

6

SOCIO-SPATIAL DIMENSIONS OF A CIRCULAR ECONOMY

*Pauline Deutz, Andrew E.G. Jonas, Sabrina Brullot,
Martin Calisto Friant, Małgorzata Pusz,
Aodhan Newsholme, Santiago Perez,
Heather A. Rogers and Kaustubh Thapa*

6.1 Introduction

Interest in the transformative potential of a circular economy (CE) has emphasised economic and environmental benefits with relatively little attention paid to how the changes anticipated might be distributed either spatially or socially. Given that economic activity is socially constructed in and across space – in specific places and regions as well as globally – it follows that activities contributing to a CE always operate within, and are shaped by, different socio-spatial contexts. Yet the difference that place and space make to the development of a CE rarely receives explicit attention in the literature. There are calls for ensuring a regionally ‘just’ transition ([Stavis and Felli, 2020](#)), e.g. from the [European Commission \(2019\)](#), with assurances which imply recognition of socio-spatial inequalities. There has also been growing interest in the role of the CE in global development (e.g. [de Souza Campos et al., 2023](#)), but likewise largely without an explicitly geographic focus.

The social dimensions of the CE have started to receive significant theoretical attention ([Mies and Gold, 2021](#); [Valencia et al., 2023](#)), but so far there is a lack of significant empirically based research to support the increasing association of the CE with social ambition in academic definitions ([Kirchherr et al., 2023](#)). Environmental policies can indeed bring social and economic benefits, but with uncertain redistributive impacts – effects on different social groups will vary ([Fullerton, 2011](#)). Furthermore, there are uneven socio-spatial outcomes, with an emerging economic focus (such as CE or bioeconomy) generating a new area of competition between places while reproducing rather than removing the contradictory interests between employers and employees characteristic of the global capitalist economy ([Deutz, 2014](#)). Moreover, while academics may have social aspirations for a CE, this is not necessarily the focus of policymakers (see [Chapter 3](#) in this volume).

Furthermore, the impacts of national-scale policies need to be examined at smaller scales (Bourdin et al., 2022); more attention is needed to understand the effects of and relationships with CE policies at a larger scale (Gregson et al., 2015). The complexity of socio-spatial effects, including cross-scalar influences, relating CE policies and practices has been neglected in CE research, which tends to be routed in specific territories. Here we counteract that shortcoming by drawing on a number of Cresting studies.

This chapter describes and examines examples of CE policies and practices in particular places and their relationship to the wider regional, national and global political economy. We thereby seek to uncover how local or place-specific factors are influencing, or are influenced by, the CE; how in turn those factors may be influenced by processes at work at wider scales; and to assess socio-spatial redistribution across and between scales. The chapter draws on project case studies of plans and proposals for the implementation of a CE in diverse places and regional settings. In so doing, the chapter addresses four spatial scales relating to the different contexts: neighbourhood-scale short-loop CE practices (Hull, United Kingdom, Graz, Austria, and Santiago, Chile); city-scale policies for the CE (comparing Amsterdam, Copenhagen, Glasgow); regional policies for long-loop CE and industrial engagement (the UK, France, Austria); and global-scale impacts of European-scale extended producer responsibility policies (Nigeria and Vietnam).

6.2 Space, place and the circular economy

For geographers, places often have material significance and meaning extending well beyond their immediate territorial boundaries. Place and territory have a complicated relationship with each other insofar as the residents of a place will have material and meaningful attachments reflecting the experience both of living there and their connections with other places (Massey, 1991; Cresswell, 2014). Businesses and organisations, including territorially defined organisations such as local government bodies, likewise have complex interests in, and perspectives on, places. These reflect views of their different branches and of their employees as well as those relating to institutional memory and similar ‘untraded interdependencies’ (Storper, 1995). Perspectives may in turn reflect connections across space and scale (Cox and Mair, 1998; Coe et al., 2008). Even the physical boundaries of a place can vary according to different local and regional functions (Warnaby, 2009). Places are thus simultaneously influenced by societal (and natural) processes both within and extending beyond their immediate territory, including state policies at different scales (Jonas, 2024). When considered together, place, territory and scale are discrete yet overlapping concepts that are often used interchangeably to describe the complexity of societal processes operating within, around and through space (Jessop et al., 2008).

While the specific combination of more or less global societal processes and circumstances seldom maps uniformly onto different specific places, territories and

scales (especially at the global scale), the underlying societal issues, conditions and constraints can be similar – and these in turn can be illuminated by a detailed study of particular places (Cox, 2021). Spatial context influences socio-environmental outcomes notwithstanding their technical similarities (e.g. Deutz et al., 2015). Spatial analyses of CE tend to focus on the territory or scale of the place in question as delimited by jurisdictional boundaries (be these urban, regional or potentially national or supranational in the case of the European Union – EU; see, for example, Colombo et al., 2019; Johansson and Henriksson, 2020; Williams, 2023). This approach, however, underplays the multi-scalar operation of societal processes as addressed in the geographic literature on place, territory and scale (Jonas, 2024), thus contributing to the problem of ‘methodological territorialism’ (Jessop et al., 2008) wherein one scale (e.g. the local) is analytically privileged at the expense of knowledge of the workings of another (e.g. the global). Gregson et al. (2015), for example, consider how EU policy for the CE has implications beyond the Union given international waste flows that the policies seek to end by promoting loop closing within the bloc. Likewise, CE literature (e.g. Stahel, 2013) that idealises the local scale for closing loops tends to underplay the role of wider (e.g. regional) collaborative networks for achieving such a transition. Conversely, focusing on a given scale (especially national or above) can overlook spatial variations at smaller scales. This calls into question the prospects for implementing a more socially *and* spatially encompassing ‘just transition’ to a CE.

Within the field of CE research there is emerging interest in approaches focused on cities and/or regions. Scholars have highlighted the important role that cities and urban planning and governance can play in developing CE initiatives and adapting to climate change (Petit-Boix and Leipold, 2018; Campbell-Johnston et al., 2019). Much of this work examines the potential challenges and barriers that cities (urban administrations) and their stakeholders face when transitioning to a CE. Notably, city CE policies tend to focus on the types of initiatives relating to existing functions of cities (such as waste management, public health and supportive of company-facing economic development) (Petit-Boix and Leipold, 2018; Fratini et al., 2019). Similarly, regionally focused work is also emerging (Tapia et al., 2021; Bourdin et al., 2022) that examines challenges facing policymakers, such as recruiting companies to participate in industrial symbiosis (exchange of pre-consumer residues between different entities (Chertow, 2000; Rincón-Moreno et al., 2022)). The scalar focus of this work reflects the limited scope to directly impact approaches beyond the spatial scale of the territory, but also exhibits limited reflection on unintentional impacts.

City-focused as well as regional CE research tends to concentrate on what can be termed top-down approaches. These consist of institutional change, such as strategy and policy decisions from public bodies focused on projects concerned with developing and facilitating market initiatives (Ghisellini et al., 2016; Lieder and Rashid, 2016). Conversely, bottom-up change describes company collaborations within supply chains and also social movements such as sharing schemes

(Hobson and Lynch, 2016). The shorter-loop resource recovery options such as repair, reuse and sharing options (Stahel, 2013) are commonly overlooked, or under-emphasised, in city-regional approaches to the CE (e.g. Petit-Boix and Leipold, 2018). Nevertheless, these strategies are starting to attract research attention, sometimes under the heading of ‘diverse’ (not financially driven) economic approaches (Gibson-Graham, 2008; see, for example, Hobson and Lynch, 2016; Lekan and Rogers, 2020) rather than in mainstream urban or regional analyses.

This chapter reports on aspects of the Cresting project that have sought to analyse the socio-spatial dimensions of the CE. The intention is that by carrying out spatially situated analyses of the local and regional development of different aspects of the CE we can uncover the structures, mechanisms and contingent conditions that would, or could, be of more general applicability to knowledge of the development of the CE at wider scales including the global.

6.3 Methods

In this chapter we draw on Cresting research conducted under both ‘place’ and ‘policy’ headings that utilise a range of primarily qualitative methods including document analysis, stakeholder interviews, workshops and the Delphi method. Following a critical realist philosophy, we seek to separate the underlying causal mechanisms and contingent conditions (those that are place-specific as well as those that operate across multiple scales; Sayer, 2000). Using this approach we can strive to understand general patterns from the experiences of specific places and regions; itself a well-established approach in geographical research (Cox, 2021). Furthermore, working with multiple scales enables us to gain an understanding of their interrelationships without prejudice to one over another (Ollman, 2003; Jessop et al., 2008).

Some comparisons are made between case studies conducted by the same person, while others draw on case studies conducted as separate research studies. Table 6.1 shows the different aspects of the CE, along with their scales, places and territories of operation, which are included in the studies considered in this chapter. There is no space here to provide details about the methods used so references are provided instead. Given the large number of different places involved, contextual information is provided in section 6.4 alongside a discussion of the findings.

