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Manuscript

Mapping the emergence of the circular economy within the governance paths of shrinking cities and regions: a comparative study of Parkstad Limburg (NL) and Satakunta (FI)

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This paper studies the interplay between governance priorities concerning urban shrinkage and the circular economy (CE) agenda in the cases of Parkstad Limburg (NL) and Satakunta (FI), aiming to assess the potential of European circular imaginaries for creating novel development pathways in shrinking cities and regions. The findings reveal that the CE agenda emerges within specific sectors due to various influences, including European institutional frameworks, national policies and local initiatives. Notably, the advocacy of commercial actors plays an instrumental role in advancing the CE concept into policy. However, both regions also demonstrate differences arising from distinct regional characteristics. Satakunta harnesses its manufacturing legacy to pursue economic and demographic growth through an industrial CE. Meanwhile, Parkstad Limburg prioritises circular construction to facilitate spatial restructuring and secure public funding. Therefore, in shrinking contexts, CE operates as a unifying agenda for existing interests, upholding prevailing political priorities rather than opening novel governance avenues.

Keywords: circular economy, circular cities, evolutionary governance theory, governance path, shrinking cities, urban shrinkage

JEL Classifications: R58, R11

Introduction

Shrinking cities and regions have been overlooked so far in the academic and policy discussions concerning the circular economy (CE), although certain authors recognise the opportunities to develop circular activities on vacant land or emphasise the potential benefits of introducing CE models to areas experiencing decline, such as: creating new local economic value chains, diversifying the economic base, creating jobs and stabilising and empowering local communities (Williams, 2021a, 2021b). However, governments in only a handful of shrinking cities and regions have decided to pursue a CE agenda. Generally, global cities like Paris or Amsterdam, which are growing economically and demographically, are at the forefront of the circular transition (Fratini et al., 2019; Prendeville et al., 2018; Williams, 2021a).

Similarly, the scholarly discourse concerning the CE adoption in the context of shrinkage has remained relatively limited. Existing studies have only marginally covered specific aspects of this relationship, such as the

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question of economic restructuring in resource-based cities (He et al., 2017), or have addressed some of the challenges that shrinking cities face, particularly the issue of vacant houses (Wuyts and Marjanović, 2023; Wuyts et al., 2020). However, a notable gap lies in the lack of connection to structural transformation processes that underpin urban shrinkage and their impact on governing CE transitions.

While governments of growing cities widely employ the CE concept to reconcile economic growth with environmental sustainability (Calisto Friant et al., 2023; Prendeville et al., 2018), actors in shrinking cities and regions must contend with mounting socio-economic challenges surrounding sustained population decline and economic downturn, compounded by limited resources and capacity to effectively address them. Moreover, the complex and context-specific character of urban shrinkage engenders a range of interpretations concerning its potential causes and consequences, which leads to distinct governance arrangements and policymaking outcomes (Haase et al., 2014, 2017; Rink et al., 2011). For instance, conventional pro-growth governance coalitions can give way to grant coalitions and welfare governance arrangements while a shift from growth-supporting strategies to more degrowth-oriented approaches may also take place (Bernt et al., 2014; Rink et al., 2011; Schindler, 2016). With a heavy emphasis on growing cities, current debates on the CE transition within urban contexts largely tend to overlook such critical social and political dimensions (Geissdoerfer et al., 2017; Korhonen et al., 2018; Vanhuyse et al., 2021). Instead, they remain extensively focussed on the technical aspects of material flow closure, associated business models and various indicator frameworks (Heurkens and Dabrowski, 2020; Marin and De Meulder, 2018; Marjanović et al., 2022).

For these reasons, shifting the focus to urban and regional contexts characterised by structural shrinkage can open the door to alternative perspectives on the transition to CE, particularly those that diverge from the dominant ecomodernist and technocratic paradigms (Calisto Friant et al., 2023; Marin and De Meuler, 2018). This shift may offer novel and context-based insights into the underlying social realities and political complexities involved in developing and enacting CE transition agendas. Therefore, this paper aims to illuminate why and how CE develops into a knowable object of governance in the context of structural shrinkage and whether it presents opportunities for novel development pathways. This involves exploring the motivations of various actors in adopting a CE agenda in shrinking cities and regions, examining the discourses they embrace and identifying new institutions and practices that emerge to support this process. In that way, the present paper effectively contributes to the broader imperative of investigating how CE imaginaries manifest across contexts outside of global cities.

To address these elements, we assessed the evolution of the relationship between the governance approaches to regenerating two shrinking European regions and their emerging CE agendas. Developing a robust description of the most important events that have unfolded in each case has allowed us to closely examine the key actors, institutions and discourses that have contributed to framing and promoting CE as the object of governance. Our findings illuminate the intricate dynamics of mutual influence between the CE adoption and the governance of urban shrinkage, underscoring the inherently political dimension of CE transitions in shrinking cities and regions.

Research design: evolutionary governance theory, path mapping and comparative cases

Given that the adoption of circular activities is contingent upon the characteristics of the local context, which can offer both opportunities and challenges (Bolger and Doyon, 2019; Savini, 2019; Williams, 2019a, 2019b, 2021a, 2022a, 2022b), it is reasonable to assume that the conditions linked to shrinking cities and regions would exert a considerable influence on the formulation of a CE agenda. The notion of governance may offer a valuable perspective on understanding how these conditions interact with the development of CE. On the one hand, urban/regional governance is inherently context-specific, whereby the prevailing norms, values, goals and practices of governance reflect the distinct characteristics of the local context, especially in the case of shrinking cities and regions (Haase et al., 2014, 2017; Pierre, 2011). On the other hand, the ways in which CE imaginaries are developed, mobilised and operationalised in different contexts simultaneously shape and are being shaped by underlying social, economic and political conditions (Fratini et al., 2019; Williams, 2021a; Winslow and Coenen, 2023). Therefore, studying the development of CE governance in shrinking cities and regions requires accounting for shifting interests, priorities and goals of the actors involved as they work to collectively understand and act upon the intricate political and socio-economic conditions associated with sustained population decline. To achieve this, we employ Evolutionary Governance Theory (EGT) and its associated approach of path mapping as the conceptual and methodological tools for analysis, as presented below.

Evolutionary Governance Theory

EGT suggests that the elements of governance and the relations between them continually co-evolve in and through governance (Beunen et al., 2016; Van Assche et al., 2013). Governance involves the intricate process of coordinating various actors to arrive at collectively binding decisions. In this process, actors rely on institutions and

discourses as mechanisms for coordination. Therefore, the EGT framework encompasses two key components: the configuration of actors and institutions and the configuration of power and knowledge.

The actor/institution configuration focuses on the dynamic relationship between actors and institutions in governance. Actors rely on specialised institutions to guide their interactions and decision-making while simultaneously shaping those institutions through their actions and decisions. In comparison, the power/knowledge configuration pertains to the discursive dynamics of governance interactions, i.e. the mutual influence of power and knowledge exhibited through discourse. The knowledge that shapes interactions and decision-making in governance is continuously contested and negotiated through ongoing power struggles, which are the product of historically contingent access to certain types of knowledge.

