC). The extent to which this finding (and the other patterns discussed above) is structural and relevant, and what it means for the role of actor tactics in triggering institutional change, can be determined by comparing this with the findings from the Rotterdam synthesis in paragraph 5.4.

Tactic	De Ceudel (DC)	Circular Buiksloterham (BSH)	New Sanitation (NS)
Theorising	DC's entrepreneurs and external partners jointly think of circular practices and how they might work	Elaborating circular practices specific for BSH, during prior research and continued in thematic round tables	
Defining	Testing circular ideas in practice allows learning about the technical details	Projects being realized in BSH help define technical details of circular area development	Technical and social details of how the theorised system works in practice
Educating	'Inspiring, educating and activating' strategy: showing visitors how circular practices work		Encouraging proper user behaviour by providing information how to use it and stimulating to do so
(De)routinising	- Joint projects with DC trigger a deroutinisation of the non-innovative way traditional organisations work (towards innovative and entrepreneurial)	To keep up progress over the years, the municipality is increasingly changing their routine way of working to suit and support circular area development in BSH	
Mimicry		Municipality promotes circular principles by embedding these new standards in the 'old', known tender procedures	Tackling the social challenge of proper user behaviour, by showing the (use of the) new system is not that different from the old way
Shaping cognitive foundations	- Altering the perceptions of partners and society by showing that circular built environment is possible (challenging linear beliefs)		
Shaping normative foundations	- Presenting the merits of successful circular alternatives, thereby showing partners and society they are desirable over linear practices	- Municipality convinces private developers to include CE by appealing to norms and expectations within BSH - To keep up progress among future residents: encourage conformity to 'mores of BSH'	
Narrative work	- Convincing partners to join in projects (DC offers needed testing ground) - Legitimise and promote circular alternatives tested at DC among society	Convincing stakeholders to commit to a project: urgency to anticipate transition (context) and why BSH is an opportunity for this that should be seized (content)	Convincing partners to commit, by explaining how it works and what its enticing prospects are (content), in light of the CE transition (context)
Networking	- Expanding the network with new partners to allow more projects to be set up - Deepening partnerships with key stakeholders who can take the lessons learned here further	- Stakeholder sessions to expand network around Manifest (though not all were convinced) - To keep up progress among partners: recommitment to Manifest with new projects	To gain the partnerships essential to start realizing the pilot (expansion), though some still needed convincing
Advocacy	Spreading their knowledge through advocacy on a suitable governmental role (political) and changes in laws and regulations to allow CE in the built environment (regulative)	- Metabolic advocated for structural support mechanisms in the beginning - Municipality advocates for more experimental space (regulative) and internal commitment to CE (political)	A favourable context to expand the system needs more top-down support from municipality (political) and addressing regulations that are in their experience hampering (regulative)

Table 9. Synthesis Amsterdam cases

5. Analysis: Rotterdam

This chapter revolves around the circular initiatives under study in Rotterdam. They are discussed in the same order, therefore beginning with BlueCity (meso), followed by the Port of Rotterdam (macro) and then Ioniqa Circular (micro). The structure of analysis is also the same, starting with an introduction to case and context, going into the actor tactics along three development phases ('getting started', 'furthering' and 'recent and upcoming') and then a summary and visualisation per case (with references to other cases that present similar findings). After discussing all three cases ('zooming in'), this chapter also ends with a synthesis ('zooming out') of the insights and patterns found among the Rotterdam cases.

5.1 BlueCity

BlueCity (BC) in Rotterdam is a hub for innovation in the Circular or 'Blue' Economy. In 2015 a group of entrepreneurs bought the formerly vacant building Tropicana, which used to be a tropical swimming pool, and converted it, based on circular principles, into an entrepreneurial hotspot. It is now home to various innovative start-ups, who are exemplary for how to connect waste streams and close loops in a CE, showing that circularity is possible. BlueCity offers these circular entrepreneurs space, knowledge and a network to turn plans into reality. The main goals are continuous innovation and reducing waste by seeing waste as a resource (BlueCity, n.d.). On the way towards reaching this goal, many circular initiatives have been realised or moved into BlueCity over the years. Many of whom have connected their waste streams and their knowledge with each other (SB r.388; BlueCity, n.d.). In addition to housing and supporting entrepreneurs, BlueCity also contributes to the CE transition through presenting a vision on circularity, renovating a depreciated building based on circular principles, and providing a platform for broader discussion, events and other exposure around the circular economy (IB r.221).

BlueCity was initiated in a context characterised by a port city in transition, with the ambition to become a living lab for experimentation in circularity and a frontrunner in the transition to CE. This urban context created momentum for an initiative like BlueCity, embracing it as a contribution to and leading example in the CE transition of Rotterdam (Municipality of Rotterdam, 2017a; SB). Nevertheless momentum in the initiation phase is not enough and BlueCity and their entrepreneurs have faced a number of challenges in their development. Ranging from the ways of thinking among partners and linear manufacturing practices (way of doing), to hampering regulations and incentives in the way of organising markets. But, driven by their entrepreneurial mentality (SB r.595), BlueCity continues to develop and contribute to the CE transition. Various actor tactics played a role in achieving this.

5.1.1 Getting started : Creating BlueCity itself

The idea for BlueCity came from the two founders of the RotterZwam: the first initiative at this location. However, in order to realise this idea, they needed to first engage in *networking* to bring together a consortium: to fill all of the essential roles with the right partners and their resources. Some of these actors joined the network because they knew the initiators. Others were actively asked to join. And again others were found through a broad external call for entrepreneurs to help set up this initiative (SB r.52).

To specify a number of these partners and their contributing resources, a first example is the initial investor. This partner was essential in the beginning, as they provided financial support and eventually bought the building. They also contribute financially to the renovation of this building and to some of the start-ups further along the way (SB r.57; r.493). Having a committed investor in the consortium was also important in gaining municipal support, as an initiative building on their own financial resources

and little subsidy was appealing (SB r. 181). Another important type of partner was architects and project developers. They joined the consortium to contribute strategic knowledge, particularly on the purchase of the building and on renovating it (SB r.52). This was essential given the challenge of transforming a building purposed as tropical swimming pool into a business complex, following circular principles (SB r.128; r.245). And finally, the municipality too became involved with the initiating consortium. Specifically an innovation-oriented contact at the municipality with an extensive network, helped the consortium find useful partners in the Rotterdam municipal area and guided them to the right people in the municipal organisation throughout the initiating process (SB r.54). These partners and resources, joined in a consortium, created a structure that enabled a novel concept like BlueCity to start up.

While a connection was made with the municipality from the start, which was helpful in networking for the consortium, it did require some *narrative work* to get the municipality on board with the idea and change their way of thinking about it. BlueCity was not, like many other CE initiatives, initiated through an experimental status providing temporary exceptions. Instead it followed the ‘normal routes’, which means that the initiators had to convince the municipality of their plans to be allowed to buy the building (SB r.197). They needed a strong story, linking the Municipality’s sustainability ambitions (context) to enticing prospects of what BlueCity might contribute to that (content).

This was hard work, because of the values, perceptions and preferences of the municipality at the time. Tropicana was a depreciated building at a prominent location in the city, which the municipality wanted to get rid of. Moreover there were concerns regarding the consequences of experimentation, production and events located in a residential area rather than the preferred port area. Nevertheless she was enthusiastic about BlueCity’s sustainable initiative and their entrepreneurship. BlueCity managed to compensate their concerns and persuade the municipality to support them (SB r.178 & r.207). Their cooperation included engaging in what turned out to be a long process in order to officially repurpose the building from a recreational location to a business location⁴. This was important to provide them with broader regulative space in activities allowed in BlueCity (SB r.197).

In the meantime, they got started with what could already be done. Following the purpose of an innovation ‘breeding ground’, an early actor tactic employed in order to learn about and promote circular ways of doing is firstly *theorising*. One of BlueCity’s goals is to promote the use of waste as a resource. They do so by presenting (‘naming’) the Blue Economy concept. Motivated from the resource scarcity issue, BlueCity promotes resource efficiency and locality, bio-based solutions and the regenerative potential of nature. By elaborating the concept of Blue Economy, BlueCity as a whole theorises how such ‘blue’ circular principles can be realised in practice (SB r.89).

This does not, however, indicate agreement: in fact there are different preferences among the entrepreneurs within BlueCity on which circular practices to realise and how at the technical level. While they all share the same core vision, the businesses have their own operationalisations thereof and work on varying circular practices and technologies (SB r.109). Thus where BlueCity broadly theorises the concept of Blue Economy, the theorising of circular practices and the definitional work – i.e. explicating technical details of these – takes place at the level of the businesses within BlueCity.

5.1.2 Furthering : BlueCity’s entrepreneurs

As explained above, promoting new ways of doing is coming mostly from the entrepreneurs within BlueCity. BlueCity is a hub for entrepreneurs and therefore comprises many different actors who

⁴ In May 2018, the new municipal zoning plan was adopted, providing BlueCity an exemption from spatial regulations and more possibilities for the activities taking place in BlueCity (Municipality of Rotterdam, 2017c).

work on the CE transition in their own ways. The innovative businesses within BlueCity are promoting alternatives through the actor tactics of *theorising* and *defining*: they present new practices and technologies that are meant to contribute to a CE transition and they figure out the technical details thereof with the goal of promoting their use. Examples range from the very first initiative RotterZwam, which grows mushrooms on coffee grounds, to initiatives around algae cultivation, aquaponics, beer brewing, slow fashion, plastic recycling and various others that have joined over the years (SB r.389).

However, in their efforts to establish these new circular practices or technologies, many of the entrepreneurs face hampering factors, such as procedures and regulations, in the institutionalised ways of doing, thinking and organising. They attempt to overcome these – i.e. to change these selection environments and/or promote their alternatives – through a number of actor tactics. Some employed by themselves, some through internal cooperation and others by BlueCity as overarching hub.

To exemplify how a business within BlueCity employs actor tactics to alter the barriers they face in their selection environment, this paragraph will zoom in on the initiative Better Future Factory (BFF). This company developed a number of successful plastic recycling projects and continues to take on new projects and expand their existing ones (CvdM, r.69). For example their project ‘New Marble’, in which tiles are made from plastic waste, has gone international. However the marketization of plastic recycling products faces a conservative market. For instance the New Marble tiles face a conservative building market as selection environment. This is grounded in multiple institutionalised ways: the regulation of building products (way of organising); lack of understanding this new and different circular product (way of thinking); and the market being used to traditional products (way of doing) (CvdM r.320, r.421).

Various actor tactics are employed by BFF to trigger institutional change and promote the use of their circular products. One example is *networking*, to make connections outside BlueCity that may help them enter mainstream markets and processes. BFF needs to expand and deepen the network around its projects in order to find an essential partner: the launching customer. This is the right actor with the right resources (i.e. investment and initial sale) to provide a jump-start. This is important especially in the case of new circular products trying to ‘break through’: they are in deadlock until they find their first launching customer who decides to invest (SB r.426). That is when they can start to become competitive.

Another example is that BFF focusses not only on the promotion of their circular projects but also on altering the selection environments around them. This can be seen through the actor tactic of *shaping cognitive foundations*. For example by doing projects that may not be very marketable but which are valuable for raising awareness on the potential of plastic recycling, thereby encouraging the market towards associating waste with its potential as resource (CvdM r.71, r.773). Along a similar vein, BFF works on *shaping normative foundations*. For instance through creating tangible products from plastic waste and showcasing these, BFF undermines the preference for virgin materials and promotes the desirability of plastic recycling as legitimate alternative practices and technologies (CvdM r.157).

Even though the businesses within BlueCity work on institutionalising circularity through different foci, as reflected on earlier, there is nevertheless a matching core vision among these entrepreneurs as they share the BlueCity philosophy (SB r.102). This allows for collective strength in altering institutional contexts, besides individual efforts. For instance their internal cooperation around connecting waste streams promotes a circular principle for a new way of organising the economy. Similarly, having a shared philosophy among the businesses in BlueCity (for instance the entrepreneurial spirit and the ‘blue economy’ vision on CE) creates a like-minded environment internally and allows them to collectively propagate this philosophy as a new way of thinking (SB r.81, r.555; CvdM; r.575).

Networking is an important actor tactic employed by BlueCity for ensuring this collective strength. Specifically through the selection of entrepreneurs to settle in BlueCity on a number of criteria. BlueCity looks not only at whether a start-up has a viable business case (IB r.247), but also at whether they

‘match’. Does the philosophy of the company match the mission and vision of BlueCity? Is there real ‘entrepreneurial DNA’ and willingness to cooperate? And is the company interesting (that is, complementary) to the entrepreneurs already present in BlueCity? (SB r.369). These criteria are meant to lead to a BlueCity network in which everyone is pursuing the same path of institutional change.

