OECD Urban Studies

The Circular Economy in Cities and Regions of the European Union

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Please cite this publication as:
OECD (2025), *The Circular Economy in Cities and Regions of the European Union*, OECD Urban Studies, OECD Publishing, Paris, https://doi.org/10.1787/e09c21e2-en.

ISBN 978-92-64-98405-9 (print)
ISBN 978-92-64-79604-1 (PDF)
ISBN 978-92-64-51662-5 (HTML)

OECD Urban Studies
ISSN 2707-3432 (print)
ISSN 2707-3440 (online)

Photo credits: Cover © imagean/Getty Images Plus.

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Preface

We, Mayors and Leaders from Berlin (Germany), Central Macedonia (Greece), Jyväskylä (Finland), Matosinhos (Portugal), Møre and Romsdal (Norway), Sofia (Bulgaria), Eurométropole of Strasbourg (France), Valencia Region (Spain), Western Region (Ireland), and Zuid-Holland (Netherlands), are pleased to introduce the results of this OECD report on the Circular Economy in Cities and Regions of the European Union (EU).

By shifting to a circular system — where materials are reused, repaired, and recycled — we can reduce waste, lower emissions, and enhance resource efficiency while also driving innovation, creating market and job opportunities, supporting local businesses, and reducing health risks.

Through its Circular Cities and Regions Initiative (CCRI), dedicated funds and stakeholder engagement programmes, the European Commission (EC) is providing several tools to make the transition happen. Progress is underway, but much remains to be done to scale up efforts and accelerate implementation. As the EU moves forward with a renewed political mandate, the circular economy can help drive sustainable development and boost competitiveness.

Cities and regions have a pivotal role to play in this transition. They can promote, facilitate and enable the circular economy, while transposing national and EU-wide circular economy strategies to local and regional contexts. They can be test beds for circular models, such as sharing platforms, repair services, or circular supply chains, raise awareness about resource efficiency thanks to their proximity to citizens and local businesses, and incentivise product life extension or repair and reuse schemes.

Nevertheless, cities and regions cannot drive the circular transition on their own. National governments need to set regulatory frameworks conducive to circularity. Businesses can boost circular innovation. Citizens must rethink their consumption patterns and influence production, making circular practices part of everyday life.

This report offers in-depth analysis of circular economy initiatives, challenges, and opportunities in cities and regions, including on overarching EU policies. It draws on a survey of 64 cities and regions, 10 policy dialogues in specific cities and regions, as well as several interviews and workshops with experts and local and regional leaders as part of the OECD Task Force for Circular Strategic Thinking.

We are confident that the inclusive approach taken in the development of this report over the past two years, along with the policy recommendations, will help accelerate the transition to a circular economy in cities and regions, not just in Europe but across the world. We will continue to champion circular progress in our communities, foster peer learning and call for widespread adoption of these recommendations to achieve a cleaner, and more prosperous future for all.

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Timo Koivisto
Mayor
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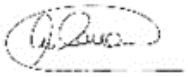

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Matosinhos, Portugal

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Mayor
Sofia, Bulgaria.

Meindert Stolk
Regional Minister
Zuid-Holland, Netherlands

Foreword

The transition to a circular economy is a critical step towards achieving sustainable development and a resilient future for all. It provides a framework that shifts the traditional linear take-make-consume-dispose model towards one that keeps the value of materials in the economy for as long as possible while minimising waste generation. In addressing resource scarcity, environmental degradation and economic inequality, the circular economy offers solutions that are particularly relevant to cities and regions, which are uniquely positioned as hubs of both opportunity and pressure.

This report highlights the pivotal role that cities and regions play in driving the circular economy. Local governments are key to shaping the infrastructure, policies, and partnerships needed for circular practices to thrive. The proximity of city and regional governments to businesses, communities, and ecosystems offers significant advantages in testing innovative solutions, piloting new business models, and scaling up successful circular initiatives. Cities like Berlin (Germany) and Jyväskylä (Finland), along with regions such as the Valencia Region (Spain), among many others, are taking bold steps towards circularity, offering valuable lessons for cities and regions across the globe.

Furthermore, the report highlights the broader policy landscape needed to foster a thriving circular economy, an area that remains largely underexplored in many urban and regional development strategies. As the European Union (EU) continues to prioritise green growth and sustainable development, the circular economy is becoming an integral part of its vision. Initiatives such as the forthcoming Circular Economy Act, the updated Bioeconomy Strategy, and the New European Bauhaus reflect the EU's growing commitment to embedding circular principles across sectors and territories. These initiatives will help drive demand for circular solutions, support local economies, and encourage innovation in areas such as waste management, energy efficiency, and material reuse.

Five years after the OECD 2020 report on the Circular Economy in Cities and Regions, which provided a first-of-its-kind overview of the circular economy at local and regional levels and proposed a Checklist for Action to drive the circular transition, this report aims to help accelerate the adoption and implementation of circular economy strategies at the local and regional levels.

Looking ahead, the report serves as a call to action for cities and regions to unlock the circular economy in a shared responsibility across levels of government.

Acknowledgements

This report was prepared by the OECD Centre for Entrepreneurship, SMEs, Regions and Cities (CFE) led by Lamia Kamal-Chaoui, Director, as part of the of the Programme of Work and Budget of the OECD Regional Development Policy Committee (RDPC), with the financial support and co-operation of the European Commission's Directorate-General for Research and Innovation (DG RTD), led by Marc Lemaitre, Director-General of DG RTD.

The report was led by Oriana Romano, Head of the Water Governance, Blue and Circular Economy Unit, and co-authored with Ander Eizaguirre, María Ferrer Estevez, Georges Laimé, Juliette Lassman and Sho Yamasaki, Policy Analysts, under the supervision of Aziza Akhmouch, Head of the Cities, Urban Policies and Sustainable Development Division in the CFE. Mariam Fofana, Danijel Sudarevic and Doros Voulgaridis, interns, contributed to the literature review.

Authors are grateful to Nadim Ahmad, Deputy Director, Andres Fuentes Hutfilter, Head of the Environmental and Land Use Economics Unit, and Soo-Jin Kim, Deputy Head of the Cities, Urban Policies and Sustainable Development Division, all in the CFE, as well as to Peter Borkey, Principal Administrator, and Frithjof Laubinger, Policy Analyst in the OECD Environment Directorate (ENV), for their comments on the draft report.

Thanks are extended to Astrid Ladefoged, Head of Unit (DG RTD, European Commission), Lucie Blondel and Marta Andreoni, Policy Officers (DG RTD, European Commission) and Andrea Accorigi, Project Manager (CCRI-CSO) for the excellent collaboration throughout the project, as well as to Pavel Misiga, former Head of Unit (DG RTD, European Commission) for his pivotal role at the early stages of the process.

Special thanks are expressed to the 64 cities and regions (see the list in Annex A) who responded to the OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU), which was disseminated in collaboration with the OECD Champion Mayors for Inclusive Growth Initiative, the ASSET Interreg project, the EC Circular Cities and Regions Initiative - Coordination and Support Office (CCRI-CSO), the Ellen MacArthur Foundation, the European Committee of the Regions (CoR), ICLEI and the UK Circular Cities Network.

Thanks are also conveyed to Paul Ekins, Professor of Resources and Environmental Policy at the University College London (UCL) Institute for Sustainable Resources and Henning Wilts, Director of Circular Economy at the Wuppertal Institute for their contribution to the three Workshop of the OECD Task Force for Circular Strategic Thinking held on 15 November 2024, 16 December 2024 and 31 January 2025.

Authors are grateful to Anthony Cox, Senior Policy Advisor, Ecologic Economics and former Deputy Director of the OECD Environment Directorate (ENV) for his in-depth review of the report.

Preliminary findings were shared and discussed at the 6th OECD Roundtable on the Circular Economy in Cities and Regions held on 18 April 2024 (Brussels, Belgium) and at the 36th session of the WPURB on 3 December 2024.

Thanks are extended to Jack Waters in the CFE for preparing the report for publication.

Table of contents

FIGURES

TABLES

BOXES

Abbreviations and acronyms

ADEME	*Agence de l'environnement et de la maîtrise de l'énergie* (French Ecological Transition Agency)
ADF	Advanced Disposal Fee
AI	Artificial Intelligence
AIDIMME	*Instituto Técnológico Metalmecánico, Mueble, Madera, Embalaje y Afines* (Technological Institute for Metalworking, Furniture, Wood, Packaging and Related Industries)
AUD	Australian Dollar
BAU	business-as-usual
BEdC	Basque Ecodesign Center
BEL	Belgium
BerlAVG	Berlin Tendering and Procurement Act
BGR	Bulgaria
C3	Circular City Centre
CAD	Canadian Dollar
CBAM	Carbon Border Adjustment Mechanism
CCD	Circular Cities Declaration
CCRI	Circular Cities and Regions Initiative
CCRI-CSO	Circular Cities and Regions Initiative - Coordination and Support Office
CEAP	Circular Economy Action Plan
CEMF	Circular Economy Monitoring Framework
CLES	*Coopérations Locales et Environnementales en Synergies* (Local and Environmental Cooperation in Synergies)
CMUR	Circular material use rate
CO_2	Carbon dioxide
CODEC	*Contrat d'Objectifs Déchets et Économie Circulaire* (Waste and Circular Economy Contract of Objectives)
CZE	Czechia
DEU	Germany
DG RTD	Directorate-General for Research and Innovation
DMC	Domestic Material Consumption
DRS	Deposit Refund Systems
EC	European Commission
ECESP	European Circular Economy Stakeholder Platform
EIB	European Investment Bank
EIF	European Investment Fund
EIT	European Institute of Innovation and Technology
EMS	Eurométropole of Strasbourg
EPR	Extended Producer Responsibility
ERDF	European Regional Development Fund
ESP	Spain
ESPR	Ecodesign for Sustainable Products Regulation
EST	Estonia
ETS	Emissions Trading System
EU	European Union
EUI	European Urban Initiative

EUR	Euro
EURES	European Employment Services
FIN	Finland
FRA	France
FUA	Functional Urban Area
GBR	United Kingdom
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GLA	Greater London Authority
GPP	Green Public Procurement
GRC	Greece
HOSBEC	Hotel and Tourism Business Association of the Region of Valencia
HUN	Hungary
ICC	Intelligent Cities Challenge
ICLEI	Local Governments for Sustainability
ICT	Information and communication technology
IoT	Internet of Things
IRE	Ireland
ITA	Italy
KPI	Key performance indicator
LCA	Life Cycle Analysis
LIFE	*L'Instrument Financier pour l'Environnement*
LUX	Luxembourg
NDCs	Nationally Determined Contributions
NGOs	Non-governmental organisations
NLD	Netherlands
NOR	Norway
PAAS	Product as a service
PAYT	Pay-as-you-throw
PP	Percentage point
PPP	Public-Private Partnership
PPS	Purchasing Power Standards
PRO	Producer Responsibility Organisation
PRT	Portugal
R&D	Research and development
REEs	Rare Earth Elements
RFID	Radio Frequency Identification
SDG	Sustainable Development Goal
SLK	Slovak Republic
SLV	Slovenia
SMEs	Small and Medium Enterprise
STEM	Science, technology, engineering, and mathematics
SWE	Sweden
TEOM	Household Waste Removal Tax
UCLG	United Cities and Local Governments
UK	United Kingdom
UN	United Nations
US	United States
USD	United States Dollar
VAT	Value Added Tax
VCI	*Versnellingsnetwerk Circulair Inkopen* (Circular Procurement Acceleration Network)
VwVBU	Administrative Regulation on Procurement and the Environment
WEEE	Waste from Electrical and Electronic Equipment
ZAR	South African Rand

Executive summary

The circular economy is a transformative model that aims to preserve the value of products, materials and resources for as long as possible, while minimising waste. Unlike the traditional linear "take-make-consume-dispose" model, it takes into account the whole life cycle of products including the upstream (design), midstream (use and reuse), and downstream (end-of-life management) stages. The transition to a circular economy requires systemic changes in how resources are managed across sectors such as the built environment, food, waste, water, and energy - all areas where local and regional governments play critical roles. The circular economy is an imperative to deliver on the green transition and to mitigate the growing risks and negative impacts of climate change whilst boosting economic resilience and energy security.