6.4 Findings and discussion

These are presented in terms of the four scales of the CE considered, which broadly correspond to the scales of policymaking and the underlying generative conditions (neighbourhood scale, urban scale, regional policies, and global implications of national/supranational policies) with multiple examples compared at each scale. Although each scale provides a discrete analytical entry point into the CE, the examples also explore inter-scalar connections.

TABLE 6.1 Scales and approaches to the CE presented in this chapter, with methods used and references for further information

<i>CE aspect and scale</i>	<i>Places and territories</i>	<i>Methods</i>	<i>Reference</i>
Community-embedded short-loop approaches (repair, reuse, repurposing)	Hull, UK, Graz, Austria, Santiago, Chile	Interviews	Pusz, 2023 Rogers et al., 2024
Urban-scale CE policies	Amsterdam, Netherlands, Copenhagen, Denmark, Glasgow, UK	Policy analysis Secondary data to characterise the cities	Calisto Friant et al., 2023
Regional-scale collaborations for CE development	North Humberside, UK, Styria, Austria, Strasbourg, France	Document analysis, semi-structured interviews	Newsholme, 2023 ; Perez et al., 2020
Global-scale material flows	Vietnam, Nigeria	Documents, interviews, workshops, observations	Thapa et al., 2023 ; 2024

6.4.1 *Neighbourhood-scale: community-embedded short-loop CE strategies*

This section examines ‘actually existing’ CE initiatives, which, in contrast to the policies discussed below, are not necessarily self-defined as CE initiatives. They tend to emerge from already existing neighbourhood-based projects, organisations and/or social enterprises embedded in their communities. What the organisations in this section have in common is that they are engaging with short-loop CE strategies (repair, reuse, repurpose – and to some extent recycling). Some of these organisations engaging in CE activities are not independent of local government influence, as will be shown, but they are engaging in CE practices because they suit the organisations’ purposes and capacities, rather than responding to a city plan (i.e. they comprise bottom-up initiatives). The cities used for this aspect of the research are Hull, UK, Graz, Austria and Santiago, Chile.

Both Graz and Hull are manufacturing cities surrounded by a rural agricultural economy. Hull (population 267,010 in 2021; [Hull City Council, 2022](#)), is a maritime port city with an industrial heritage linked to water as a means to import, export and dispose of waste. While Graz (estimated population 305,404; World Population Review, 2023a) is the capital of the region of Styria, Hull is a standalone local authority as the UK does not have a regional scale of governance. The third city, Santiago, was selected as a contrast. It is the national capital of Chile with a much

larger population than the other two cities (estimated population 6,903,392; World Population Review, 2023b) and is the dominant urban centre within the Chilean economy. Hull notably includes some of the most deprived neighbourhoods in the UK, with a thriving voluntary and community sector. By contrast, Graz benefits from the greater social protections in Austria (scoring 13.3% compared to the UK's 18.6% poverty rate; World Population Review, 2023c), and is missing the extensive and embedded poverty found in Hull, where there are families with multiple generations of worklessness. The overall level of prosperity in Austria may contribute to the relatively high per capita production of waste for the EU. However, it does not indicate an absence of underprivileged residents, albeit that they may be comparatively hidden and potentially therefore missing out on support to which they may be entitled (Eisfeld and Seebauer, 2022). Although a high-income country since 2012 by World Bank definitions, Chile has a much lower per capita income than the UK or Austria and a higher Gini co-efficient indicating the social shortcomings of apparent economic development in recent years¹ (World Bank, 2023). The city is strongly segregated along class or income lines, with some neighbourhoods exhibiting deep and firmly entrenched poverty re-enforced by institutional arrangements (Dockemdorff et al., 2000). Frustrations with this spatially uneven development resulted in an outbreak of social unrest across Chile known as the 'Estallido Social' (Laing et al., 2019).

6.4.1.1 *Institutional arrangements for community organisations/ social enterprises*

Many, though not all, of the organisations considered in this section broadly fall into the category of social enterprises (SEs). This term encompasses a range of legal arrangements and organisational forms in different countries, which have developed since the early 2000s as a new form of organisation alongside more traditional charities. We adopt the academic definition of a SE as a mission-driven organisation that may have a 'business arm' for the generation of income, but which invests that income in a social and/or environmental cause of benefit to local communities (Longhurst et al., 2016). In exchange for their investment to the common good, organisations may enjoy tax privileges and other simplifications of the barriers to business in comparison to regular companies. In Chile and Austria, there have been deliberate initiatives to encourage environmentally driven SEs; by contrast in the UK there are tax incentives for regular (i.e. profit-driven) companies to invest in organisations delivering social benefits (Pusz, 2023).

Other organisations, notably the small-scale repair companies in Hull, do not necessarily have the motivation of community or environmental benefit, though these may be present (Rogers et al., 2024); nonetheless, they are embedded in neighbourhoods across the city. Organisations studied in Chile are primarily led by entrepreneurs trying to launch businesses drawing on CE strategies, such as

upcycling. These organisations are protected by the status of SE under Chilean terms (i.e. for their environmental benefits). They are not setting out with altruistic motives, albeit that they may have intentions of addressing social issues in the future. Crucially, while there are many examples of more ‘altruistic’ SEs in Chile, the researchers primarily engaged with those Chilean SEs that target financially privileged consumers, with the aim of cross-fertilising ideas across different socio-spatial contexts (e.g. proposing new business ideas/circular activities to be implemented by SEs in Hull; Puszt, 2023).

6.4.1.2 Circular activities

An overview of spaces where circular activities are taking place, circulating materials and (co)producers for each city is shown in [Figure 6.1](#). This demonstrates the wide range of neighbourhood and social contexts involved, ranging from individuals’ homes to institutional settings such as prisons and schools, allotments and community spaces. Some of these are providing public services; others are community driven (albeit that they are sanctioned by local authority policy, as in the case of allotments). Likewise, the individuals participating represent a wide range of social groupings – some are explicitly disadvantaged (prisoners, ex-offenders, the mentally disadvantaged, the homeless), others are defined by characteristics that might imply a level of need depending on their circumstances (the elderly, ethnic minorities, women) and still others who are apparently in certain categories by choice (artisans, students). Finally, a wide range of materials are reused, conserved or recovered by these groups. Sometimes these activities (arts and crafts) are undertaken for their own sake, sometimes for support, or to provide local cost options (such as food).

In Graz, a detailed case study was made of *heidenspass* – a project run by an association established to provide work for unemployed youth. A range of CE activities are undertaken, including the preparation of meals for staff and customers from the unsold surplus of a large retailer, or repurposing/upcycling a range of materials (including vehicle parts, clothes and furniture) into goods with aesthetic and economic value ([Lekan et al., 2021](#)). In addition to the environmental benefits of preventing materials from going to landfill, the SE provides work experience and skills to disadvantaged youth. Notably, the latter comprise a low-cost workforce, which alongside the fact that many of the inputs are donated, help to keep *heidenspass* financially viable. Not all of the resources/customers are local – many of its retrieved/remade/resold goods are products of global production systems. The SE’s relationship to the city of Graz is via social services, i.e. with respect to the workforce. Relationships surrounding material supplies largely occur with companies (other goods being donated). Those companies are also the key customers (in line with the ambitions of Chilean entrepreneurs), paying, on a business-to-business basis, prime prices for the image of environmental and social care conveyed in remanufactured/upcycled goods.

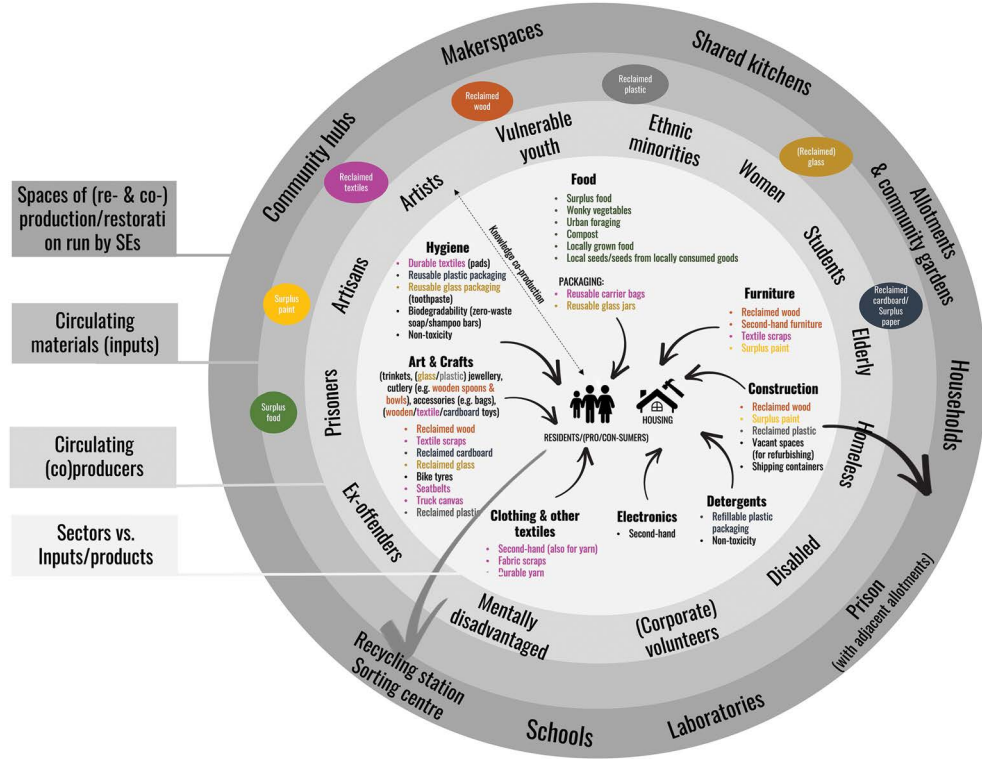


FIGURE 6.1 An overview of circular spaces of (re- and co-)production, circulating materials and (co-)producers, and generated items in the context of case study SEs in Hull (UK), Graz (Austria) and Santiago (Chile)

Source: Designed by co-author (Pusz, 2023, p. 128).

