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Inspire Policy Making with Territorial Evidence

POLICY BRIEF

# A territorial approach to transitioning towards a circular economy



One of the main building blocks of Europe's new agenda for sustainable growth, the European Green Deal, is the circular economy action plan (adopted in 2020). This action plan aims to, among other things, ensure less waste is produced, make sustainable products the norm and make circularity work for people, regions and cities in the EU.

The ESPON circular economy and territorial consequences (Circter) project has played a timely role in supporting the circular design of territories at subnational levels. The project provided a regional-level monitoring framework and looked closely at several territorial factors important in circular systems. This territorial perspective proved critical in identifying drivers and bottlenecks relevant for circular configurations. Three additional case studies, for Luxembourg, the cross-border Scandinavian area, and Switzerland and Liechtenstein, were carried out to increase the amount of evidence collected and better tailor it to specific territorial contexts.

Building on the experience gained in the Circter project, this policy brief aims to provide national, regional and urban authorities with information to support the design of place-based policies for deploying circular economy solutions at regional level. The brief addresses and illustrates how the regulations and instruments available, such as those related to public procurement and spatial planning, can be used to facilitate the transition towards a circular economy. The policy brief further provides food for thought for the 2021–27 cohesion policy programming period by highlighting policy priorities for regional development from a circular economy perspective.

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## KEY POLICY MESSAGES

- Early recognition of local enabling factors and **adopting a territorial perspective** are key to designing successful place-based circular economy strategies. For example, local economies with greater availability of natural resource and specialised in primary and secondary sectors are clear assets for circular bioeconomy initiatives.
- **Analysing circular business activities in place** in terms of, for example, employment generated or financial turnover generated is fundamental in establishing closed-loop configurations in a specific territory.
- To reduce the footprint of consumption, a more systemic approach to resource management should be adopted through collaboration between different actors. Implementing circularities within the production–consumption system will be a crucial step in this approach, and a sound **dialogue between product designers and the waste industry** is essential.
- Promoting sustainable urban planning and mixed-use zones can strongly facilitate circular economy practices. It is important to **make circular resource management visible and accessible to citizens** by creating strategic spaces that integrate circular economy practices such as sharing, reusing and repairing.
- Circular initiatives not only have the advantage of moving towards more sustainable development models; a **circular system may also increase the resilience of regional economies**, especially when these economies depend on stable flows of imports from foreign countries.
- **Interreg programmes are very relevant** for territories transitioning to a circular economy, as they **provide an optimal framework** for the exchanges of circular practices and experiences between national, regional and local actors.

# 1 Introduction

The **transition to a circular economy** is a top priority of the European Commission in supporting the development of a sustainable, low-carbon, resource-efficient and competitive economy (European Commission, 2020). A circular economy is an economy that strives to be more resource efficient and environmentally sustainable than a linear economy. It is an alternative economic system, based on a resource flow model with closed loops, that aims to preserve the natural resources of the environment while limiting waste production and energy consumption. The end-of-life concept of the linear economy is replaced by restoration, and waste is regenerated as a secondary resource so that natural resources can be kept in the economy as long as possible. Transitioning towards a circular economy calls for a radical overhaul of the current production system and underlying business models in order to reshape the flow of resources through the economic system.

Given the multidimensional nature of circular systems and the complexity of system transformations, circular economy strategies cannot rely on a one-size-fits-all formulation (Bassi et al., 2021). **Understanding territorial specificities is crucial to envisaging a successful transition towards a circular economy.** This endeavour calls for place-based policy approaches that take account of the available capacity within each territory and that promote inclusive and participatory policy design and implementation as the best way to unlock territorial potential (Tapia et al., 2021). Local authorities are recognised as well positioned to play a key role in the successful implementation of a circular economy owing to their mandate in planning and regulation. Local authorities, companies, associations and citizens are increasingly developing initiatives based on this new economic model (Hartley et al., 2020). They are taking the opportunity to revamp their local economies by creating new circular business models, new markets for secondary raw materials and jobs.

A fundamental first step in **designing circular economy strategies** is monitoring and analysing material and waste flows. The resulting information can be used to assess whether or not policy actions and measures contribute to the

goal of a resource-efficient circular economy. In December 2015, the European Commission published an EU action plan for the circular economy. This was followed, in 2018, by a framework to monitor progress towards the circular economy (European Commission, 2018). This monitoring framework consists of 10 indicators, some of them with sub-indicators, addressing a range of aspects related to the circular economy, including material consumption, waste management, secondary material uses, and competitiveness and innovation in relation to circular economy businesses, all at national level.

The circular economy and territorial consequences (Circter) project (ESPON, 2019) has played a timely role in supporting the circular design of territories at subnational levels. Not only did it provide the first **monitoring framework at regional level**, but it also looked closely at several key territorial factors for circular systems. This territorial perspective was found to be critical in addressing the territorial consequences stemming from circular economy transitions and in identifying the circular economy drivers and bottlenecks that characterise specific local contexts. Moreover, three additional case studies, for Luxembourg, the cross-border Scandinavian area, and Liechtenstein and Switzerland, were carried out with the goal of increasing the amount of evidence collected and better tailoring it to specific territorial contexts.

Building on the experience gained in the Circter project and its spin-off case studies, this policy brief provides an information basis **to support the design of place-based policies for the deployment of circular economy solutions at regional level**. In particular, it addresses and illustrates how regulations and instruments, such as those related to public procurement and spatial planning, available to local authorities can be used to facilitate the transition towards a circular economy. The policy brief also aims to provide food for thought for the 2021–27 cohesion policy programming period by highlighting policy priorities for regional development from a circular economy perspective.

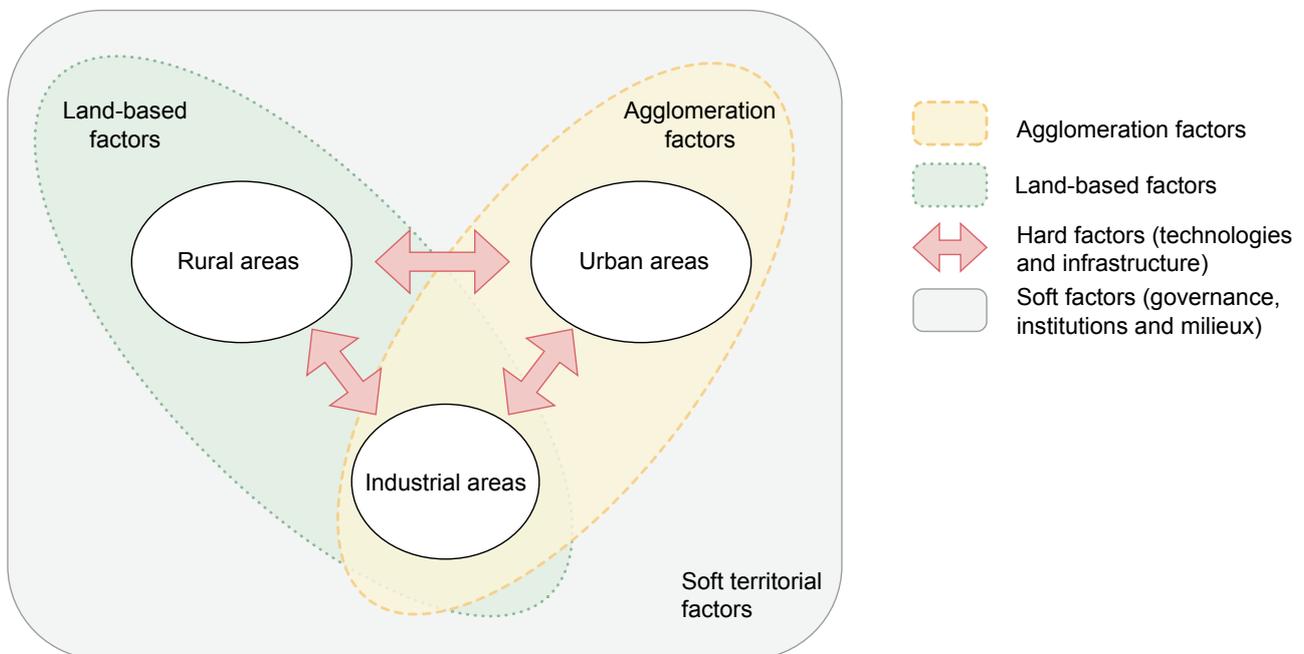
## 2 A territorial approach to designing a circular economy