Key benefits of the circular economy

- The circular economy holds potential to mitigate global environmental challenges and reduce waste production. In 2024, around 60% of global greenhouse gas (GHG) emissions were generated by materials such as iron and steel, cement and plastic. Material efficiency measures can cut hard-to-abate process emissions in the EU's production of raw materials by over 50% by 2050. Resource demand strategies in buildings, transport, food, and energy supply systems could reduce global GHG emissions by 40-70% by 2050. Cities generate 50-70% of global waste. In a business-as-usual scenario, municipal waste generation is projected to increase by 5.3% from 220 Mt in 2018 to 231.5 in 2035 in EU. In that context, the implementation of circular economy principles could reduce total municipal waste generation by 34% by 2030, compared to 2020.
- A shift to a circular economy offers substantial cost savings and new economic opportunities. By increasing resource efficiency and using secondary materials, businesses can benefit from economic gains and more resilient supply chains. It could also serve to improve economic security. The EU, for instance, imports nearly half of its metal and over 70% of fossil energy materials. Circular practices in sectors such as construction, mobility and energy efficiency help reduce reliance on imported raw materials and energy. Moreover, the valorisation of the materials contained in waste not only decreases the demand for raw materials, it can also lower waste disposal costs. Households can reduce expenses by improving energy efficiency, reusing materials, and adopting practices such as repair and refurbishment.
- The circular economy offers significant economic and social benefits, including job creation, improved public health, and enhanced community well-being. By 2030, it could create 2.5 million new jobs within the EU in sectors such as recycling, repair and reuse. By reducing waste production and sharing products and assets such as cars, bikes, and workspaces fostering community engagement, the circular economy can make cities more liveable. It helps decrease noise levels, traffic congestion, and air pollution – factors that can contribute to health-related issues – while ultimately improving quality of life for residents.

Progress and challenges in the circular economy transition

Over the last decade, many countries have demonstrated significant commitment to advancing circular economy principles at all levels of government. As of 2023, 24 of 27 EU Member States had adopted national circular economy strategies, roadmaps or action plans. Additionally, in 2024, three-quarters of the

cities and regions contributing to the *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)* reported having established circular economy strategies. For example, the Basque Country's Circular Economy Strategy 2030 in Spain targets a 30% increase in material productivity and a 30% reduction in waste generation by 2030; the Circular Economy Roadmap of Oulu, Finland aims for carbon neutrality by 2035; and the 2020 Circular Economy Route Map of Glasgow, United Kingdom, focuses on localising the economy to ensure it is based on social inclusion, justice and wellbeing of communities.

Despite these positive developments, the circular economy remains a marginal approach in many countries, In the EU for example, it accounts for only about 2% of total EU GDP and employment and the circular material use rate of 12% in 2023 was still far short of the 2030 target of 24% in the EC 2020 Circular Economy Action Plan. Several EU countries fail to meet binding waste management targets. At subnational level, only 13% of OECD large regions have currently met Sustainable Development Goal (SDG) 12 on responsible production and consumption.

The primary obstacles to the circular economy transition are not technological, but related to the policy environment, notably governance, regulation and financing. Existing policies have emphasised downstream actions, such as waste management, while providing limited incentives for upstream measures like eco-design, circular planning, and reuse. As a result, producers often have few regulatory obligations or financial motivations to design products for longevity, material recovery or reuse. Consumers also have insufficient economic incentives – such as tax benefits or deposit-return schemes – to keep products in use. Financing remains another major hurdle, as businesses and local governments struggle with limited public resources and access to finance. Traditional linear models often remain more profitable due to the slow development of secondary markets for materials like wood, plastics, textiles, and construction and demolition waste. Without stronger financial incentives ('carrots') and regulatory requirements ('sticks'), circular activities can continue to face competitive disadvantages. Finally, governance challenges persist, particularly in tracking progress towards a circular economy. Most available data focuses on waste rather than broader resource flows, urban metabolism, and material inputs and output, making it difficult to measure circularity effectively at local and regional national level.

Policy recommendations for accelerating the circular economy transition

This report highlights actionable policy recommendations for the European Commission (EC), national, regional and local governments, as well as businesses. While directed to the EU context, these recommendations can inspire other OECD and non-OECD countries to accelerate their circular transitions. Key recommendations include:

- **Make the circular economy accessible and affordable to people**. Consumers in cities and regions should have easy access to clear, standardised and simple information on product durability, repairability, and recyclability. Separate collection instructions for recycling should be easy to understand, and repair services should be available and affordable. The EU Eco-design Directive and its emphasis on the "right to repair" provides a good example.
- **Enhance the competitiveness of the circular economy**. First, continuing to work with Member States towards a legally binding framework to phase out subsidies that undermine the circular economy could support circular business models and, at the same time, free up fiscal resources for investments in resource and low-carbon economic activities. Second, pricing negative environmental externalities such as carbon emissions and pollution through taxes could incentivise the use of secondary materials, which are often more expensive than virgin ones, and improve the relative competitiveness of circular businesses. Similar measures could be considered for single-use products (to discourage their use), landfilling and incineration (to encourage recycling, reuse, and waste prevention). In parallel, notwithstanding challenges related to measurement, the EU could investigate the scope to adopt a similar instrument to the Carbon Border Adjustment Mechanism (CBAM), which is designed to tackle carbon leakage, to deal with material leakage

- **Drive circularity upstream**. Circular policies should be defined on a sectoral basis, focusing on materials rather than waste management. The aim should be for national and local governments to move from action on lower levels of the circular economy hierarchy (e.g. recycling) towards higher levels (e.g. waste prevention), with clear targets on resource use reduction, environmental impact, economic output, and job creation. Synergies across value chains (electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, and food, water, and nutrients) should be taken into account. In addition, Extended Producer Responsibility (EPR) schemes could be broadened beyond packaging. Moreover, Green Public Procurement (GPP) could include mandatory circular criteria. While these may, but not necessarily, result in higher public procurement costs in the short term, they hold great potential to deliver longer term (economic and social) benefits including to the public purse, that offset short term costs. They can also help accelerate momentum for more sustainable and eco-friendly products and services that strengthen resilience to climate shocks and indeed economic, supply, shocks.
- **Ensure a just and regionally balanced circular transition**. Through territorial assessments, national governments could identify the current and future implications of the circular transition for industries, workforce groups and communities, and inform circular economy policies, including innovation policies and re-skilling programmes. This would promote circular economy initiatives that are place-sensitive, i.e. that consider the territorially differentiated implications of the circular transition. The EU could support “net losing” regions, experiencing job and income losses, as well as skills mismatches between workers’ expertise in traditional linear roles and the demands of emerging circular economy positions. For example, as part of the 2025 Start-up and Scale-up Strategy, the EU could focus on areas where businesses can successfully scale up circular solutions, particularly those with access to skilled labour, essential services and the necessary infrastructure.
- **Improve granular data for better decision-making**. Subnationally disaggregated indicators should feature in the EC Circular Economy Monitoring Framework (CEMF). National authorities can strengthen their own reporting on circular economy indicators to support place-sensitive circular economy strategies by enhancing data collection methodologies, integrating digital tools, and standardising indicators to improve the accuracy of circular economy statistics. Additionally, investing in experimental data methods, such as big data analytics and remote sensing, could support the collection of new indicators at subnational level.

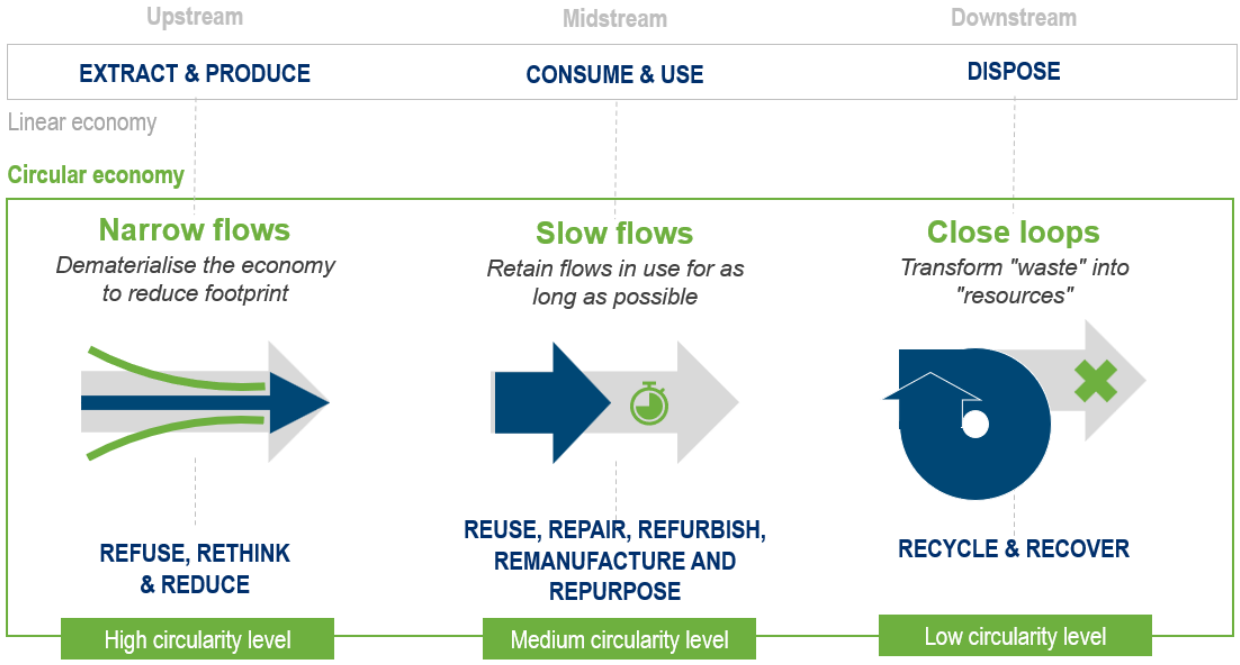
1 Key factors driving the circular economy in cities and regions in the European Union

The shift towards the circular economy in EU cities and regions is driven by several interconnected factors that reflect the urgent need for systemic change: environmental imperatives, economic growth and resilience of supply chains, technological progress and R&D, regulatory and policy frameworks and jobs and societal engagement. This chapter provides the narrative, data, costs of inaction and co-benefits for each driver.