Both configurations are interdependent, reacting to each other and continuously reproducing themselves through mutual interaction. The configuration of actors and institutions determines which knowledge and expertise are included or excluded in governance interactions, while ongoing confrontations with power and knowledge dynamics directly shape their interplay. This makes isolating different components rather challenging, which is why it is more advantageous to concentrate on a distinct meta-configuration of actors, institutions and discourses. The evolution of such a configuration within a specific case is known as a governance path, and by tracing it, we can attain a deeper understanding of how the elements of governance interact and co-evolve in response to changing circumstances.

Therefore, EGT suggests that the development of a CE agenda in the context of urban shrinkage must be observed within a distinct governance path of a shrinking city/region, as illustrated in Figure 1 (Van Assche et al., 2021). Within a given path, the ongoing interactions between actors (A_1 and A_2) and institutions (I_α) are framed by a specific discourse on urban shrinkage (D_1) that arises from past interactions (Haase et al., 2017). The introduction of a CE discourse (D_2) by a particular actor—a policy entrepreneur (A_3) can alter existing interactions. However, under the influence of underlying configurations, this discourse will be reframed in the process, stimulating the adoption of a new discourse (D_3) among the involved actors and potentially initiating a discourse coalition. The governance configuration may transform over time as the new discourse becomes adopted by key actors in governance and embedded in the existing institutional practices (I_α) or gives rise to novel institutions (I_β), which will shape interactions moving forward (Hajer and Wagenaar, 2003).

Given that the conditions associated with population decline manifest in governance through discourse (Haase et al., 2017), this framework allows us to establish the relationship between urban shrinkage and CE, gaining a better understanding of their interaction and mutual influence. This means that the co-evolution of actors, institutions and discourses over time in a specific case of urban shrinkage will not only influence the recognition of CE as an object of governance but will also be instrumental in shaping how CE governance plays out in practice. At the same time, pursuing a CE agenda can transform underlying governance configurations, potentially reshaping how urban shrinkage is governed within a particular governance path.

Path mapping

Following EGT, we adopted the path-mapping approach in our analysis, recognising its integral relevance to this framework and previous application to the study of

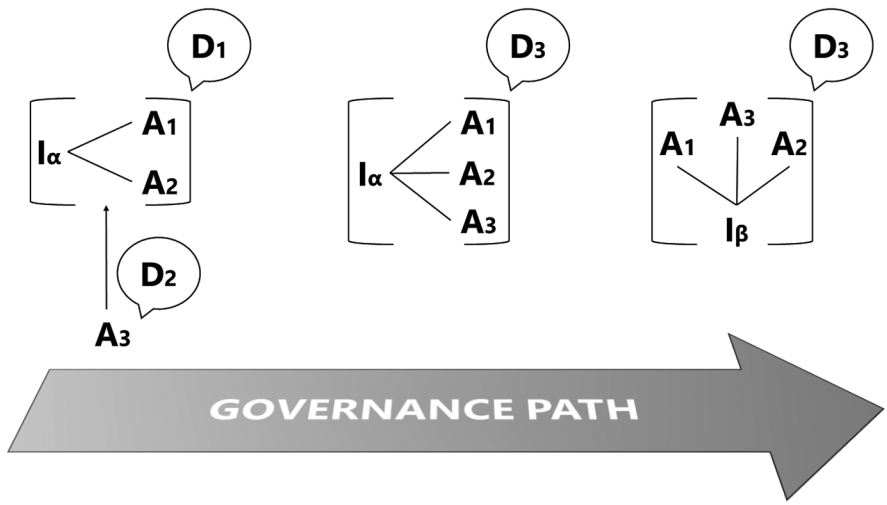

Figure 1. The evolution of governance configurations within a governance path (adapted from Van Assche et al., 2021, p. 738).

shrinking communities (Van Assche et al., 2017, 2019). Path mapping specifically focuses on tracing the evolutions in governance configurations by answering questions such as:

- what actors have become involved and when,
- what institutions have been developed and mobilised,
- which types of knowledge dominate and why, and
- how they influence governance interactions and collective decision-making (Van Assche et al., 2019, 2021).

However, path mapping is not intended to provide a comprehensive collection of facts and events. Instead, it involves selecting and describing key events that have influenced and reshaped the governance path. Its aim is to retrospectively reconstruct the actors, institutions and discourses that have led to varying modes of interaction and decision-making in governance (Van Assche et al., 2021).

Mapping governance paths does not mean taking into account only what happened but working through why and how governance processes unfolded in the manner in which they did. Therefore, in addition to considering the specific content of individual events, it is essential to account for the sequences and patterns in their unfolding. This may provide crucial insights into the reasons behind their occurrence and how they played out in each respective case.

Comparative case study

To complement path mapping and examine the causal relationships between the governance of urban shrinkage and the adoption of a CE agenda, we used a comparative analysis of two typical cases (Pierre, 2011). This also allowed us to determine whether our findings were specific to a particular case or could be extrapolated to the broader population. Following the most similar systems design, we chose to focus on two cases of European regions experiencing urban shrinkage, i.e., ongoing structural and functional transformations in their urban areas surrounding sustained population decline. Our decision to prioritise the regional level aligns with scholarly recognition of the significance of regional development frameworks in addressing shrinking cities (Bontje and Musterd, 2012; Hoekveld, 2012; Mallach et al., 2017). Moreover, developing circular economies at the regional scale holds relevance in European policy contexts, while some imaginaries place a strong emphasis on the regional CE (Arsova et al., 2022; Heurkens & Dabrowski, 2020; Obersteg et al., 2019; Silvestri et al., 2020). In addition, by focussing on European case studies, we could explore the interaction of a shrinking context with a distinct conceptualisation of CE, specifically the one promoted by the EU, rather than having to account for diverse imaginaries.

Following a comprehensive screening of shrinking European regions pursuing a CE transition, we identified two cases most fitting to our study: the Satakunta region in Finland and the Parkstad Limburg region in the Netherlands—their locations are shown in Figure 2. Our choice was driven by several factors, including the extent of development of the CE agenda, the degree of control variables shared between the two contexts and practical considerations, such as language barriers. Finland and the Netherlands were the first countries in the world to adopt nationwide programmes for transitioning to CE in the autumn of 2016 (Government of the Netherlands, 2016; Sitra, 2016). Moreover, the governments of Satakunta and Parkstad have demonstrated proactive efforts in integrating CE into their agendas (Parkstad Limburg, 2019; Regional Council of Satakunta, 2019).

In addition, representing formal cooperation between seven municipalities within the province of Limburg, Parkstad's statutory powers are similar to those of Finnish regions, such as Satakunta, which wield limited legislative authority compared to Dutch provinces. Besides, both cases are situated in a common context of social-democratic welfare states and have comparable populations, which have been shrinking due to similar causes related to post-industrial restructuring. However, the Netherlands and Finland also demonstrate certain differences in governance structures and political cultures, while the chosen regions exhibit contrasting decline dynamics along with divergent governance responses to shrinkage. This makes them compelling for comparative analysis within the scope of our study and for understanding both the similarities and differences in governance outcomes concerning CE.