**Circular economy strategies are strongly context specific.** Local authorities select a specific circular initiative depending on the characteristics and key assets of their territories. However, supranational monitoring schemes such as the one promoted by the European Commission very often do not meet the needs of regional and local policymakers, as national statistics tend not to capture the multifaceted territorial contexts that local authorities have to deal with (Avdiushchenko, 2018; Bianchi et al., 2020). Therefore, **the adoption of a territorial perspective and the early recognition of local enabling factors are key to the design of successful place-based circular economy strategies.**

The Circter project has made significant progress in identifying the potential territorial implications of a circular economy at subnational level. Figure 1 shows the interlinkages between different territorial factors, including land-based factors, such as the availability of natural resources, and agglomeration factors related to both the concentration of people (e.g. urban areas or cities) and the

concentration of businesses (e.g. industrial areas, clusters). As a general rule, the spatial distribution and combination of socioeconomic factors (e.g. density of population and/or businesses), along with the availability of natural assets, often determine the framework conditions of circular systems. The presence of large stocks of biomass resources might, for example, drive the uptake of circular solutions based on a bioeconomy (e.g. as in the spin-off case study for the cross-border Scandinavian area). In contrast, the presence of a dense socioeconomic fabric and the lack of primary raw materials might favour the deployment of circular economy strategies based on the valorisation of produced waste (e.g. as in the spin-off case study for Luxembourg). Identifying these ‘hard’ factors is important to envisage overall goals. A sound understanding of the ‘soft’ factors – circular economy enablers such as the available technological or research and development capacity, and the governance, institutional and social systems in place – is critical to guarantee a smooth transition to circular economies (Tapia et al., 2021).

**Figure 1**  
Key territorial factors for a circular economy

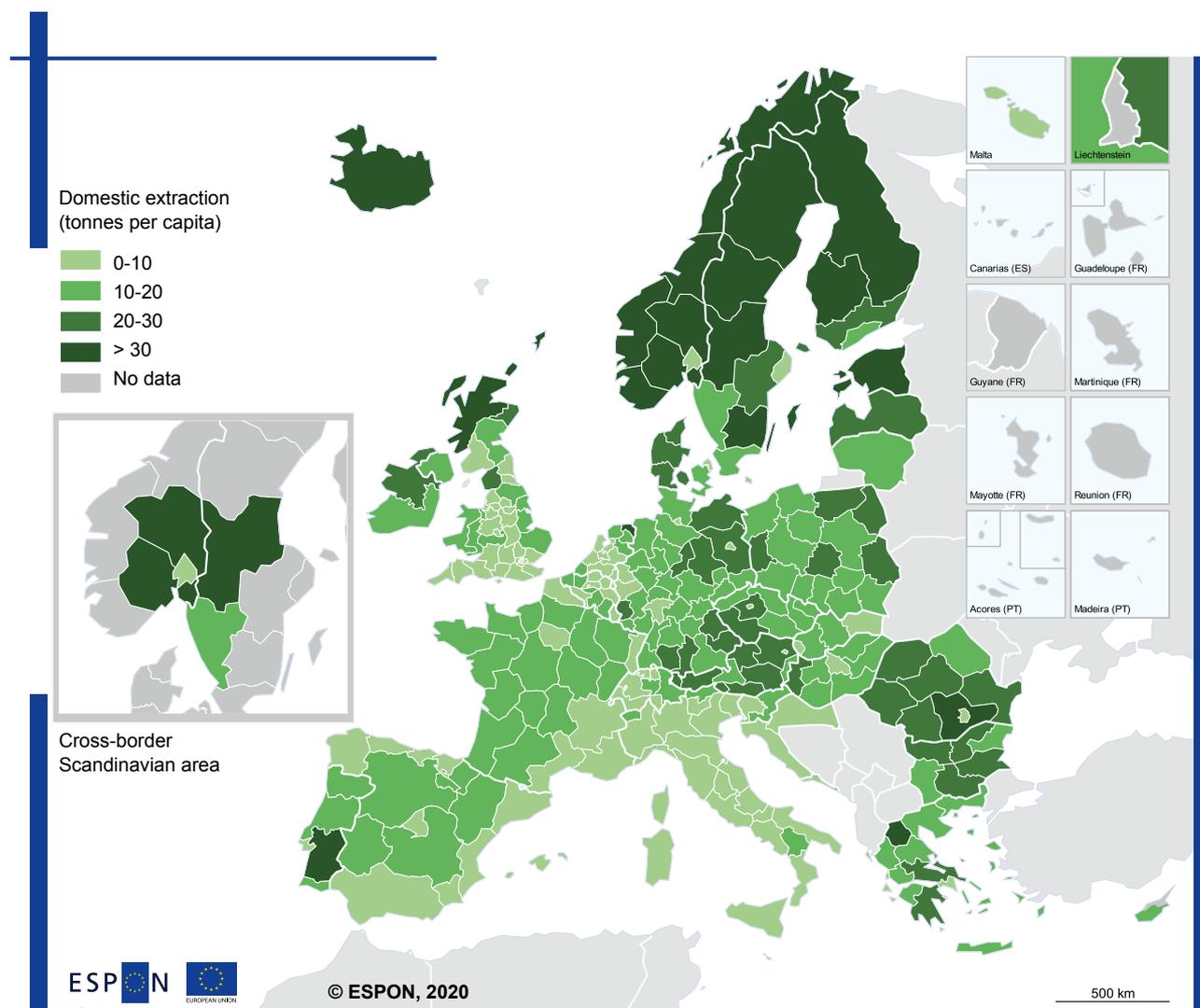


The territorial perspective has been enabled by monitoring and analysing relevant circular economy indicators at regional (NUTS 2) level. The Circter project produced regional estimates for the main **material consumption and waste generation and treatment indicators** available from Eurostat (at national level). In addition, the project developed a set of **new indicators focusing on the sectoral aspects of a circular economy** in terms of, for example, employment rate and financial turnover. This new granular information made it possible to distinguish clear territorial patterns across Europe, which, in turn, have been used to provide guidance tailored to regional contexts.