Defining the circular economy in cities and regions

The circular economy is a production and consumption model that aims to maintain the value of products, materials, and resources in the economy for as long as possible while minimising waste generation (European Parliament, 2023[1]; European Union, 2021[2]) (OECD, 2019[3]). By doing so, it contributes to key European Union (EU) priorities, including a green recovery, climate mitigation and energy savings, biodiversity protection, sustainable development and competitiveness (European Commission, 2015[4]).

Figure 1.1. Circular economy actions to close loops



Source: Author's elaboration based on Potting et al. (2017[5]) Circular Economy: Measuring innovation in the product chain.

Contrary to the linear economy, which follows a take-make-consume-dispose pattern and relies on large quantities of cheap and readily available materials and energy, the circular economy applies R-strategies (Box 1.1) to the upstream, midstream and downstream phases of production and consumption. These strategies aim to *narrow economic flows* by minimising the inputs of raw materials and energy; *slow material flows* by extending the life span of products and services; and *close loops* by reintegrating treated resources back into the economy (Figure 1.1).

- In the upstream phase, where products are designed and produced, strategies based on *refusing, rethinking, and reducing* aim to dematerialise the economy. They show high circularity potential as they can narrow material flows. Several business models can be applied. For instance, user-oriented product-service systems, such as leasing, pay-per-use, or subscription services provide access without ownership, reducing material footprint consumption. Similarly, result-oriented models focus on delivering outcomes, such as lighting or printing as a service, with providers retaining responsibility for efficiency and maintenance of the goods used to provide the service. Sharing models optimise the utilisation of underused assets, including goods libraries, shared mobility platforms, and co-working spaces. Digital business models leverage technology to minimise resource use, including subscription-based software, e-commerce platforms, and digital twins for efficient system management. Finally, circular supply models facilitate eco-design, circular sourcing, take-back schemes, and reverse logistics to promote reuse, repair, and recycling.

- In the midstream phase, which is related to consumption, *reuse, repair, refurbish, remanufacture and repurpose* have a medium level of circularity potential as they *slow material flows*, extending the life span of products and services. According to the European Commission (EC's classification of materials, material flows include categories such as biomass, metal ores, non-metallic minerals, and fossil energy materials/carriers (Eurostat, 2024[6]). In this phase, product-oriented or product-service systems combine product sales with extended services, such as warranties, maintenance contracts and repair services, to extend product lifetimes and mitigate resource extraction and waste generation (OECD, 2019[7]) (OECD, 2024[8]).
- The downstream phase includes *recycle and recover* strategies. They show a low level of circularity as they are applied when resources become waste and require treatment. Therefore, reintegrating transformed resources into the economy (*closing loops)* requires the use of additional material and energy. In this case, business models include downcycling, where materials are repurposed for less demanding applications; upcycling, which creates secondary materials for higher-value applications; and industrial symbiosis, where by-products from one industry are used as inputs for another.

The EU Taxonomy Compass[1] identifies 16 economic sectors[2], five of which are directly connected to circularity (European Commission, 2020[9]): water supply, sewerage, waste management and remediation; construction and real estate; services; manufacturing and information and communication technology (ICT). Within each sector, the EU Taxonomy highlights a series of activities across the *upstream, midstream and downstream* phases (Table 1.1).

Box 1.1. The 10 R-strategies of the circular economy

- **Refuse** refers to eliminating the use or demand for materials or products that are harmful or unnecessary. For instance, cities and regions can prohibit single-use plastics in public services and events, digitalise services to replace physical products such as files with e-files, or introduce water refill stations in public buildings and urban areas to reduce single-use bottles.
- **Rethink** relates to reformulating consumption and use models enabling cities and regions to intensify resource utilisation. Cities and regions can rethink their infrastructure and urban settings by promoting compact city designs, such as in the 15-minute city concept, alongside the provision of multi-use community spaces, co-working and co-living hubs, bike-friendly pathways, and using smart technologies to optimise resource use.
- **Reducing** the economy's material footprint requires increasing material efficiency during the manufacturing or use phases of products and services. Cities and regions can achieve this by employing resource-saving technologies, such as energy-efficient lighting and water-saving and recycling devices (e.g. decentralised water recycling systems, stormwater harvesting) in public buildings and urban areas, and by integrating renewable energy systems, such as solar panels and wind energy infrastructure.
- **Reuse** encourages the use of products and materials for their original purpose or by a new user. Examples of spaces fostering reuse in cities and regions include community exchange centres and second-hand markets.
- **Repair** strategies can prevent the disposal of products. Cities and regions can promote repair and maintenance by offering repair workshops, hubs, and cafés as well as ensuring that public services, such as schools or municipal offices, prioritise the repair of goods such as electronic devices.

- **Refurbishing** involves restoring products and infrastructure to an updated or improved condition. Cities and regions can refurbish public infrastructure instead of demolishing and rebuilding it.
- **Remanufacturing** enables discarded products or their components to be transformed into new items with the same quality and functionality as the original. This requires reverse logistics systems that allow products, such as appliances, to re-enter the industrial cycle. Cities and regions can incentivise local industries to adopt remanufacturing practices and integrate remanufactured products into public procurement.
- **Repurposing** involves adapting discarded items for new uses. In urban contexts, this can include transforming old railways into bike paths, community gardens or vertical farming infrastructure. Cities and regions can repurpose underused public buildings for new functions, such as co-working offices or community centres, and provide workshops to teach citizens how to repurpose and upcycle household items.
- **Recycling** refers to the processing of discarded materials to produce new resources of either the same or lower quality. Cities and regions can support this by prioritising the use of recycled materials in construction, promoting urban mining and building city-wide recycling systems (e.g. separate collection bins for organic waste, plastics and textiles) that include facilities for e-waste and textiles.
- **Recovery** focuses on extracting value from non-recyclable materials, often through waste-to-energy technologies. Cities and regions can establish waste-to-energy facilities to process non-recyclable waste and divert it from landfills. These facilities can produce energy, materials, and other valuable by-products, thereby reducing reliance on virgin natural resources, and wastewater-to-energy systems.

Source: Blomsma and Brennan (2017[10]), The Emergence of Circular Economy: A New Framing Around Prolonging Resource Productivity, 10.1111/jiec.12603; Reike, Vermeulen and Witjes (2018[11]), The circular economy: New or Refurbished as CE 3.0? — Exploring Controversies in the Conceptualization of the Circular Economy through a Focus on History and Resource Value Retention Options, 10.1016/j.resconrec.2017.08.027; Potting et al. (2017[5]), Circular Economy: Measuring innovation in the product chain - Policy report.

The circular economy operates at the micro (relating to products, companies, consumers), meso (e.g. eco-industrial parks) and macro (city, region, country and beyond) scales. In cities and regions, the circular economy implies a systemic shift whereby *economic activities* are planned and carried out in a way that minimises waste and uses resources efficiently across value chains; *services* (e.g. water, waste and energy) are provided by making efficient use of natural resources as primary materials and optimising their reuse; and *infrastructure* is designed and built to avoid linear lock-in (e.g. district heating, smart grids, etc.) (OECD, 2020[12]).

Cities are the places where most of the global population lives and consumes. Globally, by 2050, about 7 billion people will reside in cities (70% of the total population) (UN-Habitat, 2022[13]). In Europe, 84% of the population will be urban by 2050, representing around 600 million people, with implications for production and consumption patterns (UN-Habitat, 2022[13]). Currently, cities consume 70% of the world's food production, account for approximately 75% of global energy consumption, and generate 70% of greenhouse gas emissions – shares that are set to rise (FAO, 2025[14]; IEA, 2024[15]). Economically, cities and regions are powerful engines of growth. With more than 80% of the global gross domestic product (GDP) generated in cities, they can contribute to sustainable growth through increased productivity and innovation (World Bank Group, 2025[16]). In 2021, more than 50% of the EU's GDP and around 45% of its employment was concentrated in predominantly urban regions (Eurostat, 2024[17]). Urban areas also represent 83% of total household spending, amounting to USD 51 trillion globally (World Economic Forum, 2024[18]). Moreover, local and regional governments hold competencies in areas relevant to the circular economy such as water supply and sanitation services, solid waste management, land use, and climate

change. These governments can enforce regulations, manage infrastructure, and develop policies that promote sustainable practices and resource efficiency (OECD, 2020[12]). Both the OECD Principles on Urban Policy (OECD, 2019[19]) and the OECD Principles on Rural Policy (OECD, 2019[20]) consider the circular economy as a means to encourage more efficient resource use.