By way of comparison, in Hull 31 participating organisations were studied ranging from locally predominant SEs operating multiple retail outlets (i.e. charity shops in UK terminology) to those that are heavily dependent on a key individual. The SEs typically function in more than one field, but variously focus on food (six); furniture (five); clothing and other textiles (five); arts and crafts (four); hygiene (one); electronics (two); construction/housing (six); mixed (two) sectors (Pusz et al., 2023). Of these, two of the arts and crafts organisations are defined primarily by their target beneficiaries (i.e. the elderly and autistic people). These organisations work with a wide range of social groups, sometimes more than one, namely the elderly, the disabled, the mentally struggling, the homeless, ex-offenders, prisoners, vulnerable youth, refugees and asylum seekers. As with *heidenspass*, there are SEs with close relationships to large corporations. In the case of Hull, this also includes a large commercial waste management company enabling one SE to capture reusable items from a waste recycling centre, and local authorities. While companies act as sources of unwanted products (rather than as customers), local authorities offer SEs contracts to provide a service (although many are filling in gaps in service delivery of their own accord, possibly with financial support). There is a level of competitiveness and distrust between organisations, which are protective of both their geographic space in the town and their remit. The CE is typically a means to an end (e.g. providing affordable food or consumer goods, cheap materials for craft or similar activities, or raising money for social ends by selling to the public). SEs in Hull may also deliver social-circular value across the city through concessionary leases or ‘liability transfers’, whereby local authorities rent their premises (i.e. surplus public sector assets) to mission-driven SEs for a peppercorn rent provided that those properties are not used for profit. Nonetheless, such properties in Hull are often in poor condition, entailing high maintenance and repair costs. Property leasing from companies thus seems to be a more viable alternative for financially constrained SEs, especially in case those companies can cover any repair/refurbishing costs.

A further group of five self-employed repairers were interviewed in Hull (Rogers et al., 2024). Having been working in their respective fields for up to 25 years, these individuals were not motivated by the concept of the CE, but were nonetheless providing a service that is arguably the ideal of a CE (Stahel, 2013), namely extending product life and not just keeping the products in use but with the same owner (minimising both energy and transaction costs) and keeping both the product and the economic opportunity arising from the CE in the same locality. Notably, however, these individuals already had the possibility of taking on more business than they could manage, but nonetheless were operating at the edges of financial viability and were either too busy or too far removed from their skill set to contemplate taking on staff to expand their business. This is in contrast to creative and usually young entrepreneurs from Santiago, albeit that they were engaged in sectors other than repair, who were looking to develop their businesses.

In Santiago 17 SEs participated in the study and were selected on the basis of materials (e.g. food, wood, textiles), online visibility and recommendations. The participants were engaged in a range of activities including recycling and upcycling, making toxin-free products, running recycling centres and providing consultancy services. Similar to the other cities under study, not all of these arrangements embody financial transactions. Some materials and services are donated by private companies or individuals (e.g. tetra pak to insulate houses for the poor, textiles to make yarn and then new high-quality items, or waste management company-derived plastic caps for repurposing into plastic filaments that are used by indigenous artisans), and some SEs offer services that are provided for free (e.g. offering internships) – partly as a relationship building exercise. One company, Prana Sopas, is circular in the sense of selling food in reusable packaging (e.g. glass jars) – albeit that the glass jars are bought from the People’s Republic of China. Such SEs tend to consciously use reusable packaging not so much for economic benefits but as the basis of their marketing strategy and awareness raising. Unlike SEs in Hull or Graz, many of the SEs in Santiago intend to upscale their ventures to sell their goods internationally (although this entails complex and expensive shipping arrangements), or replicate their businesses, i.e. establish circular social franchises (Pusz, 2023, p. 239), not only across the country but also abroad. The case of Plastic LUP also reveals how SEs can empower artisan communities across the country by equipping them with the necessary skills, knowledge and tools to sell their circular products directly to customers (i.e. bypassing profit-driven middlemen).

The SEs under study are providers of short-loop CE services, and these community organisations can be framed as part of the ‘diverse economy’ (Lekan and Rogers, 2020; Lekan et al., 2021). They produce ‘circuits of value’ (Lee et al., 2004) drawing on non-financial values (voluntary labour, donated premises/materials/products). SEs in Hull and Graz were primarily working for a socially ‘good cause’ (e.g. raising money to support disadvantaged groups, or directly providing resources/opportunities for people especially in socially deprived urban neighbourhoods). In Santiago, however, the SEs bore more resemblance to small companies with a business model of cheap/secondary inputs enabling the marketing of environmental products (although exceptions apply e.g. one venture produces reusable sanitary pads using first-hand, high-quality imported materials). However, while that may appear less altruistic, many of these organisations look forward to becoming more socially responsible (e.g. by providing workshops for disabled individuals). They seem to have found a more remunerative approach than their opposite numbers in Hull: targeting people keen to consume (and pay for) circular goods, rather than those who are constrained in their choices. This may offer a more financially sustainable approach (not always helpful to the marginalised), therefore potentially being a secure route for material circulation. Whether similar markets for such goods exist in Hull, or other relatively small cities (compared to large capital city Santiago) is uncertain. Above all, while these SEs are encouraging a different type of consumption, which can serve as a means to generate

socially beneficial new employment opportunities, their activities are probably still not as environmentally beneficial as reducing consumption when it comes to non-essential products.

There is an element of competitiveness among SEs in all contexts (SEs compete for funding awarded locally, regionally and nationally; some SEs such as *heidenspass* tend to compete for specific materials from private companies working with similar SEs in the city). The case of SEs in Hull and Graz also revealed distrust between organisations, which are protective of both their geographic space in the town and their remit. What these SEs also share is a use of materials/goods produced in the profit-driven enterprises derived on a global scale from ‘global circuits of capital’ (Lekan et al., 2021), and therefore do not comprise a separate economic category. A third way of regarding these organisations is that while it is possible to extract additional use value from pre-used/discarded items (i.e. to make something that someone will want to use), there is limited potential in terms of exchange value (what anyone might want to pay) as individuals try to earn a living at the margins constrained by the costs of alternatives or SEs cannot be self-sufficient (so also linked closely with public support) as we discuss elsewhere with respect to Hull (Deutz et al., 2024). This underscores the limitations inherent in a CE strategy founded on SEs, and also the limitations of a corresponding social strategy. SEs are largely treating the symptoms of social problems, rather than resolving them, which should serve to remind us that while CE approaches may offer some cost saving and even fundraising options, these are nonetheless merely a form of first aid from a social perspective. They may also encourage private companies to pursue greenwashing practices. Some SEs do, however, set an example for large private companies on how they could reinvent their business models in a more sustainable fashion (e.g. by offering toxin-free products or refillable packaging), taking responsibility for their end-of-life-products rather than shifting it to third parties (see also Chapter 9 for EPR schemes).

In sum, a wide range of local-based short-loop CE activities take place in the cities under study. The circular activities in Chile and the repair workers in Hull provide models for how individuals can generate a living through a CE (see also Chapter 7 in this volume). The social enterprises in Hull and Graz are, both knowingly and coincidentally, using CE approaches to provide support, social activities and affordable commodities to local people. Importantly, while none of these activities is directly under the control of a public authority, or part of a wider CE strategy, they do reflect the characteristics of the neighbourhoods and communities in the places where they are operating. There are varying forms of support and funding and ways in which organisations are complementing or directly delivering local public social services or responding to national government financial policies. The materials they work with are sourced from the financially motivated economy (on a global scale), despite the fact that some of the exchanges described are enabled or subsidised by non-economic values. In all the above cases, the aims of the SEs include (re)entering products into the mainstream economy, which they then

have to enter into competition, and meet the requirements for other products. Thus, these circular activities are neither a means to opt out of the economy nor a means to find a more secure pathway within it.

