Circular Area Design or Circular Area Functioning? A Discourse-Institutional Analysis of Circular Area Developments in Amsterdam and Utrecht, The Netherlands

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Abstract: The hypothesis of this paper is that the circular economy (CE) has the potential to (re)balance the conflict within urban spatial planning between 'place as a location' and the 'organization of space'. The former dominates the latter following a shift from a Fordist towards a finance and real-estate driven regime. A consequence is that existing manufacturing areas are increasingly transformed into residential and commercial areas. However, this conflicts with the rationale of CE, namely that to end the linear economy, externalized activities, such as the (re)manufacturing of waste, should be internalized again, especially within urban regions. Emphasized by the EU, The Netherlands have the ambition to become fully circular in 2050. To test our hypothesis, we focus on two ongoing circular area developments in Amsterdam and Utrecht. By performing a discourse-institutional analysis, we detect in both case studies a change in discourse towards CE. Our results show that in contrast to our hypothesis, the concept of circularity is not emphasizing the 'organization of space', but even accelerating 'space as a location', increasingly transforming urban industrial areas into circular built residential and commercial areas. We conclude with spatial policy recommendations regarding the ambitions of a future CE.

Keywords: circular economy; discourse-institutional analysis; spatial planning; organization of space; space as a location; urban metabolism; Atlas.ti

1. Introduction

Although the main focus of this paper is on circular area development, the denominator of this paper revolves around the fundamental conflict within urban planning between 'space as a location' and the 'organization of space' (see for example [1–3]). As explained by Gleye [4], 'space as a location' is design-oriented (physical) planning, while 'the organization of space' is socioeconomic planning. Although both focus on places, the former concerns tangible place-oriented qualities (e.g., sidewalks, parking spots, and green areas), while the latter concerns intangible spatial aspects making a community function and develop. These are, for example, job creation, knowledge development, logistical and infrastructural systems, and value creation among others. Understood as such, socioeconomic planning focuses on the value of land—in many cases, for those who own it, but also for the broader community related to these lands. The quality of those places, or the design of the place, is not taken into account or is only secondary to this.

While arguably until a few decades ago socioeconomic planning was dominant [5], today within many city and urban governments, design-oriented planning dominates. Explained by Albrechts [1], one of the reasons is the growing influence of neo-liberal policies which has led a move from a more

socially oriented policy to a more economic focused policy [6]. In response, cities and regions adapted a more entrepreneurial style of planning to enhance their competitiveness [7]. As at the same time the economy became depoliticized, policy, and thus also spatial policy, became 'regulated deregulated' and market logics set the tone [8]. This had important consequences for urban planning. While, in general, economic planning increasingly became the focus, this was less true for its intangible aspects. Additionally, it was precisely the tangible aspect of socioeconomic planning—improving the design of a location in order to raise its value—that became the focus. Hence, one could say that the current dominating design-oriented planning is tangible socioeconomic planning. In other words, it is not the value creation of land but the increase in the value of land through its design that stands central. Illustrative for this is the increasing use of investment projects (cf. 'eye-catchers') in urban planning, presented as a tool to create competitive neighborhoods and urban regions [9]. This is part of the broader transformation from a former Fordist regime of accumulation to a finance-driven regime. In a recent paper, Hofman and Aalbers [10] explain that while within the Fordist regime a government fueled the economy by facilitating job creation and wages, increasingly the government fuels the economy by facilitating private money creation and real estate price inflation [11]. In this paper, we do not go deeper into this matter, but we want to highlight an important consequence for urban development. Especially during the last decade, residential and commercial real estate developments, developments with the highest price per land unit, outcompete other land use such as manufacturing land use, not only within urban areas [10,12]. Considering that especially residential and commercial real estate depend on the surroundings (e.g., safety, green areas, shops), this explains why within many Western cities, space as location is dominant [4].

This brings us to the circular economy (CE). The rationale of CE can be linked to four arguments. First, the environmental argument. A circular economy, in comparison to a linear economy, is better for the environment, following the decreased use of new materials (cf. 11R framework) and decreasing logistical chains (cf. congestion and emission-gasses) [13]. Secondly, the economic argument. This relates to the increased local and regional (re)production and hence the created added value and employment. The latter brings us to the third argument—the social argument. All kinds of labor profiles will be needed, from highly skilled financial advisors to waste collectors. Lastly, the geostrategic aspect of the CE is increasingly stressed [14]. A CE has not yet been realized, because the needed innovative processes are not yet available [15]. In other words, the CE will be a knowledge-driven economy—hence the geostrategic importance of developing this knowledge [16].

In one way or another, these four arguments all link to space. Arguably, space could be seen as a fifth or even a transversal argument. CE thus calls for a (re)balance between space as a location and the organization of space [17]. Following the arguments put above, core CE activities (e.g., remanufacturing, R&D, and waste treatment) will or should be located nearby or within urban regions to make their economy truly circular [18]. The latter links CE with the literature on sustainability. Sustainability and circularity are often named or used together, making their conceptual similarities and differences ambiguous [19]. Both sustainability and CE share concerns with technology development, industrial (re)production and consumption, economic competition and social integration. To guide development, both also rely on regulation and design, for example urban design. Sustainability is, however, more open-ended [20,21] than CE. Sustainability can be considered as a wicked concept [22]. Key to such concepts is that it is able to bridge competing and conflicting values, but it lacks an unambiguous operationalization. A lot of effort and time is put into policy making and the search for common definitions, and less attention is given to implementation and understanding the different positive and negative feedback loops [23]. CE is clearer—it aims at closing loops—and has more potential to connect policy intentions with practice [19]. Hence, sustainability and CE have an important relationship—conceptual but also in reference to practice [24]. For example, in order to become a sustainable urban region, a circular urban metabolism is seen as one of the possibilities to design cities as ecosystems within their wider context [18,19,21].

The hypothesis of this paper, therefore, is that within regional and urban planning under the influence of CE ideas, the organization of space gains increased attention in comparison with the space as location. This entails that, for example, existing industrial areas within cities are seen to be important to host core CE activities. If so, this should be noticeable in spatial plans, spatial discourses or (semi-) developed circular areas. This leads to our research question: "To what extent is circular area functioning, or the circular organization of space, increasingly important in spatial debates?".

The remainder of this paper is as follows: in our theoretical section, we give an overview of the trajectory of the concept of circularity. We also introduce our analytical framework capable of detecting changes in discourse. In the third section, we operationalize this framework. Next, we present our empirical results. We discuss our results and end this paper with a conclusion.

2. A Discourse-Institutional Analysis of Circularity

2.1. A Meta-Perspective on Circular Discourses

We do not have the ambition, nor space, to give an overview of the existing numerous definitions of circularity (see in this respect [24]). What we are more interested in is a (meta-) overview of the concept and the debates and fields it is subject in. This overview will help us to understand whether and why different circular discourses exist and potentially conflict. However, before we start exploring its trajectories, first we have to acknowledge that by focusing on the concept of circularity in this paper, we have in fact already taken a particular position. Indeed, the concept of circularity is not 'neutral', if the latter exist at all, but already projects—at least implicitly—a preferred normative end situation. This differs from for example urban metabolism [25], which is an analytical concept. Circularity is an operational concept, i.e., it wants that 'something that flows or moves, should do this in a circular way' [24].

Arguably, this operational approach explains why the concept has recently become popular [19,26]. This occurs internationally within public spheres [27,28] and within more private spheres [29]. This is similar for the Netherlands. The Dutch government has the ambition to be fully circular in 2050 [30], and increasingly think tanks, private companies and research institutions are taking up this agenda.

But where does this operational concept of circularity come from? To answer this question, we turn to the overview of Wachsmuth [31] in his seminal paper on the three ecologies of urban metabolism. As he argues, the distinction between linear and circular metabolisms were put on the research agenda foremost by Girardet [32], advocating that we should limit the existing urban world of 'resources in, waste out'. The concept of circularity herein is technocratic in nature—from materials, to building technologies or logistics [24]. Wachsmuth [31] situates this circularity within the 'second ecology', the (urban) 'industrial ecology' (IE). As he argues, this urban ecology started with Wolman's [33] "The Metabolism of Cities". This IE subfield emerged when IE, focusing on macro material and energy flows within industrial systems, 'merged' with the urban part of the 'first ecology', namely 'human ecology' [31]. Within this first ecology, the city is seen as an autonomous socioeconomic metabolic system, but where nature is completely absent. This view was foremost advocated by the Chicago School [34]. Based on location theory, here, one theoretically takes mobility as the main relational variable to map out the different functional zones to make 'a city work'.