Table 1.1. Circular sectors and value chains

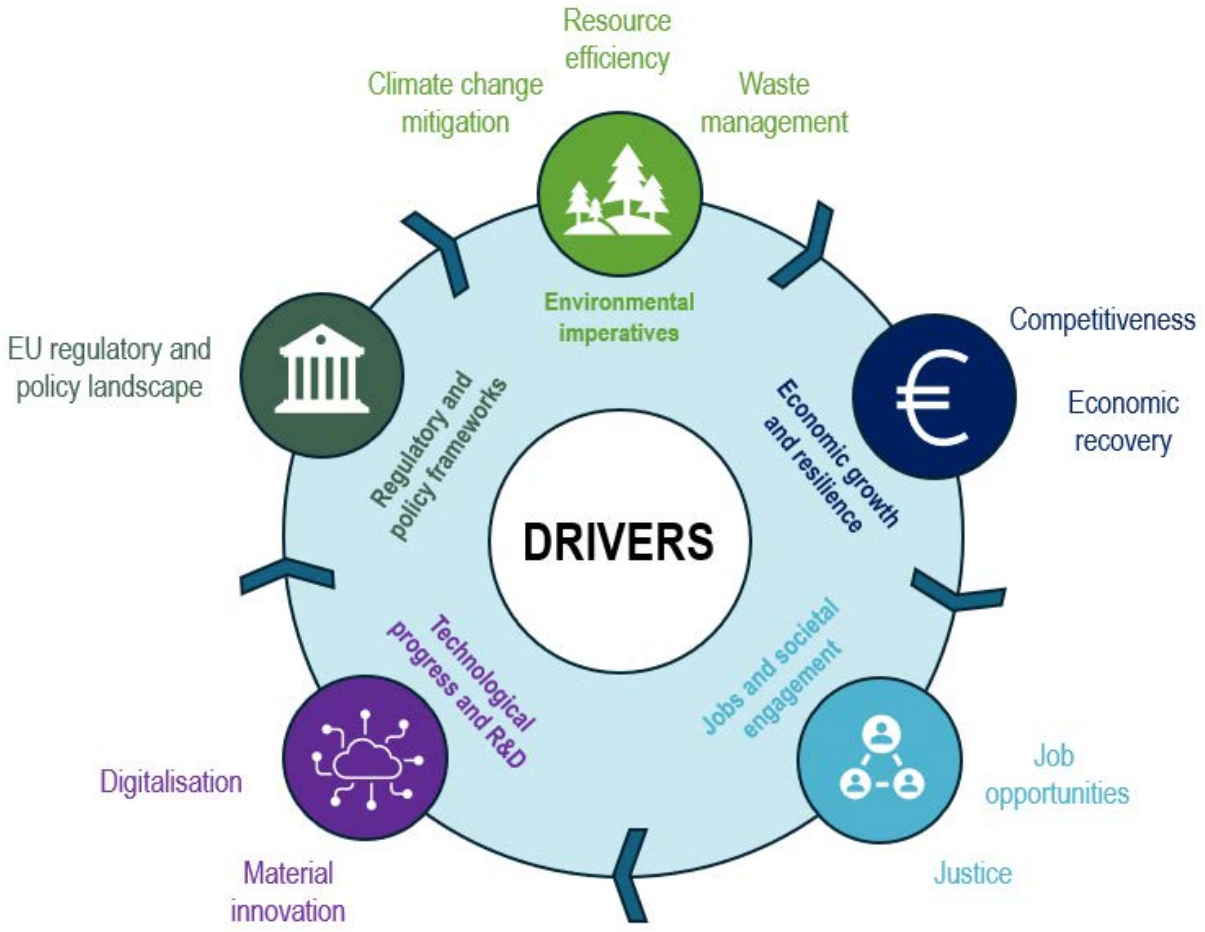
Sector	Activity	R-strategy	Circularity level	Circular economy value chains						
				Electronic and ICT	Batteries & vehicles	Packaging & Plastics	Textiles	Construction & Buildings	Food	Water & nutrients
Water supply, sewerage, waste management and remediation	Phosphorus recovery from wastewater	Recovery	Low	✗	✗	✗	✗	✗	✗	✓
	Production of alternative water resources for purposes other than human consumption	Recycling and recovery	Low	✗	✗	✗	✗	✗	✗	✓
	Collection and transport of non-hazardous and hazardous waste	Recycling and recovery	Low	✓	✓	✓	✓	✓	✓	✗
	Treatment of hazardous waste	Recycling and recovery	Low	✓	✓	✓	✓	✓	✗	✗
	Recovery of bio-waste by anaerobic digestion or composting	Recovery	Low	✗	✗	✗	✗	✗	✓	✗
	Depollution and dismantling of end-of-life products	Recycling and recovery	Low	✓	✓	✓	✓	✓	✓	✗
	Sorting and material recovery of non-hazardous waste	Recycling and recovery	Low	✓	✓	✓	✓	✓	✓	✗
Construction and real estate activities	Construction of new buildings	Reduce, rethink, reduce	High	✗	✗	✗	✗	✓	✗	✗
	Renovation of existing buildings	Refurbish	Medium	✗	✗	✗	✗	✓	✗	✗
	Demolition and wrecking of buildings and other structures	Recycle	Low	✗	✗	✗	✗	✓	✗	✗
	Maintenance of roads and motorways	Repair	Medium	✗	✗	✗	✗	✓	✗	✗
	Use of concrete in civil engineering	Recycle	Low	✗	✗	✗	✗	✓	✗	✗
Services	Repair, refurbishment and remanufacturing	Repair	Medium	✓	✓	✗	✓	✗	✗	✗
	Sale of spare parts	Refurbish	Medium	✓	✓	✗	✗	✗	✗	✗
	Preparation for reuse of end-of-life products and product components	Remanufacture	Medium	✓	✓	✗	✓	✗	✗	✗
	Sale of second-hand goods	Reuse	Medium	✓	✓	✗	✓	✗	✗	✗
	Product-as-a-service and other circular use- and result-oriented service models	Reduce, rethink, reduce	High	✓	✓	✗	✓	✗	✗	✗
	Marketplace for the trade of second-hand goods for reuse	Reuse	Medium	✓	✓	✗	✓	✗	✗	✗
Manufacturing	Manufacture of plastic packaging goods	Reduce, rethink, reduce	High	✗	✗	✓	✗	✗	✗	✗
	Manufacture of electrical and electronic equipment	Reduce, rethink, reduce	High	✓	✓	✗	✗	✗	✗	✗
Information & communication	Provision of IT/OT data-driven solutions	Reduce, rethink, reduce	High	✓	✗	✗	✗	✗	✗	✗

Note: ✓ = Relevant value chain for the sector ✗ = Not relevant value chain
Source: Author's elaboration based on European Commission (2020[21]) A new Circular Economy Action Plan and European Commission (2020[9]) EU Taxonomy Compass.

Key factors driving the circular economy in EU cities and regions

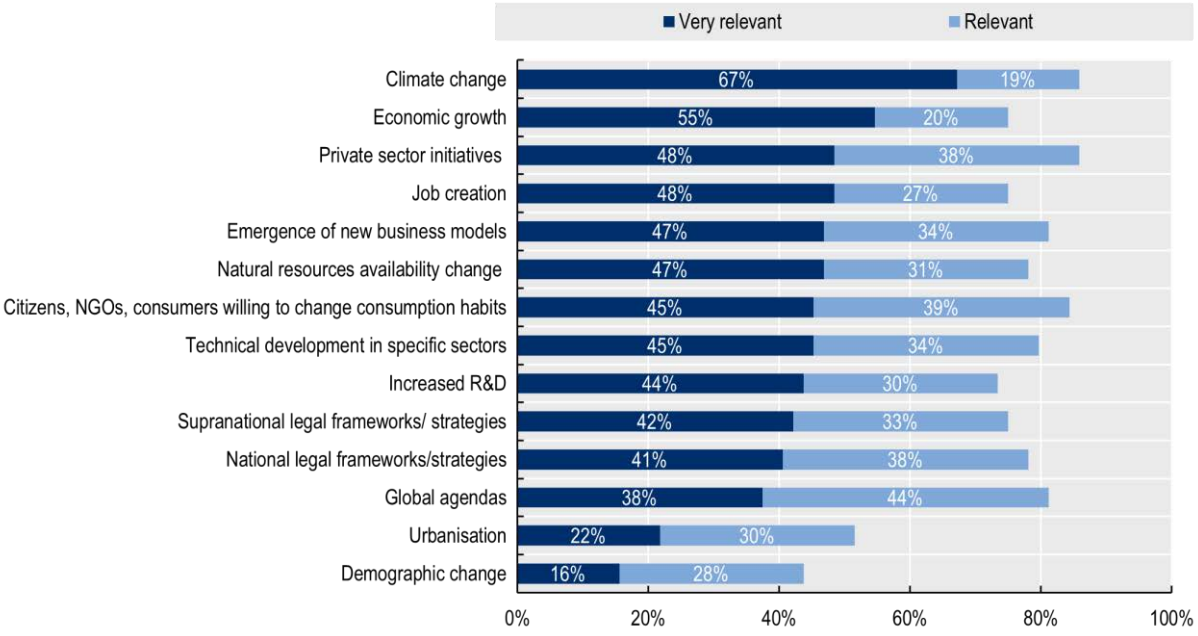
The shift towards a circular economy in EU cities and regions is driven by several interconnected factors that reflect the urgent need for systemic change. According to the results of the *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU),* across 48 cities, 15 regions and 1 province from 21 countries of the EU-27 Member States, the United Kingdom and Norway (Box 1.2), major drivers for transitioning to a circular economy include climate change (67% of respondents), economic growth (55%), and private sector initiatives and job creation (48%) (Figure 1.3). Based on survey responses and major macrotrends, five key factors driving the circular economy in cities and regions emerge: environmental imperatives, economic growth and resilience of supply chains, market and jobs opportunities, technological development and Research & Development (R&D), regulatory frameworks and societal engagement (Figure 1.2). These drivers are not mutually exclusive and may align or conflict, requiring implicit or explicit prioritisation. For instance, reducing resource depletion or negative environmental impacts do not always support economic activity and employment, nor does economic growth necessarily minimise resource use or environmental harm (Ekins, 2024[22]). Figure 1.5 illustrates examples of the costs of inaction and co-benefits of the circular transition.

Figure 1.2. Five key factors driving the circular economy



Source: Author's elaboration.

Figure 1.3. Drivers to transition from a linear to a circular economy in cities and regions



Note: Results based on a sample of 64 respondents that indicated the drivers being "Very relevant" and "Relevant".
Source: OECD (2024[23]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Box 1.2. OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)

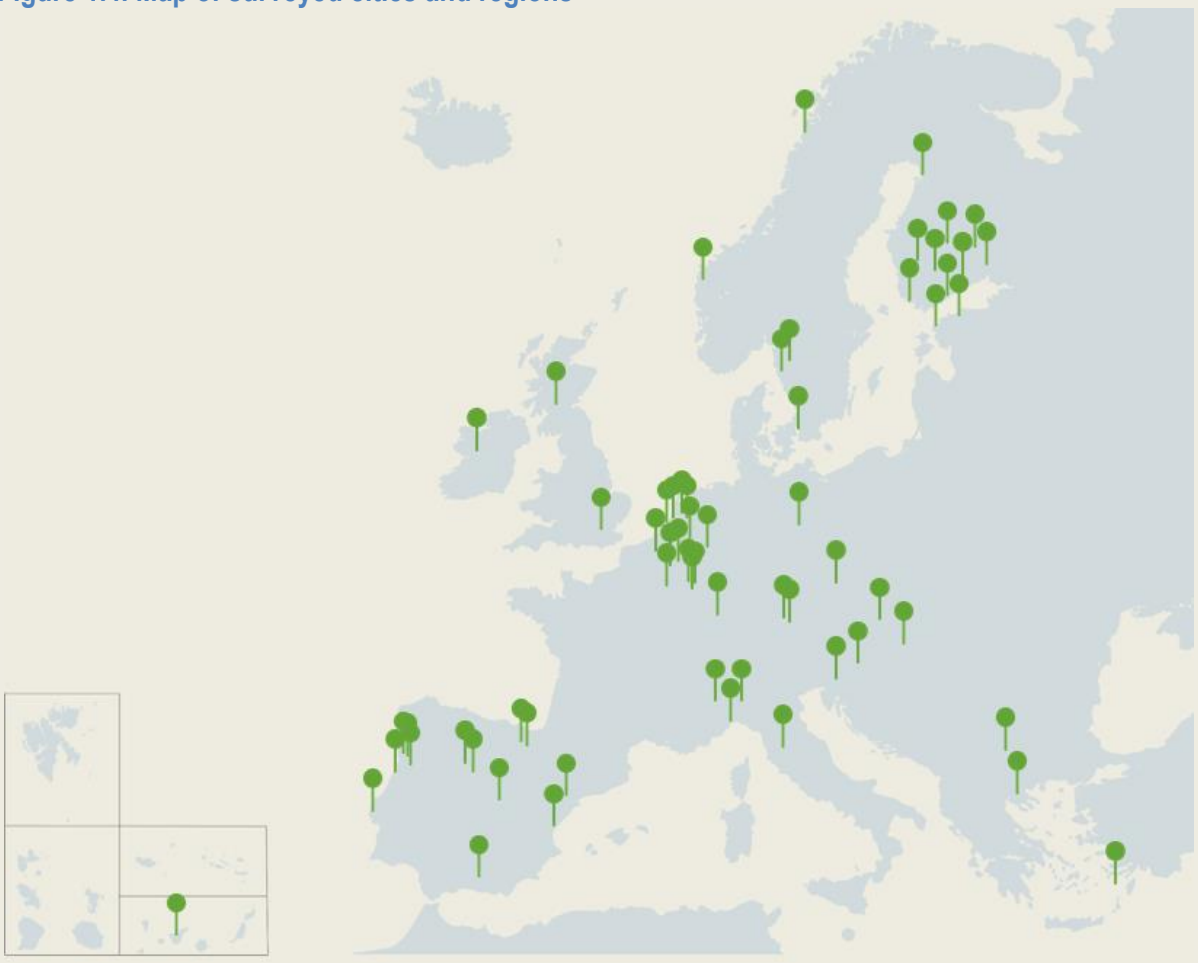
Undertaken between February 2024 and October 2024, the OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU) aimed at gathering data and information on:

- The status of circular economy in EU cities and regions, including common understanding, definitions and applications.
- The main tools (including plans, legal and regulatory frameworks, economic instruments) to implement circular economy in EU cities and regions.
- The main obstacles for circular economy to happen in EU cities and regions.
- The good practices available to date.

The target respondents of the survey were policymakers from subnational governments in EU-27 Member States, the United Kingdom and Norway (as participating countries in the Horizon Europe programme for 2021-2027). The survey was developed by the OECD in collaboration with the CCRI-CSO and disseminated in co-operation with ICLEI, European Committee of the Regions – CoR, ASSET Interreg project, Ellen MacArthur Foundation, UK Circular Cities Network and the OECD Champion Mayors for Inclusive Growth. A total of 64 responses were provided on a voluntary basis by 48 cities, 15 regions and 1 province from 21 countries (Figure 1.4). The countries represented in the survey are Finland (10 responses); Spain (9); the Netherlands (6); Portugal (5); Germany and Italy (4); Belgium, Luxembourg and Sweden (3); Estonia, France, Greece, Norway, Slovenia and the United Kingdom (2); and Bulgaria, Czechia, Hungary, Ireland and the Slovak Republic (1). It should be noted that while the survey highlights trends across various cities and regions in EU countries, the sample is not

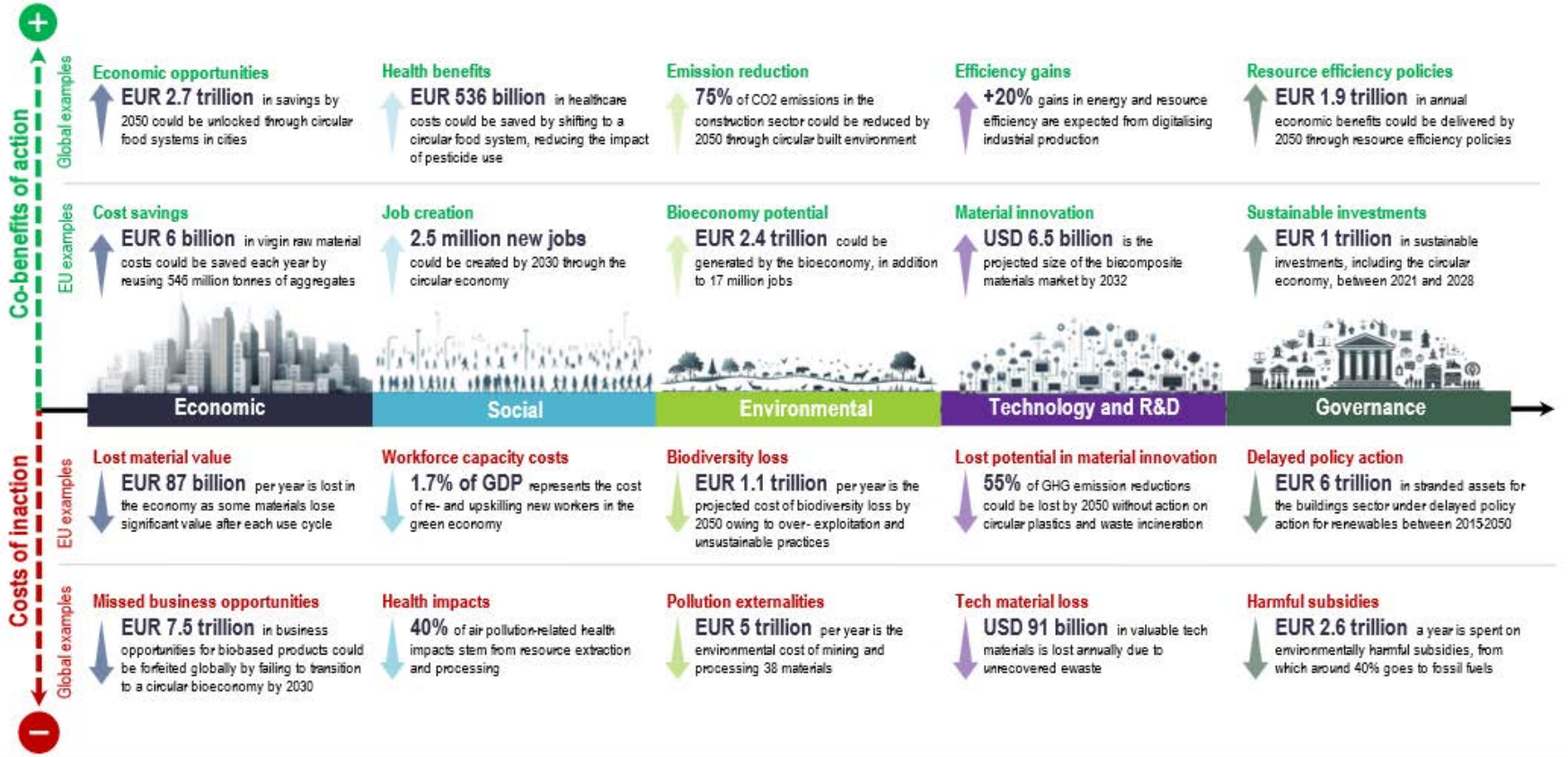
representative of the entire population of European cities and regions. Additionally, some results are influenced by respondents' perceptions.

Figure 1.4. Map of surveyed cities and regions



Note: Based on the 64 cities and regions that completed the OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).
Source (figure and box): OECD (2024[23]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Figure 1.5. Overview of selected costs of inaction and co-benefits of the circular economy



Source: Author's elaboration

Environmental imperatives

Circular economy practices in cities and regions are on the rise as they contribute to lower carbon emissions in material and energy-intensive processes. They can favour decoupling of economic growth from environmental depletion, and contribute to reducing waste production, by extending the life cycle of products and goods, while decreasing the need for landfill and incineration which cause environmental harm (Table 1.2).

Climate change mitigation

A circular economy aims to minimise the extraction and processing of raw materials, which is a major source of emissions in cities and regions. In 2024, around 60% of global greenhouse gas (GHG) emissions were generated by materials such as iron and steel, cement and plastic, and the construction sector was responsible for 50% of emissions (UNFCCC, 2023[24]; UNEP, 2024[25]). The extraction and processing of non-energy and non-agricultural raw materials are estimated to contribute to 18% of EU consumption-based GHG emissions (EEA, 2024[26]). In the EU, GHG emissions from production activities decreased by 18% between 2008 and 2022 (Eurostat, 2024[27]), although the environmental costs of mining and processing remain high. Globally, these costs for 38 materials can reach EUR 5 trillion per year, equivalent to 6.4% of GDP (Arendt, Bach and Finkbeiner, 2022[28]).

The circular economy contributes to achieving climate mitigation targets. First, resource demand reduction strategies and new models of service provision could reduce global GHG emissions from buildings, transport, food, industry and energy supply systems by 40-70% by 2050 (IRP, 2022[29]). Second, material efficiency measures can cut hard-to-abate process emissions in the EU's production of raw materials such as steel, cement, aluminium, and plastic by over 50% by 2050 (Material Economics, 2018[30]). Third, solutions such as waste segregation, composting, and recycling could reduce the waste sector's total emissions by 84% (WEF, 2022[31]). The EU set a 55% reduction target in net GHG emissions by 2030 and 90% by 2040 compared to 1990 levels. The European Green Deal, aiming for Europe to become the first climate-neutral continent by 2050, identifies the circular economy as one of its pillars. Yet only 28% of current Nationally Determined Contributions (NDCs)[3] include the circular economy (UNDP, 2024[32]). The cost of inaction on climate change is expected to reach 10-12% of the EU's GDP by the end of the century (CoR, 2024[33]).

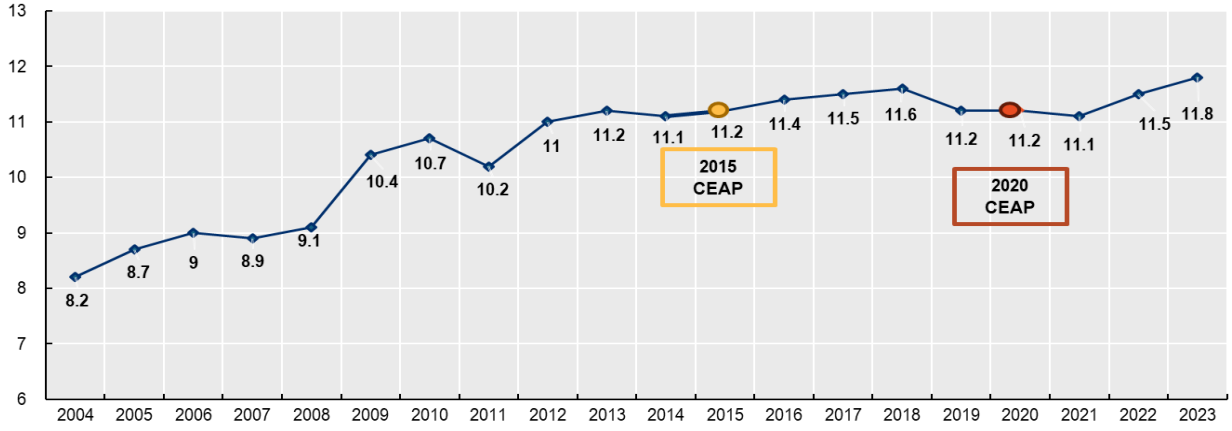
Importantly, there is a potential trade-off between decarbonisation and dematerialisation. It is crucial to recognise that not all decarbonisation policies will lead to reduced material use, but rather, some could increase demand for resources. For example, fully electrifying the current passenger car fleet would require over 227 million tonnes of key materials, equivalent to 3.5% of the EU's total raw material consumption (Blot and Stainforth, 2022[34]). However, this does not account for the significant reduction in fossil fuel consumption that electrification brings, which can contribute to offsetting a share of the overall material demand. This substantial increase in demand for critical raw materials highlights the need for careful consideration of the impact of climate change mitigation policies on circular economy objectives. Policy coherence between dematerialisation and decarbonisation measures is critical to maximise synergy between these objectives while mitigating potential trade-offs.

