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‘Mattering’ the circular economy: tackling the Achilles’ heel of sustainable places via adopting a critical-relational perspective

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The transition towards a circular economy (CE) is seen as vital for developing sustainable places. CE is used as a new buzzword, as well as an inducement to innovate and change socio-economic practices, by a diverse set of actors to meet sustainability and other goals. Genuine transformation, we argue here, requires those practices to seriously alter discourses and metrics. We adopt a material critical-relational perspective, drawing on the assemblage notion of (counter)actualisation. Our contribution is both conceptual and empirical. Conceptually, we develop an assemblage-based framework featuring practices, discourses and metrics. Empirically, we apply this to national CE policy and local initiatives in the Netherlands. Our results point out both passions and challenges to come to a genuinely transformative discourse and use of metrics.

Keywords: critical-relational perspective, topology, circular economy, actualisation, metrics

JEL classifications: O38

Introduction

As discussed throughout this special issue, achieving a truly sustainable circular economy (CE) comes with major challenges regarding the ways societies engage in practices of production and consumption, and how those practices are governed and supported at various scales from individual operations to global economies. In a relational perspective, besides the multi-level dimension, this challenge also implies the working together of different spheres. One sphere driving the CE is constituted by, among others, the Circular Economy Action Plans of the [European Commission \(2015, 2020\)](#) and the United Nation’s Sustainable Development Goal (SDG) 12 (Responsible consumption and production), featuring fixed concepts, targets and numbers. A second sphere encompasses the concrete sites where the CE is practiced, including a search for different functions for which re-used material still meets sufficient quality ([Bastein et al., 2013](#); [Ersoy et al., 2020](#)). Then, connecting these spheres, there is a

third sphere that, through developing discourses and networks, fuels and frames CE practices through policy mobility ([Cochrane and Ward, 2012](#); [Temenos and McCann, 2012](#)). Through such connections, governments across the world collaborate with other public authorities, knowledge institutions, consultants businesses and civil society organisations to find smarter and efficient ways of (re)using materials and energy.

The Netherlands is one of the countries planning to be completely circular by 2050 ([The Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs, 2016](#)). One of the main challenges towards implementing circular economy goals here is related to the way different levels of government (international, national and regional) ambitions are aligned in practice. Planbureau voor de Leefomgeving (PBL) ([Hanemaaijer et al., 2023](#)) has recently published a document that explains Dutch Government’s circular economy ambitions. The document signals strengthening policy commitments with regard to

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moving from government-wide ambitions to government-wide commitment. However, such a commitment comes with understanding the empirical and practical relevance of developing and connecting circular economy practices, discourses and indicators at different levels. In this paper we present a framework for engaging with the CE challenge, elaborating a critical-relational perspective, using the Netherlands as an illustration. We work with two research questions. The first question is to what extent does the overarching CE ambition go beyond a top-down, metrics-based perspective approach to the economy to enable fundamental change in value chains and business models? Second, to what extent do CE policy developments capture the strength and potential of bottom-up ideas, energies, values, actors and practices, emerging from the local level? We will start with extending our motivation for these questions, adopting a critical-relational approach, followed by our framework, case illustration and conclusion.

The CE transformation: from a substantive to a theoretical challenge

Against the background of societies' grand challenges, a genuine transformation towards CE has become the Achilles' heel for sustainable places. While national and local governments have been formulating various strategies, with their incentives for sustainable development, they lack a clear pathway for delivering the substance that is actually going to transform circular economy practices. This vulnerability starts with an emphasis on technical fixes. The long-standing literature on how regions and cities have promoted programmes to exchange 'best practices' and create new networks to strengthen 'territorial capacities' not only provides opportunities for local authorities to promote their visibility but also presents a technocratic expectation that 'ideas that work' are able to quickly find a worldwide audience and transnational salience, as is also argued in the policy mobilities literature (Cochrane and Ward, 2012; McCann, 2013; Peck, 2011; Peck and Theodore, 2010; Temenos and McCann, 2012). CE in that respect serves as an effective concept for local authorities as well as for those who argue its effectiveness as a matter of hype not to 'miss the boat'. However, although broader society and government engagement in the field of 'green policy' has been argued to promote inclusive and alternative forms of urban entrepreneurialism that privilege environmentalism, social inclusion and grassroots creativity (see Ersoy and Larner, 2020), social impacts resulting from a shift from a linear to a circular economy is still lacking (Kirchherr et al., 2017; Mies and Gold, 2021). Hodson (2016) argues that socially transformative enactments of the CE are implicit and require further conceptual and empirical exploration. This would promote an alternative to the top-down understanding of the transition.