Next to entrepreneurs’ individual and collective efforts, BlueCity itself also aids the entrepreneurs and contributes to triggering change through their actor tactics. There are a number of advantages to being located within BlueCity: it provides a network, knowledge, guidance and exposure for the innovative businesses (KdK r.359; IB r.261; SB r.332, r.347, r.360, r.386). One of the advantages of the network of businesses is that it allows BlueCity to promote internal *routinisation* of circular entrepreneurship. For example routinising the connecting of waste streams between different companies, by embedding it into their day-to-day activity (SB r.386). Moreover, the knowledge concentrated within the BlueCity network and the ability of BlueCity to guide entrepreneurs when they are uncertain how to proceed, allows BlueCity to employ the tactic of internal *educating*. Educating in terms of collecting experiences and spreading (‘diffusing’) knowledge and skills for circular entrepreneurship across the BlueCity network. And finally the fact that BlueCity has exposure – that is, there is a large interested public to which BlueCity can present its story and its activities (SB r.360; IB r.263) – allows various other actor tactics to help the CE transition along, which are directed externally (outside of BlueCity itself).

5.1.3 Recent and upcoming : Outward focus

Through the exposure of BlueCity, this innovation hub is able to convey a strong and unified narrative (CvdM r.617; SB r.130). In other words, BlueCity is able to engage in *narrative work* aimed at creating legitimacy for circular practices and promoting the required institutional change. It does so by linking the positive experiences from BlueCity’s start-ups – the content, i.e. claims about the features of these innovations – to a broader call for a circular economy – the context, i.e. the urgency for a transition of the economy. In their words, a transition is necessary due to scarcity of resources (SB r.73). There is a need for more efficient use of resources and an economy without waste. This is based on principles such as regenerative nature, emphasis on bio-based and the importance of redesign and locality (SB r.89). The way to achieve this is through circular entrepreneurship. To not keep researching, but just get started and entrepreneur (SB r.116). “*We believe that entrepreneurship, that is the delivery of new, circular services and products, is the means towards change [...]. We truly believe that entrepreneurs and businesses are the drivers*” (SB r.81). The contribution of BlueCity’s entrepreneurs is the development of these circular products and services. And the contribution of BlueCity itself is helping them, venturing and being an example that circularity is possible, showing what this can entail (SB r.74; IB r.22). Thus by combining this context and content, BlueCity presents the narrative that the entrepreneurship towards circular practices and technologies is the solution to reaching the necessary CE transition.

This narrative is BlueCity’s philosophy, which is in fact underlying to both internal and external actor tactics employed. In the tactics discussed above, this narrative can be identified as underlying to for instance BlueCity’s theorising of the circular economy, the convincing of the municipality and its networking activities such as the selection of new businesses. They are grounded in BlueCity’s narrative. Moreover, its narrative work allows other actor tactics to be employed which are aimed outside of BlueCity itself and encourage the broader CE transition.

Firstly the narrative is being propagated to the visitors that come to BlueCity, who are thereby *educated* on CE. They hear what BlueCity’s ambition is and its philosophy to achieve it. Also they see what the businesses there are doing to realise circularity (i.e. the circular practices and technologies they are theorising and defining) (IB r.225; SB r.130). Though that does not give visitors skills for circular

practices, it does diffuse knowledge on what circularity can be in practice. This actor tactic of education concretely takes place in for instance group tours of BlueCity and the conferences or events that they organise to provide insight into and discussion on the circular economy (IB r.229; SB r.302).

Secondly, BlueCity goes beyond spreading knowledge and also works towards triggering actual change. Therefore it employs the actor tactic of regulatory *advocacy*, in which the narrative is helpful. On the one hand, this tactic is aimed at addressing issues faced by their start-ups. Based on the experiences of these innovative businesses, framed as opportunities for transition, BlueCity is able to discuss and challenge regulations at the local level that hamper this circular entrepreneurship with the local Environmental Service (DCMR) (SB r.334). Questioning why certain hampering rules exist and whether this can be done differently can help innovation along (SB r.338). On the other hand, this tactic is employed to address broader obstacles for the CE transition. For instance, BlueCity is organising a debate series around issues hampering circular business models (SB r.128; r.636; IB r.206). Regulative advocacy is not, however, a major focus for BlueCity. They have a clear opinion on what is going wrong and what developments are required, but they see their venturing activities as their main means of influence (SB r.453; r.610). Again, this is part of their narrative that entrepreneurship is the way to go.

The outward focus of BlueCity is also shaped through the actor tactic of *networking*. BlueCity is looking ahead by cooperating with external partners at various levels. For instance at local level with ‘Rotterdam Partners’, other innovation hubs for start-ups and related companies; at national level with other circular hubs in the Netherlands to discuss cooperation and strengthening the hub concept; and at European level BlueCity is involved in international projects and a large EU consortium on plastic recycling. This external networking as actor tactic is helping BlueCity to connect with and learn from other related projects, increase its influence and anticipate a possible replication of the BlueCity concept elsewhere.

5.1.4 Summary

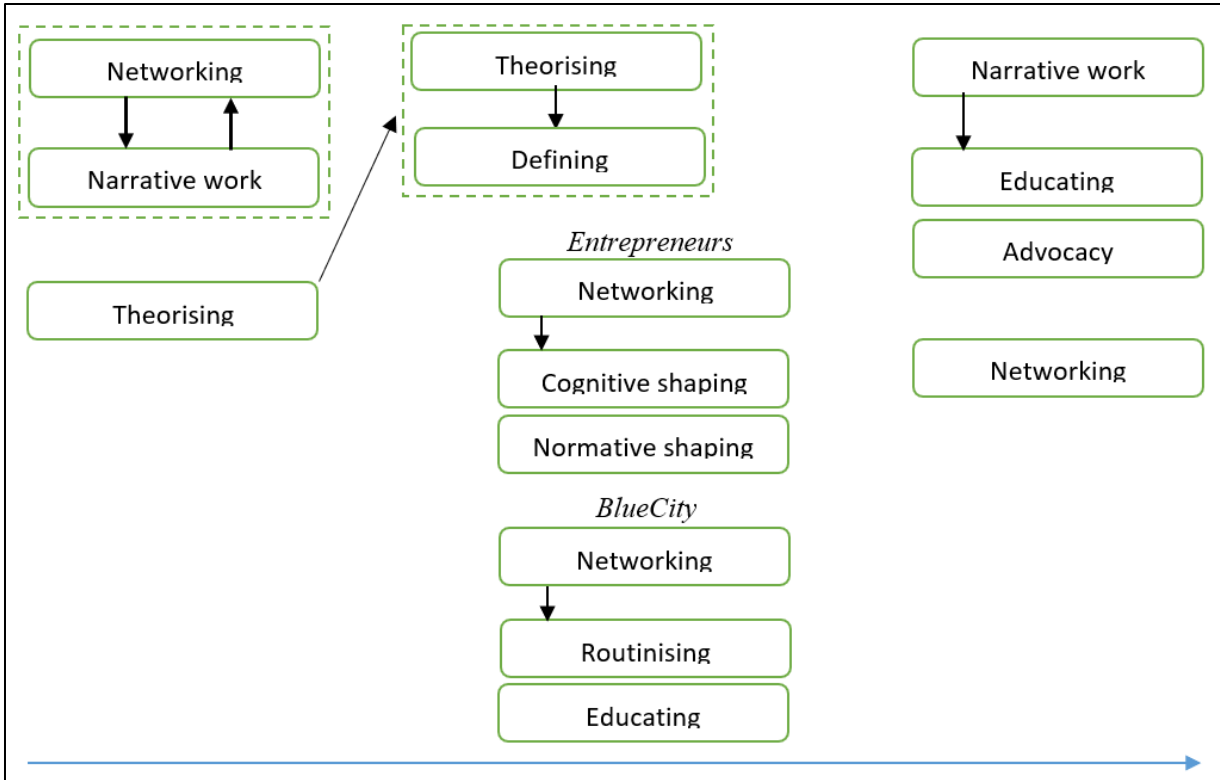


Figure 6. Visualisation case BlueCity

To conclude the analysis of BlueCity (BC), the main findings come down to the following. *Networking* was an essential first tactic to allow realisation, as an initiating consortium had to be brought together. As some stakeholders needed convincing, *narrative work* was employed simultaneously. These two tactics had mutually reinforcing influence: networking with important partners helped create a more convincing narrative to positively frame the BC concept, and in return the narrative helped to convince further network partners to join the consortium (*cf. DC, BSH and NS*). With these two tactics, BC could be created and experimentation could start, consisting of both *theorising* and *defining*. These two tactics are also employed together: first theorising circular concepts and then defining them at the technical level in practice through the work of BC's entrepreneurs (*cf. DC and BSH*).

BC employs several tactics aimed at internally organising the initiative for the entrepreneurs to do their defining work. Including *networking* for fitting companies, *routinising* circular entrepreneurship and *educating* among the internal companies. Later in the development, actor tactics got a more external focus to create broader impact outside BC (*cf. DC, BSH and NS*). In this phase, for instance *educating* is employed in terms of showing visitors their work to promote circular alternatives, but not really teaching skills or motivating to engage. Also there is *advocacy* aimed at altering the selection environment, both regarding what hampers the entrepreneurs as well as institutional change for the broader CE transition (*cf. DC, BSH and NS*). And at last *networking* again, in an attempt to expand impact outside the local BC context, for entrepreneurs to connect with markets and for BC to learn from other hubs and anticipate replication of their initiative elsewhere. All in all, BC's tactics are oriented mostly towards creating new ways of doing, with less deliberate altering of ways of thinking and organising, stemming from their entrepreneurial spirit and belief that the best way to trigger change is by 'just doing it' rather than contemplating barriers in the selection environment.

5.2 Port of Rotterdam

The Port of Rotterdam (PoR) is not only a major mobility juncture but also host to a large network of industry and business. This port has made commitments to the energy transition and CO₂ reduction, but besides these the port has also come to face another transition task: the transition to a CE. As authority in and manager of the area, particularly the Port Authority plays an important role in this. The Port Authority has been working intensively on CE in the Port of Rotterdam for about two and a half years. Nevertheless it remains a rather new theme and they are still in a thinking phase: interpreting and developing an understanding of CE that works for them. What is it, what does it mean for us, and what position do we want to assume? These questions are being still being explored (JP r.93, r.437, r.722)

In the meantime, however, a number of things have already been realised. For instance an internal team around the Circular Economy was formed inside the Port Authority, in which people from various departments work together on a regular basis. This gave CE more attention within the Port Authority and it is taken more seriously in relation to the other goal of CO₂ reduction (JP r.647). In practice, the Port of Rotterdam is working on a CE from different angles. For example through innovative business as well as circular area development. Although the focus is on circularity in the chemical cluster, as the largest impact is expected to come from here, through new technologies such as waste-to-chemicals and green feedstocks (JP r.667). Circular area development in the Port is found in the redevelopment of 'Stadshavens' area, where the *Makers District* was initiated to stimulate innovative manufacturing industry geared towards a CE. Consisting of two places, the RDM terrain and former industrial area Merwe-vierhaven (M4H), the area development of M4H is currently taking off, with the aim of developing it as residential-work area along circular principles (Rotterdam Makers District, 2017).

The efforts to improve the circularity of the Port of Rotterdam, through circular entrepreneurship and area development, initiated in a context in which the urgency for transition is being felt by important

actors such as the Port Authority. The Port of Rotterdam is strongly dependent on fossil fuels and therefore faces a radical change (SB r.506). Both commercial interest and dedication to the Climate Agreement fuelled this development (JP r.118). Also, the Port Authority already set other climate-related ambitions as well and works towards the energy transition and CO2 reduction goals (JP r.72). Though they are linked, these other ambitions do overshadow the Port's more recent attention towards the CE transition (JP r.385, r.591). As a result of this lower prioritisation, the circular transition in the Port of Rotterdam is still in an early phase. Nevertheless actor tactics are being employed to contribute to the CE transition, in terms of promoting circular activity in the area and tackling institutional barriers.