Resource efficiency

The EU shows a circular material use rate (CMUR)[4] of 11.8% (in 2023), indicating a 1.1 percentage point increase since 2010 (10.7%) and slow progress towards the EU's 2030 target for circularity (which is set at 23.4%) (Figure 1.6) (European Commission, 2022[35]). Between 2014 and 2023, the circularity rate increased for biomass (+1.8 percentage points) and fossil-based materials (0.9 percentage point) but decreased for metal ores (-0.3 percentage point) and non-metallic minerals (-1.2 percentage point)

(Eurostat, 2024[36]). Rates vary across countries, from 30.6% in the Netherlands to less than 3% in Finland, Ireland, and Portugal (European Commission, 2022[35]).

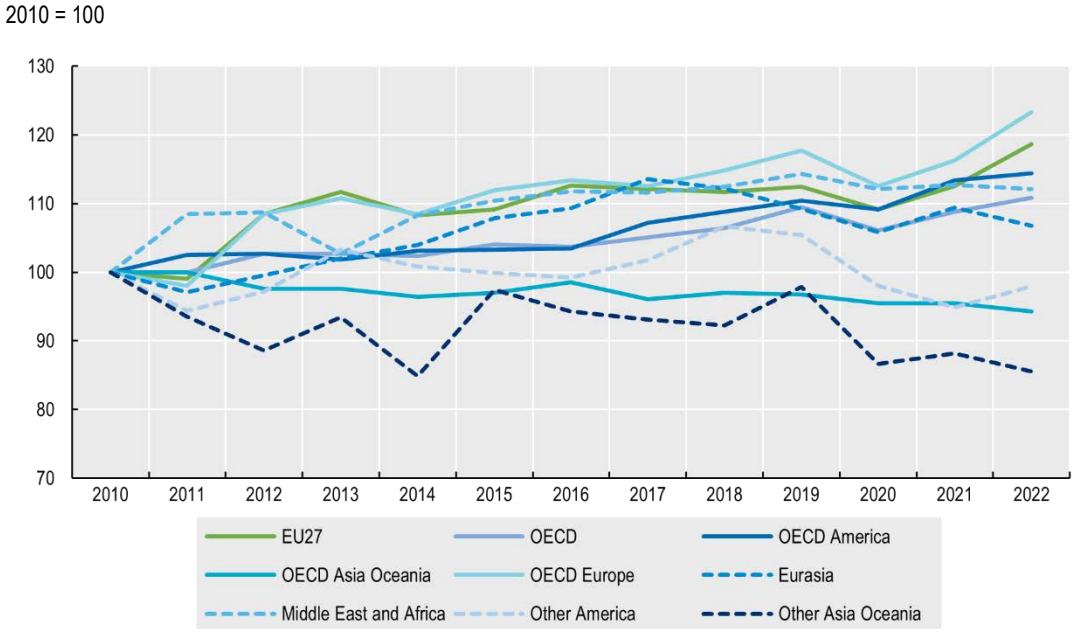
Figure 1.6. Circular material use rate trend in the EU-27 2004-2023



Source: Author's elaboration based on (Eurostat, 2025[37]), Circular material use rate, https://ec.europa.eu/eurostat/web/circular-economy/monitoring-framework

Resource efficiency directly impacts the material footprint when overall material consumption is reduced. Housing and food, which are key sectors in cities and regions, are major drivers of resource consumption, accounting for a total of 72% of the EU's material footprint (i.e. the economic value generated per unit of material used) and requiring the highest material input per EUR spent (EEA, 2024[26]). At EU level, the average material footprint was estimated at 14 tonnes per capita in 2023, exceeding the 6-8 tonnes per capita sustainability threshold used across different studies (IEEP, 2022[38]). There are national and regional differences. For instance, Finland has the highest material footprint in the EU (46 tonnes per capita), six times higher than the lowest in the Netherlands and Malta (6.6 tonnes per capita). At the local level, the material footprint is, on average, 2.4 and 1.9 times larger than the domestic material consumption in Gothenburg, Sweden, and Nantes-Saint-Nazaire, France, respectively (Bahers and Rosado, 2023[39]). Despite relative reductions in the average EU material footprint, GDP growth in the EU between 2010 and 2018 increased resource extraction 4 times more than the material savings achieved by circular economy initiatives. On average, a 1% increase in GDP can increase resource extraction between 0.3 and 0.6% (Bianchi and Cordella, 2023[40]). Most material extraction in the EU takes place in rural regions. In 2022, urban regions (NUTS 3 level[5]) extracted 6.4 tonnes of materials per capita on average, while rural areas extracted over three times as much at 21 tonnes per capita (ESPON, 2025[41]).

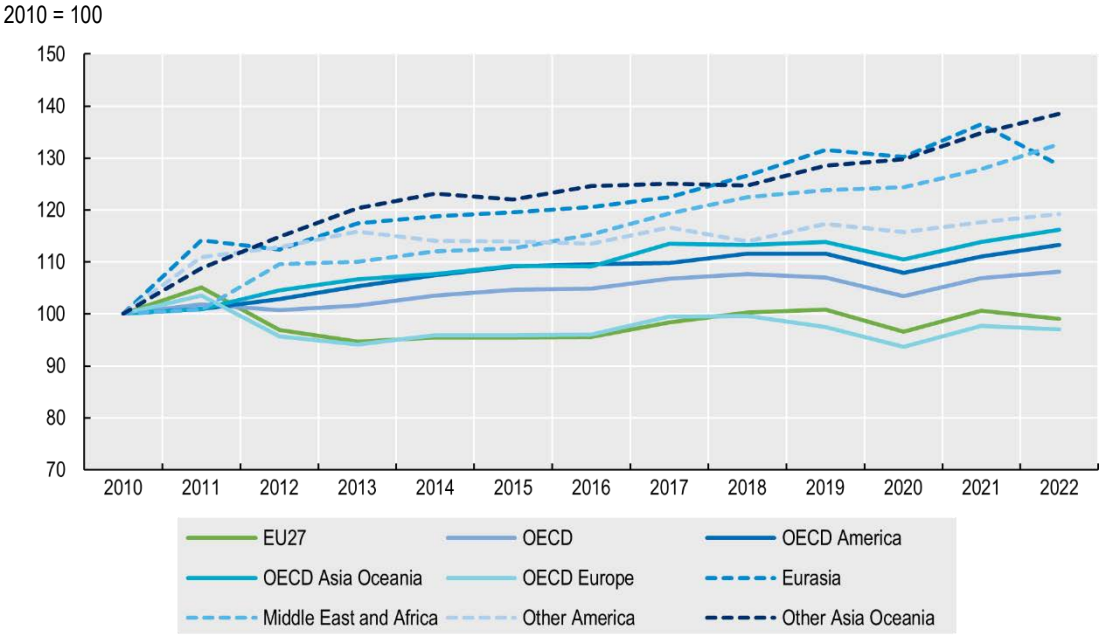
Figure 1.7. Trend of non-energy material productivity by global region, 2010-2022



Note: Eurasia includes countries in Caspian regions, Russian and non-OECD European countries; Other America includes American countries excluding OECD American countries (Canada, Chile, Colombia, Costa Rica, Mexico, United States); Other Asia Oceania includes China, India and other non-OECD Asian and countries.
Source: OECD (2025[42]), OECD Data Explorer: Material Productivity, https://data-explorer.oecd.org/

Material productivity – the economic output or value added generated per unit of material consumed excluding energy production – increased by 19% in the EU over 2010-2022 (Figure 1.7). It more than doubled in Ireland and grew by over 50% in Cyprus, Malta, and Spain between 2010 and 2022 (OECD, 2025[43]). These increases reflect efficiency gains in production processes and changes in the materials mix. By 2024, 93% of EU SMEs implemented at least one resource-efficiency measure, primarily focusing on energy saving (66%), waste minimisation (66%), material saving (57%), and water conservation (49%) (European Commission, 2024[86]). Across NUTS 3 level regions, urban areas demonstrate greater material productivity in 2022, producing EUR 3.77 of economic output per kilogramme of material used, compared to EUR 1.50 in rural areas (ESPON, 2025[41]). Moreover, between 2010 and 2022, European OECD countries decreased their domestic material consumption (DMC) (i.e. the weight of the materials used in the domestic economic system) (OECD, 2019[3]) by 3% (OECD, 2025[42]). This implies a decoupling[6] of material consumption from economic growth. While all OECD countries decreased their DMC per unit of GDP between 2010 and 2022, the DMC per unit of some countries such as Australia, Canada, Chile and Finland was double the OECD average in 2022 (Figure 1.9). At the NUTS 3 level, around 30% of small regions achieved absolute decoupling between 2014 and 2022, reducing material dependency while sustaining economic growth (ESPON, 2025[41]). This trend is particularly evident in regions of Germany, Greece, and Norway, along with several regions of France, Italy, the Netherlands, Spain, and the United Kingdom. The strategies and innovations in these regions—such as circular investments, technological advancements, and shifts to low-impact, high-value economic activities—offer valuable insights that could be adapted and applied to other contexts.