Data collection and analysis

Aiming to offer a nuanced understanding of the development of a CE agenda in both cases, we built our evidence base on a comprehensive literature review, in-depth interviews with selected actors and a robust analysis of key policy documents and public media sources. We conducted a total of 54 interviews in both Parkstad and Satakunta, engaging representatives from regional and local governments, businesses, educational institutions and civil society organisations. In addition, we assessed 26 regional policy documents and 186 media articles from both national and regional news outlets, all related to urban shrinkage and/or CE within the study regions. The collected data was analysed through interpretive content analysis, which allowed for scrutinising critical relations within the governance path of each case (Drisco and Maschi, 2016). Emergent first-order codes were inductively developed to categorise accounts of various events in the development of the CE agenda, as well as the presence and roles of participating actors, their discourses and the underlying institutions that shaped this process. They were subsequently categorised into second-order themes, which formed broader analytical dimensions (Gioia et al., 2013).

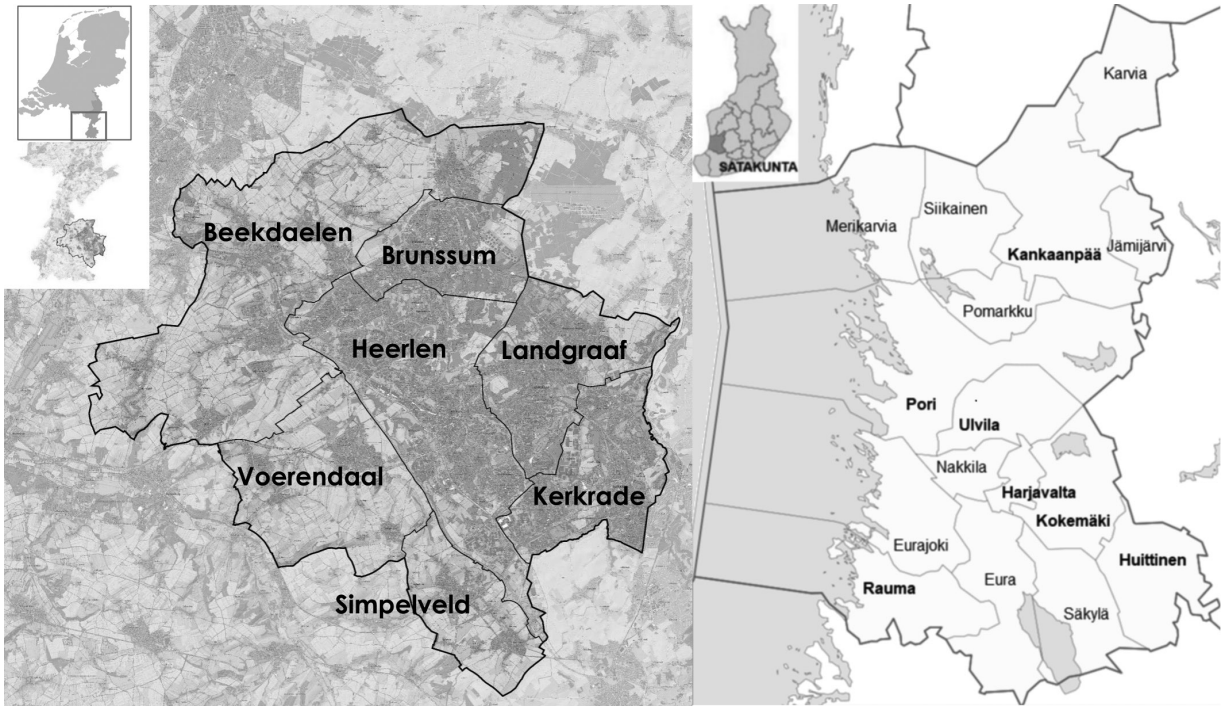

Figure 2. Parkstad Limburg (left) and Satakunta (right) (adapted from Schepers et al., 2022, p. 8; Regional Council of Satakunta, 2022, p. 25).

In addition, we used narrative analysis, adopting a 'storyteller' perspective and crafting a cohesive story for each case, building on the research findings (Smith, 2016). This approach enabled us to move beyond merely recounting the main events towards a thick description of the pathway, laying the foundation for deriving a more detailed understanding of the underlying dynamics.

Urban shrinkage in Satakunta and Parkstad Limburg

Satakunta

Satakunta is a region in western Finland, home to 212,566 residents (Statistics Finland, 2023). It encompasses 16 municipalities (seven of which have city status), with Pori (83,205) and Rauma (38,667) being its largest population centres. After reaching its peak population in the early 1980s, the region faced a lasting demographic decline initiated by rising unemployment due to extensive restructuring that adversely impacted its heavily industrialised economy. This trend was later fuelled by heightened migratory losses to more prosperous areas in the south of Finland, ageing demographics and plummeting birth rates. However, since the export-focussed regional economy has historically placed less emphasis on population size and more on increasing industrial productivity to drive growth, the economic implications of the declining population in Satakunta have not been readily apparent to policymakers. As a result, urban shrinkage has largely gone unacknowledged in political discussions despite its enduring presence.

The situation began changing around 2016 when several population forecasts highlighting negative demographic trends within the country drew broader political attention (MDI, 2022). Nevertheless, decision-makers in Satakunta have been slow to respond, opting to downplay or even call into question the credibility of negative projections despite facing the reality of diminishing public finances and a crumbling tax base (Niemelä, 2017; Regional Council of Satakunta, 2017; Uhari, 2018). Consequently, the issue of shrinkage has been conspicuously absent from local-level politics (Muurinen, 2021). Considering that municipalities in Satakunta employ a significant proportion of the regional workforce, municipal leaders have refrained from making difficult decisions to cut down services due to concerns about potential electoral backlash (Keskinen, 2019; Tuori, 2018). Instead, they have relied on increasing taxes as a convenient means to offset the loss of taxpayers (Mäntysalo, 2020).

However, it has been increasingly difficult to overlook all the negative consequences of sustained demographic decline in the region. A shift in public perception occurred when it became evident that even Pori, a key regional centre, was grappling with declining tax income, deteriorating services and increasing public expenditure

due to a shrinking population (Aro, 2020; Hammarberg, 2020; Lähdeniemi, 2021). Following a dedicated advocacy effort by regional researcher Timo Aro, who optimistically emphasised that bleak population forecasts could be averted with appropriate action, Satakunta's political leaders and policymakers eventually acknowledged the imperative of addressing the issue proactively (Aro, 2018, 2019, 2020; Aro and Aro, 2022).

The resulting discussions on appropriate responses have mainly focussed on stopping and reversing negative demographic trends. The prevailing discourse emphasises that demographic decline places a heavier burden on fewer taxpayers to support the welfare needs of an ageing population while impeding economic competitiveness and the generation of municipal revenues as prospective companies are discouraged from investing in the region due to shortages of skilled labour (Meritähti, 2022). The regional and local governments in Satakunta decided to work on stimulating growth, both in demographic and economic terms (City of Pori, 2022; Regional Council of Satakunta, 2021). The imperative for growth has been particularly stressed in light of the perceived intensifying interregional competition for labour and investments. It created a strong emphasis on enhancing Satakunta's attractiveness to people and companies in order to reverse the trend of population decline, bolster the labour supply and bring more businesses to the region.