Of course, in reality, such self-containing social (urban) system highly depends on its *glocal* [35], ecological and physical surrounding environment. These are, however, in this view, at least implicitly, externalized. This externalization of environment is arguably the start of the linear economy: increasingly waste longer returned to the soil as a fertilizer, but was disposed of in the sewer system as landfill or was incinerated [21]. This eventually created the 'tragedy of the commons' [36]. Because of this awareness (cf. [20,37]), the Chicago school perspective became connected with the more macro research field of material flows—hence the second form of urban ecology [31]. Herein lies the origin of the 'technocratic' circularity within urban metabolism [33].

Hereby, two important ontological shifts occurred. First, while during the first urban metabolism nature was absent and the social system stood central, in the second urban metabolism, the human became neglected; and the in- and outgoing material flows, the human became the prime focus. Nevertheless, taking into account this perspective dates back at least half century, why did circularity in this version resonate significantly rather recently? The reason for this popularity is linked to the 'claim' that the world, since the beginning of this century, has entered the 'urban age'. This is the second shift, namely a scale shift. At least implicitly, the (normative) solution to a diverse set of problems is also urban. Examples are institutional (cities rule the world), social (inclusiveness), economic (global cities) and also environmental (urban metabolism). However, Brenner and Schmid [38] have warned us that the urban age discourse is, on the one hand, empirically and theoretically weak but, on the other hand, also creates important biases. Indeed, the focus on the urban scale at least implicitly excludes the non-urban scale. As such, global problems, for example climate change or environmental problems, are dealt with by urban solutions, e.g., urban metabolism. However, global causes, such as global capitalism and neoliberal systems, are hardly questioned (cf. [39]).

Partly in reaction to this, a third 'version' of ecology, urban political ecology, exists. The main proposition here is that nature does not stop at the urban border but is an integral part of the city [21]. Vice versa, nature is no different than the socioeconomic system and is as political as urban society. In other words, there is no dependence between the two—hence also no independence. We do not go into detail here [40], but two things are apparent in reference to the two ontological shifts within the second ecology. First, nature and social confluence. Second, scales intertwine, from the local to the global [35]. Challenges as urban heat islands, water pollution or food production first surpass the urban 'technocratic' flows and boundaries, and second involve more pro-active social (e.g., labor, injustice), economic (e.g., global production networks, stock markets) and institutional aspects (see in this respect also [41]). These studies are often linked to post-growth arguments [42].

The three ecologies put forward by Wachsmuth [31] are useful to put urban metabolism in context. As argued, circularity is situated within the second ecology, the non-human technocratic urban metabolism. However, this is not suitable to explain why there are two potential conflicting circular discourses related to our proposition between circular functioning and circular development. Hence, we need further elaboration. For this, we turn to the paper of Broto, Allen and Rapoport [25]. Similar to Wachsmuth [31], they position the concept of urban metabolism within six themes [43]. What is interesting is that their themes offer 'cross overs' in reference to the three ecologies. We point out theme three, namely 'economic–material relations within the city'. As the theme name says, herein, one combines tangible material relations with the intangible economy. Arguably, hereby, it interweaves the three ecologies. It not only examines the material aspects of urban metabolism, but also tries to understand the reason why these material flows and stocks exist, who or what is influenced hereby and what changes or processes are necessary. For example, the question of the needed 'green' skills and 'green' activities stands central [15].

Circularity thus becomes broadened and links to the (socio) economy, or in other words the circular economy (CE). Although there is no consensus on what CE is [17], the CE is a heterogeneous and composite economy of different sectors (e.g., financial, industrial, agricultural etc.) [44]. Each of these has their own specific, and ever-changing, knowledge bases, labor profiles, experiences, market settings and glocal production networks.

This heterogeneous composite implies that the arguably 'quest of the holy grail' within some circular studies and reports, namely looking for the 'optimal scale' in which a city or region can become self-sufficient or circular [28], is futile. Acknowledging this in the first place is crucial to adequately grasping the complexities and subtleties of socio–environmental relationships, including thus the social, political, economic and natural systems [25]. To bring in the notion of space and scale within this debate, we refer here to the conclusion of Burger, Stavropoulos, Ramkumar, Dufourmont and van Oort [15]: "The CE does not assume that city or country borders will close material loops—a hypothesis often posted in CE-debates. [. . .] [C]ertain regions will be more, or less specialized in

specific CE activities according to their positions in value chains [...]. [I]n regard to regional and global economies, it is essential to understand the geographical spread of economic activity according to the different CE strategies [...]" [15]. Within a CE, they differ between enabling functions and skills, and core functions and skills. Without going into detail, they argue that for example for a city or region to foster a CE, within that particular region, some 'optimal scales' do exist in terms of waste treatment and local (re)production. This is not only understood in terms of logistics, but also in terms of knowledge [15]. But all these local or regional CE activities will not be possible without enabling activities and skills such as engineering, IT or finance. Although some of these can be local or regional, only a few global places will dominate, for example the trading and financial flows enabling a CE, similar to the situation today. In other words, depending on what one focuses on, there are different 'optimal scales'. Hence, the critique on the focus on places instead of processes within resilience and metabolic studies [45].

Summarizing, the concept of circularity has (at least) two different 'versions'. On the one hand, circularity, as a core operational concept within the second ecology, focuses on (non-human) technocratic solutions to close existing material flow loops and stocks within a certain defined bounded region or city. On the other hand, circularity is used for the broader CE and focuses more on the complexity of socio–environmental and socioeconomic aspects. In reference to Gleye [4], we refer to these discourses respectively as 'circular area design' (space as location) and 'circular area functioning' (the organization of space). Arguably within the former, the main focuses are material flows and the avoidance of waste. Examples are circular buildings and the circular built environment [18]. Hereby, ideally every input resource is later used for a renovated or new building. Hence, the avoidance of waste. The way this is done (in terms of skills and activities), for whom and where, however, is secondary. Within the latter, the prime focus is the working of the (circular) socioeconomy (e.g., of cities, regions, nations), where waste, and also the avoidance of it, is secondary and only a means to achieve a CE.

2.2. A Discourse-Institutional Analytical Framework

In the former paragraph, we appointed two versions within the circular discourse. Our interest is in how these versions are used by actors to influence or change the agenda setting in a particular setting. We are especially focusing on the change or stability of policy arrangements and how this is achieved. This differs to other wide-spread discourse analyses. As explained by Arts and Buizer [46], many stick to the reconstruction of ideas and meanings in texts and societies, but focus less on how or to what extent such discourses become institutionalized. The latter is understood if a discourse affects social processes and outcomes. This, however, is not yet sufficient. To link discourses with institutional changes, one needs to take into account the mechanisms implementing this change. To analytically be able to do so, one needs to make an abstract difference between discourses and institutions. This differs for example to Hajer [47], who defines discourses in a broad manner, including social practices, power and institutions [46].

A discourse-institutional analysis puts these apart and focuses thus on the institutional dynamics emerging out of new narratives that become institutionalized and eventually influence our social practices and outcomes [14,48]. These ideas are part of the critical realist perspective, assuming there is a 'real world out there', enabling us to analytically distinguish discourse and institutional practice ('analytical duality') [49].

Because of this dualism, Schmidt [48] argues that discourse-institutional approaches are promising as they go beyond the limits of both traditional institutionalism as discourse analyses. However, she also points out the weaknesses of the approach. By focusing on changes, one could overemphasize ideas and meanings. Not every idea or meaning entails an institutional change, nor is any institutional change based on a (clear) idea or meaning. In other words, one should be able to distinguish the observed effects from the relevant—and thus not all possible—mechanisms [50].

Indeed, when using a discourse-institutional approach, Schmidt [48] warns that the theoretical debate should not (anymore) stand central, but empirical questions: how, when, where, and why ideas and discourses matter for institutional changes, and importantly, when they do not.