Map 1 shows the level of natural resources extracted across European regions in 2014. The per capita domestic extraction reflects the level of natural resources present in a territory, and thereby the type of economic activity likely to be of most benefit to the area. Very often, territories rich in

natural resources are export oriented, serving as suppliers of raw materials and/or semi-finished products for the more urbanised regions. **Local economies with greater availability of natural resources and mainly specialised in primary and secondary sectors are clear assets for circular bioeconomy initiatives.** The cross-border area of central Scandinavia (see Box 1) is a great example of this type of territory, as the Norwegian regions Innlandet and Viken and the Swedish regions Dalarna and Värmland are among the main suppliers of crops and timber not only in Norway and Sweden but also in foreign markets. This area had set the ambitious goal of becoming the leading region of the forest bioeconomy, which was supported by the **Interreg project ‘the bioeconomy region’**, which started in 2017, to stimulate wood-based innovations throughout the whole value chain.

**Map 1**  
Domestic material extraction of natural resources (2014)



**BOX 1****Spin-off case study for the cross-border Scandinavian area**

One of the distinguishing territorial features of the cross-border Scandinavian area is the abundance of natural assets and resources, including agricultural land, forests, lakes and rivers. Viken has 20 % of the agricultural land currently used in Norway, and 60 % of the land used to grow wheat and oats. Agriculture and forestry are also important industries in Innlandet, which produces 20 % of Norway's agricultural production and about 40 % of its timber. The primary sector, including forestry, also plays a key role in the Swedish regions of Dalarna and Värmland. These territorial assets have shaped regional economic structures, which are mainly specialised in material-intensive activities, making the area principally export oriented.

The cross-border Scandinavian area also benefits from a historical tradition of cooperation. High levels of collaboration between research-intensive industry, academia, research institutes and the public sector are already in place, not only at local level, but also at the level of cross-border regions. As an example, Innlandet and Värmland have recently established a strategic cooperation agreement within selected priority areas to promote joint regional development and growth. Overall, these territorial assets offer excellent conditions for the development of a world-class circular bioeconomy, as reflected by the most recent strategic objectives included in regional policy documents.

Source: ESPON, 2021a.

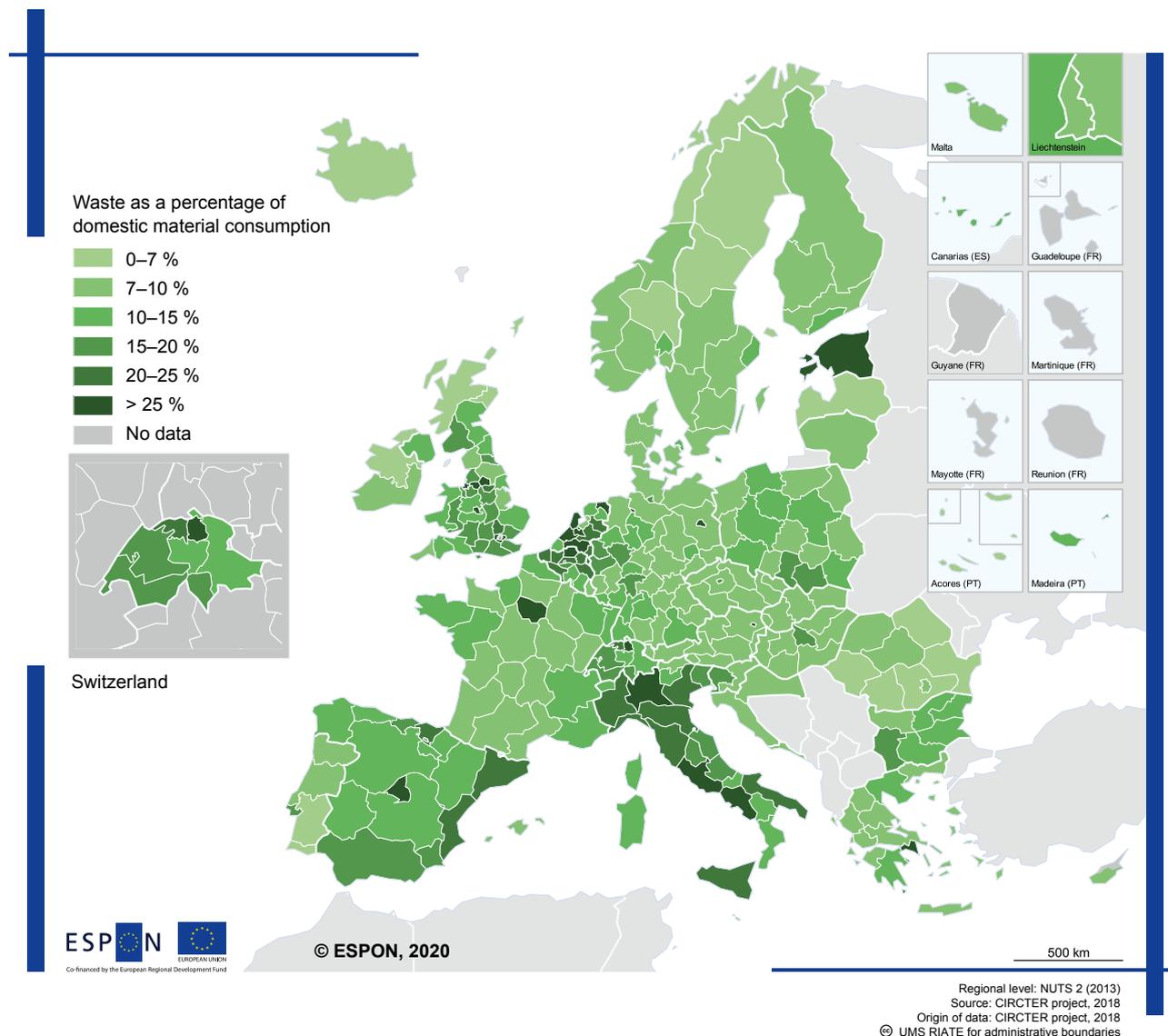
Other **critical circular economy indicators** providing information about the type of economy and available natural assets characterising territories are domestic material consumption and domestic extraction. Furthermore, waste-monitoring indicators improve understanding of whether territories are moving towards circular systems by, for example, increasing the rate of recycling; they also provide information on the overall performance of waste management. When combining waste generation and material consumption, we can assess the overall efficiency of productive and consumption systems. In this sense, Map 2 shows the generation of waste in relation to domestic material consumption (i.e. the amount of waste generated per a certain amount of material inputs in the economy). This indicator provides information on the relative intensity of raw material consumption and waste generation 'pressures' of an economy. It can be seen that very urbanised areas such as Berlin, Île-de-France, Lombardy, Madrid and Zürich are critical hotspots in the European region as they exhibit the highest proportions of waste generated compared with materials consumed. As these areas have the largest population concentrations, they also have the highest levels of waste generated by final consumption. Therefore, circular initiatives geared at waste prevention and behavioural consumption changes are critical in these areas. In contrast, the high level of Estonia, which can be considered a low-density region, is mostly explained by

the nature of its national economy, strongly reliant on oil shale. Indeed, Estonia generates 35 times the EU average of hazardous waste per capita, 98 % of which comes from oil shale combustion and refining. Reducing the generation and increasing the reuse of such waste would substantially improve environmental quality in the whole country and particularly in the mining region of north-eastern Estonia (OECD, 2017).

In addition to the material flow indicators (i.e. material extraction and material consumption) and waste generation indicators, the third aspect analysed in the Circter project concerns the sectoral perspective of a circular economy. **The analysis of operational circular business activities in place, in terms of, for example, employment generated or financial turnover generated, is in fact fundamental to establish closed-loop configurations in a specific territory.** Similarly, knowing the economic specialisation of a region might help to define the most promising routes for circular economy deployment. As an example, Map 3, which shows the turnover generated by companies linked to circular business models, shows Luxembourg to be among the most cutting-edge regions in Europe, reflecting the larger number of circular economy initiatives already operational and established in the local socioeconomic fabric (see Box 2).