Parkstad Limburg

Parkstad Limburg is an urban region in the south of the Netherlands with a population of 257,660 (Statistics Netherlands, 2023). It comprises seven municipalities (three of which have a city status), the most populous being Heerlen (86,845) and Kerkrade (45,324). After a prosperous period of economic and demographic growth during the 1950s, driven by thriving coal mining activity, the region experienced severe economic and social problems when the national government decided to shut down all the mines between 1965 and 1975. Mine closures were accompanied by a robust intervention to remove the entire mining heritage and convert the industrial landscape into a verdant natural environment (Peet, 2013; VanHoose et al., 2021). Since substitute jobs in relocated government agencies were neither sufficient nor appropriate for the local workforce, the socioeconomic situation in Parkstad deteriorated over time. It culminated in the 1990s when escalating crime rates and extensive neighbourhood decay compelled an increasing number of people to relocate, marking the onset of a lasting process of demographic decline (Ročak, 2020; Verwest, 2011).

Although the issue was immediately recognised by demographer Wim Derks (1996), who warned about negative population developments in the region, local and regional authorities dismissed these concerns in their policies, as they deviated significantly from broader demographic trends in the country. However, different actors became more attentive to the consequences of a declining population over time, with regional housing corporations being the first to acknowledge the detrimental impacts of shrinking demographics on housing demand and call for public intervention (Elzerman and Bontje, 2015). After some time, other influential actors started to pay attention to the issue, particularly the Province of Limburg and the Regional Organisation Parkstad Limburg (Verwest, 2011). Lacking the capacity to initiate dedicated interventions, the involved actors actively worked towards generating awareness about the growing regional challenges at the national level, spearheading numerous research studies that underscored urban shrinkage as a structural problem demanding urgent government attention (Elzerman and Bontje, 2015; Verwest, 2011).

The initial interventions primarily centred around reducing visible vacancy levels by demolishing low-quality social rental housing stock (Hoekstra, 2020; Hoekstra et al., 2020). However, both the reluctance of municipal governments in Parkstad to limit new construction and the deep-seated public mistrust in government institutions within the region posed significant challenges in organising effective regional action (Ročak, 2020). The situation changed as regional decision-makers increasingly accepted urban shrinkage as an irreversible structural trend, and the dominant discourse expanded to encompass a range of social, economic and environmental aspects (Elzerman and Bontje, 2015). This shift led to more holistic interventions oriented towards degrowth, most notably the signing of the Parkstad Pact and the development of the Regional Programme on Population Decline in 2010 (Parkstad Limburg, 2010). Through these initiatives, regional and municipal authorities, together with housing corporations, pledged their commitment to achieving spatial and functional restructuring of the region. In parallel, they actively pursued financial support from the national government by stressing their pioneering efforts in tackling unique regional challenges, considering that Parkstad was the first urban region in the Netherlands to face enduring population decline.

The evolution of the circular economy agenda in Satakunta

The adoption of the CE concept in Satakunta is primarily reflected in the proliferation of business investments in the industrial CE, which can be attributed to two simultaneous influences. The first considers the framing of existing industrial symbiosis processes in Satakunta's industrial parks in terms of CE, with Kirkkokallio eco-industrial park being the most notable example. The second concerns the implementation of the national CIRCWASTE project in Pori, which promoted CE principles throughout the region

and facilitated collaboration among public and private actors in the domain of industrial CE.

Industrial symbiosis in Kirkkokallio eco-industrial park

Initiated in 1986, Kirkkokallio eco-industrial park, located in the municipality of Kankaanpää, demonstrates symbiotic relationships between seven businesses, which utilise each other's material and energy streams. One of them, Honkajoki Oy, a pioneer in recycling material of animal origin in Finland, was the first company in Satakunta to use the CE label to describe its operation. Its 2016 investment of 10 million euros in the modernisation of processing facilities was said to employ CE thinking to utilise raw materials more efficiently and minimise waste (Satakunnankansa, 2016). This description aligned with the expanding national policy agenda concerning CE, which prioritised the industrial sector (Sitra, 2015, 2016). Since then, the company has been actively promoting itself as a pioneer in CE while highlighting the unique business ecosystem that has emerged in Kirkkokallio (Riihentupa, n.d.).

Other companies in the cluster have also embraced this narrative, stressing the advantages of CE beyond financial savings, such as reducing greenhouse gas emissions and tackling the overconsumption of virgin materials and non-renewable resources. They have also called for upscaling their operational model to other industries, urging the government to incentivise this process through subsidies and zoning regulations. Over time, their efforts have captured the attention of regional authorities and other industrial operators in Satakunta, inspiring the adoption of CE principles across different material flows in the industry. Consequently, Kirkkokallio has gained growing recognition within political and business circles as a pioneer in the industrial CE (Leppilahti, 2017).

Mounting political pressure at the national level to address climate change and environmental challenges provided further motivation for companies in Satakunta to embrace CE (Saarenmaa, 2020). For instance, following repeated increases in the tax on peat, local businesses reliant on peat for energy production have turned to waste-to-energy solutions to remain competitive, such as the construction of a heating facility in Kankaanpää that sources waste steam from a nearby plasterboard factory (Niemistö, 2021). By demonstrating their commitment to carbon neutrality and sustainability, many companies strive to enhance their reputation as leaders in sustainable resource management among government decision-makers, hoping to gain a competitive advantage over their rivals.

CIRCWASTE

The uptake of CE concepts in Satakunta has been influenced further by the national CIRCWASTE project, funded mainly by the EU LIFE programme and implemented by the Finnish Environment Institute (SYKE) in collaboration with 20 partners and regional stakeholders. The project aimed to accelerate Finland's transition to CE through 20 sub-projects that test and demonstrate resource-efficient circular solutions in four designated regions. The City of Pori became the principal project partner from Satakunta due to existing relationships with SYKE. At the same time, its industrial background and efforts to diversify the economy made it an ideal testing bed for circular practices in the industrial sector.

Under the framework of CIRCWASTE, Pori's environment department, alongside its partner organisation Prizztech Oy and Satakunta University of Applied Sciences (SAMK), delivered three sub-projects with a total funding of 1.4 million euros (Jokinen, 2020). The first sub-project addressed resource-efficient construction. This involved establishing a cooperation network amongst various stakeholders in the construction industry and conducting feasibility studies for adopting recycled materials and reducing waste. Several demonstration projects showcased best practices in recycling, waste management and green procurement. The construction sector was prioritised due to increased demolition activities across Satakunta, driven by concerns about indoor air quality in public buildings (Jokinen, 2019).

The second sub-project aimed to develop the Peittoo Recycling Park into Finland's leading industrial recycling facility by promoting the integration of industrial waste streams into an industrial symbiosis model like Kirkkokallio. The Peittoo area, near Pori, was chosen due to its favourable location, existing infrastructure and history of ash and slag processing. The sub-project focussed on testing the recycling potential of various industrial by-products and identifying cost-effective ways to integrate material waste flows from different industries, intending to establish new CE businesses in the area (Saarinen, 2018).