In response, bottom-up perspectives have stressed the increasing role of stakeholders' relationships in the supply chain and the role of collaboration (Mishra et al, 2021; Köhler et al., 2022; Sudusinghe and Seuring, 2022). Strategic partnerships combined with knowledge and technology between stakeholders play a critical role in resource management and new models of governance (Veleva and Bodkin, 2018). However, involving 'bottom-up agents' in transformative governance regimes is not sufficient. Transforming also warrants a change in paradigms and structural conditions, to enable an effective reframing of resource governance and management practices (Ersoy and Hall, 2020; Pahl-Wostl, 2009). From a place-based perspective, this may require, to quote Robinson, attention for 'series of unbounded, relatively disconnected and dispersed, perhaps sprawling activities, made in and through many different kinds of networks stretching far beyond [its] physical extent' (Robinson, 2006, p. 763). The policies of circularity can be seen as part of 'assemblage' that stands for 'emergence, multiplicity and indeterminacy, and connects to a wider redefinition of the socio-spatial in terms of the composition of diverse elements into some form of provisional socio-spatial formation' (Anderson and McFarlane, 2011, p. 124). In that sense, the Deleuzian term 'assemblage' serves as a way of analysing the present whole and its style of structuration (see Bennet, 2005). It invokes a relational understanding of a space encompassing various sites of sites, spaces and scales that can be copresent at the same time (Allen and Cochrane, 2007). Therefore, the term 'assemblage' speaks comfortably and critically with the political imperatives of CE thinking that privilege modes of experimental governance in which policy-makers, researchers, businesses and communities are collectively charged with finding new paths to sustainability (Evans, 2011).

In particular, a critical-relational perspective, drawing on assemblage and topological thinking, serves to focus on policy discourse as part of multifaceted becoming of the CE as conceptualisation, dreaming, story-telling, practical applications, metrics, etc. Regarding conceptualisation, while CE can be used as 'quick fixes' by policy-makers and practitioners, the idea of closing loops without much deliberation of the social dimensions of sustainability raises concerns around social impact, justice and value (Barba-Lata et al, 2023; Friant et al., 2020; Hodson, 2016; Morrow and Davies, 2022). Studies suggest while different actors and sectors are articulating circular discourses that align with their interests, they do not sufficiently examine the ecological, social and political implications of circularity (Friant et al., 2020). They argue that the CE agenda has become a contented concept in the 21st century with many public and private actors competing to influence its meaning and interpretation as part of a policy-led approach (ibid). However, in her critical analysis of urban sustainability, Bulkeley (2006) argues that

transition to sustainable practices requires a discursive process in which actors shape urban futures rather than a process of policy transfer alone. Her study found that policy exchange is not only a process of exchanging new knowledge about a policy problem, but also one of challenging and reframing the nature and interpretation of the policy problem in practice (Bulkeley, 2006). Moreover, such techno-managerial aspects of CE overlook the role of local communities and practices, and power asymmetries (Genovese and Pansera, 2021). There is a risk that economic imperatives to 'closing the loop' have not been sufficient to explore the issues of justice and power relations, and hence insufficiently unleash bottom-up entrepreneurial and communal energies to fuel the transformation (Pansera et al., 2021).

Further to metrics, long-standing literature on theorising processes recognises that the assessment and identification of indicators are difficult, if not impossible, to measure (Ersoy, 2011). While data can portray outcomes—what has happened in the past and what is the current situation—and act as a signpost towards what might happen in the future, it is only through theory that processes can be conjectured, making theory central to the formulation of policies to generate local economic growth. As such, regional economic policies are only as good as the theories that are used in their formulation. What is only too clear at present is that there is no shortage of interpretations and discourses that specify the concept of CE. However, unclear is which of the measures have any empirical and practical relevance in developing the policies of CE. For instance, Harris et al. (2021) show how circularity indicators are used at different scales without necessarily connecting them, that is, national monitoring programmes do not have indicators on stocks of materials or the extent of the circular economy processes (such as the reuse economy, maintenance and spare parts) which already contribute to the CE. Similarly, Corona et al. (2019) show how a wide variety of CE metrics are being developed and applied without necessarily addressing the CE concept in full. They call for the development of new metrics indicating how the benefits of recycling are allocated between the primary and secondary products. How we can take on board these concerns theoretically, is the subject of the next section.

A critical-relational perspective on transformation

Our critical-relational approach builds on an evolutionary take in relational thinking. More specifically, this builds on what and which is described as 'mattering' in Actor-Network Theory and is described as 'actualisation' in Assemblage Theory (De Haan, 2022; Deleuze and Guattari, 1988). We combine this with a geographical perspective drawing on the work of Massey (2005), Stengers (2005), and others.

Mattering draws on Latour's (2004, 2008) crucial distinction between 'matters-of-concern' and 'matters-of-fact' in his account of modernisation. Matters-of-concern are what we take issue with, notably through sense-making, gathering and expression in the public domain (communities, societies). Matters-of-concern feature where publics express certain concerns, often giving rise to different views and debates on alternatives. Matters-of-fact presents what, in our 'modernist' world's reliance on axiomatic analytical systems, yields the respected, legitimate and performative state-of-affairs based on scoring and calculations. This gives rise to technocratic form of governance. However, as explored in-depth by Latour and other STS scholars, the question of *which facts and calculations*, and hence *which truths*, are articulated and become performative is deeply political and interest-driven (Latour 2004; Schindler, 2020). Hence, for Latour addressing the core ecological and social predicaments of our world warrants a return to matters-of-concern, that is, a re-politisation escaping from the taken-of-grantedness of matters-of-fact and from the hegemony of technocracy. This chimes with broad calls in the CE literature for re-politicisation (Barba-Lata et al., 2023).

The notion of 'actualisation' can further help to address this call for matters-of-concern. Drawing on Deleuze and Guattari (1988), De Haan has developed a framework in which 'actualisation' is interpreted as a radical, evolutionary pathway of 'actualisation' which moves from the spheres of 'practices' to that of 'discourses' and 'metrics' (Figure 1). Actualisation gives rise to languages and metrics in society's evolution, as well to a shift from 'matters-of-concern' to 'matters-of-fact'. A crucial aspect of this framework is 'recursive configurative agency' (Madsen, 2021), linked to the assemblage notion of 'counteractualisation' (De Haan, 2022; Deleuze and Guattari, 1988). Recursive configurative agency means that a more 'advanced' spheres of assemblage (towards metrics), impact upon the selection and development of underlying spheres of assemblages (towards practices). So, under modernisation, more metrological discourses meeting the sphere of metrics prevail, as do more metrological practices (Figure 1). We will discuss both forms of dominance in turn.