## Map 2

### Generation of waste (excluding major mineral waste) as a proportion of domestic material consumption (2014)



## BOX 2

### Spin-off case study for Luxembourg

The scarce availability of natural resources on the one hand and the presence of strong agglomeration economies, know-how and technology capacity on the other hand can be seen as the leading and reinforcing territorial factors currently supporting Luxembourg’s transition towards a circular economy. Luxembourg already claimed, as one of its main strategic goals, to be ‘a knowledge capital and testing ground for the circular economy’ (EPEA, 2014). This objective is reflected in the Circter project’s results, which show Luxembourg to be one of the cutting-edge European regions in terms of circular business models already being used in the domestic territory.

Similarly, Luxembourg has some of the most advanced manufacturing sectors, among which steel production stands out. Indeed, thanks also to Luxembourg’s historical tradition in this sector, the flow of metal waste appears to be well on its way to closing the loop. Luxembourg is one of the larger traders of metal waste in Europe, and its metallic waste imports, mostly iron and steel waste, amount to more than 2 gigatonnes yearly. These imports are approximately three

times the amount of waste generated in Luxembourg. Overall, 31 % of the material processed in Luxembourg comes from secondary materials.

Luxembourgish municipalities show very different circularity performance scores (i.e. for recycling and the polluter pays principle), which might hamper coherent circular transitions. By **enhancing institutional cooperation at the local level, policymakers** could avoid trade-offs across the existing urban centres and municipalities and together strive for a common incentive framework.

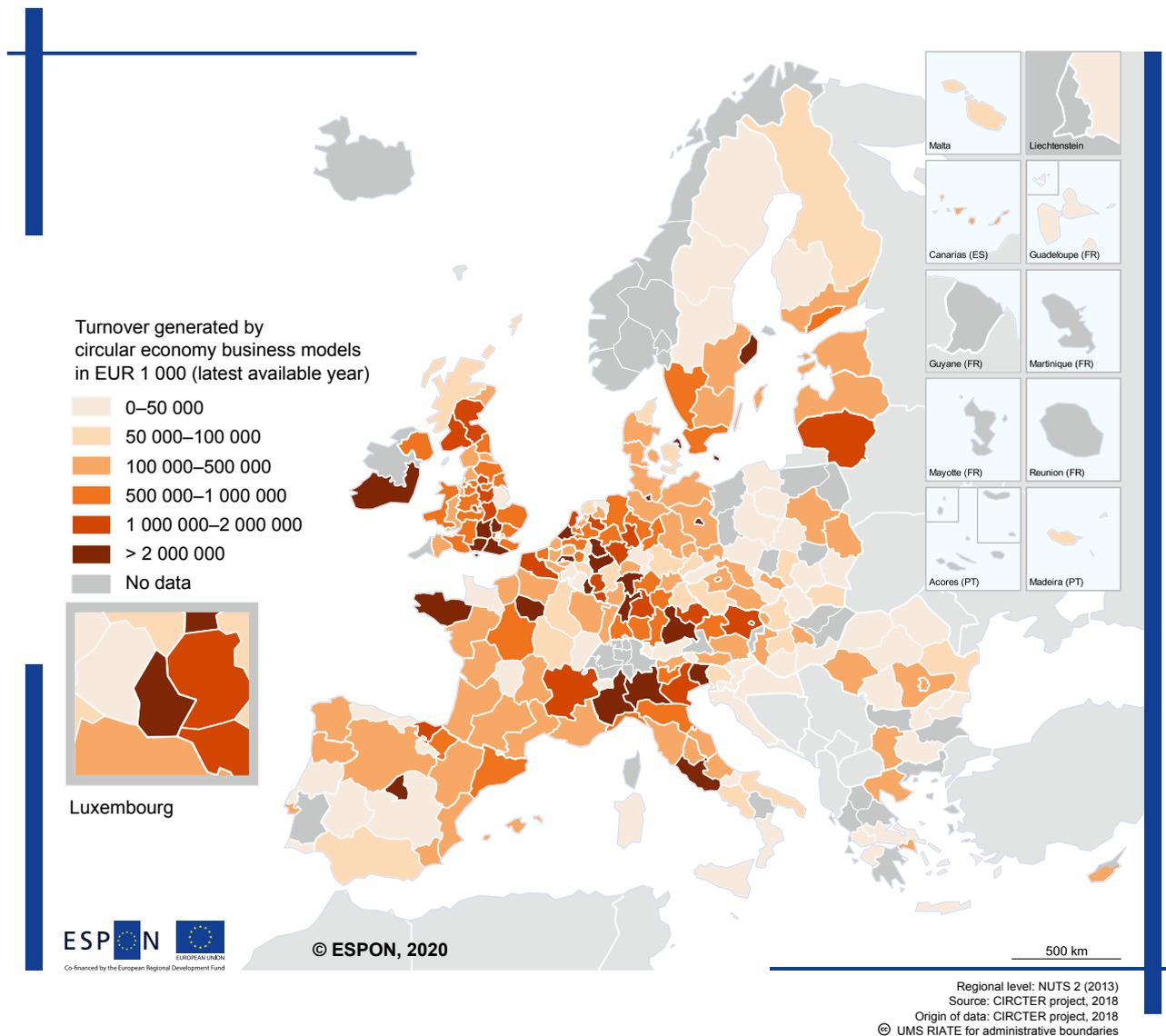
Source: ESPON, 2021b.

To conclude, the data gathered and developed by the Circter project provided a good starting point for analysing and understanding the multifaceted territorial contexts in which circular systems might exist. The spin-off case studies show

that this understanding can help, during the early stages of strategy development, to identify territorial strengths and weakness, and thus provide an initial overview of the most promising actions related to circular economy practices.

### Map 3

#### Turnover generated by companies associated with circular economy business models



## 3

## Taking stock of territorial strengths for harnessing circular configurations

The Circter project provided an overview and analysis of several types of circular economy policies and initiatives, making a direct link between policy actions and territorial configurations and/or factors (Figure 1). Building on that, the spin-off case studies sought to investigate the territorial resources of specific areas to better understand the local drivers of and barriers to circular configurations. The studies revealed that there are several types of circular initiative that local authorities can implement. The choice of one or another should not only be based on a thorough understanding of local assets but should also be made with the long-term goal of regional planning in mind. The following sections discuss some of the territory-specific initial overarching patterns observed at regional level.

## 3.1

### An emerging circular economy imperative: from waste management to waste prevention

Very urbanised areas are the epicentres of final consumption and, thereby, waste generation. In addition, thanks to the overall more advantageous labour market conditions, urbanised regions are characterised by continually inflated populations (owing to commuter workers). Territorial evidence from Switzerland (see Box 3) shows that even high waste management standards coupled with the presence of highly efficient infrastructure cannot always counter the increase in municipal waste (Figure 2).