The third sub-project involved organising a region-wide expert network on resource wisdom known as *Luppi*, intending to promote CE principles and facilitate cooperation between municipal administrations, private companies and NGOs. The network was tasked with developing environmental education programmes for schools, organising information campaigns for residents and creating green public procurement guidelines for municipal administrations. However, while these activities aimed to expand CE at a local level and through community initiatives, the broader discourse still primarily emphasised large-scale economic considerations focussed on economic growth.

Growing investments in the industrial circular economy

Following these interventions, local governments in Satakunta began actively stimulating investments in

industrial circular businesses to achieve environmental and economic goals. They recognised circular initiatives in the industry to reduce waste, drive business growth and create jobs, thereby promoting them as win-win solutions. Fortum's ash refinery in Pori's Kirrinsanta industrial area was one of the first such investments. The company extensively lobbied local politicians, pitching the initiative as an opportunity for economic growth that supported the city's environmental goals through effective resource management (Kangas, 2018). Despite public concerns about Fortum's CE model, the city management endorsed the project with the justification of supporting cleantech industries (Hacklin, 2018). Examples from other municipalities include the construction of an eco-heating plant in Rauma and Eurajoki (Suni, 2019), the launch of a modern waste plastic processing line in Merikarvia (Satakunnankansa, 2019) and the expansion of Crisolteq's battery recycling facilities in Harjavalta (Rakkolainen, 2020). Consequently, the concept of CE became increasingly associated with recycling processes, specifically the recovery of materials from industrial waste, reflecting the region's industrial heritage. Accordingly, municipal governments focussed on positioning themselves as hubs for CE innovation in the industry. They aimed to attract investments in the recycling sector by creating favourable business conditions, such as streamlining decision-making procedures for environment and construction permits and improving service infrastructure.

One prominent example of this trend is the decision of Pori's government to grant permission to the Australian company Critical Metals to construct a metal recycling facility near Tahkoluoto port. The facility was designed to recover vanadium compounds from steel slag, which was allegedly operating according to CE principles. Despite concerns about potential environmental impacts and scepticism regarding emissions claims, the investment was promoted as an opportunity to establish Pori as a leading industrial CE hub in Europe, given vanadium's importance as a critical metal (Reko, 2020; Reko and Karonen, 2020).

The city government also downplayed the criticism surrounding the detrimental environmental and economic impacts of industrial recycling. They presented waste as a resource and emphasised the need to stimulate business growth in the region suffering economic and demographic challenges (Hacklin, 2021; Reko, 2020). The perception of intensified global competition for circular businesses reinforced the pursuit of industrial circular investments in Satakunta, overshadowing associated environmental concerns.

Resulting regional circular economy policy

On the policymaking front, the CE concept gained traction in Satakunta through the regional industrial growth programme prepared by Prizztech in late 2016 (Vartia and Leppimäki, 2016). It recognised the potential for a circular economy to increase resource efficiency and create business opportunities in regional industrial parks. In 2017, the Satakunta Regional Programme further emphasised the benefits of industrial symbiosis in enhancing the regional economy and reducing environmental impact (Regional Council of Satakunta, 2017).

In 2018, Satakunta adopted a CE roadmap for the broader region of Southwest Finland (Varsinais-Suomen liitto, 2018). The roadmap was developed through collaboration among over 20 stakeholders from the public sector, industry and academia. The Regional Council of Satakunta, the City of Pori, SAMK and recycling company Lassila & Tikanoja represented the region. The aim was to promote the transition to CE that was aligned with the national waste plan. Local authorities were called upon to lead the transition by promoting the circulation of raw materials through environmental regulations and procurement practices. This document laid the foundation for Satakunta's own CE strategy, which was realised with the adoption of the Bio- and Circular Economy Growth Programme in 2019 (Regional Council of Satakunta, 2019). Developed by Prizztech and several industrial operators, the strategy focussed on creating circular processes around biogas plants by integrating waste streams from industry and agriculture.

The political commitment to CE was further solidified in February 2021. The City of Pori and the Finnish Ministry of Labour and Economy signed an ecosystem agreement, a specific contract between the state and selected university cities enabling joint investments in enhancing innovation activities (City of Pori, 2021). The agreement focussed on two main thematic areas: technology metals and automation and robotics. The highly competitive process of securing ecosystem agreements, initially limited to 16 university cities in Finland, saw Pori successfully lobbying for its inclusion with the backing of the Regional Council of Satakunta. Realising that positioning Pori as a hub for the industrial CE aligned with the national agenda, regional leaders perceived the agreement as a strategic opportunity to bolster the economic growth and competitiveness of the entire region.

The evolution of the circular economy agenda in Parkstad Limburg

The adoption of the CE concept in Parkstad is primarily observed in the proliferation of initiatives focussed on circular construction. This trend can be traced back to the locally developed SUPERLOCAL project. After obtaining significant EU funding, it has become a model for other regional initiatives concerned with the circular built environment. Before that, the project's inclusion within the framework of IBA Parkstad had considerably enhanced its visibility and garnered increased political attention.

SUPERLOCAL

During the 1960s, several apartment complexes were constructed throughout Parkstad to house the growing population. One such residential complex consisting of four high-rise buildings was built in 1967 in Bleijerheide, a neighbourhood of Kerkrade, becoming home to a multicultural, tightly-knit community (Maurer, 2015). Unfortunately, in the early 1990s, population decline and social issues began to plague the area, which led to a high concentration of vacancies, unemployment and poverty (Hoekveld and Bontje, 2016).

In 2010, as part of a regional restructuring programme, the housing corporation HEEMwonen planned to demolish the apartment complex due to low occupancy. Despite resident protests, one of the buildings was demolished in 2012. However, after witnessing the negative impact of large-scale demolitions on community values and social cohesion in the neighbourhood of Heilust, the corporation's management decided to rethink its strategy (Banach, 2020). Together with architectural firm Maurer United, they developed a project plan to transform the residential complex while preserving material and social values. The plan aimed to revitalise the neighbourhood. It would reduce the number of dwellings in the remaining buildings through deconstruction, reusing on-site materials, harnessing local knowledge and conserving existing social structures. The project, named SUPERLOCAL, emphasised reusing local construction materials, fostering community engagement and preserving the neighbourhood's identity (Banach, 2020; Buis, 2022).

However, HEEMwonen faced challenges in securing financial resources, attracting partners to undertake an experimental project and finding contractors capable of executing it. Not only did the uncertainties associated with the project's long timeline make it challenging to bring investors in, but the conservative nature of the building industry also meant that most construction companies preferred to stick to established business models rather than venture into unproven approaches (Banach, 2020). However, the situation changed with the development of IBA Parkstad, which provided new opportunities and support for innovative initiatives like SUPERLOCAL.

IBA Parkstad

In 2010, the Regional Organisation Parkstad Limburg decided to pursue a comprehensive spatial restructuring programme, with the International Building Exhibition (IBA) as the principal instrument for implementation. The IBA model represents an approach to regional transformation pioneered in Germany and employed in revitalising shrinking regions with mining and industrial legacies. With support from the provincial government, concerted efforts were made to actively engage stakeholders and attract partners in establishing a comprehensive framework, securing funding and defining the content and structure of IBA Parkstad (Province of Limburg, 2016). In 2012, the national government and the province of Limburg signed a covenant that solidified their commitment to addressing population decline in the region (Valkhoff, 2012). This led to the establishment of IBA Parkstad in 2013 as a private limited company, backed by a funding of 45 million euros from the region and the Parkstad municipalities (IBA Parkstad, 2015).