Metrics, including axiomatic reasoning, constitute what Mitchell (2008) calls 'metrology', from an assemblage perspective, metrology can only thrive if sustained by metrological ('quantifying') discourses and practices. Metrics shape and tie different sites under one umbrella, in one network of calculation and linear reasoning. The result is an 'absolute space' (De Haan, 2022), occupied by what Espeland and Stevens (2008, p. 413) describe as a 'statistical community'. Such a space is overseen and run by spreadsheets, scoreboards, rankings and model-based abstractions, etcetera, what Latour (2005) describes as 'oligopticons'. Metrics meet deep-seated desires for

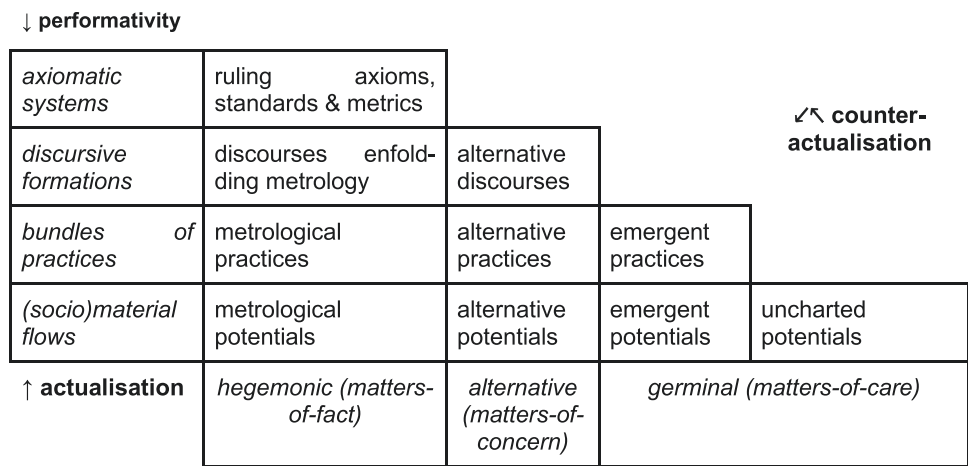


Figure 1. Stepwise (counter)actualisation—based on De Haan (2022).

oversight and control: ‘Quantitative measures are a key mechanism for the simplifying, classifying, comparing, and evaluating that is at the heart of [Foucault’s] disciplinary power’ (Espeland and Stevens, 2008, p. 414). ‘making an otherwise amorphous composite of people and attributes into a thing that holds together in the imaginations of politicians, government officials, and the general public’ (Espeland and Stevens, 2008, p. 412). In this holding together, metrological discourses and practices play an important role. Metrological discourses articulate strict definitions and categories, universal signifiers, statements and linear reasoning. They thus help to express ‘matters-of-fact’. Metrological practices entail strict protocols and methods of calculation. A fundamental problem, however, is that such quantification is ‘ill-equipped to deal with such contemporary realities as multiplicity, transience, and dispersion’ (Feldman and Orlikowski, 2011, p. 1250).

More widely, discourses have the crucial role to articulate dominance as well as alternatives and critique. Discourses make metrology matter, through giving meaning to signifiers underlying metrics and axiom, in supporting webs of signification (Nabers, 2023). CE presents such a crucial signifier. In our relational perspective, signifiers play vital upwards and downwards roles (Figure 1). Upwards, they underpin metrics, through discursive acts of de-contextualisation, reification and abstraction into universal relations and models. Crucially, such discursive acts entail processes of qualitative choice. Which elements and links are included, in what ways, in shaping and operationalisation of signifiers? This qualitative choice stems from a politics of inclusion and exclusion (Nabers, 2023), conditioned by ‘modernist’ configurative agency promoting quantifiability. The latter ensures, in words of Espeland and Stevens (2008, p. 423) that ‘the real easily becomes coextensive with what is measurable’. Downwards, signifiers name and foreground practices enabling reifying

discursive acts and methods of calculation. As a manifestation of recursive configurative agency, these practices turn visible and mobile, while others remain unnamed and backgrounded. Signifiers thus present a key vehicle of the proliferation (Peck, 2011) of quantifying practices and policies, steeped in qualifying webs of signification. As we will discuss below, the web of signification around CE includes notions such as sustainability, innovation, entrepreneurship and piloting, as well as serious critiques on these connotations (Barba-Lata et al., 2023; Genovese and Pansera, 2021; Moreau et al., 2017; Pansera et al., 2021; Reike et al., 2018; Witjes and Lozano, 2016). Importantly, however, qualitative nature of webs of signification always provides scope, maybe subdued, for critiquing hegemonic signifiers and metrics. This may be in the form of proposing new signifiers and metrics, as well as overcoming the dominance of metrology itself. So, to be precise, a metric system can only host ‘alternative’ metrics through the role of discourse making a case for a different calculative practice (alternative discourse). There is no scope for alternatives within the ‘absolute’ sphere of metrics itself (De Haan, 2022; Mitchell, 2008).