6.4.2 *City-wide policies for the CE*

In this section we consider policies for implementing the CE at the city scale. Three European cities, Amsterdam, Glasgow and Copenhagen, were chosen for analysis, all of which developed wide-ranging CE strategies following the enactment of the CE Action Plans launched by the European Union (EU) in 2015 and 2020 (Calisto Friant et al., 2023). These wealthy cities in the Global North may shape the nature and scope of the debate on the topic and influence other cities seeking to implement CE policies within and beyond the EU. Analysis was undertaken of self-defined CE policy documents for each city to uncover their vision of a circular economy based on the scope of issues included, the policy commitment to implementation and in particular the extent to which they are attempting to build in socially distributive elements (or safeguard against retrogressive impacts) (Calisto Friant et al., 2023a).

Each of these cities is the most populous city in their respective country and each is of key economic importance for their regions as port cities and major industrial, trade and cultural centres. Copenhagen and Amsterdam are also capital cities while Glasgow is not (though Amsterdam is not the seat of government for the Netherlands). National population and country size are variable, but all three have populations of one to two million including suburbs (World Population Review, 2024a, 2024b, 2024c). Glasgow has a notably deprived population compared to the rest of the UK (it suffers from deindustrialisation without the benefits of the commercial/financial opportunities of the other cities under consideration). While inequalities are lower in the Netherlands and Denmark compared to the UK (World Population Review, 2023), there are nonetheless pockets of deprivation in Amsterdam (with one in five households meeting a local definition of poverty; City of Amsterdam, n.d.) and poverty is an emerging issue in Denmark (notwithstanding the overall high quality of life in that country) as benefits have shrunk over the last decade (Ejrnæs et al., 2020; Hussain et al., 2021). Of little consolation to individuals affected, the scale of the problem of poverty in Copenhagen and Amsterdam is very dissimilar to that in Glasgow (Glasgow Centre for Population Health, n.d.).

Besides their social characteristics, the cities need to be understood in the context of national circular economy policy. Notably, Amsterdam published its own inaugural circular strategy in 2012, ahead of the Dutch national programme in 2016 (Government of the Netherlands, 2016). The plan was further developed and revised in 2020 (Municipality of Amsterdam, 2020a), with a strengthening of the country's social ambitions. The plan explicitly targets not just reducing the city's ecological impact, but promoting wellbeing and 'a fair chance at a good life' (Municipality of Amsterdam, 2020b, p. 11) while still being reliant on economic growth to bring

this about. Thus, although this is an unusually socially aware approach to the CE, it is nonetheless reformist rather than socially transformative in the sense of [Calisto Friant et al. \(2023\)](#). The first Scottish CE strategy appeared in 2016, similar at the time to that of the Netherlands. Glasgow City Council responded to the national approach with its own policy appearing in 2019. Critical of the socially divisive impact of neoliberal (i.e. relatively unregulated) capitalism on the city ([Glasgow City Council, 2020a](#)), the Council sought better social outcomes from the environmental safeguards envisaged within a CE. This is a strongly reformist approach – a triumph of optimism in expecting a significantly different socio-economic outcome from a (somewhat) different enviro-economic approach. As with Glasgow, the Copenhagen CE policy followed on from the Danish national policy of 2018. Published in 2019, the Copenhagen approach to the CE is likewise firmly embedded in a pro-growth strategy. Similarly to the UK's national approach to the CE, the policy highlights the association of the CE with 'waste and resources' ([Municipality of Copenhagen, 2019](#)). While concerned for the city's and respective countries' disproportionate use of resources, the drive is for increased eco-efficiency in the context of green economic growth, rather than a call for reduced resource use and socio-environmental impacts; it is also not a call for increasing equality of access to resources. In all cases, policies were largely based on industry rather than community consultations. While the Dutch government held some participatory workshops with citizens and civil society organisations to build their CE policies, their role in shaping the outcomes of the CE strategies was consultative and the impact of the workshops is thus rather unclear.

An extensive review of the urban CE literature led to a categorisation of published CE policies at the urban scale into the 12 policy areas presented in [Table 6.2](#) (based on [Calisto Friant et al., 2023](#)). Each city's level of commitment to each policy area is based on the both the number of policies under each heading and the scope and strength of these proposals, i.e. their implementation (i.e. the number and scope of actions proposed to back up a given area of CE activity).

All three cities' CE plans focus on areas critical to their own operations. New monitoring programmes, public procurement and public-private partnerships relating to the CE have been put in place. Education is also a common priority, especially as a means to raise awareness of the CE and wasteful practices. However, the cities promote such issues in ways that bring the responsibility to the consumer rather than challenging the systemic conditions that influence consumption habits. Food waste reduction and recycling is another core policy area with many actions taken to make use of organic waste, which must now be separately collected and recycled according to the new EU directives and regulations on the CE (also a requirement in the UK). Waste management, besides food, is one of the top priority areas for Copenhagen, where there are plans to improve recovery and recycling infrastructures and technologies. It is also an important policy area in Amsterdam, but seemingly less so in Glasgow based on specific CE policies. However, it is likely that this reflects the fact that there is a separate zero waste policy in Glasgow

TABLE 6.2 Commitment of the municipalities of Amsterdam, Glasgow and Copenhagen to different policy areas in their respective CE action plans. Policies are shown in order of collective policy commitment for the three cities.

<i>Policy area</i>	<i>Amsterdam</i>	<i>Glasgow</i>	<i>Copenhagen</i>
Governance and municipal operations	Strong commitment	Strong commitment	Medium commitment
Education and knowledge development	Strong commitment	Strong commitment	Medium commitment
Food and organic waste streams	Strong commitment	Medium commitment	Medium commitment
Economic and industrial policy	Medium commitment	Medium commitment	Medium commitment
Green buildings	Medium commitment	Medium commitment	Medium commitment
Waste management	Medium commitment	Limited commitment	Strong commitment
Social justice and livelihoods	Limited commitment	Limited commitment	Limited commitment
Renewable energy	Limited commitment	Medium commitment	No commitment
Transport and mobility	Limited commitment	Medium commitment	No commitment
Water management	Limited commitment	No commitment	No commitment

Source: based on Figures 3, 5 and 7 in [Calisto Friant et al. \(2023\)](#).

Note: The commitment of each city is measured as follows: no commitment: no policies in that area are developed; limited commitment: some minor policies are proposed for that area; medium commitment: a reasonable number of policies were developed for the area, possibly leading to real changes; strong commitment: a wide range of policies are proposed for that area likely causing substantial changes to the sector.

([Glasgow City Council, 2021](#)). Likewise, the relatively low commitment to transport or mobility, water management or renewable energy tells us that the cities are more narrowly defining the CE than is the academic literature, but does not mean that they are not giving attention to those issues. This emphasises the need to broadly define how CE policies are investigated as they may come under different policy areas in different cities (and indeed may not be identified as circular).

Economic and industrial policies emerge as important aspects of the CE policies of the examined cities, albeit with a medium level of commitment. All three had incentives and support systems for CE innovations, technologies and start-ups, with an overall ambition to make CE an avenue for economic growth, development and competitiveness. Green buildings and constructions standards also stand out as relatively important policies in all three cities, which seek to improve the recovery and recycling of demolition wastes and the use of sustainable building materials. Conversely, little attention was given in CE-specific policy to urban form or

territorial planning. Thus, the focus is more on dealing with, literally, material-related issues, rather than instituting new urban design principles with the associated need for financial resources and long-term planning.

Significantly, policies in the area of social justice and livelihoods are largely absent from all three cases, despite that Glasgow and Amsterdam both positioned their CE strategies in terms of social justice and improved social wellbeing. Copenhagen has significantly lower commitment to CE policies across the range (with a high-level commitment only to waste). Glasgow and Amsterdam are perhaps driven by observations of social deprivation at the urban scale, but ultimately they are constrained by the policy areas within their remit and the budgets at their disposal. Thus, they appear to be relying on the increased economic growth that they associate with a CE to provide social benefits without redistributive intervention. Unlike the other cities, Copenhagen did not claim to have social justice as a goal or an aspiration in its CE strategy. However, this may not reflect a disinterest in social wellbeing in Copenhagen so much as an assumption that such issues are managed at the national scale (for better, or, increasingly, for worse).

We see therefore that these three cities have taken on board ambitions for a CE that reflect their multi-scalar circumstances. The combination of a socially ambitious rhetoric in the absence of a socially ambitious CE policy (as seen at the EU scale) is reflected most closely in Amsterdam. Copenhagen shares the waste/technology focus of the EU in practice, without the social welfare rhetoric. Glasgow, which is of course no longer part of the EU, is nonetheless closer to the EU than the Scottish approach (which is far more waste-oriented and with economic expectations, but social concern addressed by non-CE policy areas). This may reflect contrasting political views in response to the observed levels of deprivation in the city. CE policies without awareness of social implications risk reproducing existing social relations (Calisto Friant et al., 2023a), but more radical or socially transformative options (see Chapter 3 in this volume) are not in the gift of city governments, especially not those with tightly constrained budgets. Little attention is paid to the social or environmental implications of their consumption beyond the territory of the city.