5.2.1 Getting started : Developing a CE ambition

The start of CE transition efforts in the Port of Rotterdam traces back to a change in its way of thinking, regarding its organisational objectives and targets collected in the Port Vision 2030. In the Port Vision 2030 itself, written in 2011, the CE was not explicitly mentioned (Port Authority Rotterdam, 2011). However, with the development of CE as a trend in recent years, this changed. Since the Progress Report of 2016 (Port Authority Rotterdam, 2016), the circular economy has been taken up as a part of the Port Vision 2030. Although it remains just one of many themes therein, along with earlier CO2 reduction and energy transition goals (JP r.432, r.622, r.773), ambitions have formed for more circular industry chains and the role of CE in the area development of 'Stadshavens' (Port Authority Rotterdam, 2017).

An actor tactic employed to contribute to this change in the way of thinking is *narrative work*. The narrative that was developed to argue why a circular economy ambition should be included in the vision and agenda of the Port of Rotterdam builds firstly on a sense of urgency. The urgency that the Port Authority feels towards CE is based on the Paris Climate Agreement and the drive to meet its targets (JP r.73). Additionally it is based on their commercial interest as company (JP r.118). "*We are currently still a rather fossil fuel oriented port. If we want to maintain a right to existence in 2030, -40, -50, then we have to make that transformation*" (JP r.121). This convinced the Port Authority to take position on circular opportunities from both commercial and climate perspective (JP r.96). Secondly, this narrative of why to pursue a CE ambition builds on the coupling of circularity and the energy transition. In other words, hooking the CE transition onto the energy transition and CO2 reduction goals already being worked on, with the intention of lowering the threshold for including efforts on CE as well. The Climate agreements and CO2 reduction targets are seen as opportunity to also further measurements around resources or raw materials. However, where the circular economy does not yet have societal and political weight similar to the energy transition, the Port of Rotterdam includes the CE under its energy transition header. This allowed the CE to join efforts on the energy transition as two sides of the medallion, making CE an integral part of the climate strategy and an important policy priority of the Port Authority (JP r.73, r.591). This narrative thus draws strongly on claims about the 'context' (the urgency of climate change and opportunities of transition) as a motivation for the Port of Rotterdam to act.

However, there is no clear narrative (yet) as to how to go about this, i.e. what is the desired 'content'. The ideas about what a CE requires and the right way to go are diverse within the Port Authority. Ambitions vary from zero-waste and 100% circularity, to building on what is possible to ask of the industry, to favouring pragmatic thinking in which CE is not the goal (not necessarily circular, just reducing negative effects) (JP r.443). Thus different ideas exist internally and there is no consensus yet. The Port of Rotterdam is still in a phase of contemplation and exploration (JP r.93, r.722). Also because CE means something different for the different aspects of port activities; for instance area development versus the chemical cluster. Not each angle receives the same priority (JP r.767). So despite the Port Authority having familiarised itself with the CE, putting this into practice in projects and business cases – the 'content' – presents a challenge (PdW r.415).

The Port Authority takes on this challenge through its various roles within the Port of Rotterdam. They are not only the authority in port processes, but also the area manager and a business in itself (JP r.417, r.726). Therefore their influence varies from own business management, to area development projects, port process management and steering the industry development (PdW r.496). Out of these, the Port Authority focusses on two main activities: management of port activities and businesses (around circular innovation), and area development (which is increasingly focussing on circularity). Because of the higher priority given to developments in the chemical cluster over area developments – because larger impact is expected from this – experience with circular area development is still limited here. Efficient management of the port industry, on the other hand, is a more experienced field for the Port Authority which it now puts to use for the CE transition (JP r.504, r.637, r.673; PdW r.86)

5.2.2 Furthering : Managing port activities and businesses

The Port Authority is the primary actor in managing the activities taking place in the port area and businesses located here. In this management, they are making efforts to contribute to a CE transition. Firstly through the actor tactic of *networking*. The Port Authority employs a twofold strategy: on the one hand they encourage the businesses already located in the port to join in working more circularly and more based on renewable energy ('deepening' the network) and on the other hand they aim to welcome new circular businesses, such as chemical recycling ('broadening' the network) (JP r.122).

The Port Authority thus deepens the network around circular activities through supporting the businesses therein. This goes further than the regular support businesses located in the port receive from them. So not only helping in permit applications and Environmental Impact Assessments, but also providing these innovative businesses with technical and policy advice, guidance in End-of-Waste processes, communication and commercial support, and relevant knowledge from for instance life cycle analyses, environmental data and mapping of feedstocks (JP r.198). This all increases the amount of contact, resource exchange and interdependence between the Port Authority and these businesses.

In addition, new innovative businesses are being actively attracted to settle in the port area in order to broaden the network. This benefits both the Port of Rotterdam, contributing to their technology development ambitions (JP r.122), and the innovative businesses themselves, for whom it provides opportunities for industrial symbioses and product chain cooperation to help the innovation along (JP r.230). To ensure the required compatibility for this, the Port Authority – in their management of port activities and businesses – base this network expansion on selection criteria for allowing new businesses. New businesses or activities that want to settle in the Port of Rotterdam are selected based on: viability of the business case (JP r.160); opportunities for industrial symbioses, infrastructure sharing or co-sighting (JP r.481); whether settlement conditions are met in this area (JP r.517); and the expected environmental benefits of this new activity, such as CO₂ reduction and circularity (PdW r.251).

Within this network of businesses and industry in the port area, a second actor tactic that is found to be employed is *routinisation* of a circular practice. Specifically, of industrial symbiosis: “*the use of one company's waste streams as resource for another company*” (JP r.481). By having this as a selection criterion and a high priority in the area, this circular practice is embedded into the port's way of doing and becomes routine. Although this promotes a circular practice, this tactic is perhaps not employed consciously. This because industrial symbiosis is something the port already did long before the rise of the circular economy concept (JP r.495). However, now it is being put to the benefit of the CE transition. The fact that the Port Authority knows what each company in the area is doing, and is increasingly studying what their waste streams exactly are and which can become resources (JP r.511), means that they can contribute to CE by promoting and routinising the circular use of waste streams (CvdM r.394).

For the promotion of other circular ways of doing that are new to them, the Port of Rotterdam takes the approach of linking their CE transition challenge to the efforts they are already making in the field of energy transition and CO2 reduction. Because in the Port of Rotterdam material resources are mainly used in energy production, they strongly link (circular) resource use to the themes of energy and CO2 targets (JP r.103). “*Energy and resources are very closely connected and need to be regarded integrally*” (JP r.89). This approach can be seen as a form of the *mimicry* actor tactic: connecting the new expectations regarding circularity to the existing work around technologies and practices for the energy transition in the Port area, to make the new more accessible. For instance, as the Port and its businesses are already familiar with the ‘CO2 footprint’, taking into consideration their ‘material footprint’ as well then seems less of a challenge (JP r.455).

Despite the linking of CE measures to the energy transition measures that they already have to take, the companies located in the Port of Rotterdam are still facing barriers around CE. Particularly in the way of organising, regulations can be hampering to circular activities. For example regulations limiting the possibilities of using waste streams as resource (JP r.249), regulations creating large administrative workload around the European cross-border transport of waste (JP r.319, r.336) and subsidies that incentivize waste incineration rather than recycling (JP r.736). In this context, the Port Authority is engaged in the actor tactic of regulatory *advocacy* in order to address these issues and work towards altering the constraining impact of this way of organising. The Port Authority is for instance part of the international partnership North Sea Resources Roundabout, whose lobby has already resulted in for example certain international end-of-waste criteria enabling more international transport of waste (JP r.360). This partnership is generally effective in advocacy efforts, and market parties regularly bring to their attention regulative issues that they face in their pursuit of circularity and a CE (JP r.352, r.365). Additionally the Port Authority is involved in other lobby activities and also has local partnerships, for instance with the Municipality of Rotterdam and the Environmental Service, with whom they can discuss regulatory barriers for the CE transition in the Port that they alone cannot influence (JP r.738). As the Port Authority and the Municipality generally find themselves on the same page – which is why the Port Authority is not inclined to engage in political advocacy around the CE matter – the question is often not what to change but how to achieve this change (JP r.740).

5.2.3 Recent and upcoming : Circular area development

The other activity through which the Port of Rotterdam contributes to the CE transition, now that CE is part of the Port Vision, is circular area development. Compared to the management of port industry, this is a fairly recent endeavour: the circular area development of M4H is still in an early phase. So far, a number of initial actor tactics have been employed in order to allow circular area development to unfold here in the face of institutionalised ways of doing, thinking and organising in the built environment.

An important early actor tactic employed is *narrative work*: the actors involved in the Rotterdam Makers District developed a narrative with which to positively frame and so legitimate the circular development of M4H’s former port industry into a residential-working area with circular-based built environment. This narrative aims to change the way of thinking towards seeing the value of circularity for the M4H area and for the broader Port of Rotterdam. The narrative draws firstly on a characterisation of context: the transition towards the ‘next’ (circular) economy that has been initiated in Rotterdam and for which innovation is essential. Other elements, such as Rotterdam’s ambition to continue being a leader in this CE transition, the urgency of climate change and the wish to secure future employment in the area, are also referred to in characterising the context (Rotterdam Makers District, 2017, p.2).

Regarding content – that is, the appropriate response to these contextual issues - this narrative departs from the claim that “[i]nnovation is a crucial and lasting component of this new economy” (Rotterdam Makers District, 2017, p.2). Following this, the novelty of circular area development of M4H is legitimised by positioning it as “*the physical centre of innovation*” that is currently still missing in Rotterdam (Port Authority Rotterdam, 2016, p.21). Qualities of the area, such as its good accessibility, proximity to urban facilities, creative and circular initiatives already settled there, and room for applying and testing circular technologies, are referred to in order to legitimise this as the appropriate place for circular area development (Port Authority Rotterdam, 2017, p.22; PdW r.87). In legitimising this development, the narrative work makes strong effort to frame the area development as being genuinely circular (PdW r.197). In doing so it refers to the success of the fellow Makers District area RDM and to examples of circular area development elsewhere (such as Buiksloterham, Amsterdam) which Rotterdam is drawing lessons from (PdW r.148). M4H is framed as “*experimental garden and showcase for the circular future of city and port*” (Rotterdam Makers District, 2017, p.3).

One of the motivations behind the effort made on narrative work, is that it is expected to benefit another important actor tactic: *networking*. The positive framing and so legitimating of circular area development in M4H helps to attract investors (PdW r.197) and provides a means of steering the type of industry that will settle here (towards innovative, circular manufacturing industry) (PdW r.93). “*Because of this positioning, many businesses are attracted to settle in this area*” (Port Authority Rotterdam, 2016, p.21). Besides such newcomers, others in the network around circular area development of M4H are mainly market parties already settled in the area prior, the Port Authority, the Municipality of Rotterdam and their programme office Stadshavens Rotterdam. They play various roles and contribute various resources to the process.

The Municipality, for example, contributes knowledge to the process based on their experience with other sustainable and circular transformations of neighbourhoods in Rotterdam (PdW r.175). They also helped drafting the vision and strategy (Port Authority Rotterdam, 2017, p.22), set up the programme office and are investing in research (PdW r.578). And for instance the Port Authority contributes by purchasing tenantless property in the area (from the former industry) and engaging in renovating this based on circular principles (PdW r.101). Similarly they are going to rebuild infrastructure, also with the intention of using circular principles, in order to translate circularity into the built environment and creating exposure for the area (PdW r.103). The Port Authority is also anticipating an advisory role in balancing the coming challenges for industry in a residential area and vice versa residents in an industrial area (PdW r.381). However, the possibility to contribute by the Port Authority is limited by for instance their yield requirement as a business (their efforts need to be profitable) (PdW r.362) and privately owned lands in the area that they have no say over (PdW r.562).

Networking is employed not only to gather useful partners and resources, and to steer the industry development, but also to bring together the group of stakeholders in the area (such as the local businesses) and outside experts (such as architectural firm DELVA Landscape Architects) with whom to come up with plans for the area (PdW r.109, r.128). “*We do that together, because participation is very important*” (PdW r.134). In various sessions, these stakeholders and experts have created the first version of the ‘Spatial Framework’ for M4H’s circular area development, containing (open and flexible) ambitions and plans for various themes in the area and the role of circularity therein (PdW r.109; IB r.549). This can be seen as *theorising* new ways of doing: contemplating what circular area development entails and developing ideas for achieving it. In the expert- or stakeholder sessions, the various actors discussed what circular principles are, which ones are suitable for the area and what measures need to be taken for this (JP in PdW r.179). Thus in general they contemplated what circularity actually means to them. “*This is a basis that you need to determine first. Although at the same time, [...] you actually*

cannot determine it because there are still many directions it can go in and you do not want to demarcate it too much beforehand” (JP in PdW r.192). Thus various options remained open, suggesting that the theorising has not been followed up yet with *defining* the technical details of the circular area development plans. For now, the next step is getting approvals from the Environmental Service, municipality and Port Authority board for the first version of the Spatial Framework (PdW r.412, r.602). The stakeholders will go further from there, choosing a direction in which to continue in more detail.