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**BOX 3**

### Spin-off case study for Liechtenstein and Switzerland

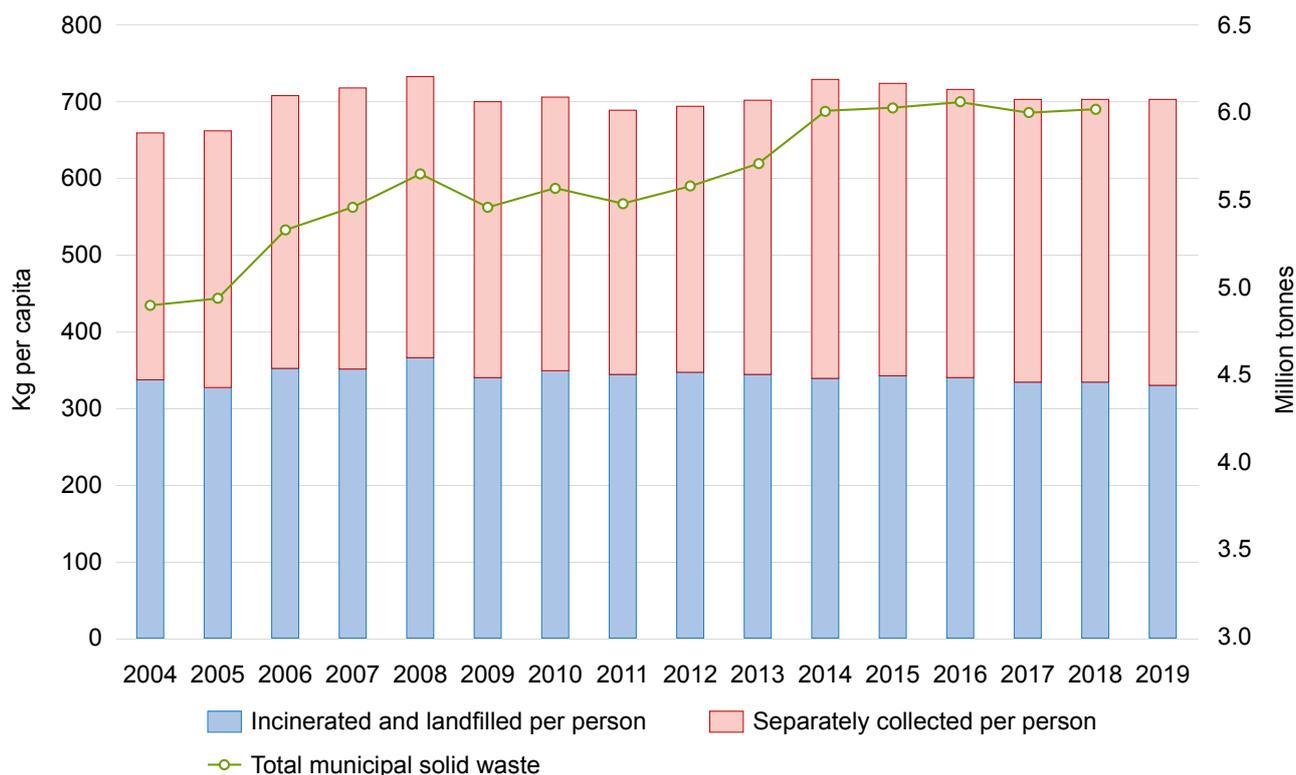
Liechtenstein and Switzerland are among the European territories best positioned to exploit the operational technological know-how in place for the deployment of circular systems. This is already reflected in the high recycling rates of these two countries, which are the highest in Europe (53 % of urban waste was separated, collected and recycled in Switzerland in 2019; in Liechtenstein this was even 68 %). Several cooperation platforms have been created to promote the exchange of know-how and the collaboration between all industry actors across value chains in order to find innovative circular solutions.

Despite the highly efficient waste management infrastructure in place, Switzerland is among the countries with the highest levels of material consumption and municipal waste generation in Europe. In this context, moving towards a circular economy is increasingly seen as a priority for Switzerland, not only to improve the national consumption footprint, but also because the implementation of circular solutions might help to reduce the dependence on imported raw materials.

*Source:* ESPON, 2021c.

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**Figure 2**  
**Swiss municipal waste generation and treatment (2004–2019)**



Note: Municipal waste generation is shown in kg per capita (bars) and in total million tonnes (line graph).

If the final goal is to reduce consumption footprints (i.e. reducing impacts from a demand-side perspective encompassing global value chains), **a more systemic approach to resource management should be adopted through the collaboration of different actors.** Circular system configurations are unlikely to be implemented by individual companies. Rather, the entire territorial ecosystem can close the circle. To achieve this aim, governments should go beyond traditional waste policies and narrow end-of-life perspectives, and promote coordination and partnerships between different stakeholders, including citizens.

Similarly, **the promotion of eco-design principles and functional requirements would also reduce waste generation** by fostering the market introduction of products and services with improved durability, reparability and recyclability, in addition to energy efficiency. Depending on the sectoral specialisation of a territory, public authorities should stimulate value chain actors through various instruments (e.g. economic incentives, standards, legislation) to bring more circular and sustainable products to the market. Such collaborations should bring industry and small and medium-sized enterprises (including entrepreneurs), knowledge centres, investors and public authorities together

for creating enabling environments for innovation territories featuring know-how and technological capacity in place.

Reducing the total amounts of waste in the first place would also mitigate the risk of investing in unnecessary waste infrastructures. Experience from the cross-border Scandinavian area and Liechtenstein and Switzerland has shown that it is difficult to move away from waste treatment options, such as incineration, once long-term investments have been made and facilities have been installed. A sound **dialogue between product designers and end-of-life materials managers** (i.e. the waste industry) needs to be at the heart of the discussion, as it will be a crucial step for the implementation of circularities within the production–consumption system. In this context, the creation of collaborative platforms involving all industry actors across value chains might be an important means of promoting cooperation. For example, the Swiss Circular Economy platform (<https://circular-economy-switzerland.ch/>) promotes knowledge exchanges between different actors by collecting and making available relevant information and offering the possibility of developing industrial networks.

## 3.2

### A circular economy for the built environment

The circular economy concept applied to a territory goes far beyond the search for circular loops of materials and resources. The Circter case studies show that **people, space and infrastructures are also important aspects that should be integrated into the conceptualisation of a circular system.**