Under the framework of IBA Parkstad, 50 urban transformation projects were developed, aiming to strengthen residents' connection to the region and enhance its public image (Elzerman and Bontje, 2015; Parkstad Limburg, 2010). Projects were selected through an open call and grouped into three overarching themes: Flexible City, Energy City and Recycle City. The selection process prioritised the initiatives focussed on addressing visible problems in the built environment and engaging the public through experimentation (Hendriks, 2022).

In 2015, SUPERLOCAL became an IBA-certified project under the 'Recycle City' theme. The term 'recycling' was strategically incorporated into the project narrative, which was reframed to encompass building 100 new homes in Bleijerheide from on-site materials (Ritzen et al., 2019). Despite limited funding, SUPERLOCAL garnered visibility and attracted project partners by being associated with the IBA. However, its designation as an IBA 'key project' in 2017 brought additional requirements and expanded the project's scope, necessitating extra financing and support.

Growing circular construction projects

Recognising the budgetary constraints posed by shrinkage, the Regional Organisation Parkstad Limburg decided to proactively pursue European support for the ambitious IBA Parkstad programme, enlisting the assistance of an external consulting firm to explore potential financing opportunities. After identifying the Urban Innovative Actions (UIA) initiative as a promising avenue, the regional management submitted a funding application for the SUPERLOCAL project under the CE theme in 2016. To meet evaluation criteria, the project was expanded with additional interventions, which necessitated bringing new partners on board, including VERAS—the Dutch Association of Demolition Contractors and Zuyd University of Applied Sciences. Ultimately, SUPERLOCAL was rebranded as *Super Circular Estate*, presenting the ambition of managing urban shrinkage through the material and social circularity in the housing sector (Durmišević, 2018).

The 5 million euro UIA grant awarded to the project in October 2017 encouraged other IBA Parkstad initiatives to embrace the 'circular' label and explore the reuse of construction materials. Examples include the redevelopment of the Treebeek neighbourhood in Brunssum, where demolished apartment buildings were used to construct single-family homes, and the SLOTLAB initiative,

which investigated circular material flows in the reconstruction of Castle Schaesberg (IBA Parkstad, 2015). The availability of European funds for circular initiatives was underscored when SUPERLOCAL received an additional 2.5 million euros from the LIFE programme in 2018. This led to the emergence of new circular construction projects throughout Parkstad. Notable examples include the Green Transformative Lab, which tests innovative approaches to the reuse of buildings, and Digital DeConstruction, which leverages digital technology for material recycling (GTB Lab, 2021; Interreg NWE, 2019).

The success of SUPERLOCAL in securing European funding spurred local politicians and policymakers in Parkstad to endorse circular construction projects, positioning the region as an (inter)national hub for circular construction in their discourses (Bruijns, 2020; Parkstad Limburg, 2020). Consequently, the concept of CE has become closely associated with the need for spatial restructuring and demolition of vacant properties in response to population decline (Baggerman, 2019). As a result, political leaders took to promoting the shrinking context as an opportunity for implementing circular solutions in the construction sector (Afval Circulair, n.d.; Banach, 2022). They emphasised the diverse socio-economic benefits that the circular approach brings, including job creation, improved public health, enhanced living environments and strengthened social cohesion.

Resulting regional circular economy policy

Developing a CE policy in Parkstad has been less straightforward. Heerlen was the first municipality in the region to introduce the concept in its Sustainability Vision in 2017 (City of Heerlen, 2017). However, local entrepreneurs from the architecture and construction industry involved in ongoing circular projects soon began criticising policymakers for using CE interchangeably with climate change and energy transition. They launched a door-to-door campaign, advocating for a more material-oriented understanding of the concept, particularly emphasising the built environment sector. Although their efforts were met with scepticism, the perception of politicians and policymakers shifted over time following the accomplishments of circular projects like SUPERLOCAL. Ultimately, the regional organisation committed to transitioning to a circular built environment, spearheading different initiatives to promote circular practices, engage stakeholders and foster collaboration with the industry (Afval Circulair, n.d.; Parkstad Limburg, 2020).

In 2019, the political commitment to developing a CE policy in Parkstad was formalised by signing the Regional Deal agreement, which granted the region 40 million euros of financial support from the national government (Parkstad Limburg, 2019). This agreement focussed on the spatial and socio-economic transformation of Parkstad in the face of population decline, with circular construction playing a vital role in addressing associated challenges. The regional organisation committed to creating a comprehensive CE strategy and expressed the ambition of establishing the region as a national hub for circular buildings, underscored by the significant demolition requirements in the housing sector (Parkstad Limburg, 2019, 2020). Therefore, the Regional Deal allowed the decision-makers to leverage the success of pioneering projects like SUPERLOCAL and mobilise circular construction as a compelling narrative to attract support from the national government.

The interplay of actors, institutions and discourses

The development of the CE agenda has played out in different ways in Parkstad and Satakunta. Parkstad embraced a predominantly bottom-up approach. The actors, institutions and discourses co-evolved around a specific local project, driven by EU funding and advocacy from the construction domain. In contrast, the transformation of governance configurations in Satakunta was primarily shaped by national-level regulation and initiatives, supplemented by the promotional efforts of actors from the industrial sector. Nevertheless, both regions share certain similarities in how the configurations of actors, institutions and discourses have co-evolved in response to this agenda, as illustrated in Figure 3.

Initially, the CE discourse emerged within the business sphere, where it became closely associated with past and ongoing initiatives. As it was reframed under the influence of underlying governance configurations, its broader uptake is observed, particularly amongst government actors, who formed coalitions with the private sector to spearhead a new discourse. Consequently, the governance configurations transformed, giving rise to novel institutions and institutional practices. Although this shift resulted in a more formalised integration of CE within the governance paths of the two regions, it has failed to instigate fundamental changes in the direction of governance in either case. The prevailing discourses and power dynamics remain unchallenged, and the evolution of governance configurations continues along existing paths. The lasting prioritisation of economic growth through industrial investments underpins the CE agenda in Satakunta, while the dominant commitment to socio-environmental regeneration through spatial and functional restructuring drives the CE transition in Parkstad.