6.4.3 *Regional place-based collaborations*

This section addresses the efforts of policymakers to engage with industry to bring about CE-focused collaborations within their regional territories. The policy intentions of Hull and the neighbouring authority, East Riding of Yorkshire (collectively North Humberside), were analysed in Newsholme et al. (2022). Both local authorities and companies view circular activities as primarily in the companies' remit, but although the local authorities are nonetheless envisaging social benefits for the region, companies are focusing on internal and supply chain considerations. In this discussion, we draw on interviews with local authorities and

companies not just in North Humberside, but also in Styria, Austria (Newsholme et al., accepted) and the city and neighbouring port of Strasbourg, France (Perez et al., 2020) to consider the respective influences on building the collaborations necessary for a CE.

The selection of a regional scale of analysis for North Humberside was empirically driven, incorporating both political and physical delineations of the 'region' as a semi-coherent scale of territorial organisation. For example, industry in and around Hull has located itself there part to take advantage of the Humber Estuary (historically for water supply and waste disposal purposes). Companies are located along both sides of the estuary, distributed between four different local authorities (the identity of which has varied over the decades), which are in some areas acting together and in others competing with each other (e.g. Deutz, 2014). Companies network with each other, relocate and otherwise are not driven by these jurisdictional boundaries. Likewise, in the French case, the city of Strasbourg collaborates with the Autonomous Port of Strasbourg, i.e. the companies associated with the city are not necessarily located within its jurisdictional boundaries but are functionally connected by port activities and trade. The city of Graz, in Austria, the initial focus of a planned comparison with Hull, is the capital of the region of Styria. In this case, the region is the relevant level of governance for waste and resource issues (contrasting with the lack of a regional scale of governance in the UK) and likewise manufacturing and other companies are predominantly located outside of the city itself. In France there is a strong alignment of CE priorities between the national and regional scale supporting the activities in and around Strasbourg (Perez et al., 2020).

These three regions all have historic connections with CE activities specifically relating to industrial symbiosis. Humberside was home to one of the two original regional franchises of what became the National Industrial Symbiosis Programme (Mirata et al., 2004), which was supported by governmental funding from 2005 to 2012 (Wang et al., 2015). Companies in the region have multiple connections, predominantly transactional supply-disposal chain links (Penn et al., 2014), including the recovery of biowastes (Velenturf, 2016). Styria became known as an example of an industrial symbiosis network that was uncovered, rather than planned, with economically-driven connections between traditional manufacturers including heavy industries (Schwarz and Steininger, 1997). Now the region bases its environmental credentials on the Green Tech Cluster, a network of more than 180 companies internationally recognised for innovation in environmental technologies (Newsholme, 2023). Strasbourg, in eastern France, is a port-city on the River Rhine. The Autonomous Port of Strasbourg, the entity responsible of the management and administration of the port, celebrated its 95th birthday in 2021 and still holds the position as the second most important fluvial port in France. Since the late 1990s the city of Strasbourg and the Autonomous Port of Strasbourg have worked to generate synergies among the industrial firms and their surroundings as part of their sustainability agenda (Beyer and Lacoste, 2017).

A key feature shared by these regions is that the authorities concerned see industrial symbiosis as a tool for decarbonisation. This is particularly striking in the case of North Humberside, with its legacy of oil and gas companies and power generation. It is the prime carbon-emitting region in the UK and a prominent target for the government's decarbonisation agenda. However, the public bodies see the establishment of initiatives between companies as being an industry responsibility. By contrast, in Strasbourg, there is an ongoing local authority-led involvement of companies in environmental projects, with decarbonisation being the latest context (following on from the Millennium and later the Sustainable Development Goals). This territory-based collaboration may be characterised more as an industrial ecology (environmentally driven inter-firm collaboration) than industrial symbiosis in particular. Companies interviewed in both Styria and Humberside held similar views to those of the authorities that inter-firm connections and CE initiatives are the purview of the companies. This alignment may be fortuitous in some sense, but limits the potential for local authorities to influence the nature of those connections or to achieve the sort of economic development benefits that they associate with them (Newsholme et al., 2022). As discussed in Chapter 4 in this volume, the companies interviewed saw their supply chain partners rather than their neighbours as the assumed partners for environmental initiatives beyond the scale of the company. For a number of reasons (such as particular material requirements or longstanding contractual arrangements) those supply chain partners were internationally distributed.

Our research suggests that there is a range of circumstances between the three regions, with Strasbourg having been the most successful in achieving a role for public authorities in industrial collaboration, followed by Styria and finally North Humberside. It is far more difficult to assess whether the actual level of inter-firm collaboration, especially industrial symbiosis, differs between the regions. Previous research has indicated that some companies in Humberside are well connected (Penn et al., 2014), while current research indicates that only a small minority of companies in Strasbourg are participating in industrial symbiosis. Further research is needed for a quantitative comparison. Nonetheless, the perception that the city is valid partner to industry collaboration in France is helped by several factors: one is the consistent approach over the past two decades. In 2015, with the publication of the National CE Roadmap, Industrial Ecology became one of the seven central strategies to develop a national CE strategy. In the UK, national funding for industrial symbiosis was discontinued after only seven years, even when activities were implemented through a company (not a governmental body). The latter could be seen as a third party facilitator for industrial symbiosis, and at the time offered a free service. The public agencies in France appear to be similarly trusted in this context and also have been more consistently supported by national government funds. The alignment of policy across scales of governance is more effective in both France and Austria than in the UK. The French national CE policy offers support for regions, whereas the UK policy remains waste- and company-focused.

Expectations for regional decarbonisation are not necessarily well resourced and the authorities interviewed felt that they lacked the regulatory tools to encourage, let alone require, companies to engage. In Austria, the situation is intermediate, with authorities having the ability to engage companies in public-private partnerships. This affords an economic tool for fostering collaboration which is missing in the UK case.

6.4.4 *Global-scale dimensions*

The fourth scale of entry for analysing the CE concerns the global-scale impact of CE policies enacted in Europe. In the section above we referred to disconnections between national and subnational scales, and a lack of connections between the scale and practices of the CE within cities. Here we consider the unintended consequences of a policy at a geographic scale greater than the relevant territorial jurisdiction. This analysis emphasises the interconnectedness of places as well as influences across scales, indicating how aspects of a CE may be very differently experienced and understood depending on the spatial context.

Research was conducted into material leakages from the European CE using used electronic and electrical equipment (UEEE) shipped to Nigeria and to-be-recycled plastics shipped to Vietnam as case studies (Thapa et al., 2023, 2024). These extra-territorial impacts of the EU's extended producer responsibility are an unintended consequence of seeking to impose controls on material recovery within the EU. Implications for *producers* beyond the EU were very much intended (as imports have to meet the same requirements as products manufactured in the EU). However, the implications for managing waste were not sufficiently considered. Lacking the capacity to manage the increasing amount of plastic waste generation, the EU legally ships some of its collected to-be-recycled plastic to Vietnam legally and similarly to-be-reused plastic to Nigeria, but without putting in place sufficient safeguards. These safeguards ought to apply both at the source and destination. Electronics ostensibly exported for reuse should still be in working order (and not technically outdated); plastics should be clean and sorted to have a realistic prospect of being recycled. Furthermore, the intended destination should be equipped with facilities operating according to the health and safety and environmental standards expected in the source countries. Lack of law enforcement leaves open loopholes for waste crime, a financially lucrative business that attracts illegal and illicit activities (Bisschop and van Wingerde, 2021), despite well-documented social and ecological injustices (Clapp, 2002).

Waste exports to Nigeria and Vietnam burden the existing waste management capacities of those countries (Thapa et al., 2022a). UEEE are shipped to Nigeria to be reused, one-third of which may not be functional, and the rest becomes e-waste, usually with a shorter lifespan. With only two formal e-waste management facilities, the burden of e-waste management falls squarely on the informal sector (Thapa et al., 2022b, 2023). The informal sector is usually associated

with precarious working conditions. In the EU, producers are responsible for their e-waste management, and are therefore no longer responsible for the UEEE and e-waste shipped to Vietnam. On the one hand, e-waste contains valuable material while containing toxic elements – which is why exports of e-waste from Organisation for Economic Co-operation and Development (OECD) countries to non-OECD countries are illegal, according to national and international laws. To-be-recycled plastic provides an economic opportunity for Vietnam, but this waste value chain is not transparent, and our research found that the informal sector's waste management practices cause harm to the waste workers, their homes and the environment (Thapa et al., 2024). Shipping EU waste to Vietnam helps the EU to meet the recycling targets and CE goals applicable in its own territory, effectively by dumping material beyond that jurisdiction. This process lacks accountability and ethics – suggesting that the vaunted 'just transition' itself is only applicable within the EU. While reuse and recycling are part of the CE and its transition in the EU, our research finds a lack of justice and ethical considerations while shipping EU discards and waste to third countries for reuse and recycling. Overlooking the fairness and ethical dimensions results in harms to individuals, society and their environment in Nigeria and Vietnam. This is a case of spatial injustice (Soja, 2010), where economic and environmental goals in the EU hurts the wellbeing of Vietnamese and Nigerians. It calls for just sustainability (Agyeman, 2008) to ensure that environmental sustainability in the EU does not come at the cost of injustice, inequality, racism and classism.