To be able to analytically operationalize the discourse-institutional approach, we refer to Liefferink [51] and his tetrahedron. While his tetrahedron draws upon for example discourse analysis [47], the difference is that an institutional structure is not just a sum of the different dimensions, but inextricably interwoven within the tetrahedron. In other words, any change in one of the dimensions may induce changes in other dimensions, hence creating an institutional change. Liefferink distinguishes four dimensions (Figure 1):

- **The actors** and the coalitions involved in the policy domain. In our study, we restrict our focus on the agents, understood as actors, individually or in a coalition, that gain or have the capacity to act (see in this regard [52]). These can be public or private, local or non-local. Although in our study we do not include actants, focusing for example on waste as an actant is a possibility.
- **The resources** of these actors, leading to differences in power and influence. Power refers to the mobilization and deployment of the available resources, and influence refers to who determines policy outcomes and how.
- **The rules of the game** or " . . . the humanly devised constraints that shape human interaction" [53]. These define the formal and informal procedures of decision making, economic production or social processes. Game, here, is thus understood as the setting wherein actors interact. The institutional constrains are analogous to for example the formal and informal rules of the game in a competitive team sport, framing the ongoing interaction. Note that in this example, the actor or coalition is the sport team.
- **The discourses** entail the ideas and narratives of the involved actors (e.g., how they see and define problems or solutions, and what their norms and values are).
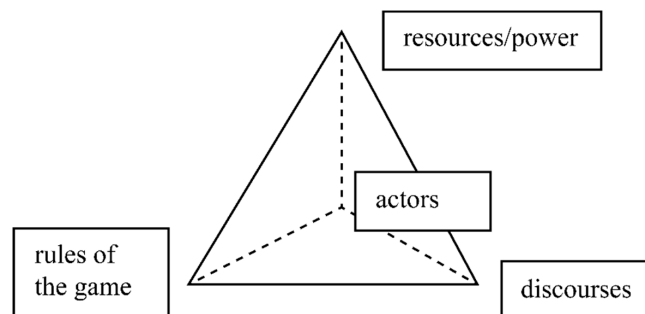
Figure 1. The tetrahedron, a discourse-institutional analytical framework [51].

Because we focus on particular circular area developments, we focus on a particular space within a particular context and time. As already explained in our introduction, the role of space and context may not be overlooked. The relevant actors and their resources differ, but also the rules of the game and the discourses used, differ strongly—even on an area level. Moreover, the way institutional changes can or cannot occur in regard to CE has an important relation with knowledge. Linked to the fourth argument of the rationale of CE, a CE is/will be highly innovative and driven by different knowledge bases in term of skills, education and experience [15]. Hence, to understand the occurrence of a possible institutional change, we underline the importance of contextual knowledge development in relation to the tetrahedron.

3. Operationalization

As explained by Liefferink [51], research can start at each of the four dimensions of the tetrahedron as long as all four dimensions are covered. However, this does not imply that the choice of this starting point is irrelevant. Each starting point implies a different conceptual and methodological tool. The

choice depends on the research goal. First, one can choose the actor side. This is most suitable to answer questions about policy-making processes around a certain topic. Secondly, the resources side provides a way to analyze the impact of specific policy interventions. Such interventions are mostly linked to the introduction or withdrawal of certain resources from the policy arrangement. Third, starting from the rules dimension is suitable for studying the influence of institutional change on particular policy areas. Hereby, one evaluates the effect of new rules on the other three dimensions of the policy arrangement. Lastly, the discourse dimension can be used to study how a change in ideas or problem perception influences the other dimensions.

In this paper, we are interested in observing how actors use the two detected circular discourse versions to influence or change the agenda setting in a particular setting. Hence, we choose to start from the actor side. As explained by Liefferink [51], this steers our analysis. First, one identifies the relevant actors and their roles and influence in the policy process. This can be done by focusing on relevant documents. We focused on two types of documents. These are policy documents from relevant authorities (e.g., European Commission, municipalities) discussing circularity, and documents directly related to the two area developments taken into consideration. The latter are not per se linked to circularity, while the former are not per se linked to the area developments. Next, one focuses on the relations between these actors. Hereby one takes into account what and how resources are mobilized and deployed. Examples are subsidies, taxes on production, or knowledge. Taking the resources and actors together, one is able to identify the power relation between actors and the resources dependencies. Mapping this reveals whether and how different actors are linked to each other. Next, one analyses the used discourses. Similar to resources, discourses can be used to influence the process or to gain for example political legitimacy. However, the difference between resource and discourse is that the latter is not under any actor's exclusive control. Indeed, actors can form a coalition under the umbrella of a certain discourse, this for example to counter another actor's or coalition's discourse. Finally, the rules of the game define how the interaction between the involved actors is governed. For example, the state can have an exclusive role within a particular policy setting, and thus steer the interaction for all actors involved. The rules of the game also define what resources can or cannot be used, and by whom. They also define what kind of discourses can be used, for example extreme political messages.

We present our results in two ways, with a timeline and a co-occurrence table. First, in our timeline, we present the relevant actors on the y axis. Subsequently, we plot their resources, the key moments, and their relations and dependencies against the time. As such, we can reconstruct the process of the area development. These timelines enable us to identify the shifts in dependencies, which clarify what actor has the regulatory power or discursive power influencing the process. For legibility, we use a grid which we will refer to in the text as the background. Using the timelines, we can point out whether there are shifts in relations and dependencies and whether they are accompanied by changing discourses. Next, as explained by Liefferink [51], we zoom out to move to the rules side within the tetrahedron, presented within the discussion section. Here, we discuss the rules that govern the interaction between the different actors on a larger scale. This will help us to eventually identify the potential conflicts and incongruences between the different circular discourse variants, which we can use to answer our research question.

Second, to support both our results and discussion section, we used a coding method to generate a co-occurrence table. We chose to do this because of the relatively high amount of documents taken into account and to keep an overview of the different dimensions and their relations. Indeed, by coding the documents according to their dimension, we are able to produce a co-occurrence table, presenting the relations between the different dimensions in more detail. Based on our specific research focus of circular area developments, we constructed a coding tree by subdividing the four main general dimensions into a coding tree with subcodes (Figure 2). To assist us, we used the computer-assisted qualitative data analysis software Atlas.ti [54]. This program helps researchers analyze empirical data. Because we deal with qualitative research, there is not a clear cookbook recipe, unlike for example

statistical analysis. As explained by Yin [54], tools can assist, but can only be useful if one knows what to look for. Regarding our tetrahedron, we looked for the relation between the four dimensions and their subcodes within a large amount of different kinds of documents, which is an ability of Atlas.ti, hence our choice for this program (Other computer-assisted tools are NVivo or HyperRESEARCH). To improve the legibility of the co-occurrence tables, we highlighted the mentioned numbers in the text which show how many times two subcodes of different dimensions have occurred together within the analyzed documents.
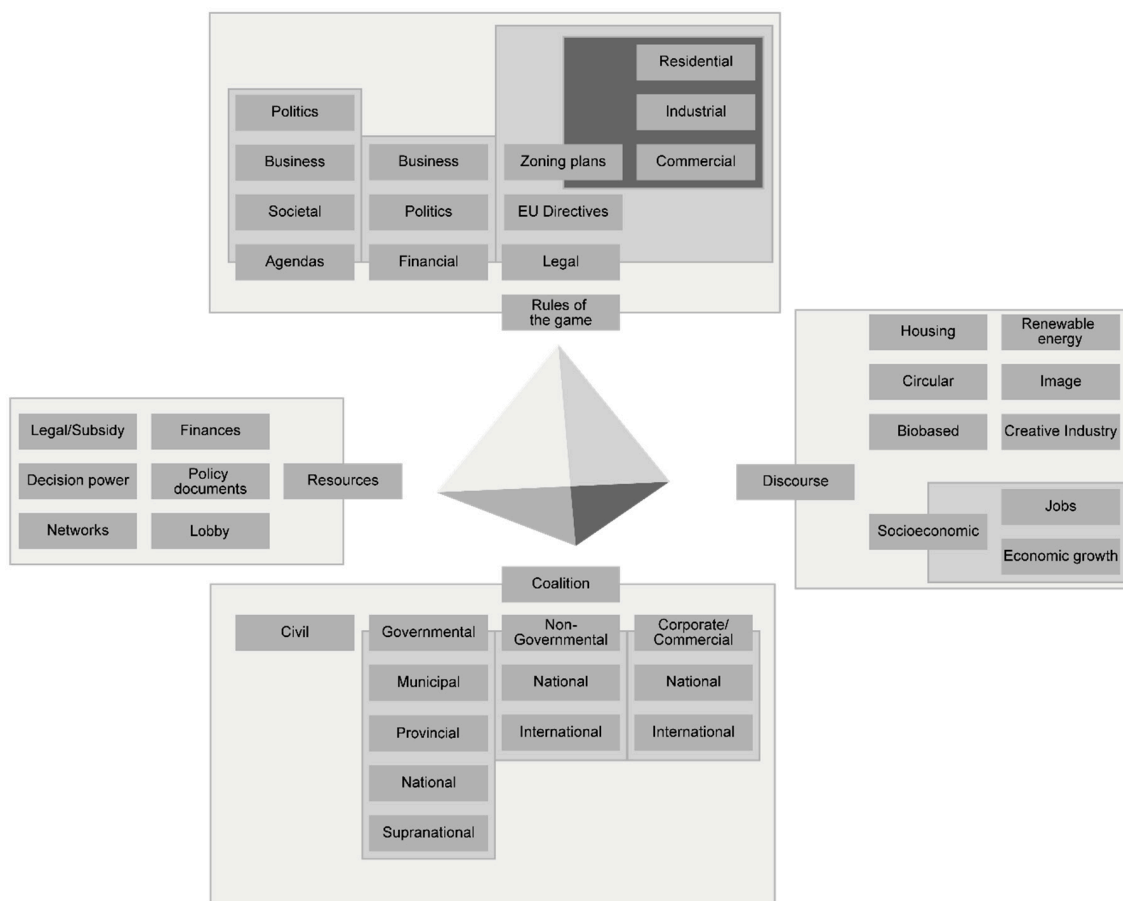
Figure 2. Coding tree used for the empirical research. Subsequently, the coding is used to produce the co-occurrence of these different codes, or the relation between the four dimensions.