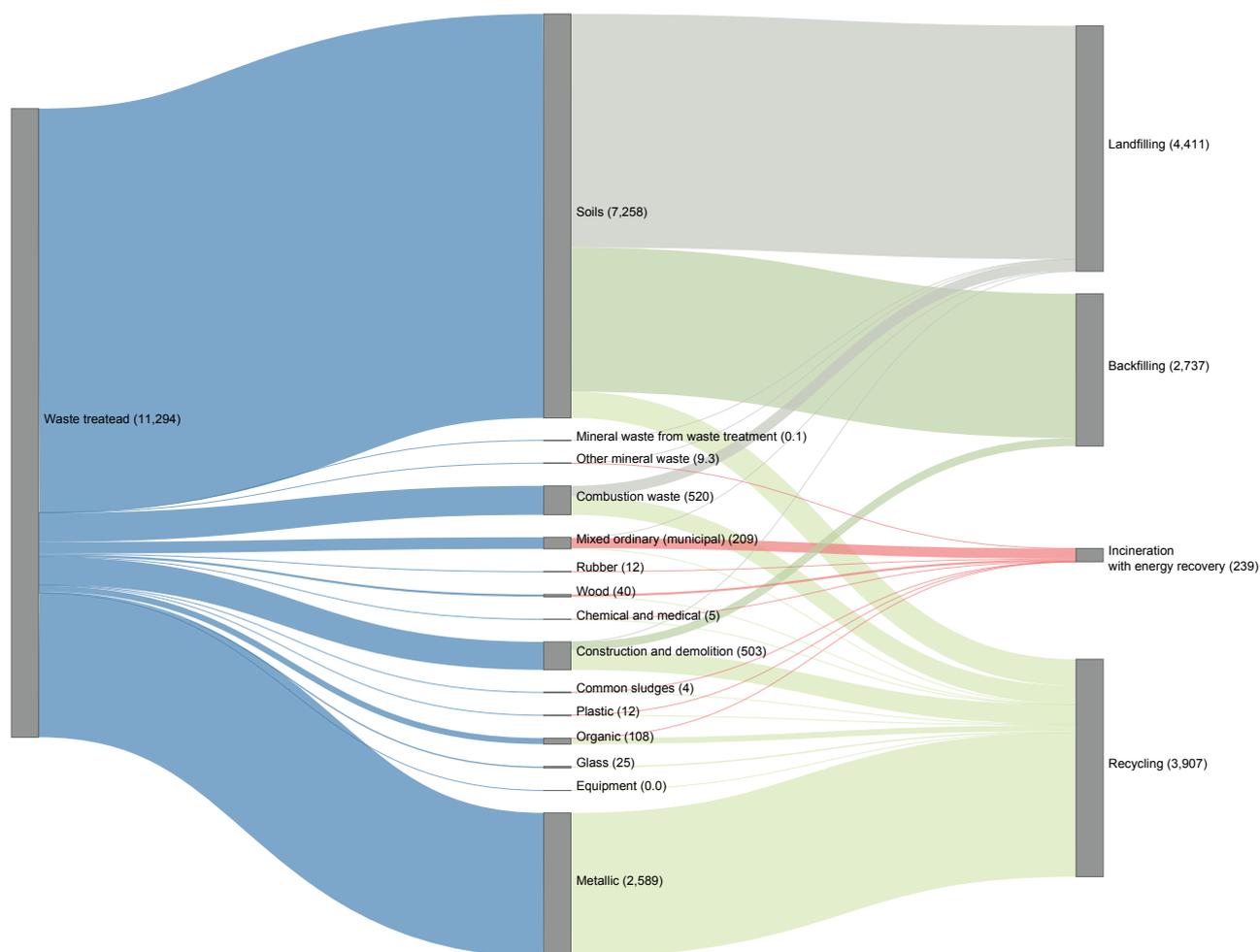
Cross-border areas are generally characterised by significant flows of commuters who cross borders daily. In some cases, the magnitude and span of these workforce flows can significantly affect resource efficiency, not only by saturating road and rail networks, but also by contributing to fossil fuel depletion and carbon dioxide emissions associated with transport. In this context, the **promotion of sustainable urban planning and mixed-used zones can greatly facilitate circular economy practices** and, at the same time, mitigate social and environmental harms. Areas with significant commuting flows such as Luxembourg, Switzerland and Viken can particularly benefit from a purposeful design of the built environment and reduced urban sprawl.

**Spaces should be designed to make circular resource management visible and accessible.** There is increasing evidence that considering waste prevention as merely a matter of individuals making better choices is often too simplistic an approach. Rather, citizens should be encouraged and incentivised to participate in circular systems. Therefore, policymakers should facilitate the design of strategic spaces that integrate circular economy practices

such as sharing, reusing and repairing into the built environment to make circular resource management visible and accessible to citizens. Abandoned industrial areas such as those in Luxembourg deserve particular attention in the spirit of a circular economy, as these areas, also known as brownfield sites, can be adapted to new circular industrial and non-industrial uses or be transformed into public spaces and offer new services. Returning abandoned land and buildings to the economic cycle can be seen as an effective way to reduce urban sprawl and its environmental impacts and to keep neighbourhoods occupied and vital.

One of the biggest issues in terms of material circularity remains the management of construction waste, which represents the largest material streams in Europe and is still largely disposed of in landfills. The spin-off case studies analysed are not an exception. As an example, about 7.5 million tonnes of rubble are excavated each year on Luxembourg's construction sites. Some (about 40 %) is recovered and reused in areas excavated for the purpose of reclamation or safety of slopes or for engineering purposes in landscaping. However, more than half of this rubble continues to be landfilled (Figure 3). Therefore, the concept of circularity in the built environment should be integrated from the earliest stages of building design. This can be done by **promoting construction techniques that enable buildings to be adaptable for multiple purposes (extending their life cycles) or facilitating their deconstruction, reuse and recycling.** Designing buildings that can easily be deconstructed or transformed must become a necessary practice if we are to mitigate the building industry's negative environmental impacts.

**Figure 3**  
**Luxembourg's waste flows by type of waste and treatment (thousand tonnes, 2016)**



### 3.3 Increasing local economy resilience

Circular initiatives have more advantages for territories than 'just' moving towards more sustainable development models. A circular system may in fact also increase the resilience of their economies, especially when these depend on stable flows of imports from foreign countries. Territories with limited natural resources such as Liechtenstein, Luxembourg and Switzerland could reclaim raw materials from used products, buildings and waste to reduce risks of global supply chains. **Urban mining** is an example of a circular initiative that aims to manage and use these reclaimed materials as a source of raw material supply, utilising not only the waste of today but also anticipating and capturing the value contained in the waste of tomorrow. In the case of mineral waste, the creation of databanks of construction materials from demolition sites in an area seems to be a cornerstone for creating a marketplace for recovered construction materials.