Figure 1.8. Trends in domestic material consumption by global region, 2010-2022

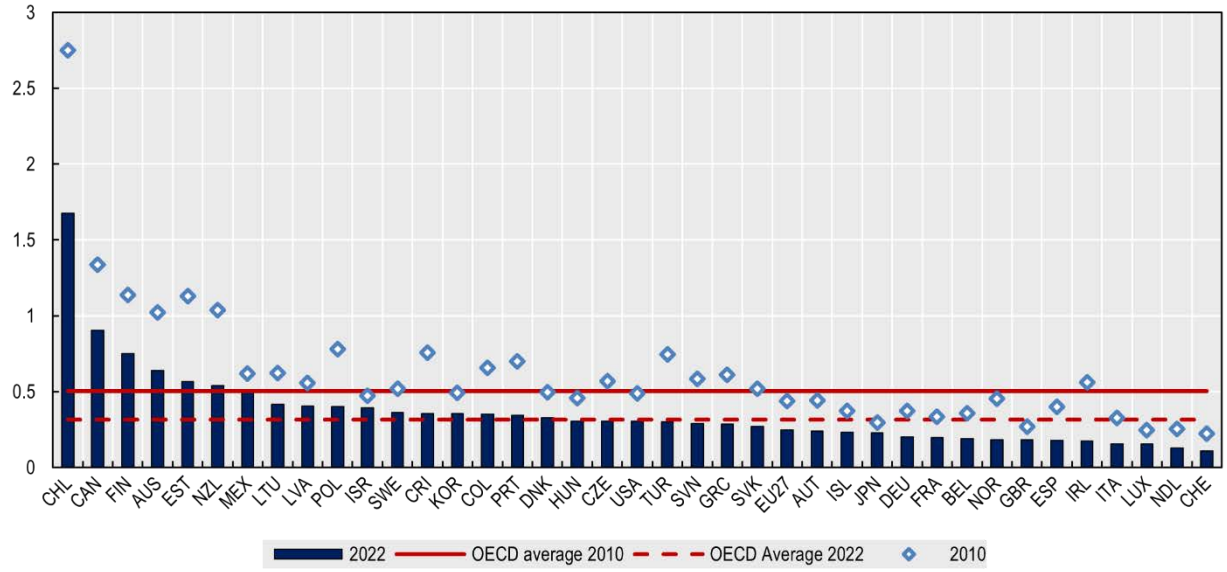


Note: Eurasia includes countries in Caspian regions, Russian and non-OECD European countries; Other America includes American countries excluding OECD American countries (Canada, Chile, Colombia, Costa Rica, Mexico and United States); Other Asia Oceania includes China, India and other non-OECD Asian and countries.

Source: OECD (2025[42]), OECD Data Explorer: Domestic Material Consumption, https://data-explorer.oecd.org/

Figure 1.9. Domestic material consumption per unit of GDP in OECD countries, 2010-2022

Non-energy materials, kilogram per USD current prices using 2010 base year and Purchasing Power Parities

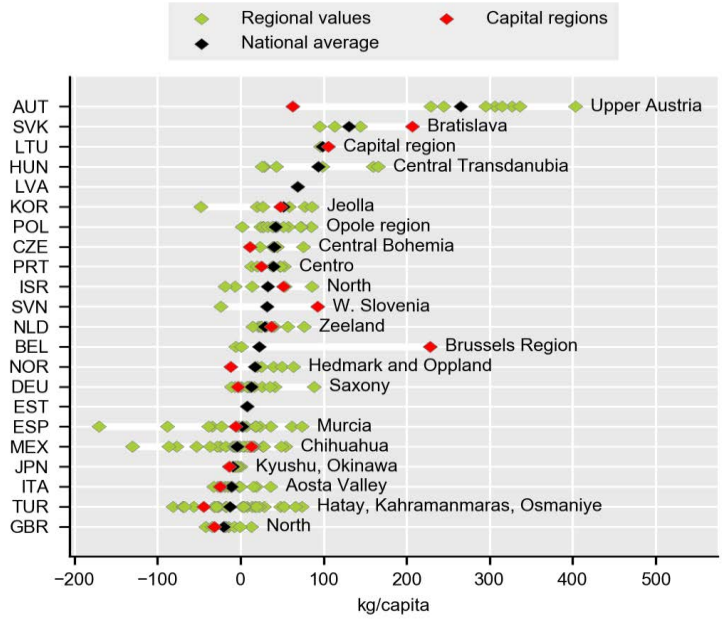


Source: OECD (2024), "Material productivity" (indicator), https://doi.org/10.1787/dae52b45-en (accessed on 25 January 2025).

Waste management

In 2023, municipal waste constituted approximately 10% of total waste generated in the EU. Its diverse composition (e.g. organic materials, paper, plastic, various metals, textiles, glass, wood) poses challenges for environmentally sound management. In 2022, EU countries generated 513 kg of municipal waste on average, the same amount as in 2000, with relevant variations across EU Member States, from 803 kg per capita in Austria to 303 kg per capita in Romania (Eurostat, 2022[44]). At the NUTS 3 level, rural regions generated the least waste in 2022, averaging 422 kg per capita, compared to 608 kg per capita in urban regions (ESPON, 2025[41]). In the EU, municipal waste generation is projected to increase by 5.3%, from 220 Mt in 2018 to 231.5 Mt in 2035 (European Commission, 2022[45]). Globally, municipal waste generation is forecast to grow from 2.1 billion tonnes in 2023 to 3.8 billion tonnes in 2050 (UNEP, 2024[46]). Among OECD TL2 regions, Upper Austria, Austria, and Brussels, Belgium, show significant increases in municipal waste per capita generation between 2016 and 2020 and disparities in relation to municipal waste management (Figure 1.10).

Figure 1.10. Municipal waste per capita trends in large OECD regions (TL2 level), 2016-2020



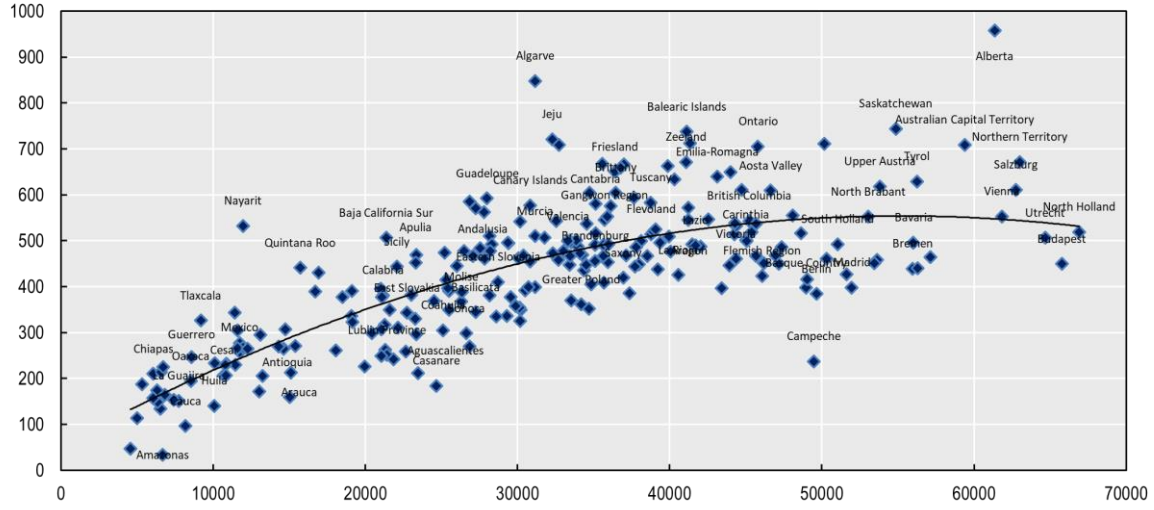
Note: This includes the change in municipal waste per capita in large OECD regions (TL2 territorial level classification) for the period 2016-2020.
Source: OECD (2024[47]), *OECD Regions and Cities at a Glance 2024*, https://doi.org/10.1787/f42db3bf-en.

Correlation analyses across 239 OECD large regions suggest a possible inverted U-relationship (known as the Environmental Kuznets Curve[7]) between GDP per capita and municipal waste generation, whereby municipal waste generation initially increases with GDP per capita but eventually tends to decline after reaching a certain point (Figure 1.11). Other studies have confirmed a similar inverted U-relationship between GDP per capita and e-waste generation (Boubellouta and Kusch-Brandt, 2021[48]), GDP per capita and construction waste generation (Bao and Lu, 2023[49]), and GDP per capita and mismanaged[8] plastic waste generation (Rom and Guillotreau, 2024[50]). In this case, data seem to show that OECD large regions generate more waste as they get wealthier, until a certain point when measures are taken to reduce waste production. Once GDP per capita surpasses approximately EUR 45 000, waste generation per capita seems to decrease. The low value of the R2 indicates that a substantial share of the variation remains unexplained, warranting caution in interpreting these trends. Based on the estimated curve equation, a 20% increase in GDP per capita in the wealthiest OECD large regions (beyond the turning point) could

lead to a 3.6% reduction in municipal waste per capita. This may reflect a greater willingness to invest in environmental quality, driven by improved waste management infrastructure, enhanced circular economy policies, and increased public awareness, ultimately leading to decoupling economic growth from waste production.

Figure 1.11. Amount of municipal waste generation by GDP per capita in large OECD regions

Municipal waste generation (kg) per capita



GDP per capita (EUR)

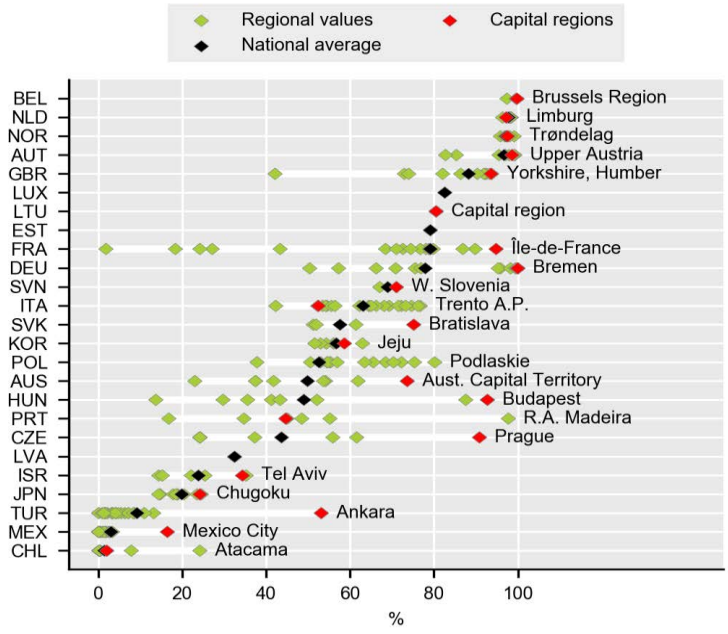
Note: This figure includes data for 239 OECD large regions (TL2) for the latest year available between 2018 and 2020. The visualisation suggests a positive correlation between municipal waste generation and GDP per capita until the threshold of approximately EUR 45 000 is reached. Beyond this point, additional municipal waste per capita shows little to no discernible relationship with GDP per capita. The curve suggests a threshold above EUR 45 000; however, this discrepancy may be due to data dispersion, scaling effects, or other factors affecting the graphical representation. The polynomial curve was selected as it provided a relatively better fit ($R^2 = 0.59$) compared to the linear curve ($R^2 = 0.51$). The low value of the R^2 (0.59) indicates that waste generation is only partially explained by GDP per capita, so data should be interpreted with caution.

Source: OECD (2025[51]), Municipal waste rate and GDP per capita, https://www.oecd.org/en/data/tools/oecd-regions-and-cities-atlas.html.