Beyond these considerations of the ethics of shipping waste internationally effectively (if not theoretically) for disposal, one can also question the circumstances by which there are 'low cost' destinations for such materials. Inequalities and inequities with historical roots in European colonialism exist in both countries. Nigeria secured independence from the British empire in the 1960s, and Vietnam gained its independence from France in 1956 after being plundered since the 1880s. Sound waste management depends on the social, economic, technological and political context, and today both Nigeria and Vietnam find managing their domestic waste challenging. Both are lower middle-income countries (according to 2024 World Bank definitions) that depend on foreign investment for economic growth – the manufacturing industry in Vietnam and the oil industry in Nigeria, for instance. Both are vulnerable to the exploitation of structural inequalities, including waste-related harm (whereas China has more effectively managed to ban the import of waste plastics, but with a detrimental impact on neighbouring countries). This trade in waste comprises an unequal exchange (Hickle et al., 2022), analogous to richer and more powerful countries exploiting others for the net appropriation of wealth and resources.

The waste value chain is increasingly complex and global, and sound waste governance must be mindful of social justice and incorporate circular value-adding practices wherever possible without causing harm to others and the environment. An ethical approach to defining the CE for the EU (or other) scale should take

into account the implications (for individuals, society and the environment) beyond the territory of the policy itself. Thus, the implications of the global waste value chain, and not just the supply chain, should be addressed. For example, our research shows a need for a functionality and durability guarantee when shipping UEEE from Europe and ensuring that the original producers are held responsible for sound management of their e-waste in Nigeria. Otherwise, such unequal exchanges of a colonial nature that shift burden and harm unfairly to others increase inequity and inequality, creating even bigger socio-ecological challenges.

6.5 Conclusions

This chapter has analysed case studies of CE policy, practice (variously intended, unaware and unintentional) and the barriers to instigating such practices across a range of places, scales and territories. This has illustrated how the expression of the CE is simultaneously rooted in places, where its local social and material benefits can be observed, and also extends across territories and scales, such that its wider distributional outcomes can be assessed. Furthermore, the opportunities for developing a CE in a place are constrained by the current and historic political and economic relationships pertaining to that location. Thus, for example, Hull, with its legacy of a high-carbon economy and an under-privileged population, has a local authority that is hoping to use decarbonisation as a route to new economic opportunities. That authority, however, is overlooking existing circular activities (largely survival mechanisms) and does not have the policy tools needed to achieve its circular goals through the actions of companies with connections beyond the region. It is also challenging to foster an entrepreneurial spirit (e.g. encourage the development of ‘innovative’ circular ventures) among such a socially deprived population whose necessary preoccupation is to make ends meet. Graz, which has a different social profile, experiences similar challenges for policymakers to engage internationally connected companies in regional activities on the one hand, while community-organised CE activity is closely connected to international economic flows on the other.

The intentions of policymakers and others working with the CE at discrete scales may be seen as either realistic or under-ambitious, or potentially over-ambitious and idealistic, but not well thought out especially in terms of understanding the interdependencies between place, territory and scale. In this respect, analyses of the CE that privilege one territory or scale at the expense of another are guilty of what has been called ‘methodological territorialism’ (Jessop et al., 2008). Similarly, one might generalise that existing CE policy approaches are not paying enough regard to the geographical dimensions of the processes with which they are attempting to engage. Ultimately, however, they have to work with what they have in order to carve out an economic niche (i.e. one that is suited to their spatial niche or place) in what is already arguably a thoroughly globalised CE and inextricably entwined with the global economy. We can see the SEs in the Global North trying to use the

CE (knowingly or otherwise) to help the disadvantaged, with some short-term benefits but no resolution of issues. The entrepreneurs in Santiago are trying to use the CE to carve out an opportunity for themselves, with good intentions for the future, but may struggle to break into the international markets needed to achieve financial security. This is even while countries in the Global North are allowing waste to be offloaded to countries in the Global South – to the economic and environmental detriment of those communities. Although the idea of the CE is to divert attention from waste to more ambitious approaches for resource management (see [Chapter 4](#) in this volume), clearly it is premature to disregard waste in a global economy in which only there are significant variations in practice and economic drivers are difficult to overcome.

Overall, we argue that CE initiatives, whether so named or not, are essentially and inevitably situated in particular places and territories. Some territorially defined activities are recent inceptions and, in part, embody responses to explicit CE policies. Others, however, are locally emergent from economic activities and practices, which have been in operation in specific places and regions well before the CE emerged as a distinctive idea and package of activities. Our analysis suggests that places and regions mould the CE more than the CE per se has transformed these places and regions. Social benefits from CE practices might be real and important to those involved in developing the CE in places and regions; however, the embracing of the CE is an opportunity for existing individuals and organisations (social enterprises, companies, etc.) to address immediate social and economic needs rather than offering a transformational route to local and regional development. Evidence for socio-spatial redistribution is limited but significantly includes the exporting of social and environmental disbenefits. The CE is constantly transformed by those places and spaces, adapting its socio-ecological functions and mechanisms to more or less local and place-specific values, capabilities, motivations and objectives. Thus, while a CE could be part of a transformation towards more sustainable and just places and spaces, this is difficult to imagine without a larger-scale and more profound political drive for such a change than has been seen so far.

Note

- 1 The Gini index is a measure of social inequality where 1 = perfect equality and 100=maximum inequality; Chile 44.9; the UK 32.6; Austria 29.8.

References

- Agyeman, J. (2008) Toward a 'just' sustainability? *Continuum*, 22(6), 751–756. <https://doi.org/10.1080/10304310802452487>
- Beyer, A. and Lacoste, R. (2017) La transition écologique des territoires urbano-portuaires: Les enseignements de la démarche de reconnexion énergétique engagée entre la ville et le port de Strasbourg. *Revue d'Économie Régionale & Urbaine*, 5 (December), 857–880. doi: [10.3917/reru.175.0857](https://doi.org/10.3917/reru.175.0857)

- Bisschop, L. and van Wingerde, K. (2021) *Transnational organized environmental crime*. In F. Allum and S. Gilmour (eds), *Routledge Handbook of Transnational Organized Crime* (2nd edn). Abingdon: Routledge, pp. 270–284. <https://doi.org/10.4324/9781003044703>
- Bourdoin, S., Galliano, D. and Gonçalves, A. (2022) Circularities in territories: Opportunities & challenges, *European Planning Studies*, 30(7), 1183–1191. <https://doi.org/10.1080/09654313.2021.1973174>
- Calisto Friant, M., Vermeulen, W.J.V. and Salomone, R. (2021) Analysing European Union circular economy policies: Words versus actions. *Sustainable Production and Consumption*, 27, 337–353. <https://doi.org/10.1016/j.spc.2020.11.001>
- Calisto Friant, M., Reid, R., Boesler, Vermeulen, W.J.V. and Salomone, R. (2023) Sustainable circular cities? Analysing urban circular economy policies in Amsterdam, Glasgow, and Copenhagen, *Local Environment*, 1–39.
- Calisto Friant M., Doezeema T. and Pansera, M. (2023a) Cross-case comparison report. JUST2CE project deliverable 2.3. https://just2ce.eu/wp-content/uploads/2023/10/JUST2CE_D2.3_Cross_Comparison_report.pdf (accessed 27 October 2023)
- Campbell-Johnston, ten Cate, J., Elfering-Petrovic, M. and Gupta, J. (2019) City level circular transitions: Barriers and limits in Amsterdam, Utrecht and The Hague. *Journal of Cleaner Production*, 235, 1232–1239. <https://doi.org/10.1016/j.jclepro.2019.06.106>
- Chertow, M.R. (2000) Industrial symbiosis: Literature and taxonomy. *Annual Review of Energy and Environment*, 25(1), 313–337.
- City of Amsterdam (n.d.) Policy: Income. <https://www.amsterdam.nl/en/policy/policy-work-income/policy-income/> (accessed 30 October 2023).
- Clapp, J. (2002) Confronting consumption. In T. Princen, M. Maniates and K. Conca (eds), *The Distancing of Waste: Overconsumption in a Global Economy* (1st edn). Cambridge, MA: MIT Press, pp. 155–176.
- Coe, N.M., Dicken, P. and Hess, M. (2008) Global production networks: Realizing the potential, *Journal of Economic Geography*, 8(3), 271–295.
- Colombo, L.A., Pansera, M. and Owen, R. (2019) The discourse of eco-innovation in the European Union: An analysis of the Eco-Innovation Action Plan and Horizon 2020. *Journal of Cleaner Production*, 214: 653–665.
- Cox, K. (2021) Massey, Marx, and human geography: Disjunctures and provocations, *Human Geography*, 14(1), 5–16.
- Cox, K.R. and Mair, A. (1988) Locality and community in the politics of local economic development. *Annals of the Association of American Geographers*, 78(2), 307–325.
- Cresswell, T. (2014) *Place: An Introduction*. New Jersey, NJ: John Wiley & Sons.
- de Souza Campos, L.M., Karl, A.A. and Vazquez-Brust, D.A. (2023) The relation between social inclusion and circular economy performance: An analysis of circular economy social practices and their contributions to the sustainable development goals. In L.M. de Souza Campos and D.A. Vázquez-Brust (eds), *Greening of Industry Networks Studies*, vol. 10: *The Social Dimensions of the Circular Economy*. Cham: Springer. https://doi.org/10.1007/978-3-031-25436-9_3
- Deutz, P. (2014) A class-based analysis of sustainable development: Developing a radical perspective on environmental justice. *Sustainable Development*, 22, 243–252. <http://onlinelibrary.wiley.com/doi/10.1002/sd.1528/pdf>
- Deutz, P., Lyons, D. and Jun, B. (eds) (2015) *International Perspective on Industrial Ecology*. Cheltenham and Northampton, MA: Edward Elgar Publishing. <http://www.e-elgar.com/shop/international-perspectives-on-industrial-ecology>
- Deutz, P. Jonas, A.E.G., Newsholme, A., Pusz, M., Rodgers, H.A., Affolderbach, J., Baumgartner R.J. and Ramos, T.B. (2024) The role of place in the development of a circular economy: A critical analysis of potential for social redistribution in Hull, UK. *Cambridge Journal of Regions, Economy and Society*. <https://doi.org/10.1093/cjres/rsae002>
- Dockemdorff, E., Rodriguez, A. and Winchester, L. (2000) Santiago de Chile: Metropolization. Globalization and inequity. *Environment and Urbanisation* 12(1), 171–183.