5.2.4 Summary

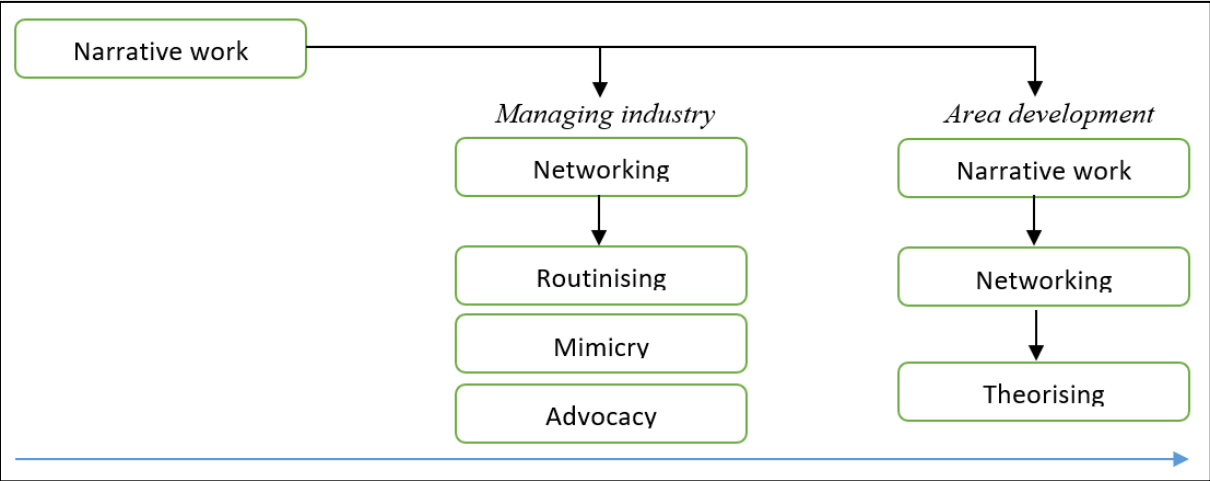


Figure 7. Visualisation case Port of Rotterdam

To conclude the analysis of the Port of Rotterdam (PoR), the main findings come down to the following. Again narrative work and networking are essential first actor tactics (cf. DC, BSH, NS and BC). However rather than simultaneous and mutually reinforcing effort, here networking follows narrative work. Initial *narrative work* legitimised and promoted the inclusion of a CE ambition in the Port Vision as first step that allowed further actor tactics to be employed around CE in both management of port industry and circular area development.

As for managing the port industry, the CE ambition encouraged the PoR to engage in *networking* (expanding and deepening CE activity in the port industry). This was followed up with both internally and externally oriented actor tactics. Internally, the Port stimulates the circular activities of this networking through *routinisation* (of industrial symbioses) and *mimicry* (with energy transition and CO2 reduction efforts). This means there is no *theorising* nor *defining* of new circular practices after initiation; rather, PoR prefers to promote these circular ways of doing that they already know. Externally, the PoR takes up what they learn about regulative issues faced by their circular industry into *advocacy*. This is a later tactic (cf. DC, BSH, NS and BC), enabled by *networking* with both local partners and international partnerships with whom they can lobby for change.

As for circular area development, the CE ambition allowed further *narrative work* to argue the M4H area should develop circularly. This helped to engage in *networking* to attract investors, stakeholders and desired industry (cf. DC, BSH, NS and BC). And together with this network of stakeholders, *theorising* could be conducted as to how the area should develop. Here the pattern that theorising follows initiation is upheld (cf. DC, BSH and BC). Although *defining* work has not yet been conducted, this is the next step anticipated once the theorised plans are accepted, therefore also upholding the pattern that defining comes with theorising (cf. DC, BSH and BC). All in all, PoR’s actor tactics are also oriented mostly towards promoting new ways of doing (though not creating new ones), with limited effort on new ways of organising and the way of thinking. This suggests that altering selection environments is not a main priority (cf. BC).

5.3 Ioniqa Circular

One concrete project being realised in the Port of Rotterdam area, is Ioniqa Circular (IC). The company Ioniqa Technologies has developed a technology to bring coloured plastic waste back to a virgin raw material for new plastic, allowing an endlessly circular loop of plastic. The project is currently running tests at a demonstration plant at Plant One, a location for such sustainable initiatives in the Port of Rotterdam. Through this demo, Ioniqa Circular was able to move up from the lab scale and is currently preparing to scale up to commercial use of this technology.

Ioniqa started out in 2009 with a technology (solution) and looking for an application (problem). Guided by the orientation in the market at the time, Ioniqa found an application for their technology in the field of sustainability: plastic recycling in a circular economy. And so the Ioniqa Circular project started in 2011 (TH r.232). Initially at lab scale, applying their technology in test-tubes, but soon attempting to become a larger player in the plastics chain. Having now managed to set up a working demo at the Plant One sight in the Port of Rotterdam, Ioniqa is anticipating their commercialisation. First partnerships with key partners in the plastics chain have been created and Ioniqa is preparing for a new large-scale factory (Ioniqa Technologies, 2018). In the growth of Ioniqa Circular, actor tactics have and continue to play a role in each step that makes this form of plastic recycling more institutionalised.

5.3.1 Getting started : The first upscaling

While Ioniqa Circular was in its R&D phase at lab scale, an important first step was to achieve first growth. This required Ioniqa to make herself and her technology relevant within the plastic chain. Two actor tactics were helpful in this: networking and narrative work. In a selection environment where growth depends on money (TH r.334), the initial people involved in Ioniqa Circular employed *networking* as a tactic to attract investors. For instance the Municipality of Rotterdam provided them with financing, next to other forms of help such as guidance with regulations and subsidies (TH r.176). Other investments came when networking with parties who were interested in investing in these kind of innovations based on their own organisational objectives for circularity (TH r.204). But an especially important partnership that was forged with this networking effort was with Plant One, a site for innovative companies to set up pilots (TH r.213). This partnership provided a number of advantages. Firstly, a benefit of this partnership is the relationship that Plant One has with the Environmental Service (DCMR). They granted Plant One an ‘umbrella permit’, which provides room for a variety of large-scale plants around sustainability to settle here through a relatively smooth permit procedure (KdK r.375). Secondly, this allowed Ioniqa Circular to set up a running demo of her technology at Plant One. This demo serves both learning and exposure purposes; testing it at a larger scale and showing potential clients that it works (TH r.323). And thirdly, being located in the Port of Rotterdam led to the Port Authority as another facilitating partner. They support Ioniqa not only financially but also with infrastructure, licencing processes, environmental data and regional feedstocks (TH r.351; JP r.198).

However it was not easy to convince these first partners of Ioniqa Circular’s potential and encourage them to become involved and invest their resources (TH r.412). It required actors to engage in *narrative work*, i.e. to argue the potential of this technology (content) in light of the plastic waste issue and the transition to a circular economy (context). At this point in time, while the technology was still in R&D phase and had not yet been tested at a larger scale, the narrative was mostly based on expectations. In other words, the content claims centred around envisioned future possibilities for the technology, as there was no evidence yet of actual performance of the technology and its socio-technical features. Examples of arguments are the quality and affordability of the product (TH r.40, r.76) and the

opportunity to close the plastic material cycle further than what is possible with current technology (JP r.215). Although this turned out to be enough to get the initial partners involved – convincing them of Ioniqa Circular as a technology solution to the plastic waste issue and the CE transition – it was not for the larger stakeholders in the plastic chain, such as the big brands and plastic producers. They wanted to see the technology working in practice first, at a large enough scale to be a relevant, legitimate alternative for them (TH r.323). As Ioniqa Circular moved up to demo scale, their narrative was able to become stronger and more impactful outside the initial network.

These two tactics allowed Ioniqa Circular to reach her initial growth from lab to demo scale. This scale made it possible to engage in *defining*. The technology was already theorised through research before it was named as possible circular alternative to plastic waste. But with the upscale from lab to demo, they could start to actually test the technology in practice, thereby defining the technical details of usage. The upscaling did not yet, however, lead to significant institutional change in the ways of doing, thinking or organising in the plastic chain. The influence on this increased later on as upscaling continued.

5.3.2 Furthering : Becoming relevant in the plastic chain

Plant One has been an essential partner in providing Ioniqa Circular with a convenient and affordable sight to set up their demo. As a result, Ioniqa can now show that the technology, as a new way of doing in the plastic chain, works at this scale. Armed with that evidence, Ioniqa could start working on taking up a relevant place within the plastic chain and attempt to alter the ways of organising in this network. Like before, *narrative work* was employed in order to facilitate the other actor tactic of *networking*.

By confronting the plastic chain with the narrative that the plastic waste issue and the upcoming transition to the circular economy present a big challenge for them, Ioniqa Circular could present itself as a relevant new ‘link in the chain’ that can provide these parties with the missing knowledge for this challenge. Where the plastic producers and brands are missing knowledge on waste, the waste processors are missing knowledge on the chemical process (TH r.283). Ioniqa Circular becomes relevant here for not only providing a technology that can take the plastic recycling a step further, but also for providing this missing knowledge and translating it to the bigger process (JP r.215; TH r.286, r.489). This narrative work thus includes new content claims compared to earlier.

This narrative – which appeals to Ioniqa’s technology, knowledge and overall business sense (TH r.290) – allowed Ioniqa Circular to expand their network, taking up their place in the plastic chain and forging partnerships with key stakeholders. These include the brands (e.g. Unilever), waste processors who could supply feedstock and the PET producers who Ioniqa could supply the virgin material to, placing Ioniqa Circular in a closed loop network (TH r.30). Having these bigger parties showing interest and support gave Ioniqa more traction (TH r.310). They are key to the next phase of commercialisation.

5.3.3 Recent and upcoming : (Anticipating) commercialisation

The *narrative work* around Ioniqa Circular continues to improve in its ability to legitimise the new technology. Where Ioniqa Circular in R&D phase had difficulty presenting a strong narrative on the performance and prospects of their technology, the demo (which shows that the technology works on a larger scale) has provided the evidence to support this. Ioniqa Circular is now being presented by the involved actors as the way to recycling plastic endlessly: “*it doesn’t get more circular than this*” (TH r.59). The context is a circular transition that is ahead, but for which banning all plastic is not an option. Plastic will remain important in society and needed by the market. The solution, it is argued, is this circular technology: in contrast to current mechanical recycling, in which there is a downcycling and

eventual disposal of plastic, Ioniqa Circular allows plastic to be reused in a circular loop endlessly. Its benefits are a fully circular process, affordable, high quality material and no downcycling (TH r.22).

This narrative work helps to change the way of thinking inside the plastic chain and also beyond, creating a more accommodating context for the growth of Ioniqa’s circular practice. As Ioniqa Circular is approaching commercialisation, its ability to *shape cognitive foundations* in society increases. The media portrays plastic as a polluting material that cannot be sustainable, which shapes the general cognitive perception of plastic in society (TH r.174). The innovation put forward by Ioniqa Circular undermines these perceptions directly: it claims that plastic can be circular. “*The idea that plastics can be made sustainable is very new for many people*” (TH r.369). This big turnaround in way of thinking creates part of the enthusiasm about this new development (TH r.174). It also has its effect on the partners in the plastics chain, where a *shaping of normative foundations* can be observed. For instance regarding the new normative stance that they should be more transparent about what products containing plastic (e.g. textile) consist of precisely and to handle plastic and colouring in their products more responsibly by considering how these can be recycled (TH r.471).

Because the narrative work is changing the way of thinking around plastic recycling and creating more enthusiasm and commitment towards Ioniqa’s innovation, the step towards commercialisation of this circular practice is getting closer. However there are still barriers that Ioniqa is facing in the way things are organised, concerning laws and regulations as well as the role of government and policies.

Regulative *advocacy* could address for instance waste regulations which focus on mechanical recycling and thus do not yet accommodate this new form of plastic recycling where plastic returns to a raw material and leaves the waste cycle (TH r.134). It could also address the difficulties in getting a ‘food-safe’ approval to use recycled plastic for food packaging (TH r.143). Additionally there are challenges in dealing with regulations at the EU level (TH r.433). Political advocacy could address more favourable conditions for Ioniqa Circular, such as a role of the government in making feedstock more locally available by improving waste separation and creating material hubs (TH r.104, r.188).