4. Results

We selected two area developments for our empirical research. To be able to detect the two versions of the circular discourse, we have chosen two relatively recently started and ongoing industrial area developments within different contexts. This increases the chance of finding the two versions, and thus also potential changes of discourse into one or the other direction. For circular area functioning, we selected the area development of Greenmills, Amsterdam, and for circular area design, we selected Werkspoorkwartier, Utrecht. The development of each area development is summarized in respective timeline Figures A1 and A2. These two timelines will be described in the following paragraphs. After the description of the actors and their resources, in the discussion section, we move to the rules and discourses.

4.1. Greenmills

Our first case study is the area development Greenmills. Greenmills is an economic and logistical cluster of bio-based companies and is located at the Horndock, a deep water bound dock within the

port of Amsterdam (Figure 3). The starting point of the development of Greenmills is 2003. In 2003, the Horndock area became vacant after a four-decade-old chemical plant closed and was demolished. From that moment, the responsible landlord, the municipality of Amsterdam, discussed what preferred land development could happen there. An economic study was published in 2006 (Figure A1, 3-A), presenting the potential of the biobased economy [55]. The economic study of 2006 was translated into a port vision 2008–2020 (Figure A1 3-B), in which one of the strategic goals is the biobased economy, and in particular biofuels [56]. One of the instruments to achieve this was the land lease of the Horndock (Figure A3, 5–21), granted to a group of biobased companies belonging to Simadan, of which Orgaworld was sold in 2007 to the British company Shanks. Simadan proposed the economic cluster Greenmills: biobased companies producing biofuels and chemicals from organic waste. The cluster became operational in 2010 (Figure A1 5/6-B). Furthermore, in 2010, Chaincraft, a university spin-off focusing on fermentation technologies, obtained investments to first build a pilot plant (Figure A3 8–20) and second a demonstration factory (Figure A1 7-D/G/J/K).
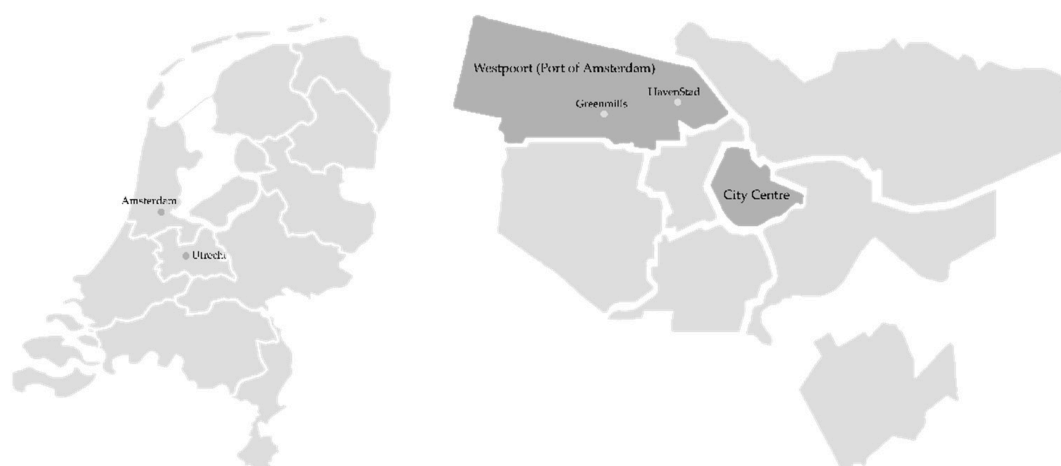
Figure 3. Location of Greenmills and HavenStad in the municipality of Amsterdam.

The term biobased became increasingly accompanied or replaced by circularity. In 2015, the port authority of Amsterdam [57], which became a semi-independent authority in 2013 (Figure A1 4-G), and the municipality of Amsterdam [58], published their economic vision and roadmap, both focusing on the circular economy (Figure A1 3-I,4-I).

The port authority frames the CE as a 'megatrend' that can lead to growing employment, added value and an increase in bulk transport [57]. The port authority explicitly links circularity with its biobased economy (Figure A3 10–11, 10–12). Hereby, it 'rebrands' itself as a circular port, by using the Greenmills cluster as its flagship. Moreover, private investments also increased (Figure A3 2–20, 3–20). While during the first few year, Greenmills was run foremost by an arguably local company Simadan, recently Simadan was sold and divided between John Swire and Sons and Parcom Capital (Figure A1 5-L). Next, a former obsolete biodiesel factory was bought and reopened by Greenergy (Figure A1 8-L). In other words, while being foremost public led in terms of resources (e.g., predetermined land lease and subsidies), one can state arguably that Greenmills is recently becoming economicallly independent and international private firms are increasingly deciding the development of the biobased sector (Figure A3 2–19). This economic success is being used by the port of Amsterdam to frame itself as a circular port (Figure A1 4-L).

4.2. Werkspoorkwartier

Our second case study concerns the Werkspoorkwartier area in Utrecht (Figure 4). The 60 ha site started in 1913 as a location for the Werkspoor factories, specializing in machinery and railway equipment. A few years later, a municipal industrial area was added to the site and in 1926, the

currently still operational heat and electricity plant opened, currently owned by Nuon/Eneco (Figure A2 6). Since the 1970s the area slowly started to transform after departure of the Werkspoor company. Nowadays it is a mixed light industrial area with car garages, municipal (waste) services, offices, recreational destinations, creative industry and some artist studios [59].

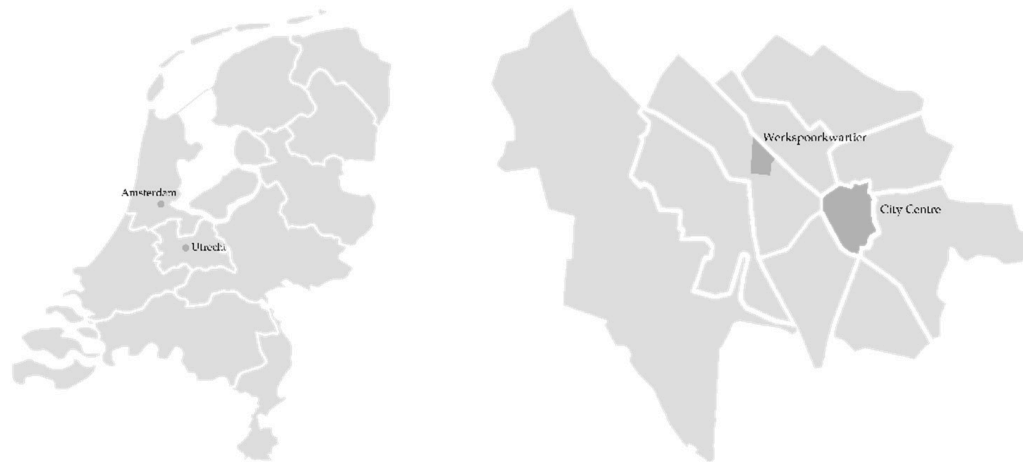**Figure 4.** Location of the Werkspoorkwartier area in the municipality of Utrecht.