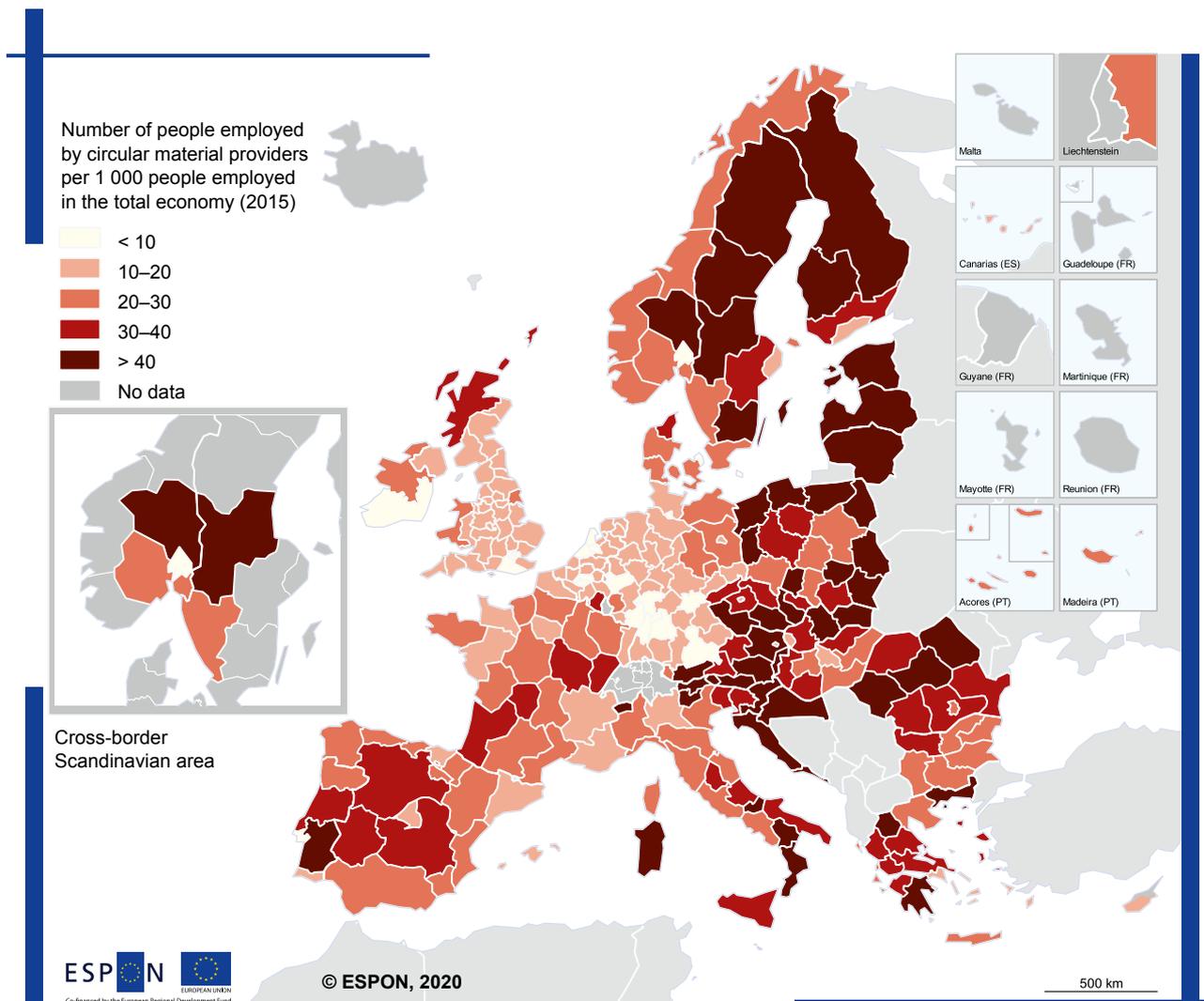
Similarly, **markets for secondary raw materials should be enhanced**, especially for those critical raw materials for which demand and thereby prices are expected to grow exponentially in the coming years, and for which there could be supply risks. Procurement rules and fiscal and other financial instruments should be better calibrated to incentivise the supply and use of secondary raw materials or circular products. Equally wise, for imported goods, a longer-term perspective should be adopted to require international suppliers of products to meet minimum eco-design standards requiring sustainable use of material resources and more cost-effective reuse, repair, remanufacturing and recycling processes.

In contrast, availability of natural resources may be seen as a major asset to strive for a **circular bioeconomy**, in particular when these assets are backed up by a strong presence of innovation stakeholders, as is the case for the cross-border Scandinavian area (see Box 1). As shown in Map 1, this region benefits from abundant natural resources

and, according to Map 4, which shows the number of workers employed in activities strictly related to the bioeconomy, appears to be among the European leaders in this area. Hence, the consideration of circular principles may help to ensure that the existing renewable bioresources are used in a cascading way, or that organic waste, co-products and by-products are treated as resources for the bioeconomy. Optimal use of the available resources should be planned

taking into account the overall effects of the implemented or desired productive system across all domains of sustainability (i.e. economy, society and environment). Therefore, it will be imperative to establish a common discussion between representatives from different sectors (i.e. society, markets (including consumers), industry (manufacturers), biomass suppliers and government) and from different scales (i.e. regional, national and international).

**Map 4**  
**Employment generated by material providers (2015)**



Regional level: NUTS 2 (2013)  
 Source: CIRCTER project, 2018  
 Origin of data: CIRCTER project, 2018  
 © UMS RIATE for administrative boundaries

## 4 Policy recommendations

### 4.1

#### Recommendations to boost territorial circular systems

Building on the experience of the Circter spin-off case studies, it was possible to draft policy recommendations for developing and implementing circular economy initiatives at regional and local levels and, more generally, for decision-makers at any governance level to help plan and implement a successful circular system. For many of the recommendations listed below, an in-practice example is given, more details of which can be found in the case studies of the Circter project.

#### Regulatory frameworks

- Public procurement, which accounts for approximately 14 % of European consumption, has the potential to shift the market towards more circular products and business models. Local authorities can help accelerate this shift by **integrating standards for circularity** within their procurement and investment frameworks to drive demand for circular services and products. **Circular public procurement** can be implemented at different levels, from the more encompassing ‘systemic’ level (product service systems, public–private partnerships, etc.) to the ‘supplier’ level and/or ‘product’ level (supplier take-back systems, design for disassembly, recycled materials, etc.) (European Commission, 2017).
- As an example, within the construction sector, **construction tenders might include circular-oriented criteria** such as implementation of sustainable design and construction principles, composing a digital materials passport, supply of recycled construction products, transport of waste to a recycling platform, traceability of the disposal of construction waste, and rate of recovery of construction waste specifying the nature of waste, sectors and suppliers.
  - This is being put into practice in Paris, where a deconstruction/demolition framework agreement that establishes a deconstruction methodology for construction waste management is being developed (OECD, 2020).
  - In addition, the Circular Construction in Regenerative Cities (CIRCuiT) project (<https://www.circuit-project.eu/>) is bringing together several partners across the entire built environment chain to showcase how circular construction approaches can be scaled up and replicated across Europe.
- Regional and local authorities could furthermore deploy, whenever possible, fiscal, financial, economic and regulatory instruments to **enable markets for secondary materials**, incentivising the use of recycled materials and penalising undesirable waste management options (such as landfilling). Pay-as-you-throw schemes, implementation of resource-based taxes and incentives supporting the use of secondary materials could also be explored.

#### Monitoring schemes and targets

- Political strategies should **prioritise solutions to reduce waste** over end-of-pipe solutions, to avoid technological lock-in traps. In addition, **priority should be given to targets aiming at the absolute reduction of waste production and associated impacts, as well as the reintroduction of secondary materials into the economy**. Recycling targets alone do not provide any incentive for waste prevention measures. Instead, they may have the undesirable consequence of constituting a technical specification resulting in a lock-in of the recycling stage in the waste hierarchy. Similarly, planning future incineration facilities should be discouraged as it would run the risk of preventing the entry into the market of more efficient waste treatment technologies.
- Currently, several material and waste flows are not monitored, nor is their exact composition known (e.g. waste electrical and electronic equipment and construction waste). Policymakers may play a role in supporting instruments for tracking materials that might be used as secondary raw materials for new purposes. The construction sector, which in general generates large amounts of waste and also has high demands for materials in expanding regions such as Luxembourg and the Akershus area in Norway, would strongly benefit from the **setting up of databanks**. As these databases store critical information on flows and stock (hence, volumes and location), as well as information on material composition, mechanical characteristics, etc., they would increase confidence and transparency among business actors, facilitating the development of new circular business models. Building on such databanks, information and communication technology tools such as **web platforms can facilitate the exchange of materials between parties**, providing virtual marketplaces where offers and demands are handled with potentially higher levels of traceability and certification.
  - The city of Mikkeli (Finland) is currently developing a three-dimensional tool for tracking construction and

demolition waste on-site and a databank and digital marketplace for recovered construction material.