However Ioniqa seems to not be that actively involved in advocacy for these issues. They focus on what they are faced with along the way and how to deal with that at the time, but do not (yet) regularly take issues up further into lobby. The focus for now is their next upscaling and commercialisation. The general way of doing around plastic recycling has not been changed by Ioniqa Circular’s doing, but once they reach commercial scale is when routines and practice may start to change accordingly and this new form of plastic recycling might become a more institutionalised circular practice.

5.3.4 Summary

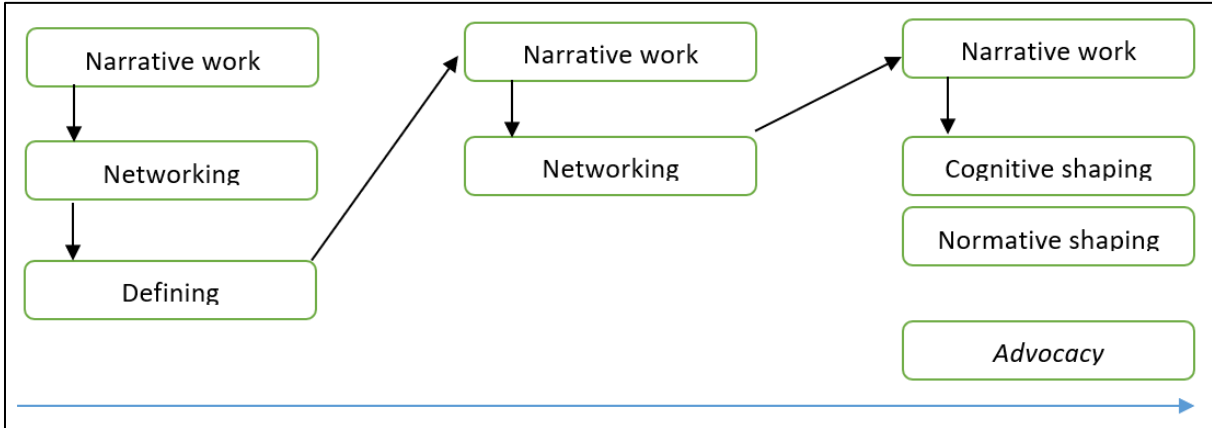


Figure 8. Visualisation case Ioniqa Circular

To conclude the analysis of Ioniqa Circular (IC), the main findings come down to the following. *Networking* and *narrative work* also proved essential first tactics to get started for this innovative start-up. They were employed simultaneously with mutually reinforcing influence (*cf. DC, BSH, NS and BC*). The narrative about the potential of their technology helped in networking to get the essential partnerships for upscaling. Though the narrative was not that strong at first (building on expectations rather than practical evidence), this evidence came with the demo (*cf. NS*). Also with this upscaling, as a result of successful narrative work and networking, IC could engage in *defining* their technology by testing a demo in practice. This was not preceded by *theorising*, as IC concerns one already theorised concept (*cf. NS*). The increasingly convincing narrative later on has also been key to allowing other actor tactics, besides networking, for broader impact. To improve their own development (internal goal) and promote the IC alternative, they anticipate engaging in *advocacy* to address regulations hampering them and advocate support from the government (*cf. DC, BSH, NS, BC and PoR*). Moreover, to have an impact on society (external goal) and alter their selection environment, they *shape cognitive and normative foundations* that plastic can be circular and what this asks of the plastic chain.

5.4 Synthesis

As in paragraph 4.4, the Rotterdam cases are synthesised into table 10 below. This provides insight into which actor tactics were employed in each case and allows comparison between them. Again, the details, nuances, contexts and connections of actor tactics are not represented in this table. This paragraph therefore draws not only from the table but mainly from the thick descriptions in the analysis chapter and the summaries of main findings at the end of each case.

The findings regarding the Rotterdam cases relate to employment of actor tactics and where relevant the connections to which selection environment they address (ways of doing, thinking and organising) and at which case level (macro, meso, micro). Moreover, while discussing these findings immediate references are made to where comparisons exist with the Amsterdam cases. This approach is chosen because it builds the bridge to the overarching findings presented in the conclusion, while at the same time avoiding too much repetition.

Firstly (and similar to the three Amsterdam cases), in all three Rotterdam cases *networking* and *narrative work* are the first tactics employed to start up the initiative. With the exception of PoR, these two tactics appear simultaneous and with mutually reinforcing effect. Their early employment in initiation – which resulted in for instance the first joint experiments at BC and the demo for IC – enabled other tactics to be employed. However all three cases also show that networking and narrative work are not limited to the early phase but come back throughout the initiatives' development with various purposes. For example networking to build lobby activities at both BC and PoR. And narrative work at IC initially to gain relevance and later to achieve upscaling.

Secondly (and in line with the Amsterdam analysis) the Rotterdam analysis shows that at both *meso-* and *macro-*level the tactics of *theorising* and *defining* are generally employed together. At both BC and PoR they are seen right after initiation and in successive order. With a small exception for one of PoR's activities, as in their management of port industry they tend to stick with circular practices they know rather than theorising and defining (i.e. experimenting) new ones. IC, as *micro-*level case, confirms the pattern even though it engages only in defining after its initiation. This because it is an already theorised circular practice that has yet to be defined.

Thirdly (and again the same as in Amsterdam), advocacy is a tactic that is employed later on in the development of an initiative. All three Rotterdam cases engage in advocacy regarding political and/or regulatory issues they are faced with, hence this takes place after a while once they figure out what the

Tactic	BlueCity (BC)	Port of Rotterdam (PoR)	Ioniqa Circular (IC)
Theorising	- BC: naming Blue Economy concept and elaborating theories for this in practice - BC's entrepreneurs: bring innovative ideas for circularity in practice	In expert- and stakeholder-sessions, contemplating what circular area development entails and plans for achieving it in M4H (in Spatial Framework)	
Defining	BC's entrepreneurs put ideas into practice, thereby figuring out technical details	<i>Once plans are approved, theorised concepts can be applied and learned from</i>	In the demo, the technology could be tested in practice to define details of usage
Educating	- Internal : businesses learn of each other's experience - External : spreading CE knowledge among visitors		
(De)routinising	Routinising circular entrepreneurship as day-to-day practice (internally)	Routinising industrial symbioses among businesses in port area	
Mimicry		Linking expected CE efforts (new) to work already done on energy transition ('old' in terms of more experience)	
Cognitive shaping	Showcasing alternatives, thereby undermining linear preferences and legitimising circular practices		Directly undermines belief that plastic is polluting, by showing a way in which plastics can become circular
Normative shaping	Raising awareness on the potential of circular alternatives, altering beliefs		Creates new normative stance in plastic chain to be transparent and responsible
Narrative work	- Employed at the start to convince municipality of their plan and ease concern - Employed towards society: BC's exposure helps to legitimise circular practices by linking BC's positive experiences (content) to the need for transition (context)	- Promoted CE ambition in Port Vision, by appealing to urgency and sustainability goals (context), but not yet clear on how (content) - Legitimise circular area development of M4H, by linking urgency and ambition (context) to qualities of the area and possible merits (content)	- To gain relevance: presenting themselves as valuable new 'link' in plastic chain, providing missing knowledge - To achieve upscaling: increasingly convincing narrative that their technology and its merits (content) is solution to plastic problem (context)
Networking	- Employed throughout: gather initiating consortium, select matching businesses internally, and expand for external influence - BC's entrepreneurs build connections outside BC, to enter mainstream markets	- Attract circular activities and businesses (broaden) and support these (deepen) - For M4H: attracting investors, steering for the right type of industry, and gather useful partners and local stakeholders	At first to attract investors and forge partnerships helpful in setting up demo. Later on to take up relevant place in the plastic chain and expand network through partnerships therein
Advocacy	- Political : for municipality to favourably repurpose the Tropicana building - Regulative : addressing issues faced by start-ups (with the Environmental Service) and broader obstacles for CE transition	Addressing regulatory barriers they face in local and international partnerships and through lobby activities	Regulative barriers (e.g. waste regulation) and preferred policies (e.g. better plastic waste separation) are addressed when Ioniqa is faced with them, though not further taken up into broader lobby

Table 10. Synthesis Rotterdam cases

barriers are. This finding suggests that the other tactics not yet mentioned – (de)routinising, mimicry, educating and cognitive and normative shaping – tend to be employed ‘in the middle’ of development.

Fourthly, when looking at the ways of doing, thinking and organising, the Rotterdam cases show that (like in Amsterdam) *advocacy* is the main tactic used to alter *ways of organising* and *narrative work* the main tactic for influencing the *way of thinking*. Cognitive and normative shaping (in contrast to Amsterdam) is seen in both the *meso* and *micro* level initiatives, although the more detailed analysis thereof shows that at IC this cognitive and normative shaping is not deliberate. Hence this tactic remains mainly a *meso*-level approach, motivated from a broader drive for institutional change. As for the tactics to alter *ways of doing*, the Rotterdam analysis (in contrast to Amsterdam) shows that, although there seems to be no pattern, their employment is in fact steered by whether internal or external goals are being pursued (such as routinisation to improve the initiative internally and advocacy to have impact externally at both BC and PoR). This relates to the fifth and final point.

Finally, the Rotterdam analysis suggest a distinction in the employment of actor tactics similar to that pointed out by the Amsterdam analysis. More specifically, the Rotterdam cases show there is a distinction in internal versus external goals behind actor tactic strategies (which was also found in Amsterdam) and that external goals are common later in an initiative’s development. In addition, the Rotterdam analysis points to the distinction in orientations towards certain ‘ways’ (doing, thinking, organising). The actor efforts of the three Rotterdam cases are generally weighted towards changing the *ways of doing*, because in their entrepreneurial mind-set this ‘way’ is the main leverage point for institutional change. As can be gathered from the detailed analyses, changing the *way of thinking* is much less pursued in Rotterdam (in contrast to the Amsterdam cases). Focus on the *way of organising* is or will be present in all cases, later in the development. Nevertheless this suggests differing orientations regarding which aspects of the selection environment are primarily tackled.

The insights from this synthesis of Rotterdam, combined with the synthesis of Amsterdam and the first comparisons between the two cities indicated above, lead to the overarching findings presented in the Conclusion (Chapter 6). These overarching findings are not simply listed (like in these synthesis paragraphs), but structured and narrated in a way that will answer the main research question.

6. Conclusion and discussion

In this chapter, the findings of this research are brought together into a conclusion with which to answer the research question posed at the beginning (paragraph 6.1). Next, the practical implications of the findings and related recommendations for innovation practice and policy are discussed, as well as avenues for further research (paragraph 6.2). The final paragraph of this chapter (6.3), and of the whole research report, is a reflection on the research process.

6.1 Answering the research question

The aim of this exploratory research into the development of various circular economy initiatives was to gain insight into the role of actor tactics in triggering institutional change. To arrive at this insight, the following research question was posed: *What is the role of actor tactics in triggering institutional change, surrounding local Circular Economy initiatives in Amsterdam and Rotterdam?*

To break down the research into steps, three sub-questions were formulated to build up to the main question. The first sub-question was answered in the theoretical framework, which presented various tactics with which CE innovation actors can trigger institutional change. The second sub-question was elaborated in the two analysis chapters, describing which actor tactics were employed when and how in each of the macro-, meso- and micro-level CE initiatives in Amsterdam and Rotterdam. The third sub-question was answered with the synthesis paragraphs, identifying the patterns in actor tactic employment and their impact on institutional change. This conclusion builds on these steps to answer the research question.

When comparing the findings in the syntheses of Amsterdam (4.4.) and Rotterdam (4.5), overarching insights come to light. They reflect patterns regarding actor tactic employment and (where relevant) their connections to case levels (macro, meso and micro) and the ways of doing, thinking and organising. The Rotterdam synthesis already indicated where these comparisons exist. The details of these findings, and what they mean for the role of actor tactics in triggering institutional change, is elaborated upon in this conclusion.

To answer the main research question, this research highlights that the role of actor tactics in triggering institutional change can be elaborated based on two characteristics: *phasing* and *orientation* in the employment of actor tactics. These are two different elements, although they tend to be connected throughout the development of a CE initiative (with certain orientations in certain phases). The two characteristics are sketched in more detail below, thereby illustrating what they mean for the role of actor tactics in triggering institutional change.

The findings regarding *phasing* appear out of patterns in actor tactic employment across the studied cases in both cities. In contrast to the conceptual framework, where the actor tactics are presented in one list without a time element, this research shows that there is in fact a phasing (or succession) in the employment of tactics that is significant for their role in triggering institutional change.