The mega housing development of Leidsche Rijn west of the city center, that started just before the turn of the century, led to centralization in the city of Werkspoorkwartier. However, this also resulted in worse accessibility to the area and, as a consequence, larger companies started to move out of the area. Several of these vacant properties were transformed into multi-tenant properties. Due to these redevelopments and the locational characteristics, the area became very attractive to tenants from the creative industry. This shift in usage and character of the area, combined with proposed nearby housing developments, triggered the municipality of Utrecht to write a development vision for the area [60]. In this document (Figure A2 3-E), the municipality acknowledges the area as a creative 'breeding ground' (Figure A4 13–31), but circularity is not mentioned as a theme. The first time circularity appeared in a major document regarding Werkspoorkwartier was in the 2017 project plan 'Werkspoorkwartier: Creatief Circulair Maakgebied' [61] (Figure A2 3-F).

A key project in the plan is the 'Hof van Cartesius' (Figure A2 4), a new development on an empty strip of land (Figure A2 3-H) containing offices and workshops for creative entrepreneurs [62]. This building is constructed with 90% circular materials and is currently being built (Figure A2 4-L). Furthermore, other initiatives started. Similar to 'Hof van Cartesius', Werkspoor cathedral focuses on creative industry. A former train industrial factory was bought (Figure A2 3-G, 5-K) and is currently redeveloped circularly (Figure A2 5-L). More recently, two more overarching projects started, 'Werkspoorkwartier Creative and Circular' (Figure A2 7) and 'Vriendinnen van Cartesius' (Figure A2 8). Arguably, the former, subsidized by the European Fund for Regional Development (Figure A2 7-K) (Figure A4 8–21), can be seen as an ongoing project with several subprojects which takes large parts of the area into the circular built environment discourse. It focuses on existing buildings and public spaces to attract residents and the creative industry. Linked to this is the latter, a network organization bringing all interested actors together to make the Werkspoorkwartier circular and creative (Figure A2 8-L).

In general, today, the most important actors within Werkspoorkwartier are the municipality strongly steering for a creative industry area development, and local actors such as Hof van Cartesius that are a part of this development (Figure A4 3–19). Increasingly, these actors dominate in comparison to the more larger industrial companies, especially since Nuon/Eneco decided to replace its electric plant within Werkspoorkwartier by a biomass plant outside the area (Figure A2 6-I/J/K/M). Recently,

the change in actors within the area led the municipality beginning the update of the vision of Werkspoorkwartier (Figure A2 3-M).

5. Discussion

Having now identified the most important actors within the two area developments, we can now analyze the actors according to their views on the area development [51]. Referring back to our theory, one can state that today, for Greenmills, the circular area functioning dominates, while, for Werkspoorkwartier, the circular area design dominates. However, the timelines show that during the development, in both developments, a shift in dominant actors occurred. In Amsterdam, the corporation of the port authority led to a clearer focus on the biobased and circular sector in reference to its profiling towards the city and its license to operate [57]. At the same time, the municipality of Amsterdam became less dominant. More recently, this circular industrial coalition has been added by international companies overtaking local ones. In Utrecht, the municipality became dominant when it published its vision on the Werkspoorkwartier. At the time, the municipality was still the owner of multiple buildings and plots in the area. Soon after, new actors arrived, partly because of the sale of municipality owned buildings and land, and because the older ones such as Nuon/Eneco gradually became less dominant. The new actors started influencing most new redevelopment projects, first via the networking activities of Vriendinnen van Cartesius (Figure A2, 8-F) and later via the Werkspoorkwartier creative and circular production area consortium (Figure A2, 7-J) [63]. A change in actors can indicate a change in discourse. And indeed, a change occurred. When counting the dominant views within the analyzed documents using Atlas.ti, one can see that for both Greenmills and Werkspoorkwartier, the discourse changed. As shown on Figure 5, in both case studies, the term circularity began to be used only in 2012. Since then, circularity increasingly dominates and overtakes the use of biobased (Figure 5a) and creative industry (Figure 5b) respectively.

In other words, a change in discourse towards circularity occurred in both case studies. However, as already explained and illustrated by the dominance of biobased and creative industry respectively, the discourse of circularity differs and is differently used. This is noticeable if the two co-occurrence tables are compared. In Amsterdam, the circular discourse is used together with biobased (Figure A3, 11–12), while, in Utrecht, it is linked with creative industry (Figure A4, 12–13).

The question thus remains why the two circular area developments differ in discourse variants. To find an explanation, we have to look at the rules governing the area developments [51]. What is interesting is that in relation to circularity, the rules are almost fully controlled and dominated by the European Union and the Dutch government. That is the reason why, in both timelines, these two actor developments are the same (Figure A1 1,2 and Figure A2 1,2). The basis includes the EU Directive 2001/77/EG [64], the EU Directive 2003/30/EG [65] and Renewable Energy Directive (RED) 2009/28/EG [66], making the use of biofuels obligatory. The Dutch government translated this into national rules (Figure A1, 2-B) [67]. These rules stimulated the biobased economic functions in Greenmills. Indeed, noticeable is the co-occurrence of the discourse of economic growth and rules regarding business (Figure A3, 17–25). In the period prior to 2012, Greenmills was in development, while Werkspoorkwartier was not. This changed in 2012. The European Union launched its manifesto for a resource-efficient Europe. In 2014, this resulted in the Circular Economy Action Plan [68]. Note that these two documents do not have the same status as a directive. Until today, beside two waste directives in 2018, no circular directive exists. This implies that the European member states are not obliged to publish national rules according circularity. This explains, first, why the Dutch government has no enforcing circular rules, but circular ambitions [67]. Second, this also explains why both the municipalities of Amsterdam, Utrecht and the port authority of Amsterdam have formulated their own ambitions and agendas [57,58,63]. The diversity of these agendas and views on circularity is possible following the rather open use and ongoing debate about the concept by the European Union and the Dutch government. Herein lies, first, the reason why both the municipalities Amsterdam (Figure A3, 14–34) and Utrecht (Figure A4, 14–34) focus on housing, the latter also on creative industry

(Figure A4, 13–31), within their zoning plans related to circularity. Second, it explains the existence and the conflict between the two discourse variants of circular space as a location from the municipality of Amsterdam, and the circular organization of space from the port of Amsterdam (Figure A3, 10–25). The conflict between the two discourse-variants in Amsterdam is well illustrated by the recent name change from the port *of* Amsterdam to the port *for* Amsterdam [69]. In other words, the different discourse variants of circularity are used to influence ongoing debates of area developments according to the different agendas.

(**a**)