The emergence of the circular economy discourse

The emergence of the CE discourse in Parkstad and Satakunta results from multiple simultaneous internal and external influences. In Satakunta, CE initiatives

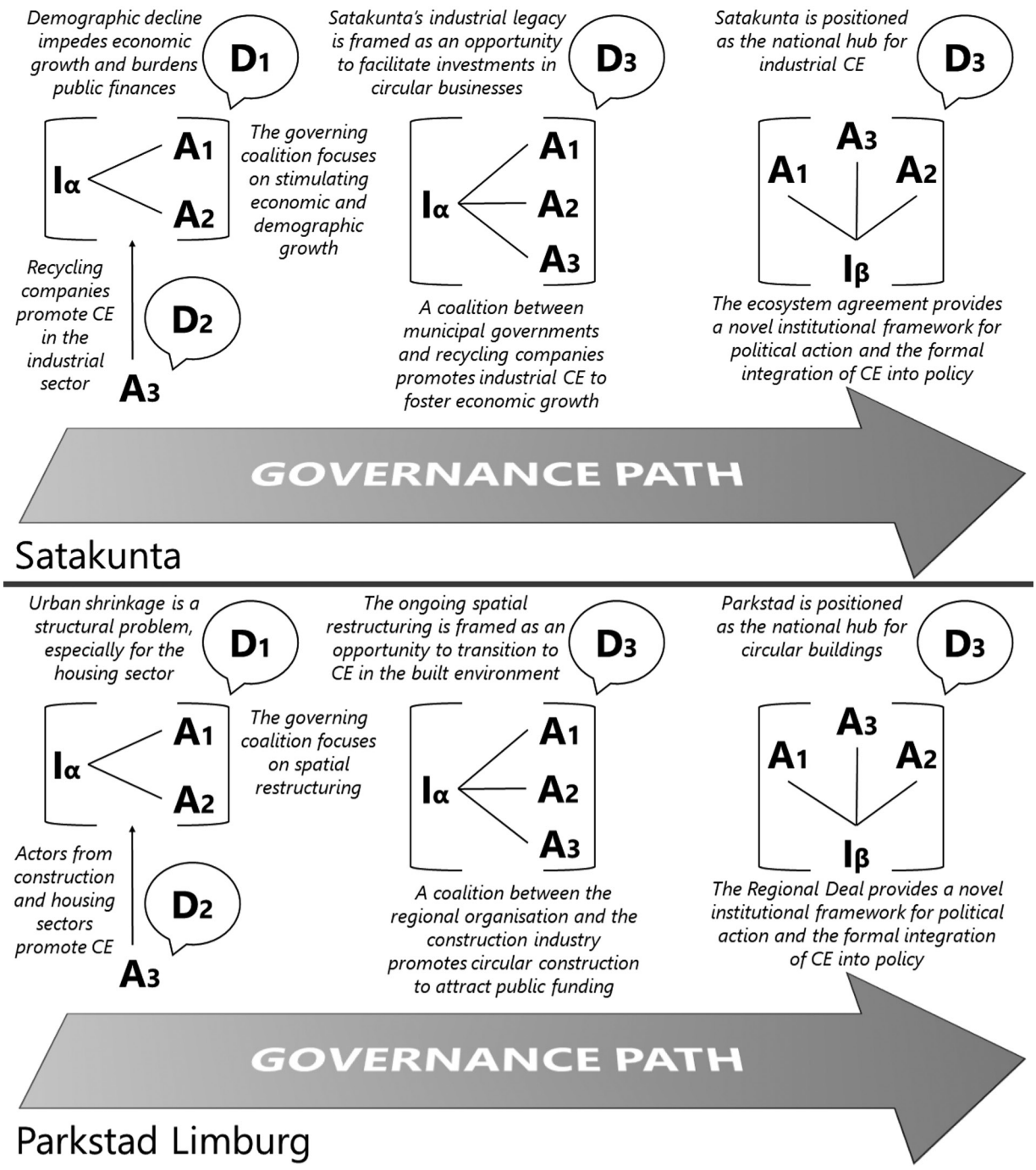

Figure 3. The evolution of governance configurations in response to the circular economy agenda in Satakunta (top) and Parkstad Limburg (bottom) (based on Van Assche et al., 2021, p. 738).

initially arose in industrial parks, notably Kirkkokallio, where different companies established symbiotic relationships between their production chains. However, these processes of industrial symbiosis became characterised as CE practices only when the concept gained prominence in national policy discussions. With tightening environmental regulations, industrial operators in the region recognised the need to transform their operational models,

and CE offered a suitable narrative to frame their activities in terms of environmental responsibility.

Similarly, in response to growing vacancy issues, housing corporations in Parkstad initiated residential demolition activities that encountered strong public resistance, from which the SUPERLOCAL project emerged. However, the project narrative remained focussed on recycling until the actors involved expanded their ambition under the influence of IBA Parkstad, leading them to reframe their discourses in pursuit of additional funding. Consequently, the perceived availability of EU funds for circular construction initiatives played a vital role in developing associated narratives among private stakeholders from the architecture and construction industry, who saw circular experimentation as an ideal opportunity to secure project financing.

Therefore, in both study cases, it was mainly commercial actors who took the lead in embracing CE, predominantly under the influence of broader institutional frameworks. However, the local drivers for change differ between the two regions. The businesses in Parkstad prioritised circular construction because of the promise of financial resources available through EU programmes. In contrast, companies in Satakunta embraced the industrial CE narrative to meet tightening environmental regulations. This observation might indicate the propensity of governance actors in contexts where shrinkage is explicitly acknowledged to align their discourses with broader institutional frameworks, aiming to access novel funding sources. For the same reason, the emergence of CE in Parkstad is directly linked to efforts to manage urban shrinkage (i.e. the SUPERLOCAL project), while such an influence is not observed in Satakunta.

The institutionalisation of the circular economy discourse

The broader political acknowledgement of the CE concept in both study regions came after substantial promotion activities undertaken by actors within the business sphere who sought to shape the political discourse and garner support for their activities. In Satakunta, industrial companies took on the role of policy entrepreneurs, seeking to actively engage with policymakers to promote the CE agenda. Similarly, in Parkstad, a group of local entrepreneurs in the architecture and construction industry actively pushed for incorporating CE principles into local policies and regulations. Interestingly, both of these actor groups have played a significant role within the established governance configurations. Industrial companies are regarded as integral to realising regional ambitions for stimulating economic growth in Satakunta, while the construction sector is indispensable to regional initiatives for delivering spatial restructuring in Parkstad. Their advantageous positions may have also enabled these actors to effectively advocate for the inclusion of CE into the regional policy agenda.

The formal incorporation of CE into the governance configurations of Parkstad and Satakunta began when political leaders and policymakers recognised the potential for attracting public investments and capitalising on broader European transition efforts to achieve their political goals. The SUPERLOCAL project in Parkstad and the CIRCWASTE project in Satakunta were instrumental in motivating decision-makers to actively embrace and promote the CE agenda within their respective regions. The tangible results and positive impacts of these initiatives offered a solid foundation to support and champion associated narratives, empowering them to develop a compelling discourse and pursue novel institutional practices by harnessing the momentum generated within the public sphere.

These developments underscore the convergence of interests between public and private actors, with distinct discourse coalitions emerging in both regions. In Parkstad, a grant coalition between the regional government and private operators in the architecture and construction industry has rallied behind the discourse of circular construction, uniting to advocate for their shared interest in attracting additional public funding to the region. In Satakunta, a growth coalition between municipal governments and recycling companies has championed the industrial CE with a shared objective of fostering business development within the region. A crucial factor enabling them to leverage the momentum and pursue their ambitions more concretely was the availability of particular national-level policy instruments. Specifically, the regional deals in the Netherlands and ecosystem agreements in Finland have presented critical avenues for political action and formal integration of CE into institutional frameworks in Parkstad and Satakunta, respectively.