The first and most significant insight (which was found in all six cases and is therefore independent from city and case-level) is that the joint employment of *networking* and *narrative work* is generally the first step taken by actors. More specifically, narrative work positively frames the initiative to convince people of its merits. And networking efforts forge partnerships with the necessary stakeholders and their resources to start realising such merits. These contributions, and often mutually reinforcing influence between them, are essential in starting up CE initiatives. Moreover, these tactics are essential also later in the development, as they enable other actor tactics to be employed which require a convincing

narrative (such as to shape cognitive and normative foundations) and the right network partners (for instance to allow advocacy). Therefore, the role of narrative work and networking could be seen as ‘pre-tactics’: a prerequisite for setting up a CE initiative at the start and a prerequisite for allowing further actor tactics towards triggering institutional change along the way. In the conceptual framework (see figure 9) they are moved to the front to present them as the first required tactics, as well as tactics which themselves are not directly linked to altering *ways of doing, thinking or organising*, but whose successful employment helps triggering change by enabling other tactics.

More insights into the phasing of actor tactics were found, supported not by all six cases but which are convincing patterns regardless. This research has shown that experimentation tends to be the first focus of actors once their CE initiative is set up. In *macro* and *meso* level CE initiatives, this experimentation consists of *theorising* which is followed by *defining*. Where theorising is thinking of new circular technologies and practices, defining is their application in practice and therefore the tactic that can trigger change in the institutionalised *way of doing*. The same goes for *micro*-level initiatives, although here the tactic of theorising is not actually applied. This because they are specific circular practices that have already been theorised, which means they require only defining after initiation. This finding is incorporated into the conceptual framework by grouping theorising followed by defining together as early tactics, where defining is connected to the institutionalised way of doing.

With these activities in motion, the other actor tactics tend to be employed. They include *educating, (de)routinising* and *mimicry* aimed at triggering change in the institutionalised *ways of doing*, and *shaping cognitive and normative foundations* aimed at triggering change in the institutionalised *way of thinking*. Although these do not appear in any specific order themselves, it has been found that there is another kind of phasing in the employment of these tactics. Namely that they are generally employed ‘in the middle’ of a CE initiative’s development. That is, after initiation (networking and narrative work) and the start of experimentation (theorising and defining) and before ‘later’ tactics (such as advocacy). In the conceptual framework, therefore, these tactics remain grouped together but with an indication of being ‘in the middle’.

This mention of ‘later’ tactics builds on an insight from this research that is supported by all six studied cases (and thus independent from city or case-level), namely that *advocacy* is an actor tactic employed most strongly later on in the development of a CE initiative. This because on the one hand, they have learned lessons by then as to what requires change from their own experience. And on the other hand, narrative work and networking throughout the development of the initiative can contribute to building a stronger story and connecting with externally influential partners, enabling more successful advocacy. Thus in the conceptual framework, advocacy is depicted as a later tactic. Since advocacy is in all cases the main tactic used to change *ways of organising*, this selection environment thus tends to be a point of focus later on (compared to the timing of efforts regarding *ways of doing* and *thinking*).

The insights into phasing of actor tactic employment are illustrated in a new version of the conceptual framework below (figure 9). This version then captures more detail as to the role that actor tactics play in triggering institutional change.

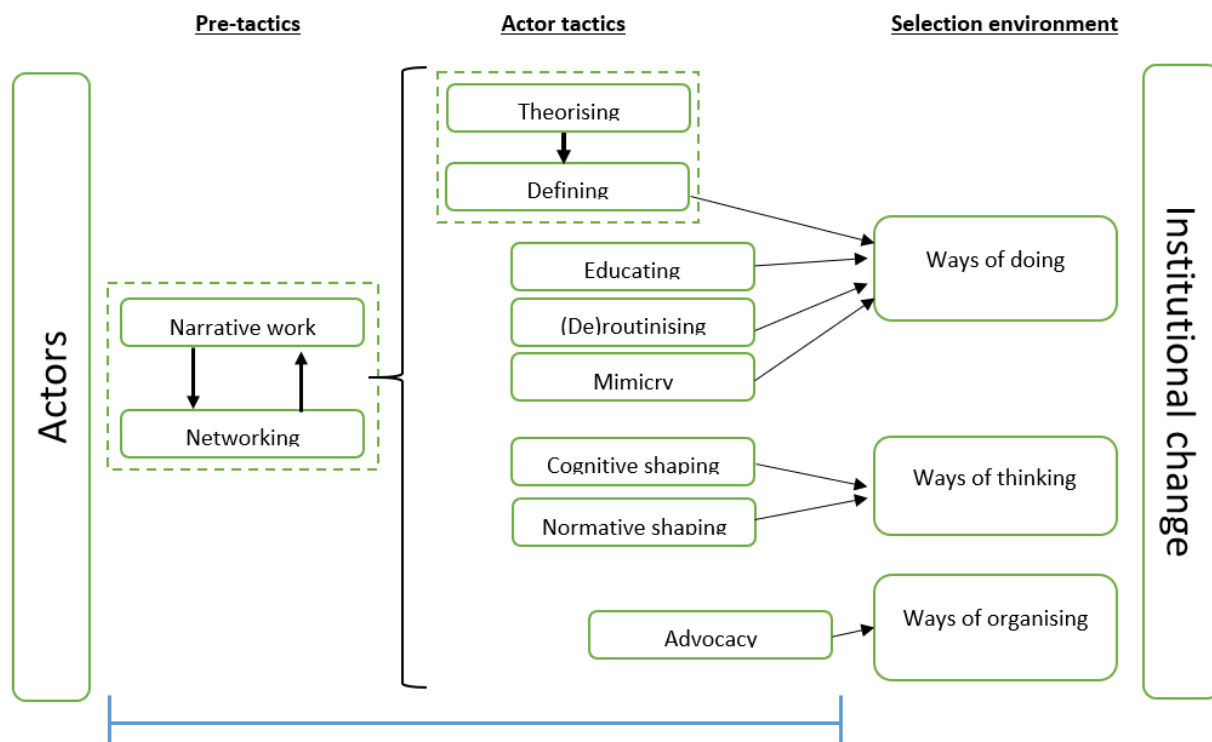


Figure 9. Conceptual framework including phasing

The findings regarding *orientation* appear particularly out of differences in actor tactic employment between the studied cases. Because even though all CE initiatives studied engage in actor tactics, they do not all use them with the same purpose. Differences can be seen in orientations regarding specific actor tactics as well as broader strategies of employing actor tactics.

Indications for this element are found across the analysis of both cities and are also pointed out as patterns in both of the synthesis paragraphs. The analysis pointed for instance towards a distinction between *internal* goals of actor tactics, to organise the initiative itself, and *external* goals to achieve impact outside of that local context. Another such distinction was identified in terms of a focus on *promoting* the circular alternative versus a focus on *altering* the selection environment. And finally another distinction was formulated in terms of employing actor tactics towards a certain institutionalised ‘way’ (doing, thinking, organising): distinguishing between a focus on creating new *ways of doing* versus changing *ways of thinking and organising*. All three formulations come down to the same division in two orientations:

- 1) an internal orientation at promoting new ways of doing, and
- 2) an external orientation at altering ways of thinking and organising.

Though this does not tend to be a hard and definitive division in practice, it does have significant implications for the employment of actor tactics and its role in triggering institutional change. These implications are three-fold: the orientation influences which tactics are employed when and how.

Regarding which actor tactics are employed, certain tactics are more common in an internal orientation whereas others are often found during an external orientation. Since the internal orientation is about promoting alternative *ways of doing*, this tends to include tactics such as theorising and defining, educating, routinising and mimicry. And where the external orientation is about altering the selection environment in terms of *ways of thinking and organising*, the tactics of shaping cognitive and normative foundations and of advocacy are more common here. In line with this, it would seem that Amsterdam

has a more external orientation, with more deliberate effort on shaping the *way of thinking*, and Rotterdam has a more internal orientation, with their entrepreneurial hands-on mentality in which it is believed the best way to trigger change is by focussing on just creating new *ways of doing*. However, this characterisation of Rotterdam may also be related to the fact that Rotterdam is not yet as far as Amsterdam in their facilitation of the CE transition, which links to the following point.

Regarding when actor tactics are employed, the internal orientation tends to be prominent early in a CE initiative's development whereas the external orientation tends to be more prominent later on. Though this is found at all case levels, it can be most clearly exemplified by looking at the *meso*-level cases. Here, the internal orientation came first, with actor tactics such as theorising and defining, networking for essential partners, influencing routines within the initiative and shaping the way of thinking of network partners. Later on a more external orientation appeared, in which the lessons learned were spread beyond the local context through the tactics of educating visitors but also networking with influential external partners and engaging in advocacy with or towards them. This shows that a CE initiative's orientation can coincide with their phasing in actor tactic employment. Also it shows that the same tactic (such as networking) can be used in different ways depending on when in an initiative's development, which links to the next point.

Regarding how actor tactics are employed, single tactics can be employed differently towards both orientations. For example educating can be used in an internal orientation to organise the initiative by helping and steering those making use of it, and in an external orientation to have an impact on the way of doing in society. Similarly, networking can be employed in an internal orientation to mobilise the resources required for the initiative and in an external orientation to achieve wider impact through connections outside the local initiative itself. And finally, advocacy can be used in an internal orientation to promote a more favourable situation for the current initiative, and in an external orientation to enable further progress or expansion of the initiative.

Thus to answer the research question, it can be concluded from the findings of this research that the role of actor tactics in triggering institutional change lies in the *phasing* of actor tactics and the *orientation* with which they are employed. Variance on these elements means variance in the impact that the CE initiative may have on institutional change. In terms of the *extent* of institutional change (whether it employs tactics at the right moments in the development) as well as the *kind* of institutional change (whether it addresses ways of doing, ways of thinking and/or ways of organising in the institutionalised selection environment).

6.2 Recommendations

Building on the conclusion, this paragraph discusses both practical recommendations (6.2.1) and suggestions for further research (6.2.2). The practical recommendations relate to the societal relevance of this research discussed in the Introduction chapter. The research suggestions address interesting avenues for further research in the field described in the scientific relevance paragraph.

6.2.1 Practical recommendations

The answer to the research question is useful in terms of its implications for both innovation practice and policy. The results of this research provide insight into the process of actor tactic employment in CE initiatives. This insight can on the one hand enrich the approach of policy in facilitating innovation and transition with an eye for the role of agency. On the other hand, the lessons learned from the studied cases can be helpful for other CE innovation cases.

As for innovation practice, this research has implications for other CE initiatives alike, particularly those with an ambition to bring about institutional change. In addition to providing more awareness of the employment of actor tactics (as initiatives may not be consciously using tactics in certain ways), it can also inform the strategies for actor tactics among those initiatives that are employing them deliberately or want to do so. The insights from this research inform them what to pay attention to in their efforts to trigger institutional change. A first recommendation would then be to start with the prerequisite or 'pre-tactics': networking and narrative work. For the right partners and a convincing story are essential to organise the initiative and allow further tactics. And also to keep improving on these throughout the process. A second recommendation would be to take into account the conceptual framework of actor tactics that includes the element of phasing (figure 9), for this gives an idea which tactics are useful in which phase and for what reasons they tend to be employed. This is not a recommendation to follow this exact representation, for there is no 'best way'. Which tactics to utilise and in what order depends on what is needed in specific contexts. Instead this recommendation suggests that this framework, presenting the 'common way', is useful to draw from when figuring out options for the next step to take. And to look back upon when figuring out why the initiative is not developing as it should or not having the desired impact on institutionalised ways of doing, thinking and organising. A third and final recommendation for CE initiatives would be to be aware of the underlying orientation in employing actor tactics. And to not cling to only one orientation but to change when the other is more suitable. Both orientations are required, for an initiative that is mainly focussed on its internal organisation will achieve impact once it decides to look further beyond their local context. And an initiative that wants to have external impact to trigger change, will first have to have their own initiative in order.

Regarding implications for CE transition policy, this research provides policy makers with a (more) detailed insight into the process of how CE initiative actors themselves work towards institutional change and transition. It implies that transition policy should not only steer CE innovation practice, but that vice versa CE initiatives should also (be able to) steer CE facilitation policy based on their actor tactic employment. In other words, for policy to take into account the role actor tactics can play in triggering institutional change and thereby transition. Two recommendations may guide policy in doing so. One way is for policy makers to aim their policies at supporting CE initiatives in the tactics they employ, thereby providing more specific facilitation. For this they could draw from the general phasing and orientations. However, given that each case is different, this would require for instance a local authority to discuss with many CE initiatives what their strategies are (if they are there) to know what tactics require facilitation. Another way is for policy to engage in tactics of their own. This could be particularly helpful regarding the 'pre-tactics'. Policy can encourage authorities to help building networks around CE initiatives and engage in narrative work to positively frame these initiatives, thereby facilitating them in starting up and helping them to employ further tactics towards institutional change themselves. Regardless of how, the overarching recommendation is for policy to consider letting their efforts towards transition flow through CE initiatives and their actor tactics.