This brings us to transformation and the role of space. Transformation occurs through the search of alternative discourses and practices. In addition, as emphasised in the literature on geographical becoming, transformation is fuelled by emergent practices not (yet) articulated through current (dominant or alternative) societal and policy discourses. Such emergent practices have come to matter in specific context, as yet lacking the capacity to become part of webs of signification or wider policy mobility. How practices emerge and come to matter in place and through space has been discussed, in detail, by Massey. In her landmark publication *For Space* Massey (2005, p. 9) calls space ‘the sphere of the possibility of the existence of multiplicity in the sense of contemporaneous plurality’. In the words

of Saldanha (2013, p. 46), Massey sees 'space as an emergent physical, affective and political reality, traversed and constituted by flows and hence continuously changing', co-evolving with 'corporeal practices', 'representations' and 'the work of objects'. Consequently, this potentiality is bounded by (socio)material conditions and exigencies, stemming from the earth system, our technologies and bodily (in)capabilities. From a practice perspective, the emphasis on corporeality can be further linked to the actual, connected agents of transformation: 'Practices have the power to form communities, or, in fact, are constitutive of any community when competent bodies are brought together by engaging in the skilful performance of the same distinctive practice or set of practices' (Everts et al., 2011, p.331).

In the remainder of the paper, we apply our stepwise framework to national CE policy-making and to local initiatives. Our case is The Netherlands, zooming in onto one local case, namely Nijmegen, a city in East-Netherlands. The Netherlands has developed quite ambitious policies and strategies to become circular, providing interesting documents and reflections to assess the (intended) role of metrics, discourses and practices, and the scope for alternatives. The national analysis is thus based on our reading of national policy documents, paying specific attention one targeted sector, namely plastic recycling. We have also held two interviews with leading figures in the exchange of ideas and practices at the national level. Our local case, Nijmegen, presents somewhat of a forerunner in CE, notably in policy-making and initiatives in waste and energy (Roemers et al., 2017). In line with work on policy mobility, we will assess the case both from a fully local (inside) and a more relational (translocal) perspective. Besides documents, our sources consist of our own observations during CE meetings in recent years, and four interviews held with local policy-makers and entrepreneurs. All interviews were held during 2023. They were open in character, probing local initiatives, collaboration, visioning and strategy-making, and the dynamics between 'grassroots' and more 'top-down' interventions. The next section will address the national development, featuring the plastics sector, followed by the local and translocal case study.

Shaping CE policy and practice in The Netherlands: how much transformation through metrology?

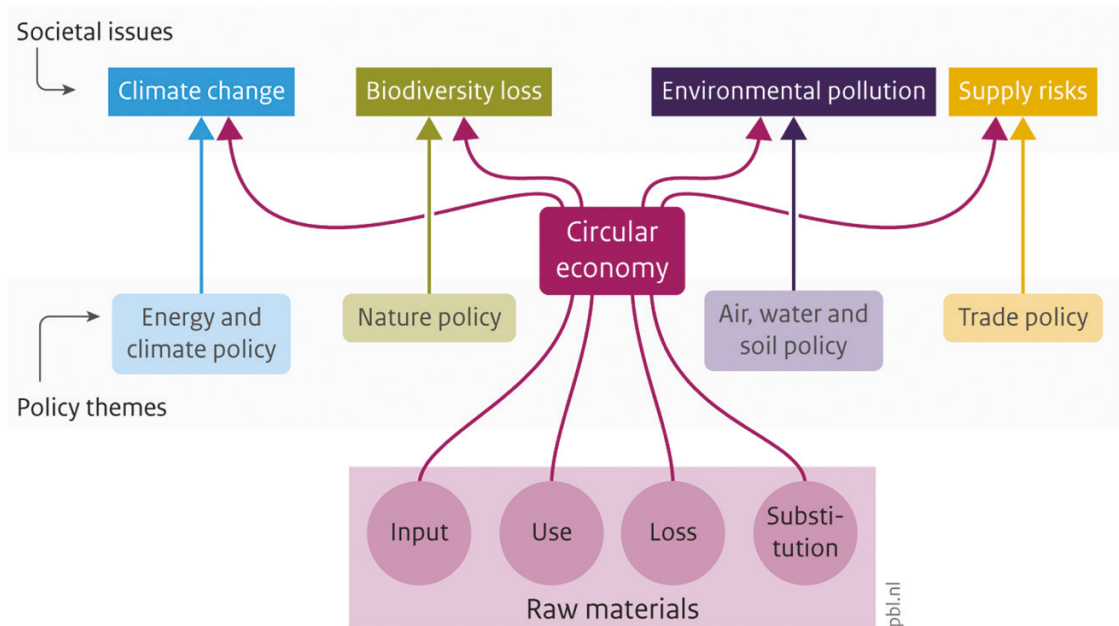
Meeting critiques of prevailing practices and discourses of economic growth, recent green economy discourses aim to distance themselves from the traditional models and actors of urban politics, and reinforces a wider involvement of civil society organisations and emergent practices by explicitly positioning them as creating sustainable futures (Ersoy and Larner, 2020; Ferguson, 2015; Gibson-

Graham, 2008; Hirsch, 1976). They fit our category of alternative discourses. What has made the circular economy policy more complex as a different kind of policy as well as academic practice and subjectivity is the ways in which the form and nature of the policy objectives have evolved and are being pursued. With the increasing widespread attention, the transition towards a circular economy has brought together businesses, citizens, NGOs and knowledge institutes, while the Dutch Cabinet's ambitions to achieve a circular economy by 2050 have been elaborated in relation to societal issues and other policy themes in the Netherlands (Hanemaaijer et al., 2023). Hence, there is more emphasis on co-creation and impact. The transition aims at using material resources more efficiently with a focus on reducing the negative environmental impacts, such as climate change, environmental pollution and biodiversity loss as well as the supply risks (Figure 2). It comes with a 'transition' mindset and pathway, embracing a vocabulary of experimentation, learning, scaling, planning and monitoring (Bocken et al., 2021).