- Eisfeld, K. and Seebauer, S. (2022) The energy austerity pitfall: Linking hidden energy poverty with self-restriction in household use in Austria. *Energy Research and Social Science*, 84, 102427. <https://doi.org/10.1016/j.erss.2021.102427>
- Ejrnæs, M., Larsen, E.M. and Müller, M. (2020) Parents on low benefits: Coping with poverty. *Journal of Poverty*, 24(7), 610–626. doi:[10.1080/10875549.2020.1740376](https://doi.org/10.1080/10875549.2020.1740376)
- Fullerton D. (2011) Six distributional effects of environmental policy. *Risk Analysis* 31, 923–929.
- European Commission (2019) Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal COM/2019/640 final. Brussels: European Commission.
- European Commission (2020) Report on the quality of life in European cities, 2020. EC D-G for Regional and Urban Policy. https://ec.europa.eu/regional_policy/sources/work/qol2020/quality_life_european_cities_en.pdf (accessed 30 October 2023)
- Fratini, C.F., Georg, S. and Jørgensen, M.S. (2019) Exploring circular economy imaginaries in European cities: A research agenda for the governance of urban sustainability transitions. *Journal of Cleaner Production*, 228, 974–989.
- Ghisellini, P., Cialani, C. and Ulgiati, S. (2016) A review on circular economy: The expected transition to a balanced interplay of environmental and economic systems. *Journal of Cleaner Production*, 114, 11–32. <http://dx.doi.org/10.1016/j.jclepro.2015.09.007>
- Gibson-Graham, J.K. (2008) Diverse economies: Performative practices for ‘other worlds’. *Progress in Human Geography*, 32(5), 613–632.
- Glasgow Centre for Population Health (n.d.) Understanding Glasgow: The Glasgow Indicators Project. <https://www.understandingglasgow.com/> (accessed 30 October 2023).
- Glasgow City Council (2020a) ‘Circular Economy Route Map For Glasgow-2020’. <https://www.glasgow.gov.uk/CHttpHandler.ashx?id=50900&p=0> (accessed 30 October 2023)
- Glasgow City Council (2021) Resource and Recycling Strategy 2020-2030. Available online <https://www.glasgow.gov.uk/article/5731/Resource-and-Recycling-Strategy-2020-30> (accessed 12 June 2024).
- Government of the Netherlands (2016) ‘A Circular Economy in the Netherlands by 2050’. <https://www.government.nl/topics/circular-economy/circular-dutch-economy-by-2050#:~:text=The%20government%2Dwide%20programme%20for,smarter%20and%20more%20efficient%20way> (accessed 30 October 2023)
- Gregson, N., Crang, M., Fuller, S. and Holmes, H. (2015) Interrogating the circular economy: The moral economy of resource recovery in the EU. *Economy and Society*, 44(2), 218–s43.
- Hickel, J., Dorninger, C., Wieland, H. and Suwandi, I. (2022) Imperialist appropriation in the world economy: Drain from the global South through unequal exchange, 1990–2015. *Global Environmental Change*, 73, 102467.
- Hobson, K. and Lynch, N. (2016) Diversifying and de-growing the circular economy: Radical social transformation in a resource-scarce world. *Futures*, 82, 15–25. <https://doi.org/10.1016/j.futures.2016.05.012>
- Hull City Council (2022) *Hull City Council Monitoring Report: Annual Monitoring Report 1st April 2021 to 31st March 2022*. <https://www.hull.gov.uk/downloads/file/97/authorityMonitoringReport2021to2022.pdf> (accessed 7 July 2024)
- Hussain, M.A., Ejrnæs, M. and Larsen, J.E. (2021) Are benefit reductions an effective activation strategy? The case of the lowest benefit recipients in Denmark. *Journal of Social Policy* 50(3), 569–587. doi:[10.1017/S0047279420000318](https://doi.org/10.1017/S0047279420000318)
- Jessop, B., Brenner, N. and Jones, M. (2008) Theorizing sociospatial relations. *Environment and Planning D: Society and Space*, 26, 389–401.
- Johansson, N. and Henriksson, M. (2020) Circular economy running in circles? A discourse analysis of shifts in ideas of circularity in Swedish environmental policy. *Sustain Prod Consum* 23, 148–156.

- Jonas, A.E.G. (2024) Scale. In J. Agnew, V. Mamadouh, N. Koch and C.Y. Woon (eds), *The Wiley-Blackwell Companion to Political Geography* (2nd edn). Oxford: Wiley Blackwell.
- Kirchherr, J., Nan-Hua, N.Y., Schulze-Spüntrup, F., Heerink, M.J. and Hartley, K. (2023) Conceptualizing the circular economy (revisited): An analysis of 221 definitions. *Resources, Conservation and Recycling*, 194, 107001. <https://doi.org/10.1016/j.resconrec.2023.107001>
- Laing, A., Sherwood, D. and Cambero, F. (2019) Explainer: Chile's inequality challenge: What went wrong and can it be fixed? Reuters. <https://www.reuters.com/article/us-chile-protests-explainer/explainer-chiles-inequality-challenge-what-went-wrong-and-can-it-be-fixed-idUSKBN1X22RK> (accessed 30 June 2022)
- Lee, R., Leyshon, A., Aldridge, T., Tooke, J., Williams, C. and Thrift, N. (2004) Making geographies and histories? Constructing local circuits of value. *Environment and Planning D, Society & Space*, 22(4), 595–617. doi:10.1068/d50j
- Lekan, M., Jonas, A.E.G. and Deutz, P. (2021) Circularity as alterity? Untangling circuits of value in the social enterprise-led development of the circular economy, *Economic Geography*, 97(3), 257–283. <https://doi.org/10.1080/00130095.2021.1931109>
- Lekan, M. and Rogers, H.A. (2020) Digitally enabled diverse economies: Exploring socially inclusive access to the circular economy in the city. *Urban Geography*. <https://doi.org/10.1080/02723638.2020.1796097>
- Lieder, M. and Rashid, A. (2016) Towards circular economy implementation: A comprehensive review in context of manufacturing industry, *Journal of Cleaner Production*, 115, 36–51. <http://dx.doi.org/10.1016/j.jclepro.2015.12.042>
- Longhurst, N., Avelino, F., Wittmayer, J., Weaver, P., Dumitru, A., Hielscher, S., Cipolla, C., Afonso, R., Kunze, I. and Elle, M. (2016) Experimenting with alternative economies: Four emergent counter-narratives of urban economic development. *Current Opinion in Environmental Sustainability*, 22(October), 69–74.
- Massey, D. (1991) A global sense of place. *Marxism Today*, June, 24–29.
- Mies, A. and Gold, S. (2021) Mapping the social dimension of the circular economy. *Journal of Cleaner Production*, 321, 128960.
- Mirata, M. (2004) Experiences from early stages of a national industrial symbiosis programme in the UK: Determinants and coordination challenges. *Journal of Cleaner Production*, 12(8–10), 967–983. <https://doi.org/10.1016/j.jclepro.2004.02.031>
- Municipality of Amsterdam (2020a) 'Amsterdam Circular Strategy 2020–2025'. <https://www.amsterdam.nl/en/policy/sustainability/circular-economy/> (accessed 30 October 2023)
- Municipality of Amsterdam (2020b) 'Amsterdam Circular 2020–2025 Innovatie: En Uitvoeringsprogramma 2020–2021'. https://www.amsterdam.nl/wonen-leefomgeving/duurzaam-amsterdam/publicaties-duurzaam-groen/amsterdam-circulair-documenten/?PagClsId=17394313#PagCls_17394313 (accessed 7 July 2024)
- Municipality of Copenhagen (2019) 'Circular Copenhagen Resource and Waste Management Plan 2024'. <https://www.amsterdam.nl/bestuur-organisatie/volg-beleid/duurzaamheid/circulaire-economie/> (accessed 7 July 2024)
- Newsholme, A. (2023) Developing a circular economy at the regional scale: A case study of stakeholders in North Humberside, England and Styria, Austria. PhD thesis, University of Hull.
- Newsholme, A., Deutz, P. Affolderbach, J. and Baumgartner, R.J. (2022) Negotiating stakeholder relationships in a regional circular economy: Discourse analysis of multi-scalar policies and company statements from the North of England. *Circular Economy and Sustainability*, 2, 783–809. <https://doi.org/10.1007/s43615-021-00143-9>
- Newsholme, A., Deutz, P., Baumgartner, R.J. and Affolderbach, J. (accepted) Building collaborations for a regional circular economy: a comparison of North Humberside, England with Styria, Austria. In S. Bourdin, E. van Leeuwen and A. Torre (eds), *Cities, Regions and the Circular Economy: Theory and Practice*. Cheltenham and Northampton, MA: Edward Elgar.