Furthermore, in both cases, the uptake of the CE narrative among political leaders and policymakers appears to have been stimulated by the ongoing efforts to tackle urban shrinkage and associated challenges. Namely, the ongoing spatial restructuring to address rising residential vacancies in Parkstad has been presented as an opportunity to experiment with circular solutions in construction and demolition activities. At the same time, Satakunta's industrial legacy has been emphasised to facilitate investments in the industrial CE, thereby contributing to creating new jobs and increasing tax revenues. This approach has allowed local and regional authorities in both regions to develop a more optimistic narrative surrounding urban shrinkage, presenting CE as a solution to pressing regional problems, such as growing vacancies and a crumbling tax base. Simultaneously, the urgency of the shrinkage situation has empowered decision-makers to prioritise the CE agenda, enabling them to override opposing viewpoints. This was particularly the case in Satakunta, where the governing coalition promptly addressed concerns about the adverse environmental effects of the industrial CE by

stressing economic challenges and introducing alternative terminology in their discourse.

A key difference is that the resulting CE discourse in Satakunta has primarily revolved around the economic benefits associated with business development and employment opportunities. In contrast, it has expanded beyond economic aspects in Parkstad to include a wide range of social advantages, including improvements to the living environment, health and social cohesion. This difference can be attributed to the more robust discourse on urban shrinkage in Parkstad, which encompasses a multiplicity of issues across various domains. In comparison, the political attention to shrinking cities in Satakunta has mainly focussed on demographic and economic problems, leading to a narrower discourse on CE primarily centred around economic benefits.

Conclusive discussion

This exploratory study has revealed how CE develops into an object of governance in the context of urban shrinkage, using the example of two shrinking European regions. We identified the critical role of commercial actors in promoting the CE agenda, which happens mainly under the influence of (inter)national policy frameworks and funding initiatives. This finding highlights the dominance of CE imaginaries that prioritise the development of circular initiatives within the business sphere while underscoring the significant role assumed by the EU in spearheading the CE transition across Europe (Williams, 2019a, 2021a). However, our case studies also demonstrate that these influences vary with respect to the local context, particularly regarding the dominant goals and priorities related to urban shrinkage, which are a product of past interactions in governance. As a result, the formulation of the CE agenda happens in both top-down and bottom-up fashion and under various internal and external factors, ranging from the imprint of European institutional frameworks and the ripple effects of national policies to the dynamism of local initiatives and the legacy of historical circumstances. This paints a more nuanced picture of CE developments in urban and regional contexts, one that deviates from conventional policy prescriptions characteristic of global cities and involves more intricate interactions among social, political and economic dimensions (Korhonen et al., 2018; Obersteg et al., 2019; Vanhuyse et al., 2021).

Furthermore, with a distinctive focus on circular construction in Parkstad and the industrial CE in Satakunta, the encountered agendas appear notably contextual and idiosyncratic, offering a valuable contrast to the more comprehensive and self-contained approaches commonly observed in the contexts of growth. The governance initiatives underpinning the shift to CE in shrinking cities and regions seemingly tend to focus on specific sectors rather than embracing a full-fledged transition that encompasses the entire urban or regional system. However, this prevailing emphasis on context-specific considerations cannot be regarded as emblematic of a broader drive to contextualise the management of resource flows (Marin and De Meulder, 2018). Instead, the shift to CE assumes a targeted instrumental role, serving to reframe underlying challenges and associated governance efforts and place shrinking regions in a niche position within the broader transition processes at the national and EU levels.

This observation reflects the flexibility of the CE concept to concurrently support divergent governance orientations, which aligns with recent views that characterise it as a boundary object (Winslow and Coenen, 2023). As observed in Satakunta's ecomodernist approach, it can bolster conventional governance efforts aimed at fostering economic growth or facilitate more adaptive strategies geared towards effectively managing shrinkage, as seen in Parkstad's socio-environmental degrowth agenda. These contradicting applications underscore the adaptability and responsiveness of CE to distinct needs and priorities of local and regional governance. As a consequence, its adoption in the two regions did not present entirely new development pathways but rather served as a unifying agenda for existing interests. It merely reinforced prevailing governance priorities without introducing fundamentally new objectives or challenging the established discourses and power dynamics.

While this insight raises questions about the limited articulation of the CE concept as a radical political agenda capable of fundamentally transforming contemporary societies (Calisto Friant et al., 2020, 2023), it also speaks of distinct structural barriers that the actors in shrinking areas encounter in effecting transformative systemic changes. The studied cases reveal a tendency towards prioritising instrumental rationality and taking a piecemeal approach in adopting CE. In addition, efforts to reframe waste as a resource in Satakunta seem to be primarily aimed at garnering public support for initiatives linked to the industrial CE rather than enhancing the appeal of waste markets for various sectors and businesses, as has been observed in other contexts (Savini, 2019, 2021). This approach may be attributed, in part, to the pronounced public mistrust in government institutions and agencies, a sentiment commonly observed in left-behind places, such as shrinking cities (Ročak, 2020; Rodríguez-Pose, 2018). This insight brings forth the issue of the political legitimacy of CE solutions, which represents yet another frequently overlooked hurdle. However, it also highlights the tendency of boundary objects, like CE, to be readily leveraged by influential actors to shape transition dynamics while safeguarding vested interests (Winslow and Coenen, 2023).

Overall, our findings highlight a strong interplay between the governance configurations of shrinking cities

and regions and the formulation of CE agendas. In both Parkstad and Satakunta, the CE discourse has influenced ongoing interactions between various actors and institutions while concurrently being transformed as it intersected with other discourses holding influence in governance, including those surrounding urban shrinkage. This observation implies the need to approach CE transitions in these contexts, and possibly broader urban and regional settings, as a political process shaping and being shaped by the contextual interplay of distinct configurations of actors, institutions and discourses. This process seemingly transcends the fundamental ambition of effectively realising CE principles, rendering CE governance under the condition of shrinkage difficult to associate with particular circular futures (Bauwens et al., 2020; Calisto Friant et al., 2020). Therefore, the pursuit of CE in such situations should not be construed as inherently amenable to idealised end-states and outcomes but rather as an emergent phenomenon that co-evolves with local governance dynamics. Distinct visions of CE do not dictate the direction of this co-evolution; instead, it is shaped by the unique character of the governing path that underlies it.

These findings suggest that, notwithstanding the observed similarities between the two study cases, the adoption of CE in different shrinking cities and regions may be vastly diverse due to unique urban shrinkage patterns and their diverging implications on resulting governance processes. Hence, a systematic inquiry into the dynamic interactions between CE developments and the multifaceted context of urban shrinkage should provide a more nuanced picture of their interrelation while unearthing potential opportunities for new path developments. The focus cannot remain solely on effectively implementing the CE concept but must shift towards studying its interactions, transformations and effects in governance. This also includes understanding the possibilities it opens or closes for realising existing aspirations or envisioning alternative futures—which may not necessarily be circular. With this in mind, we call for future studies examining the conditions under which CE evolves into a radical agenda capable of bringing together transformative coalitions that can disrupt powerful political interests, as well as investigations into why such efforts may fall short of challenging the status quo. We contend that shrinking cities and regions, already undergoing disruptive transformations, offer a valuable setting for such inquiries.

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