Such 'systematic' representation of the policy problem points to the significance of open and dynamic characteristics of the circular economy system (see de Roo and Silva, 2010) which can be used towards agenda setting and decision-making. However, the 'actual' realisation through which the measures and metrics are formulated raises questions about how those measures can create consistency and order, and how they fuel and structure discourses and practices. Earlier studies argue that most of the published circularity metrics for instance do not represent the systemic and multidisciplinary nature of the concept including environmental, economic and social sustainability performances (Corona et al., 2019; Saidani et al., 2017). These studies argue that diverse understanding of the CE concept by different stakeholders and incomplete understanding of the system change have resulted in major shortcomings of the circularity metrics (Corona et al., 2019; Kirchherr et al., 2017; Linder and Williander, 2017; Reike et al., 2018). While circularity metrics offer opportunities to highlight the relevance of reduce, reuse and recycle activities, they cannot accelerate a systemic shift or depict the complexities that CE necessitates.

This illustrates the point of recursive configurative agency. While the use of indicators can be useful to measure progress towards a circular economy (Moraga et al., 2019), difficulties in measuring the sustainability dimensions of CE, the scarcity as well as the circulation of used materials, and the complexities of multiple cycles and the overall system impact upon the role of current circularity metrics (Corona et al., 2019). What comes across, then, is that those circularity metrics do not distinguish from assemblages of individual policy interventions that otherwise exhibit spatial and temporal co-presence through the workings of other political or societal processes. They have become products of many individual

Positioning circular economy in relation to societal issues and other policy themes



Source: PBL

Figure 2. Integral Circular Economy Report 2023 Assessment for the Netherlands Summary and Main Findings, PBL, p.13.

decisions resulting from pressing short-term political imperatives and pursuit of different metric aims. Even though there is an intention to make creative and systemic thinking which is 'holistic' rather than linear or partial in character, little critical attention has been paid to the manner in which the interrelationships between circularity measures might be strategically harnessed through systematic efforts at policy 'actualisation'.

While the national metrics signal the importance of targeting and monitoring, not enough attention has been paid to the role of various policy sectors. While it is important to recognise the role of international policies and the state, it is also important to recognise that current forms of circularity matrices stimulate new cross-cutting relationships and open up new discussions about the importance of the green agenda and sustainability, and what it might mean for established understandings of local context. Therefore, an assessment of the national CE metrics requires both a consideration of multiple objectives and a concern over the ongoing compatibility of various policy sectors at multiple levels. This is not simply a post-austerity politics of circular economy policy translation, in which the national metrics have been set up to deliver on their ambitions, but rather the identification of alternative spaces of local context and diverse manifestations of ideological practices. Even though what has not been 'landed'

can be seen as part of the societal learning process, what is lacking is the sense of urgency and a stronger regulatory framework.

From national waste management to the elimination of plastic

Dutch waste policies pursuing circularity illustrate this point. The [National Waste Management Plan \(2019\)](#) has been set up and developed to offer economic opportunities for businesses and making the Netherlands less dependent on the import of scarce raw materials and makes a contribution to a cleaner environment. As part of the Plan, a system approach has been adopted to generate new business models and changes in consumer behaviour, legislation and the division of roles in society (ibid, p. 24). Some of the targets include removing barriers faced by businesses in designing their production processes for the benefit of a circular economy and the recycling of their waste streams; halving the volume of waste in the Netherlands; encouraging producers to manufacture more sustainable (and preferably circular) products and products that are easier to repair and recycle.

While some of those targets remain at strategic levels, there have also been attempts to produce quantitative and qualitative objectives for the management of specific waste substances in the Netherlands. They include

balancing decoupling the development of Gross Domestic Product and the development of the total volume of waste in volumes; increasing the proportion of the total volume of waste that is prepared for reuse and recycling from 77% in 2014 to at least 85% in 2023; increasing the proportion of building and demolition waste that is prepared for reuse and recycling from 92% in 2014 to at least 95% in 2023; and increasing the proportion of industrial waste that is prepared for reuse and recycling from 81% in 2014 to at least 85% in 2023 (ibid., p. 25). As part of this Plan, all authorities must take into account the National Waste Management Plan when dealing with aspects of waste management.

The elimination of plastic waste is one of the examples where we can see the struggle for alternative discourses and practices at different levels. Various initiatives have been created to foster a CE transition in the context of the plastic sector. They include actors such as the [Ellen MacArthur Foundation \(2021\)](#), the 'European Plastic Pact' initiated by France, the Netherlands and Denmark and the 'Circular Plastics Alliance' established by the European Commission. The Netherlands' role in the global plastic industry has been detailed and highlighted as one of the top plastic producers and exporters in the world ([Calisto Friant et al., 2022](#)). The Dutch government has set the ambitious target to become 100% circular by 2050 and its Circular Economy Action Plan focuses on plastics as a strategic sector to lead the transition ([Hanemaaijer et al., 2023](#)).