(**b**)
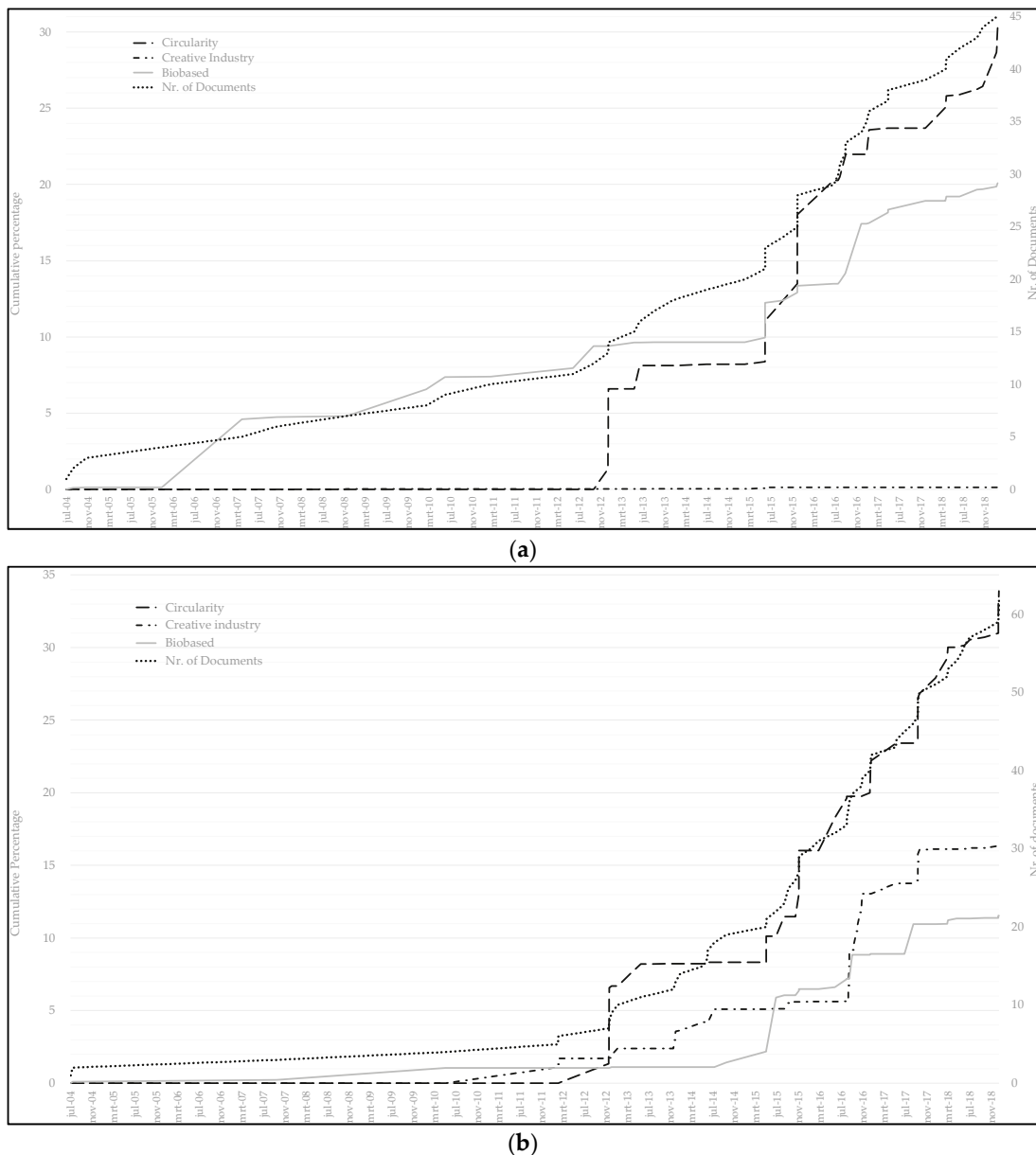
Figure 5. The evolution of the use of the concepts 'creative industry', 'biobased' and 'circularity' over time, within the analyzed documents regarding the area developments Greenmills (**a**) and Werkspoorkwartier (**b**).

6. Conclusions

This article performed a discourse-institutional analysis on two area developments in Amsterdam and Utrecht. Both profile themselves as circular area developments. The hypothesis of this article was that CE has the potential to rebalance the conflict within urban planning between place as a location

and the organization of space. In recent decades, the tangible became increasingly more important than the intangible, following that the economy is increasingly fueled by real estate inflation. Our hypothesis was based on four arguments, all linked to the importance of space within CE, in particular to strive for a sustainable urban region. Indeed, the CE will be highly innovative and knowledge driven. Our two case studies, however, do not fully confirm our hypothesis. Although the port authority of Amsterdam explicitly positions the CE as essential to fulfil the ambition of the Amsterdam municipality to become circular, this is not confirmed in the spatial area plans of the latter. Similar to the municipality of Utrecht, the concept of circularity is linked to the built environment, and not to the use of and the functions within these circular buildings. In our theoretical part we have explained how the concept of circularity is linked to the debate between space as a location and the organization of space. Explaining the conflict between the two circular discourse variants needs a connection between the evolution of urban planning and the evolution of the economy, as we did. As such, one can explain why Werkspoorkwartier does mention creative industry as a goal, but does not link this to knowledge-driven circular organization of space, exactly because at least implicitly this is not their main goal.

Vice versa, we can state that if one wants to act upon the two conflicting discourse variants, one should understand the theoretical origins of the differing views on urban metabolism. This is well illustrated by our research. The current lack of a clear definition of circularity, especially in reference to spatial planning and area development, is the reason for why the two circular discourse variants are pinned upon the longer existing views of urban metabolism. This has also its advantages as different actors can explore the possibilities of circularity, but also its disadvantages, that it can be used to influence the institutional setting, in this case of area developments.

As conclusion, we want to underline, first, the importance of circularity in bringing sustainability, a wicked concept, and its practice a step further. As explained, too much effort and time is put into policy making and less attention is given to the implementation. CE is promising in this way. However, second, we also want to underline the current ongoing problematic area developments. Although we do not want to underestimate the importance of a circular built environment, we doubt whether this will bring us the necessary progression. Indeed, if regions and cities want to become circular, not only will it be necessary to have different remanufacturing functions located nearby, it will also be necessary to foster knowledge development by linking the needed 'green skills' with the 'green activities'. Hence, especially existing manufacturing areas located close to urban knowledge economies have the potential to become areas that will be the spatial cores of a future (urban) CE, in terms of circular processes as knowledge production. A possible consequence is thus that area developments under the circular design flag are in fact making our cities and regions less circular, exactly because the circular functioning of such areas is not included. The future will determine whether this is correct and more research into the spatial planning of the CE is required.

Appendix A

Figure A1. Timeline presenting the relevant actors and the relevant resources, key moments, and the relations between these, focusing on Greenmills, Amsterdam.

Row 1 — European Union: Di: 2001/77/EC Renew. Energy; Di: 2003/30/EC Biofuels; Di: 2008/98/EC (Waste); Di: 2009/28/EC (Renew. energy); Manifesto for a resource-efficient Europe; Policy recom. for a resource-efficient Europe; EFRO 2014-2020 program; Circular Economy Action Plan; Di. Proposal 2018/0411 (Waste); Di. 2018/849-852 (Waste)

Row 2 — Dutch national government: EOS-decision (Renew. Energy Research) [2004]; SDE-arrangement (Promoting renew. energy production); Circular economy: From wish to practice; Netherlands circular in 2050; Working towards a CE: no time to lose; National Agreement on the CE; Presentation transition agendas CE; Vision circular agriculture

Row 3 — Municipality of Utrecht: Research redevelopment Werkspoor-factory; Development vision Werkspoorkwartier; Public sale of Werkspoor-factory; Open call Vlampijpzone; Land lease decision Hof van Cartesius; Decision trans-form adjacent industry area to housing; Public sale tractieweg 100-112; Call for update vision Werkspoorkwartier

Row 4 — Hof van Cartesius: Winners open call Vlampijpzone; Crowdfunding for construction; Construction started

Row 5 — Werkspoor heritage (Bob Scherrenberg): Acquisition Werkspoor cathedral; Redevelopment Werkspoor cathedral; Acquisition land Vlampijpzone; Acquisition Werkspoor-factory; Circular redevelopment werkspoor-factory

Row 6 — Nuon/ Eneco Energy: Announcement construction Biomass plant; Eneco buys Nuon facilites; Announcement change to small biomass plant; SDE subsidy for biomass plant; Start construction biomass plant; Decision phasing out of gas fired elect. plant in 2022

Row 7 — WsK: Creative & Circular Production Area Consortium: Project proposal Wsk Creative & Circular; Kansen voor West Subsidy

Row 8 — Vriendinnen van Cartesius: Launch Vriendinnen van Cartesius; Connect. stakeholders with PR ('12-AD)

Legend
- Policy document, report or similar
- Law/directive
- Investment
- Subsidy or other public funding
- Press release or other PR
- Construction
- Key document or event