6.2.2 Suggestions for further research

Due to limitations in research time and capacity, some interesting findings could not be followed up to go further into in this thesis. These present avenues for further research. A first avenue is created by some particularly interesting points that came from the study of the Circular Buikslooterham case, for which the most data was available. Since these concern only one of the six cases studied, they were not taken up further in the research, but that does not take away their possible significance. This case pointed towards the fact that the actor tactic framework used in this research does not account for the effect of

landscape factors on the transition in the regime's ways of doing, thinking and organising. Specifically the economic up- and downturn (landscape) played an important role in the dynamics between the Circular Buiksloterham initiative (employing actor tactics) and the institutionalised selection environment (which they attempt to change). Another point that arose out of studying this case, is that the role of a municipality in the employment of actor tactics around a CE initiative may be noteworthy but is not a part of the theory either. This because a municipality, as local authority, has special competencies that 'regular' actors involved in a CE initiative do not have. Therefore a municipality engaged in actor tactics makes a difference for an initiative's impact on institutional change. Further research could look into the significance of both of these 'top-down' aspects and, if useful, figure out how this may be accounted for in the now predominantly 'bottom-up' theoretical framework.

Another finding that could be interesting for further research is the distinction in orientations of actor tactic employment. Discovering and elaborating these orientations led to the idea that they may be linked to a terminology found in related literature that was explored during the literature review phase of this research. This terminology is 'fit-and-conform' and 'stretch-and-transform', two orientations in niche empowerment strategies (Rosenbloom et al., 2016, p.1278). Developed by Smith and Raven (2012) in their study of niche empowerment, they elaborate how this empowerment "*can be understood as either processes that make niche innovations competitive within unchanged selection environments (fit-and-conform) or as processes that contribute to changes in mainstream selection environments in ways favourable to a path-breaking niche innovation (stretch-and-transform)*" (Smith & Raven, 2012, p.1025). Further research could build upon this literature and the findings of this research to see how they relate and thereby possibly further substantiating both this finding and the terminology in literature.

A last avenue for further research actually builds on a suggestion made in another research, which in the end could not be attended to in this research but remains interesting nevertheless. Fuenfschilling & Truffer (2016), whom also studied actor tactics (in their vocabulary: institutional work) and the use thereof in a specific case, raised a number of reflective questions regarding this topic. Do the results of actor tactics and the intention always coincide? Are actor tactics equally possible, legitimate and probably? Are actors' efforts guided by prevailing rationalities as well as material manifestations? (Fuenfschilling & Truffer, 2016, p.310). These questions could not be addressed in this research, for instance because the data did not always cover the effects of (especially later) actor tactics extensively enough. Nevertheless, they present an avenue for further research on the topic of agency and institutional change which addresses interesting follow-up thoughts that may have been evoked by this research.

6.3 Reflection

In this paragraph, I look back at and reflect on this research in my role as researcher as well as personally. The reflection addresses the results of the research, as well as the process and lessons learned.

Regarding the outcomes of this research, I wondered for a long time how the results might turn out and what kind of, if any, merit the outcome would have (since it is an explorative research in which this aspect was uncertain). To start on a positive note, it turned out this research produced useful knowledge. The insights regarding the elements of phasing and orientation in actor tactic employment can inform the strategies of both innovation practice and policy. However they could still be further elaborated.

This relates to the more critical point regarding where limitations in the results of this research can be found. Firstly, this research studies six cases of CE initiatives in two cities (Amsterdam and Rotterdam). However, CE initiatives across the Netherlands are immensely diverse, which means the findings could be limited in their applicability in other cases. Secondly, the fact that this research covered

six cases does mean that each of these cases could not be studied in that much depth (due to limits in time and capacity available for this Master thesis project). These two limitations suggest that, when looking ahead, there could be merit in further research on this topic both in the form of a broader study of more cases as well as in-depth studies of single cases. This links to the suggestions for further research presented in paragraph 6.2.2, where similar limitations meant that certain indications of interesting insights could not be followed up within this research.

Regarding the research process, this was an explorative study in which the outline of the research developed over time and various changes were made throughout the process. As explained in paragraph 3.2, this is not necessarily problematic but a part of the iterative process that characterises this type of research. However, from a personal perspective I look back at this process as extremely challenging. This because I conducted a social-constructivist research whilst initially (and unconsciously) going into it with a background in the post-positivist research tradition. As a result, throughout the research process I had the sense that it was not going well. For instance the extensive changes made to the research set-up at a late stage of the process (reflected upon in paragraph 3.2) seemed to me as problematic and compromising the research quality. Although this might make sense when judged from post-positivist philosophy as point of view, this is not the case. Looking back I might feel like elements such as case selection, data collection and data analysis were not conducted optimally due to the changes made in research set-up, but I do recognise that it is exactly this course of action that was in fact optimal for the exploration of the studied subject that this research pursued.

The reflection on the process indicates the first lesson learned from this research, namely an understanding of what explorative research really entails and how it can be valuable. Another lesson learned is to be aware early on in the process of the research philosophy that influences your actions and judgements as researcher. As a result of these lessons, I conclude this research process as a more conscious and practiced researcher. Along with much more knowledge and several new insights to contribute to the studied field.

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Appendices

Appendix 1: Interview guide experts

> Respondent: _____

> Datum: _____

Introductie

Het PBL doet onderzoek naar de circulaire economie transitie in Nederland. Van daaruit ben ik geïnteresseerd in de ontwikkeling die CE initiatieven doormaken. Om hier inzicht in te verkrijgen, voer ik interviews uit met mensen van verschillende CE projecten maar ook met experts die brede kennis hebben van CE. Middels dit gesprek hoop ik meer inzicht te verkrijgen in de CE ontwikkeling in Nederland en hoe verschillende factoren van invloed zijn op initiatieven. Bijvoorbeeld verschillende belemmeringen en hoe daarmee om te gaan. We beginnen met enkele vragen over uzelf en uw visie op CE. Vervolgens dalen we af naar het niveau van CE projecten en hoe deze zich ontwikkelen. Als het helpt kunnen we inzoomen op één of twee projecten waar u zelf bij betrokken bent (geweest). Om uw verhaal zowel gedetailleerd als vertrouwelijk te kunnen verwerken, neem ik dit gesprek op. Het duurt naar verwachting een uur.

Topic 1: de respondent en CE

Allereerst enkele vragen over uw functie en uw visie op de CE

1. Wat houdt uw functie in? En wat is dan uw rol in de ontwikkeling van de CE (in Nederland)?
Hoe bent u tot deze rol gekomen?
2. Hoe ziet u de circulaire economie? Wat vindt u belangrijke elementen van CE?
 - Hoe is uw visie op CE ontstaan?
3. Gaat u bij deze conceptualisatie uit van enkele goede CE initiatieven? Welke? Waarom deze?
 - Wat zijn minder goede voorbeelden en waarom?
 - Welke CE projecten bent u zelf bij betrokken?

Om meer in detail te kunnen gaan, stel ik voor om verder in te zoomen op één of twee van deze voorbeelden waar u zelf bij betrokken bent en waar u het meeste over kunt vertellen.

4. Hoe dragen deze projecten bij aan de circulaire economie?
 - En wat doen deze projecten juist niet? Waarom past dit niet in de CE visie van dit project?

Doorvragen op...

- *Milieu/ecologisch aspect* [bv. grondstoffengebruik, afval]
- *Economisch aspect* [bv. kosten, toegevoegde waarde, inpassing wetgeving/maatschappij]
- *Sociaal aspect* [bv. werkgelegenheid, participatie, gelijkheid]
- *Innovatief aspect* [bv. nieuwe consumptiecultuur, nieuwe producten/productie, governance]

Topic 2: ontwikkeling CE initiatieven

Voor het onderzoek zijn we benieuwd naar hoe CE projecten ontwikkelen, wat daarbij goed ging maar vooral ook wat de moeilijkheden waren. Ik ben benieuwd naar uw brede kennis hierover, maar ook uw eigen projectervaringen.

5. Welke fasen doorloopt een CE project, van idee tot opschaling?

Doorvragen op de kenmerken:

- *Verkennen en innoveren* (persoonlijke visies, facilitering vanuit context)
 - *Gedeelde visie* (samenwerking en rolverdeling actoren, bestaande systemen)
 - *Directe sturing* (kaders vanuit doelgericht beleid)
6. Wat is er voor nodig om een CE project van de grond te krijgen?
 - Op basis van uw projectervaring, wat verliep soepel in de initiatie en beginfase?
 - Op basis van uw projectervaring, wat was moeilijk in de initiatie en beginfase? Hoe is dit opgelost? Wat zijn belangrijke kantelpunten (geweest)?
 7. Wat is er voor nodig om een CE project verder te ontwikkelen en (eventueel) op te schalen?
 - Op basis van uw projectervaring, wat verliep soepel in de vordering van het project?
 - Op basis van uw projectervaring, wat was moeilijk in de vordering van het project? Hoe is dit opgelost? Wat zijn belangrijke kantelpunten (geweest)?

Hoofdvragen → doorvragen op ontwikkelingsfactoren

- *Netwerkvorming* [bv. actoren, samenwerken, uitbreiding, motivaties, taken]
- *Leerproces* [bv. kennis creatie, kennis deling, veranderingen]
- *Verwachtingen* [bv. toekomstvisie, verwachtingen, overeenstemming/verschil, afstemming]
- *Locatie* [bv. nabijheid, specifiek beleid]

Deelvragen → doorvragen op institutionele factoren

- *Rol van de overheid* [bv. wet- en regelgeving op gemeente, provincie, Rijk, EU niveau]
 - *Legitimiteit van het project* [bv. in relatie tot lineaire processen buiten het project]
 - *Andere denkwijzen* [bv. overtuigingen, redenatie/logica, culturele identiteit, referentiekader]
 - *Andere gewoonten* [bv. doordat het al jaren op een andere manier gaat, de manier van werken niet past bij opleiding, ervaring en/of referentiekader, niet goed past in (bedrijfs)processen en bedrijfscultuur, verantwoordelijkheden onduidelijk waren, etc.]
8. Zijn er nog andere faciliterende of belemmerende factoren van belang in de ontwikkeling van CE initiatieven, die we niet hebben besproken?

Conclusie

- Hartelijk dank voor dit gesprek
- Heeft u nog vragen of opmerkingen?
- Heeft u nog suggesties voor aanvullende informatie bronnen?
- Zou ik u eventueel mogen benaderen voor verdere informatie?

Appendix 2: Interview guide project actors

Project / Respondent / Datum

Introductie:

PBL onderzoek naar de circulaire economie transitie. CE initiatieven in Nederland in kaart gebracht. Verdieping in de ontwikkeling van enkele icoonprojecten op verschillende schalen in zowel Amsterdam als Rotterdam. In [...] kijken we naar [...]. Vandaar dit interview, omdat ik verwacht dat u mij veel kunt vertellen over het project [...]. Middels dit gesprek met u hoop ik de ontwikkeling van dit project in kaart te brengen, wat daarbij faciliterend of juist belemmerend was en hoe daarmee is omgegaan, in termen van bijvoorbeeld wetgeving maar ook veranderende rollen en denkwijzen. Want operationalisaties van het brede CE concept verschillen en daarom werkt ieder initiatief op zijn eigen manier en komt daarbij verschillende barrières tegen. We zullen beginnen met enkele algemene vragen. Daarna gaan we over op de ontwikkeling van dit project, van initiatie en beginfase, via vorderingen en kantelpunten, tot groei en toekomstperspectief. De insteek is dat u het verhaal verteld. Om uw verhaal zowel gedetailleerd als vertrouwelijk te kunnen verwerken, zou ik graag dit gesprek opnemen.