In that respect, the producers and importers of plastic packaging founded *Afvalfonds Verpakkingen* (Waste Fund Packaging) to collectively implement the packaging extended producer responsibility system in the Netherlands. This is a system that indicates that producers are responsible for recycling and reusing their products and materials. The way the founded *Afvalfonds Verpakkingen* is financed is that each packaging industry is responsible by paying a 'waste management contribution fee' to the company. Each Dutch municipality organises its waste collection system independently, thereby resulting in a multiplicity of different collection systems. *Afvalfonds Verpakkingen* compensates municipalities for their collection by paying a specific fee based on the volume and quality of waste they collect.

Emergent local practices and alternative discourses in Nijmegen

Turning to a municipality renowned for its waste recycling, Nijmegen, we explore the role of emergent practices, and their capacity to shape alternative practices and to turn into more impactful stories. To do so, we follow two interwoven developments. The first entails the collaboration between core stakeholders to engage a collaborative strategy and initiate networking. Collaboration is promoted by two main players: the Circular Council (*Circulaire Raad*), consisting of core stakeholders (municipality, business repre-

sentatives, education, NGOs, and finance), and the cluster organisation *Lifeport@* (previously *RVN@*). The Circular Council plays an active role in the implementation of the regional vision for CE and its implementation in Nijmegen and surroundings ([Roemers et al., 2017](#)), bringing parties together, and publicity. Important activities are an annual circular festival as well as conferences, webinars, meetups, award events, etc.

The second development is the rise of joint entrepreneurial initiatives, resulting in local circular businesses. Our interviews point out three initiatives. One is the investment of the Waste-to-energy power plant ARN, notably in cooperation with local research centres, to shift from the burning to recycling of diapers. ARN is a forerunner in building a diaper recycling installation. The company is also cooperating with diaper producers to achieve a more recyclable design. The other initiative is the *Emmerik*, a cooperative, small-scale circular hub combining city logistics with the collection and recycling of packaging material (such as Styrofoam or timber). The hub works closely with downtown retailers and the packaging and waste industry (including ARN) to create new value chain connections and cleverly connected business models. So, while ARN's diapers recycling exemplifies a 'grand project' with a strong role for innovation and a major industrial investment, the *Emmerik* presents a successful grassroots project in which social investments enable a new material and financial economic setup. The third initiative consists of a plethora of community food projects united under 'Edible Nijmegen'. This includes collective farming, direct retail from farmers, shared gardens, food forests and pick-your-own gardens.

The extent to which this circular business ecology translates into a new dynamics of practices, discourses and metrics can be illustrated by revisiting various CE called 'Festival' organised by *RVN@/Lifeport@*. In 2019, in a truly emotional address, the owner of a small printing company explains to the festival audience how he is fighting to make his business fully sustainable, for the sake of the environment and his staff. He has managed to have a successful business without toxic ink and with minimum waste. Yet, he also lists the obstacles, notably concerning regulation, financing and policy support. He expresses his frustration about the lack of progress made in tackling these obstacles: 'business is ready, now others have to follow!'. His sentiment was echoed in our talks with the *Emmerik* and other small-scale initiatives, as well as essays and policy documents at the national level ([Mbavarira and Grimm, 2021](#)). Across the Netherlands, the circular economy can draw on persistent bottom-up entrepreneurial drive, commitment and pitches. This has resulted in an impressive development and proliferation of emergent business practices, technological, organisational, financial, HR, etc. as well as new modes of interfirm coordination along the value chain ([Faber and Witjes, 2024](#)). In (counter)actualisation

terms, it is no exaggeration to say that many Dutch cities and regions are teeming with 'inventive practice', widely venturing into uncharted domains of circular potential. So far, however, these practices largely fail to become part of an alternative discourse of how to boost and enlarge the CE. For example, in Nijmegen, the Circular Club 'De Emmerik', active in food, construction and waste, remains at a distance from Nijmegen's official 'Circular Council' tasked with uniting the local incumbents (companies, finance, municipality). Similarly, elsewhere one observes largely parallel worlds of small-scale grassroots initiatives, notably in food and repair.

Recent versions of the RVN@ event manifested a different timbre. They have turned into bigger festivals with parallel sessions. The main stage was now more for professional presenters interviewing business representatives about their 'best practices'. The stage was also for senior staff from larger companies and policy-makers, forming part of the municipal and regional circular economy co-ordination networks. The latter speakers were twofold. On the one hand, they originated from private and public organisations which had been successful in scaling up circular initiatives, notably in waste recycling and circular construction. On the other hand, speakers included representatives of companies, banks and public bodies with vested interests in 'linear', unsustainable economic activities. While they have made the step to support circular networks and events, and want to be seen that way, they are still a long way from turning circular themselves. Entrepreneurs, from small manufacturing and Nijmegen's rich food sector, now told their passionate stories in a circle of stalls at the inner yard. This turn testifies to the collective ambition to boost the circular transition through local/regional collaboration and the celebrating and awarding of regionwide 'successful performance'. The wish to be visible in the transformation is something we can observe across the country. Many local and regional missions explicitly present becoming 'leading' as one of main objectives of the collaborative effort and investment, to become the 'leading hub'.