Timeline: 2000 (A); 2001-2007 (A); 2008 (B); 2009 (C); 2010 (D); 2011 (E); 2012 (F); 2013 (G); 2014 (H); 2015 (I); 2016 (J); 2017 (K); 2018 (L); 2019 (M)
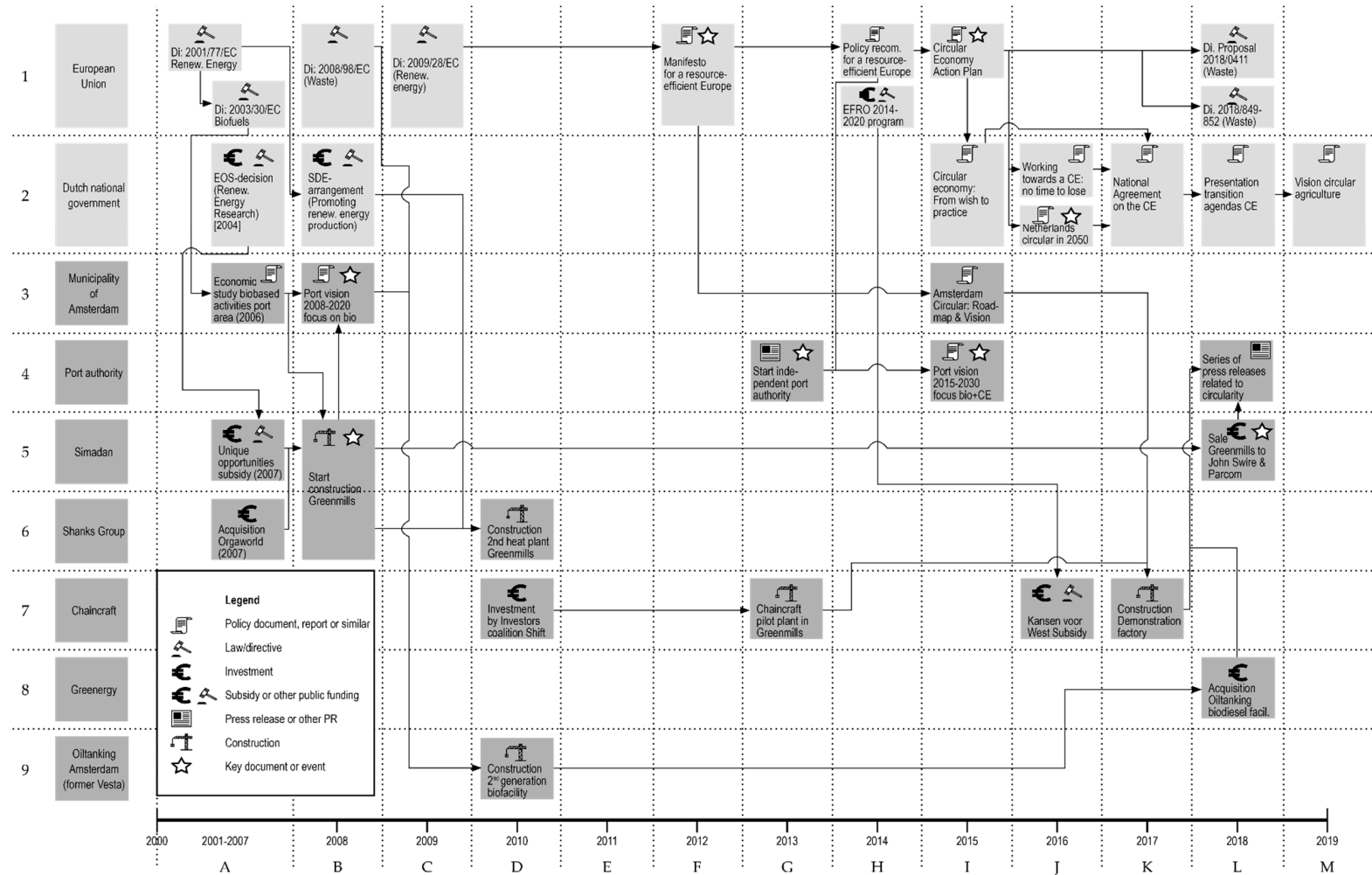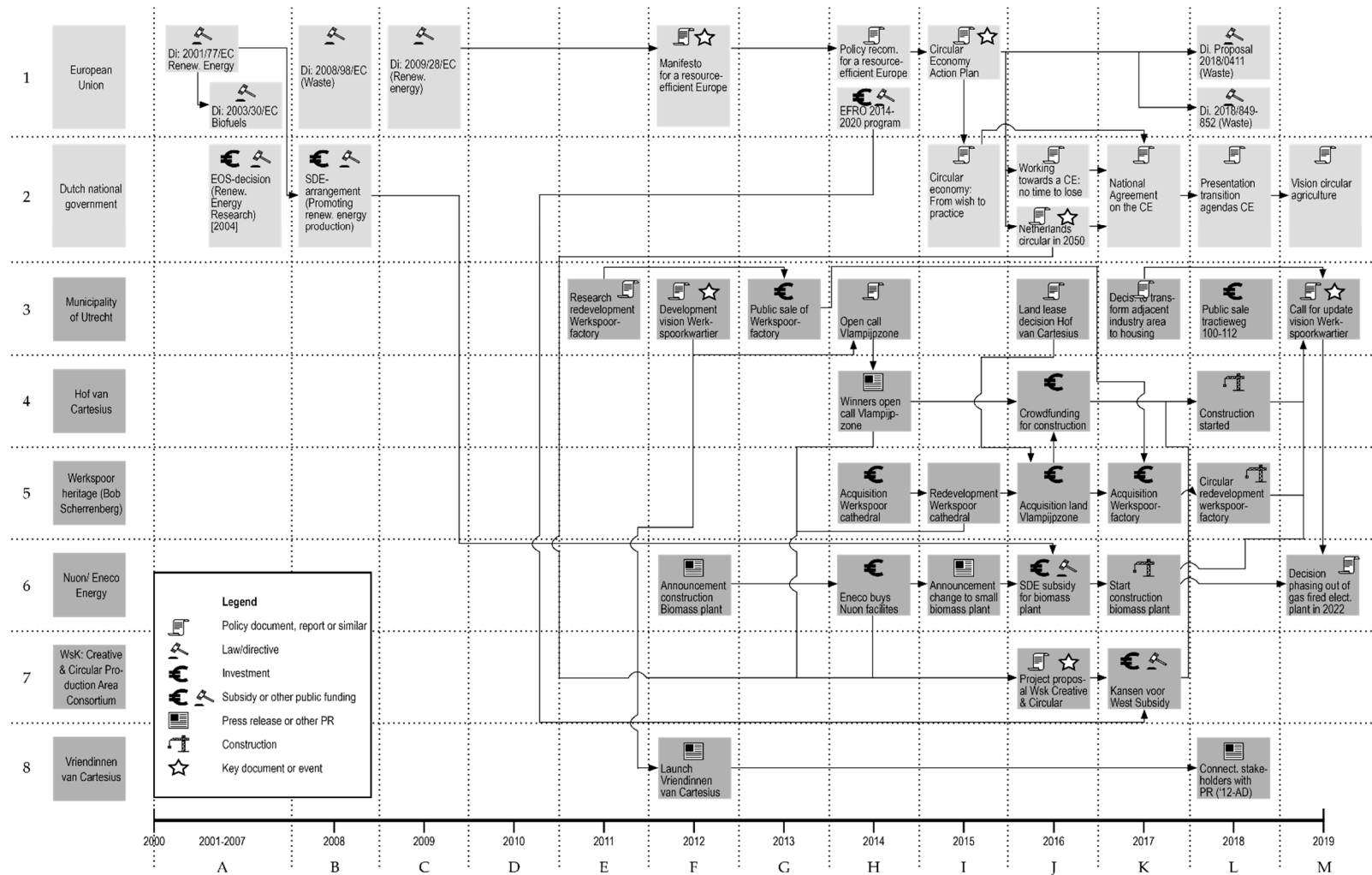
Figure A2. Timeline presenting the relevant actors and the relevant resources, key moments, and the relations between these, focusing on Werkspoorkwartier, Utrecht.