- Ollman, B. (2003) *Dance of the Dialectic: Steps in Marx's Method*. Urbana: University of Illinois Press.
- Penn, A.S., Jensen, P.D., Woodward, A., Basson, L., Schiller, F. and Druckman, A. (2014) Sketching a network portrait of the Humber region. *Complexity*, 19(6), 54–72.
- Perez, S. Dermine-Brulot, S. and Jonas, A.E.G. (2020) Assessing the relationship between Industrial Ecology, Industrial Symbiosis, and Territorial Development over time. 25th International Sustainable Development Research Society Conference, July, Budapest, Hungary.
- Petit-Boix, A. and Leipold, S. (2018) Circular economy in cities: Reviewing how environmental research aligns with local practices. *Journal of Cleaner Production*, 195, 1270–1281.
- Prendeville, S., Cherim, E. and Bocken, N. (2018) Circular cities: Mapping six cities in transition. *Environmental Innovation and Societal Transitions*, 26, 171–194.
- Pusz, M., Jonas, A.E.G. and Deutz, P. (2023) Knitting circular ties: Empowering networks for the social enterprise-led local development of an integrative circular economy. *Circular Economy and Sustainability*. <https://doi.org/10.1007/s43615-023-00271-4>
- Rincón-Moreno, J., Ormazábal, M. and Jaca, C. (2022) Stakeholder perspectives in transitioning to a local circular economy: A case study in Spain. *Circular Economy and Sustainability*, 2, 693–711. <https://doi.org/10.1007/s43615-021-00098-x>
- Rogers, H.A., Deutz, P. and Ramos, T.B. (2021) Repairing the circular economy: Public perception and participant profile of the repair economy in Hull, UK, *Resources, Conservation & Recycling*, 105447. <https://doi.org/10.1016/j.resconrec.2021.105447>
- Rogers, H.A., Deutz, P., Jonas, A.E.G. and Ramos, T.B. (2024) Quality of working life in the Circular Economy: The case of self-employment in the repair sector. *Circular Economy and Sustainability*. <https://doi.org/10.1007/s43615-023-00343-5>
- Sayer, A. (2000) *Realism and Social Science*. London: SAGE.
- Schwarz, E.J. and Steininger, K.W. (1997) Implementing nature's lesson: The industrial recycling network enhancing regional development. *Journal of Cleaner Production*, 5(1–2), 47–56.
- Siderius, T. and Zink, T. (2022) Markets and the future of the circular economy. *Circular Economy and Sustainability*, 1–27. <https://doi.org/10.1007/s43615-022-00196-4>
- Soja, E.W. (2010) *Seeking Spatial Justice*, vol. 16, *Globalisation and Community* (1st edn). University of Minnesota Press.
- Stahel, W.R. (2013) Policy for material efficiency: Sustainable taxation as a departure from the throwaway society. *Philosophical Transactions: Mathematical, Physical and Engineering Sciences*, 371(1986): 1–19.
- Stavis, D. and Felli, R. (2020) Planetary just transition? How inclusive and how just? *Earth System Governance* (6 Dec.), 100065. <https://doi.org/10.1016/j.esg.2020.100065>
- Storper, M. (1995) The resurgence of regional economies, ten years later: The region as a nexus of untraded interdependencies. *European Urban and Regional Studies*, 2(3), 191–221.
- Tapia, C., Bianchi, M., Pallaske, G. and Bassi, A.M. (2021) Towards a territorial definition of a circular economy: Exploring the role of territorial factors in closed-loop systems. *European Planning Studies*, 29(8), 1438–1457. doi:10.1080/09654313.2020.1867511
- Thapa, K., Vermeulen, W.J., Deutz, P. and Olayide, O. (2022a) Transboundary movement of waste review: From binary towards a contextual framing. *Waste Management & Research: The Journal for a Sustainable Circular Economy*, 0734242X2211054. <https://doi.org/10.1177/0734242x221105424>
- Thapa, K., Vermeulen, W.J.V., Olayide, O. and Deutz, P. (2022b) *Policy Brief: Blueprint for Ultimate Producer Responsibility*. Copernicus Institute of Sustainable Development, Utrecht University. <https://doi.org/10.5281/zenodo.5957809>
- Thapa, K., Vermeulen, W.J., Deutz, P. and Olayide, O. (2023) Ultimate Producer Responsibility for e-waste management: A proposal for just transition in the circular economy

- based on the case of used European electronic equipment exported to Nigeria. *Business Strategy and Development* 6, 33–52. <https://doi.org/10.1002/bsd2.222>
- Thapa, K., Vermeulen, W.J.V., De Waal, M.M., Deutz, P. and Nguyễn, H.Q. (2024) Towards a Just Circular Economy Transition: The Case of European Plastic Waste Trade to Vietnam for Recycling. *Circular Economy and Sustainability*. <https://doi.org/10.1007/s43615-023-00330-w>
- Valencia, M., Bocken, N., Loaiza, C. and De Jaeger, S. (2023) The social contribution of the circular economy. *Journal of Cleaner Production*, 408, 137082. <https://doi.org/10.1016/j.jclepro.2023.137082>
- Velenturf, A.P. (2016) Promoting industrial symbiosis: Empirical observations of low-carbon innovations in the Humber region, UK. *Journal of Cleaner Production*, 128, 116–130. <http://dx.doi.org/10.1016/j.jclepro.2015.06.027>
- Wang, Q., Deutz, P. and Gibbs, D. (2015) UK-China collaboration for industrial symbiosis: A multi-level approach to policy transfer analysis. In P. Deutz, D. Lyons and J. Bi (eds), *International Perspectives on Industrial Ecology*. Cheltenham and Northampton, MA: Edward Elgar, pp. 89–107.
- Warnaby, G. (2009) Towards a service-dominant place marketing logic. *Marketing Theory*, 9(4), 403–423.
- Williams, J. (2023) Circular cities: Planning for circular development in European cities. *European Planning Studies*, 31(1), 14–35. <https://doi.org/10.1080/09654313.2022.2060707>
- World Bank (2023) World Bank Gender Data Portal. <https://genderdata.worldbank.org/indicators/si-pov-gini/> (accessed 27 October 2023).
- World Bank (2024) The World by Income and Region. <https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html#:~:text=The%20World%20Bank%20classifies%20economies,%2Dmiddle%2C%20and%20high%20income> (accessed 17 May 2024).
- World Population Review (2023a) Graz Population 2024. <https://worldpopulationreview.com/world-cities/graz-population> (accessed 27 October 2023).
- World Population Review (2023b) Santiago Population 2024. <https://worldpopulationreview.com/world-cities/santiago-population> (accessed 27 October 2023).
- World Population Review (2023c) Poverty rate by country. <https://worldpopulationreview.com/country-rankings/poverty-rate-by-country> (accessed 27 October 2023).
- World Population Review (2024a) Amsterdam Population 2024. <https://worldpopulationreview.com/world-cities/amsterdam-population> (accessed 4 April 2024)
- World Population Review (2024b) Copenhagen Population 2024. <https://worldpopulationreview.com/world-cities/copenhagen-population> (accessed 4 April 2024)
- World Population Review (2024c) Glasgow Population 2024. <https://worldpopulationreview.com/world-cities/glasgow-population> (accessed 4 April 2024)