In such policy practices, moreover, we can clearly distinguish a 'modernist' drive of planning (goal-setting, data collection and analysis, selection of alternatives, implementation, monitoring, feedback), drawing on both hegemonic (economic values and jobs) and limited alternative (circularity, collaboration) discourses. The latter entails a search for new business models and economic circuits that align with vested economic interests, often justified with reference to the SDGs. This includes some space for emergent practices, such as new territorial ways for linking sustainable logistics and recycling. To become truly effective, as our Nijmegen interviewees explain, such practices warrant new stories and broader action perspectives. There is a need for more inclusive debate on how to truly overhaul value chains and consumption patterns, and how to or-

chestrate that locally, as well to help to change rules and conventions on material and finance, among others.

'Translocal' connections and policy mobility

All our interviewees indicate that, for change to truly scale, there is a strong need for policy mobility. While the drive towards a CE has created a dynamic landscape full of local sites of change, a major question is thus how it all connects and works. In exploring this sphere of connection, we further zoom in onto three aspects: intermediaries, substance and politicisation.

Intermediaries cover all agents and sites that, like meeting organisers, consultancies and learning platforms, help to transfer and bundle ideas and practices across sites of change, and to build interfaces between domains of business, state, research and civil society. One consultancy, Metabolic, has produced many visions and plans for local-regional circular transitions, based on in-depth local analysis. It has also helped to code, bundle and circulate new practices to organise flows of energy and materials. To do so, Metabolic has developed its own hands-on conceptualisations and scripts for CE transitions, including its own metrology (for example, volumes, values, jobs) and visualisations (for example, economic structures and flows). Such intermediaries are particularly important in cases where central steering is limited. As Cramer (2020, p. 5015) argues, one type of intermediary is especially important, namely 'CE transition brokers', local heroes in bringing different actors together around a CE challenge. Because, in Cramer's (2020, p. 5015) words 'synergistic governmental interventions to accelerate the CE transition are lacking', brokers play a key role in 'systems orchestration'. Additionally, there are many other agents that, from the practical level of shaping markets and research relations to the system level of building 'networked governance', connect CE sites. In part, this includes many intermediaries fully dedicated to CE, such as CIRCO-tracks and -hubs, Versnellingshuis-CE (Acceleration hub), Dutch Circular Textile Valley, Cirkelstad (public-private partnership focused on construction), NewHorizon (urban mining), Kenniscentrum Circulaire Bouw, the Dutch Academic Network on Circular Economy (DAN-CE), and the provincial and regional hubs like Vereniging Circulaire Friesland. It also includes general organisations with CE activities, such as IPO (interprovincial network), VNG (intermunicipal network), VNO-NCW (employers' federation), MKB Nederland (SME federation), and many organisations focusing on sustainability. One interviewee described this gathering as a formidable 'spaghetti'. Interviewees conveyed positive messages about the drive and commitment of these intermediaries, but also noticed problems of fragmentation, lack of scaling, and competition for scarce resources and attention.

So, to what extent do the activities in this spaghetti produce substantive forms of policy mobility? This invokes the fundamental topological question of how far connections result in shared discourses and 'oligopticons', creating unity and direction in diversity. The underlying question is what topological intermediaries (signifiers, symbols, metrics) connect and translate the manifold sites of CE development, and how these aid in coherence (in relations and orientations) and consistency (in semiotics and actions) (Law, 2004). The preliminary responses from the field are quite mixed here. On the one hand, one sees much connectivity regarding flagship terms, goals and messages (circularity, transition, scaling, etc.), with smooth translations into many sites and circuits. Impressive examples are how 'Vereniging Circulair Friesland' frames and assesses Frisian CE activities in the context of transition logic and 'value circles', and how the province of Overijssel systematically translates national into local CE agendas. Similarly, one sees wide adoption of the 'R classification' from re(f)use to recycling and other abstractions (Witjes and Lozano, 2016). What also circulates well is practical knowledge of innovation, subsidies, collaboration partners, etc., due to the plethora of dedicated and general intermediaries. On the other hand, what does not come together is the world of business and market concepts enabling systematic transformation from linear to circular. Promising initiatives, such as to boost 'products-as-a-service', even stranded, as one interviewee lamented. Changing key norms and rules of the game in the wider business and market setting remains problematic.

These limited achievements underpin our final point, namely that current policy changes and mobilities do not seem to meet the core challenge for the CE transition: an overhaul of the basic principles and configuration of our economy. For Pansera et al. (2021, p.474), this presents a key issue: 'How bottom-up practices (including social activism) can re-appropriate and reshape the CE discourse is crucial to enable a fair and just transition'. A major problem of the national debate, as discussed before, is the ontological divide between the linear and circular world, in which transition comes down to a largely technical matter of a linear-to-circular modal shift. How does the local-regional level address this divide? Unfortunately, our first reading indicates that due to the smooth top-down translation of grand narratives, this divide is largely repeated. Regional documentation frames, and calculates, the modal shift similar to the PBL's (2021) ICER, amongst others. We detect pockets of local activism voicing different views and principles. However, these activist pockets manifest little dialogue or collaboration with local policy initiatives. What we often see is that emergent and alternative practices become recognised as different and promising without really landing in more mainstream discourses. Even in academic work, there is a tendency to associate them primarily with grander convivial narratives

about the 'return to social' and the shaping of a purpose economy (Hudson, 2019; Hurst, 2016).