Topic 1: de respondent en CE

> Hoofdvraag: *Waarom dit project?*

1. Wat is uw rol in het project? Hoe bent u tot deze rol gekomen?
2. Hoe ziet u de circulaire economie? [discourse]
 - Waarom is een CE nodig? [context]
3. Hoe draagt het project waar u bij betrokken bent, bij aan de circulaire economie? [content]
 - Wat is het vernieuwende / innovatieve aan dit project? Welke veranderingen brengt het teweeg (richting CE)? [bv. andere normen/waarden, manier van denken / handelen]
 - Hoe wordt deze CE visie nagestreefd? En hoe juist niet? [normatief / gewoonten]

Vraag 2 en 3 → doorvragen op:

- *Milieu/ecologisch aspect* [bv. materiaal consumptie, afval]
- *Economisch aspect* [bv. kosten, toegevoegde waarde, inpassing wetgeving/maatschappij]
- *Sociaal aspect* [bv. werkgelegenheid, participatie, gelijkheid]
- *Innovatief aspect* [bv. nieuwe consumptiecultuur, nieuwe producten/productie, governance]

Topic 2: initiatie en beginfase

> Hoofdvraag: *Hoe is het project ontstaan?*

4. Wie waren de initiatiefnemers? [netwerk]
 - Wat was hun motivatie? [normatief / cognitief]
 - (Hoe) zijn zij op één lijn gekomen? [verwachtingen] [denkwijzen]
5. Waarom is voor deze locatie gekozen?
 - Heeft gemeentelijk/regionaal/nationaal beleid hierin een rol gespeeld? Hoe?
6. Wie zijn er later bijgekomen? Waarom? [netwerk]
 - Hoe hebben jullie mensen weten te betrekken? Heeft de locatie hier aan bijgedragen?
7. Hoe verschillen de rollen van betrokken actoren van hun rollen in ‘traditionele initiatieven’? [normatief / gewoonten]
8. Wat verliep in de beginfase soepel? Waarom?
9. Wat was in de beginfase moeilijk? Waarom? Hoe is dit opgelost?

- Was/is er ook weerstand tegen dit project? Van wie? Waarom?

Vraag 8 en 9 → doorvragen op:

- *Rol van de overheid* [bv. wet- en regelgeving op gemeente, provincie, Rijk, EU niveau]
- *Legitimiteit van het project* [bv. in relatie tot lineaire processen buiten het project]
- *Andere denkwijzen* [bv. overtuigingen, redenering/logica, culturele identiteit, referentiekader]
- *Andere gewoonten* [bv. doordat het al jaren op een andere manier gaat, de manier van werken niet past bij opleiding, ervaring en/of referentiekader, niet goed past in (bedrijfs)processen en bedrijfscultuur, verantwoordelijkheden onduidelijk waren, etc.]

Topic 3: vorderingen en kantelpunten

> *Hoofdvraag: Wat waren kantelpunten in de vordering van dit project?*

10. Wat zijn belangrijke leerervaringen in dit project? [leren]
 - Hoe heeft dit uw visie op de CE beïnvloedt?
 - Hoe heeft dit de vordering van het project beïnvloedt?
 - Hoe wordt deze kennis breder gebruikt?
11. Hoe verliep de samenwerking in het netwerk? [netwerk]
12. Zijn betrokkenen op één lijn gebleven of ontstond meningsverschil/weerstand? [verwachting]
 - [bv. over concrete zaken (wat gaan we doen en wie is verantwoordelijk?), over visie (waar gaan we naar toe?), over de CE]
 - [doorvragen op: Wie? Waarom? Wat waren die meningen? Hoe is omgegaan met andere ambities en/of CE conceptualisaties?]

Topic 4: groei en toekomstperspectief

> *Hoofdvraag: Hoe ziet u de verdere groei van dit project in de toekomst voor u?*

13. Waardoor hebben jullie tot nu toe kunnen groeien? [bv. experimenteerruimte? sturing?]
14. Wat zijn de lange termijn doelen? Wordt groei nagestreefd? Wat worden de vervolgstappen?
 - Welke actoren zijn nodig om het project te laten groeien? Waarom deze? Hoe kunnen zij worden betrokken? Hoe zullen taken / verantwoordelijkheden veranderen? [netwerk]
 - Welke kennis moet er nog ontwikkeld worden? [leren]
 - Welke barrières verwacht u nog? Hoe verwacht u deze problemen op te lossen?

Topic 5: reflectie

15. *In het project zien we institutionele belemmeringen niet alleen als wet- en regelgeving, maar ook in bijvoorbeeld normen en waarden, denkwijzen en handelwijzen.* Waren er nog andere faciliterende of belemmerende factoren die we niet hebben besproken?
16. Als we verder kijken dan dit project, wat denkt u dat er nodig is om de transitie naar een CE te realiseren? [in relatie tot bv. barrières, visie, beleid]
 - Hoe ziet u de rol van de gemeente / regio / Rijksoverheid in de CE transitie? [bv. ruimte tot experiment, richting/inspiratie vanuit gezamenlijke visie, actievere sturing naar CE]

Conclusie

- Heeft u nog vragen of opmerkingen?
- Heeft u nog suggesties voor verdere bronnen van informatie? [document, persoon, situatie]

Appendix 3: Interview guide municipal actors

Organisatie / Respondent / Datum

Introductie

PBL onderzoek naar de circulaire economie transitie in Nederland. CE initiatieven in Nederland in kaart gebracht. Verdieping in de ontwikkeling van enkele icoonprojecten op verschillende schalen in zowel Amsterdam als Rotterdam. Vandaar dit interview, omdat ik verwacht dat u mij vanuit gemeente [...] veel kunt vertellen over de beleidscontext van de CE projecten in [...]. Middels dit gesprek hoop ik meer inzicht te verkrijgen in de CE ontwikkeling in [...], wat daarbij faciliterend of juist belemmerend is en hoe daarmee wordt omgegaan, in termen van bijvoorbeeld wetgeving maar ook veranderende rollen en denkwijzen. Want operationalisaties van CE verschillen en daarom werkt ieder initiatief op zijn eigen manier en komt daarbij verschillende barrières tegen. We beginnen met enkele vragen over uzelf en uw visie op CE. Dan volgen vragen over het CE beleid van de gemeente [...]. Vervolgens dalen we af naar het niveau van CE projecten en hoe deze zich ontwikkelen. Als het helpt kunnen we inzoomen op één of twee projecten waar u zelf bij betrokken bent (geweest). Om uw verhaal zowel gedetailleerd als vertrouwelijk te kunnen verwerken, neem ik dit gesprek op.

Topic 1: de respondent en CE

1. Wat houdt uw functie bij gemeente [...] in? En wat is dan uw rol in CE ontwikkelingen? Hoe bent u tot deze rol gekomen?
2. Wat vindt u de belangrijke elementen van een circulaire economie? Waarom is een CE nodig?
3. Gaat u bij deze conceptualisatie uit van enkele goede CE initiatieven?
 - Hoe dragen deze projecten bij aan de circulaire economie? Wat is het vernieuwende / innovatieve aan dit project? [bv. andere normen/waarden, denkwijze, handelingswijze]
 - Wat zijn minder goede voorbeelden en waarom?

Doorvragen op...

- *Milieu/ecologisch aspect* [bv. grondstoffengebruik, afval]
- *Economisch aspect* [bv. kosten, toegevoegde waarde, inpassing wetgeving/maatschappij]
- *Sociaal aspect* [bv. werkgelegenheid, participatie, inclusiviteit]
- *Innovatief aspect* [bv. nieuwe consumptiecultuur, nieuwe producten/productie, governance]

Topic 2: CE beleidscontext

4. Wat is het CE beleid van de gemeente [...]?
5. Wat is de motivatie achter dit CE beleid?
 - Wat was de aanleiding? Wat zijn de doelen?
6. Welke (typen) CE projecten worden door de gemeente gestimuleerd en/of gefaciliteerd?
 - Waarom deze? Welke juist niet en waarom?
7. Hoe worden deze CE initiatieven in [...] gestimuleerd en/of gefaciliteerd?
 - [bv. subsidie, ruimte geven, samenwerking bevorderen, ...]

8. Hoe wijkt de gemeente af van haar traditionele rol om CE ontwikkelingen mogelijk te maken?
 - Is daar ook weerstand tegen?

Doorvragen op ontwikkelingsfactoren

- *Netwerkvorming* [bv. actoren, samenwerken, uitbreiding, motivaties, taken]
 - *Leerproces* [bv. kennis creatie, kennis deling, veranderingen]
 - *Verwachtingen* [bv. toekomstvisie, verwachtingen, overeenstemming/verschil, afstemming]
 - *Locatie* [bv. nabijheid, specifiek beleid]
9. Waar kan de gemeente [...] nog belemmeringen wegnemen in ontwikkeling van CE projecten?
 - [bv. met maatwerk (bestaande ruimte zoeken)? Door verandering van procedures, wet- en regelgeving?]

Deelvragen → doorvragen op institutionele factoren

- *Rol van de overheid* [bv. wet- en regelgeving op gemeente, provincie, Rijk, EU niveau]
 - *Legitimiteit van het project* [bv. in relatie tot lineaire processen buiten het project]
 - *Andere denkwijzen* [bv. overtuigingen, redenering/logica, culturele identiteit, referentiekader]
 - *Andere gewoonten* [bv. doordat het al jaren op een andere manier gaat, de manier van werken niet past bij opleiding, ervaring en/of referentiekader, niet goed past in (bedrijfs)processen en bedrijfscultuur, verantwoordelijkheden onduidelijk waren, etc.]
10. Wat zijn de vooruitzichten van CE ontwikkeling in [...]? (*toekomstplannen? beleidswijzigingen?*)

Topic 3: CE projecten

11. Met welke partijen krijgen CE initiatieven in Rotterdam te maken? [bv. gemeente, DCMR, ...]
 - Hoe verloopt de samenwerking tussen deze partijen? [bv. rolverdeling, op één lijn komen en blijven over ambities en CE conceptualisaties]

Er zijn al verschillende faciliterende en belemmerende elementen voorbij gekomen. In het onderzoek kijken we naar institutionele barrières. Naast economische prikkels en wet- en regelgeving, gaat dit ook over andere normen en waarden, manieren van denken en van handelen. Op basis van uw ervaringen...

12. Welke CE projecten in [...] bent u zelf bij betrokken (geweest)? [vraag specifiek naar de Rotterdam cases: Haven Rotterdam, BlueCity, Plant One; Ioniqa Circulair]
13. Wat verliep soepel of juist moeilijk in de initiatie en beginfase van project [...]? Hoe is dit opgelost?
14. Wat verliep soepel of juist moeilijk in de opschaling van project [...]? Hoe is dit opgelost?
15. *Reflectie*: Wat zijn grote veranderingen die zullen ontstaan in de ontwikkeling naar een CE? Wat is daar nog voor nodig?

Conclusie

- Heeft u nog suggesties voor aanvullende informatie bronnen?
- Zou ik u eventueel mogen benaderen voor verdere informatie?

Appendix 4: Coding scheme

Institutional context

(institutions in the regime that constrain or enable innovation development)

Concepts	Indicators and notes
Regulative	<i>Laws and policy</i> Rules, laws, policy, monitoring, sanctioning
Normative	<i>Values and appropriate roles and behaviour</i> Values, expectations, (behavioural) standards, roles
- Expectations	Shared future visions, adjustment / alignment
Cognitive	<i>Interpretation framework</i> Categories, schema, (cultural) beliefs, identities
- Learning	Knowledge creating, knowledge sharing, resulting change
Habitual	Predispositions, routines, habits
- Network	Network expansion, network benefits
- Governance	Actor cooperation

Discursive context

(storylines and narratives formed around an innovation that empower or resist its development)

Concepts	Indicators and notes
Discourse	Conceptualisation of CE (<i>what it is and how to reach it?</i>)
Storyline (SL)	<i>Expressions of discourse, encompassing multiple narratives</i>
- SL economic	Costs, added value
- SL ecologic	Material consumption, waste production (= resources)
- SL social	Inclusivity, behaviour, employment
- SL innovation	Social (cultural change), technological (science, design), governance (forms of cooperation)
Narrative context	Regime / landscape developments (<i>why CE needed?</i>)
Narrative content	Niche developments: socio-technical features (<i>why solution?</i>)

Additional: internship project

Concepts	Indicators and notes
Economic institution	Up- and downturn, business case, financial incentives
Barrier: other	<i>(outside institutional framework)</i>
Facilitator: other	<i>(outside institutional framework)</i>
CE transition	<i>(not project-specific)</i>
Location	Physical space, advantage, disadvantage

Inductive codes *(added during analysis)*

Concepts	Indicators and notes
Economic up- and downturn (E)	Crisis, economic boom, market
Experimentation regulation (R)	Experimental space, duration
Internal organisation (H)	Integrality
Development style	Systemic (structure mechanisms), vs. organic
Government role	
Landholding positions (N)	