- Circular economy initiatives can also contribute to the achievement of the United Nations Sustainable Development Goals (SDGs). It has been shown that some circular economy indicators are highly correlated with some SDGs (Rodriguez-Anton et al., 2019). Consequently, if local authorities were aiming to improve their performance as measured by circular economy indicators such as those provided in the Circter project or in the EU circular economy monitoring framework, they could also perform better on SDG indicators. Ideally, **future monitoring frameworks should make explicit the link between circular economy initiatives and SDGs**. This would permit policymakers to integrate circular economy initiatives within broader regional development strategies and, therefore, monitor the impact of the circular economy in terms of its contributions to SDGs, including through the development of new indicators.

### Territorial spatial planning

- The promotion of **sustainable urban planning and mixed-used zones** can greatly facilitate circular economy practices and, at the same time, mitigate social and environmental harms, especially in areas characterised by significant commuting flows and urban sprawl.
- The Belval project in Luxembourg (<https://www.belval.lu/en/belval/conversion-project>) and the RiverCity Gothenburg project in Sweden (<https://www.gothenburgatmipim.com/river-city>) are examples of how extensive dialogue and brainstorming involving local residents and representatives of municipal administrations, companies, industry and academia converged towards a shared vision for a new and functional built environment.
- Municipalities as planning authorities can have a leading role in enabling citizens to take an active role in a circular economy. This can be achieved through, for instance, the **provision of spaces** where people can carry out circular initiatives such as sharing, reusing and repairing. In this sense, ambitions should go beyond initiatives such as the setting up of the well-known 'repair cafes' to also include new transport modes in the built environment, including shared bikes and/or shared cars. In turn, these initiatives may also help local governments to achieve broader goals, including social cohesion, capacity building and equal opportunities, by envisaging the most vulnerable social groups as direct beneficiaries of reuse, repair and exchange initiatives.
- The city of Malmö (Sweden) has captured this concept in the strategic vision for the municipality, with physical spaces identified to facilitate sharing. Under this model, the circular economy in cities is built up through

relationships and networks, promoting local skills for the maintenance and repair of products.

### Governance and cooperation

- **Institutional cooperation** among local policymakers should be further enhanced in order to avoid eventual trade-offs across urban centres and municipalities at a national scale. Diverging strategic approaches, and thus diverging incentives, regulations and/or tax rates for businesses, ultimately hamper the establishment of more coherent circular transitions based on common frameworks. People, whether they live in or use a space, should also be included in decision-making procedures to a greater extent. Therefore, the design of circular economy strategies should be based on a **comprehensive engagement of relevant stakeholder groups, including citizens**. This engagement might be facilitated by **platforms with the objective of promoting dialogue and co-creation for the development of action plans**.
- Biovoices (<https://www.biovoices-platform.eu/>) an EU mobilisation and mutual learning platform and the Eco-Innovation Sicily platform (<https://www.urbanwins.eu/industrial-symbiosis-platform-in-italy/> and <http://www.industrialsymbiosis.it/>) are some examples in the bio-based domain.
- Given the systemic nature of circular configurations, the adoption of a **'functional area approach'**, focusing beyond the administrative limits on the economic organisation of a territory, can be critical in identifying all relevant stakeholders contributing to a circular solution. A functional approach might also be an effective policy tool to address complex areas characterised by borders between several fragmented administrative areas not aligned with each other. In this sense, the functional areas can bring together (or cluster) smaller administrative units under a shared vision, facilitating service provision and planning functions.

### Financing

- Finally, **several financing sources should be exploited to achieve key strategic objectives** (circularity, climate change mitigation and ultimately sustainability). These can combine public and private resources, for example various EU financial instruments and national or local funding programmes. Thanks to their privileged position, local governments have the capacity to promote collaboration between and increase engagement of private-sector actors alongside large research institutes and cluster agencies, acting as both (1) the enabler or partner of specific projects by applying for external funding (e.g. at national or EU level) and (2) the promoter and facilitator of collaboration through, for example, policy instruments (public procurement) to actively promote change.

## 4.2

### A more vigorous role for cohesion policy instruments

The territorial evidence collected in the Circter project and the spin-off case studies shows that a circular economy is relevant for all types of regions, but it is materialised in very different ways depending on local conditions. The relevance of agglomeration economies for various circular business models, where a certain critical mass is needed (e.g. product–service systems and sharing economies), suggests that tendencies towards concentration of some circular economy activities are likely to occur in larger urban areas, or according to the cohesion policy framework in the ‘more developed’ regions. Thanks to their more dynamic markets, these areas also have, on average, easier access to financial resources, which further favours the deployment of innovative business models. Therefore, once more, there is a real risk that rural and sparsely populated areas, which generally lack these agglomeration factors, will miss the opportunities that a circular economy could offer. **Cohesion policies should articulate measures to ensure, as far as possible, a balanced deployment of circular innovations across territories.**

This can be done in several ways. First of all, the circular economy can be seen as a cross-cutting topic across the four focus areas of the current European Regional Development Fund programming period, which are (1) innovation and research, (2) digital agenda, (3) support for small and medium-sized enterprises and (4) achieving a low-carbon economy. The Circter project and the spin-off case studies provided several examples of how circular initiatives can contribute to each of these focus areas. Therefore, this emphasis on reducing economic, environmental and social problems across European regions makes the **European Regional Development Fund very relevant, from a circular perspective, especially for ‘less developed’ or ‘transition’ regions, which often lack the technical and financial resources to implement ambitious circular economy strategies.**

In addition, ‘less developed’ regions in particular, which generally overlap with rural and peripheral areas, should also take advantage of cohesion funds such as the European Social Fund to **strengthen human capital**. The transition to circularity is linked to changing technology, new business models and new consumer practices. Training and educational programmes to develop such skills for the circular transition can be eligible for support from the European Social Fund and, therefore, would also indirectly

supply the labour market with new skills required in a more circular economy.

The Circter project and the spin-off case studies also showed that circular systems rely on territorial configurations that, eventually, extend beyond the administrative limits. Although there is no explicit link to circular or environmental issues, **Interreg programmes are very relevant for territories transitioning to a circular economy** as they provide an optimal framework for the exchanges of circular practices and experiences between national, regional and local actors from different Member States and at different levels (i.e. cross-border cooperation, transnational cooperation, interregional cooperation). On the one hand, Interreg programmes can foster integrated approaches for the co-creation of local development strategies based on the transnational participation of community groups including local authorities, non-governmental organisations and economic and social partners. In this context, the circular public procurement project funded by the 2014–20 Interreg Baltic Sea region programme might serve as inspiration for the future generation of Interreg programmes. The main goal of this project was to develop an adequate framework for circular procurement, including (1) building the necessary capacity on circular procurement for all relevant stakeholders of the value supply chain, and (2) delivering calls for tenders aligned with the defined priority areas to enable learning by doing and ensure the project develops practical capacity-building material.

In addition, **Interreg programmes can facilitate the cross-border circulation** of secondary raw materials as well as the setting up of stable secondary raw materials supply chains. As pointed out by the European Commission, the major obstacles to the creation of a well-functioning EU market for secondary raw materials are the legal and regulatory barriers that govern the transport and processing of by-products and end-of-waste products differently across Member States (European Commission, 2020). For this reason, future Interreg programmes should promote the creation of practices, pilots and tools to facilitate the cross-border circulation of by-products, since at this level innovative solutions can be tested and investigated. Bordering regions and communities could benefit from the creation of industrial symbiotic partnerships as a way of fostering local economic development and enhancing environmental benefits for local businesses. The **Interreg project Expansion of the CIRcular Economy concept in the Central Europe local productive districts (CIRCE2020)** offers a good starting point in this direction.

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