Conclusion

A genuine transformation towards a circular economy requires change and innovation through the development of novel practices across different places and organisations that can be added, wired and give shape to fundamentally new ways of organising regional value chains and their wider connections, (sectoral) industrial policies, and the basic orchestration of our economy. This requires, in our view, a framework that assesses transformation in terms of practices, discourses and metrics, probing, in particular, their connectivities. The urgency of the matter means that there is no time for regular modes of experimenting and scaling. It is paramount that the CE entails a radical, nonlinear move. Comparable to the Corona epidemic, solutions need to be found and diffused quickly.

We have turned to assemblage perspective featuring the notions of 'actualisation', 'mattering', and 'recursive configurative agency'. The basic idea is that, under conditions of modernity, practices evolve ('actualise') into, and are recursively selected by, dominant discourses and metrics. Successful transformations thus depend on the capacity of new practices to change dominant discourse and metrics (through alternative practices), or even to overhaul this dominance (through emergent practices). The latter chimes with Latour's call for re-politicisation by going beyond 'matters-of-fact' to 'matters-of-concern'. Only in that way, we argue, CE may truly gain substance and reorganise our local and national economies, and beyond. From this, we have derived two research questions, namely how 'top-down' processes can support genuine transformations ('beyond metrics'), and how can bottom-up potential be fully grasped?

Regarding the first question, we support the idea that, to gain substance and transformative power, the CE transformation needs different, and very likely also less metrics, as well as major, qualitative change in discourses and practices. Existing discourses of sustainability transitions towards the future emphasise a focus on reducing the negative environmental impacts of production and consumption practices through resource-efficient processes. The result is an emphasis on the development of the national metrics that signal the importance of performative measures of targeting and monitoring that are becoming problematic in yielding environmental, social and economic profits. In response, we need a serious (re)politicisation of metrics, grafted carefully on the new (socio) materiality that the CE seeks to develop. This entails a qualitative rather than quantitative practice of change, including a fundamental rethinking of basic and aggregate economic categories. Such a practice, moreover, may also induce a move towards a less metric, more qualitative

perspective. Accordingly, the crux of transformation is change in practice, re-actualising discourses and metrics through the articulation of alternatives. (Re)politicisation is not just about building and promoting a 'circular' economic language and measurement, favouring Re-use, Re-pair, de-growth etc. Indeed, one may question how much focus should go to getting the language right, given the many ambiguities and controversies in economic thinking. Put simply, topological (re)politicisation calls more for 'doing the thing' than 'doing the talk'. 'Doing the thing' means further channelling and leveraging entrepreneurial passions, deep learning from entrepreneurial achievements, connecting better policy packages and accelerating policy agendas. This requires a transformational discourse to be tactical and organisational, more than the substantive side of CE. For metrics, in our suggestion is to only use metrics that cannot be easily manipulated, and which help best to register final impact. In the end, it may be better to focus on environmental impact more than on circularity.

Meeting our second question, how grassroots potential should fuel more than the invention of promising 'local' practices. While business entrepreneurs are undoubtedly vital to the CE transformation, they should also be given a major voice in modifying regulations, value chains, markets and finance. This calls for heroes who are relationally savvy, that is, 'CE transition brokers', to use Cramer's term, who know how to channel and connect knowledge, resources and people, who can speak and modify legal, policy, financial and market languages, and who can modify dominant metrics. Many such heroes are around, but their role can be much better acknowledged and sustained through a transformational discourse and topological thinking. Despite their limited scale of operation, our evidence shows how entrepreneurs adopting CE practices have been accumulating a vast, practical knowledge about what the transformation entails and faces. Drawing on this knowledge is pivotal, and requires an open, nonlinear mindset in which this knowledge is interpreted, synthesised and made actionable. Besides technology and business models, that knowledge can also accelerate changes in regulations, market and financial practices. The emphasis on practice also warrants closer attention to the contingent and the mundane, or, in the words of Bulkeley et al. (2014, 1476): 'routine practices by a myriad of actors in a variety of settings [since] the routine and multiple dynamics processes of flow and fixity suggest that contingency is also critical'. In our perspective, the emphasis on contingency and routine practices presents an acknowledgment of the specific territorial settings in which emergent and alternative practices and alternative-discourses evolve. Urban and regional capacities and ambitions thus require full recognition and voice in how economic activities, policy-making and academic performances are shaped (Gibson-Graham, 2008).

We conclude with two caveats. First, these conclusions present the outcome of empirical work still in progress.

Here, we only focused on one municipality in the NL that is renowned for its waste recycling. There is a need for more case studies to explore grassroots potential and to inform CE policies focused less on metrics and more on quality. Moreover, regarding the sphere of connection, understanding and engaging with how those policy actors embrace the buzz terms such as 'co-creation' and 'impact' in practice would have brought in additional perspective. By critiquing the policy language, practices and discourses, one can signal shortcomings and support alternative paths forward. Second, a final word on this point of policy mobility. A relational perspective based on 'actualisation' assigns a key role to policy mobility. That role is not so much to circulate good practices, but to shape the webs of mattering and engagements through which emergent and alternative practices reshape and transfigure discourses and metrics. As we have shown here, that includes a painstaking process of connecting, step-by-step, local passions and achievements to bigger stories, measures and strategies. Otherwise, CE turns into fallibilism in which no discourses and metrics can ever be rationally supported or justified in a conclusive way. Those emergent and alternative practices permit gaining more knowledge about actualisation rather than becoming benign examples. We hope our approach helps to support this.

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