AMSTERDAM		1 Co - Civil	2 Co - Commercial - International	3 Co - Commercial - National	4 Co - Corporate/Commercial	5 Co - Governmental - Municipal	6 Co - Governmental - National	7 Co - Governmental - Provincial	8 Co - Governmental - Supranational	9 Co - Non-Governmental - International	10 Co - Non-governmental - National	11 Di - Biobased	12 Di - Circular	13 Di - Creative Industry	14 Di - Housing	15 Di - Image	16 Di - Renewable energy	17 Di - Socioeconomic - Economic Growth	18 Di - Socioeconomic - Jobs	19 Re - Decision Power	20 Re - Finances	21 Re - Legal/Subsidy	22 Re - Lobby	23 Re - Networks	24 Re - Policy documents	25 Ru - Agendas - Business	26 Ru - Agendas - Politics	27 Ru - Agendas - Societal	28 Ru - Financial - Business	29 Ru - Financial - Politics	30 Ru - Legal - EU-Directives	31 Ru - Legal - Zoning plans	32 Ru - Zoning plans - Commercial	33 Ru - Zoning plans - Industrial	34 Ru - Zoning plans - Residential
		Coalitions										**Discourse**								**Resources**						**Rules**									
1	Co - Civil		1	3	4	6	2	1			3	1				3	1					1	2	2		2		3							
2	Co - Commercial - International			31	35	22	6	6	5	5	13	2	4		1	5	1	9	1	**9**	**6**	2	4	16	3	8	5	2	2	1		6	2	6	1
3	Co - Commercial - National				55	34	8	8	5	4	22	8	4		1	8	4	12	3	10	**7**	4	6	22	4	14	7	7	5	2	2	12	2	12	1
4	Co - Corporate/Commercial					36	8	8	6	5	23	9	5		1	9	4	12	4	10	7	4	7	23	4	15	7	7	5	2	2	12	2	12	1
5	Co - Governmental - Municipal						12	22	4	4	28	5	2		2	10	6	18	16	16	4	**13**	15	31	13	23	22	18	5	10	4	10	1	10	1
6	Co - Governmental - National							3	2	3	7	1	2				5	3	3	2	2	4	2	6	7	5	8	6		2	2				
7	Co - Governmental - Provincial								2	2	7	1	2		2	1	2	5	2	1		2	5	10	4	9	6	2	1	1	1	3	1	3	1
8	Co - Governmental - Supranational									4	3		1			3		1			**1**	3		3		2				1	3				
9	Co - Non-Governmental - International										5		1			2		1			1			5	1	3	1				1				
10	Co - Non-governmental - National											**4**	**5**			6	3	6	8	6	1	1	6	19	4	**10**	5	10	3	2	2	4		1	4
11	Di - Biobased												**16**			6		17	1	1		1	9	10	1	12	6	5	4		2	3		3	
12	Di - Circular															5	5	2					6	9		8	4	5	2						
13	Di - Creative Industry															2												2							
14	Di - Housing															2		1					1	1	1	1	2	1	1			6	3	5	**5**
15	Di - Image																7	19	11	3	2	4	20	13	2	15	12	20	3		1	8	3	8	3
16	Di - Renewable energy																	4	1	3	1	1	5	5	4	10	11	11	1	1	2	1		1	
17	Di - Socioeconomic - Economic Growth																		21	7	5	2	10	13	7	**27**	18	11	4	2		13	2	13	1
18	Di - Socioeconomic - Jobs																			2	2	1	8	17	4	10	8	17		1	2			2	
19	Re - Decision Power																				4	2	2	3	9	7	7	2	4	4		10	1	10	
20	Re - Finances																					2	1		2	2	1	1	2	5		6	1	6	1
21	Re - Legal/Subsidy																						3	2	2	3	5	3	1	5	4	1		1	
22	Re - Lobby																							11	5	18	13	8	1	2	1	5	2	5	3
23	Re - Networks																								4	20	11	7	2	2	1	3		3	
24	Re - Policy documents																									9	10	4	3	2	5	5			
25	Ru - Agendas - Business																										23	21	6	1		13	1	13	2
26	Ru - Agendas - Politics																											18	2	5	2	8	3	8	2
27	Ru - Agendas - Societal																												1	2	1	2		2	
28	Ru - Financial - Business																													2	1	4		4	
29	Ru - Financial - Politics																														1	3		3	
30	Ru - Legal - EU-Directives																															1		1	
31	Ru - Legal - Zoning plans																																9	43	9
32	Ru - Zoning plans - Commercial																																	9	6
33	Ru - Zoning plans - Industrial																																		8
34	Ru - Zoning plans - Residential																																		

Figure A3. Co-occurrence coding table, Greenmills, Amsterdam.

Column legend (1–34):

Coalition: 1 Co - Civil · 2 Co - Commercial - International · 3 Co - Commercial - National · 4 Co - Corporate/Commercial · 5 Co - Governmental - Municipal · 6 Co - Governmental - National · 7 Co - Governmental - Provincial · 8 Co - Governmental - Supranational · 9 Co - Non-Governmental - International · 10 Co - Non-governmental - National

Discourse: 11 Di - Biobased · 12 Di - Circular · 13 Di - Creative Industry · 14 Di - Housing · 15 Di - Image · 16 Di - Renewable energy · 17 Di - Socioeconomic - Economic Growth · 18 Di - Socioeconomic - Jobs

Resources: 19 Re - Decision Power · 20 Re - Finances · 21 Re - Legal/Subsidy · 22 Re - Lobby · 23 Re - Networks · 24 Re - Policy documents

Rules: 25 Ru - Agendas - Business · 26 Ru - Agendas - Politics · 27 Ru - Agendas - Societal · 28 Ru - Financial - Business · 29 Ru - Financial - Politics · 30 Ru - Legal - EU-Directives · 31 Ru - Legal - Zoning plans · 32 Ru - Zoning plans - Commercial · 33 Ru - Zoning plans - Industrial · 34 Ru - Zoning plans - Residential

UTRECHT

#	Row label	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	Co - Civil		2	15	16	10	1				2	8	13	1	3					2		1	6	5	2	4	6	9			1	1	2	2	
2	Co - Commercial - International			3	4	1	2						1		3	1						2			1		1	1	1						
3	Co - Commercial - National				49	23	6	1			13	13	27		7	1		5	3	**8**	6	3	12	12	4	11	14	11	6	2	1	12	10	7	2
4	Co - Corporate/Commercial					24	6	1			13	13	27		8	1		5	3	8	6	3	12	12	4	11	15	12	6	2	1	12	10	7	2
5	Co - Governmental - Municipal						8	1	1		9	8	24	2	8			5	1	14	4	8	10	8	20	7	25	14	5	2		20	17	12	3
6	Co - Governmental - National										2	1	3	1	5	2				3	2	1	3		3	3	4	5	1	1		7	6	5	2
7	Co - Governmental - Provincial										1	1								1	1			1	1							1		1	
8	Co - Governmental - Supranational																					**1**										1			
9	Co - Non-Governmental - International																																		
10	Co - Non-governmental - National											13	6					2	3			4	13	2		1	3	7				3	3	3	1
11	Di - Biobased																																		
12	Di - Circular												**27**	3	7	1		5	10	3	2	8	15	15	5	14	11	16	1	2	6	4	4	1	
13	Di - Creative Industry													4	17			9	9	4	3	8	26	8	15	15	32	28	2	2	5	**18**	17	6	2
14	Di - Housing															3			1			1	1	1	5	1	8	4				5	4	4	**3**
15	Di - Image																	4	3	1	1	3	14	2	5	7	17	16	1		2	10	8	5	1
16	Di - Renewable energy																			1	1		1		1	1	2	1				1		1	
17	Di - Socioeconomic - Economic Growth																		6	1		3	3		5	6	10	5	2	1	2	5	5	3	1
18	Di - Socioeconomic - Jobs																					2	4		4	5	7	5		2		4	4	1	2
19	Re - Decision Power																				6	1	1	2	8	6	9	3	1	2		10	8	7	1
20	Re - Finances																				2	1	2	1		4	4	1	4	2		3	3	2	
21	Re - Legal/Subsidy																					3	2		3	2	6	1	1	4	6	5	3	3	
22	Re - Lobby																						8		12	8	25	20		2		12	10	4	2
23	Re - Networks																								4	4	5	11	1			2	2	2	1
24	Re - Policy documents																									4	26	10		1	1	15	13	10	5
25	Ru - Agendas - Business																										11	15	3		2	11	11	5	
26	Ru - Agendas - Politics																											29	1	4	2	22	19	11	6
27	Ru - Agendas - Societal																														2	13	11	4	2
28	Ru - Financial - Business																													1		1	1	1	
29	Ru - Financial - Politics																															1	1	1	
30	Ru - Legal - EU-Directives																															2	1	1	
31	Ru - Legal - Zoning plans																																42	32	12
32	Ru - Zoning plans - Commercial																																	23	11
33	Ru - Zoning plans - Industrial																																		8
34	Ru - Zoning plans - Residential																																		

Figure A4. Co-occurrence coding table, Werkspoorkwartier, Utrecht.

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