Between 2004 and 2023, total municipal waste landfilled in the EU fell by 3.2% per year on average, reaching a rate of 22% in 2023 (Eurostat, 2025[52]). Some EU countries such as the Netherlands have banned waste categories that could be recycled or recovered for energy from landfilling, while Czechia has banned the landfilling of unsorted mixed municipal waste and recoverable waste. Research shows that landfill capacity is limited in countries with high population densities (OECD, 2019[53]) (European Commission, 2024[54]). By 2022, nine Member States (Austria, Belgium, Denmark, Finland, Germany, Luxembourg, the Netherlands, Slovenia, and Sweden) had already met the EU target of reducing landfilling to less than 10% by 2035 (EEA, 2024[55]).

In the EU, 25% of total municipal waste was incinerated (with and without energy recovery) in 2023, a slightly higher share than landfilling (Eurostat, 2025[52]). Regional disparities exist in municipal waste recovery rates, with countries such as Belgium, the Netherlands and Norway having the highest recovery rates, while countries such as Czechia, Latvia and Portugal have average recovery rates below 50% (Figure 1.12). Capital-city regions (e.g., the Brussels Region, Limburg, and Trøndelag) are also at the forefront of municipal waste recovery, with average rates in capital-city regions 12 percentage points higher than the national level across OECD countries. Higher recovery rates could partially be explained by higher levels of GDP per capita, which could lead to investment in waste management (Figure 1.13). However, high incineration capacity often underlies high recovery rates, which does not necessarily indicate greater circularity.

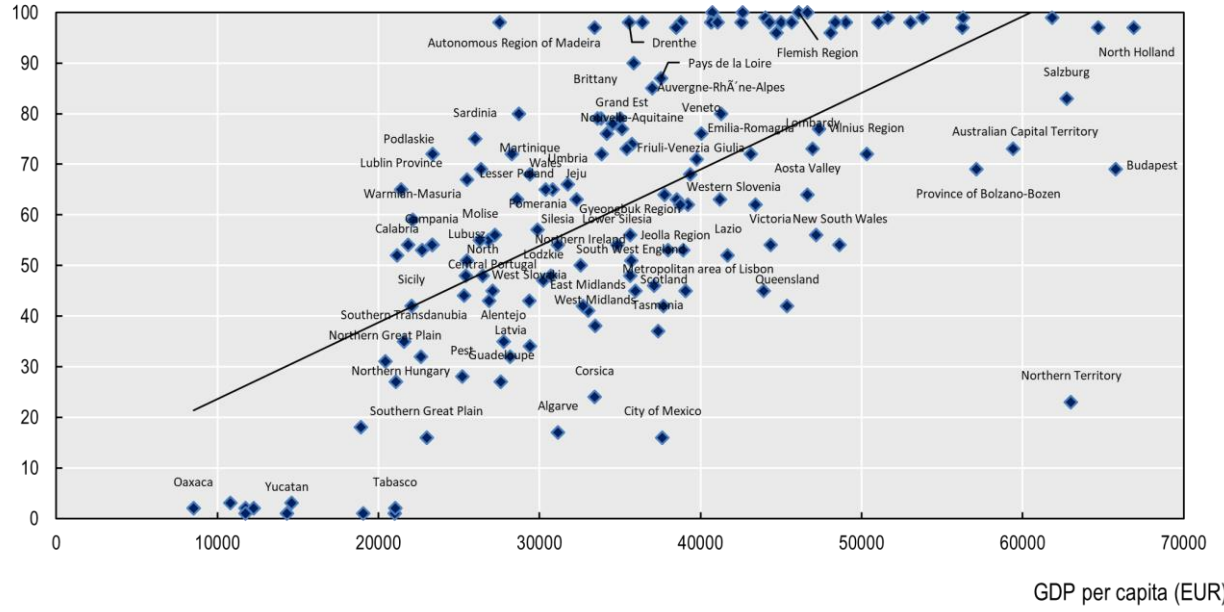
Figure 1.12. Municipal waste recovery rates in large OECD regions, 2021



Source: OECD (2024[47]), *OECD Regions and Cities at a Glance 2024*, https://doi.org/10.1787/f42db3bf-en.

Figure 1.13. Share of municipal waste recovered by GDP per capita in large regions

Share of municipal waste recovered (%)



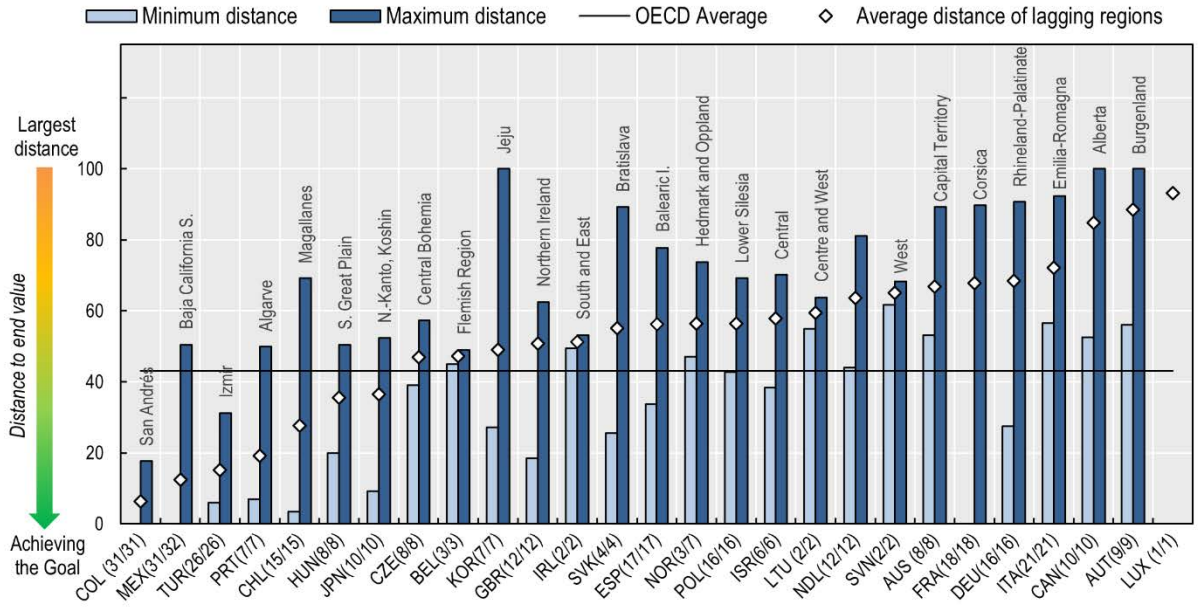
Note: This figure includes data for 144 OECD regions (TL2) for the latest year available between 2018 and 2020. Municipal waste recovery includes waste that undergoes material recycling or other forms of recovery (including energy recovery and composting). Landfilling is excluded.
Source: OECD (2025[51]), Municipal waste rate and GDP per capita, https://www.oecd.org/en/data/tools/oecd-regions-and-cities-atlas.html.

In 2023, 48% of total EU municipal waste was recycled (material recycling and composting), an increase of 21 and 3 percentage points respectively compared to 2000 (27%) and 2015 (45%) levels (Eurostat, 2025[52]). The share of recycling among waste treatment methods ranged from 69.2% in Germany to 12.3% in Romania (Eurostat, 2025[56]). Nine EU countries reached recycling rates of 50%. However, an increase

in recycling is not necessarily positive per se, as in a fully circular economy, repair and reuse should limit raw material consumption as much as possible and recycling should be seen as a second-best option. Despite recent progress in increasing EU recycling rates, in 2023, the EC identified that eighteen Member States were at risk of failing to meet the 2025 municipal and packaging waste recycling targets[9], while nine were on track to meet those targets (European Commission, 2023[57]).

Implementing circular economy principles could help reduce total waste generation in the EU by 24% by 2030 (Waste Managed, 2025[58]). However, only 13% of 306 OECD large regions have achieved the end values[10] of Sustainable Development Goal (SDG) 12 on responsible consumption and production, i.e. achieve a municipal waste generation rate lower than 366 kilogrammes per capita and a number of motor road vehicles lower than 34 per 100 people. EU regions with the largest distance from the end value include Burgenland, Austria; Corsica, France; Rhineland-Palatinate, Germany; and Emilia-Romagna, Italy, which share an average distance of 95 points out of 100. The largest in-country disparities in this indicator are shown in France (Figure 1.14). The global direct cost of waste management, together with the hidden costs of pollution, deficient health and climate change from poor waste disposal practices, is expected to reach approximately USD 600 billion by 2050, twice the estimated value for 2020 (UNEP, 2024[46]).

Figure 1.14. Distance to travel for TL2 regions in SDG 12 on responsible consumption



Note: The distance to travel for regions to achieve SDG 12 is based on a composite index estimated through three indicators: (i) Municipal waste rate (kilogrammes per capita), (ii) Percentage of municipal waste that is recycled, (iii) Number of motor road vehicles per 100 people. Given the substantial data gaps, the indicator on the percentage of municipal waste that is recycled was not considered. Lagging regions are those that have not achieved the end values for 2030, i.e. a score of 100. Data is available for 306 regions, corresponding to the latest available value in 2022. Numbers between brackets correspond to the number of lagging regions compared to the number of regions with available data.
Source: OECD (2024[59]), *Measuring the distance to the SDGs in regions and cities*, https://www.oecd-local-sdgs.org/.

Table 1.2. Estimated environmental value and impacts of inaction on the circular economy

	Rationale	Costs of inaction	Co-benefits of action	Examples
Climate change	Climate change is fuelled by resource extraction, deforestation, energy-intensive production, carbon-intensive transport, and waste generation. Circular economy initiatives, such as material reuse and reduced consumption, can lower emissions across value chains and drive the transition to a low-carbon economy.	• The global cost of climate change damage could go up to **USD 3.1 trillion** per year by 2050 (WEF, 2023[60]) • The extraction and initial processing of materials are responsible for **50%** of climate impacts (UNEP, 2024[25]). • The global water crisis due to climate impacts will threaten around **8% of the GDP** of high-income countries by 2050 (Mazzucato et al., 2024[61]).	• Circularity in the built environment could reduce CO_2 emissions in the construction sector by **75%** by 2050 (McKinsey, 2024[62]). • Reducing resource demand and adopting new service models could cut global GHG emissions by up to **70%** by 2050 (IRP, 2022[63]).	• The city of Berlin (Germany) has reduced GHG emissions by more than **900 000 tonnes of CO_2 equivalent** per year and saved around **2.2 million** tonnes of primary raw materials (Smart City, 2023[64]). • In the city of Medellín (Colombia), circular actions will contribute to reducing **10%** of total GHG emissions projected for 2030 (GIZ, 2024[65]).
Unsustainable exploitation	Resource depletion and unsustainable material footprints are driven by the reliance on intensive extraction, unsustainable production and consumption patterns, and growing material consumption. Circular economy strategies, such as sustainable sourcing and urban mining, can reduce pressure on natural systems and help close the gap between supply and demand.	• Around **30-50%** of materials are extracted unsustainably each year, if a sustainable material footprint of between 6-8 tonnes per capita is considered as the baseline (World Bank, 2022[66]; IEEP, 2022[38]). • In a business-as-usual scenario, a global resource gap of 8 billion tonnes between the supply and demand of natural resources could cost up to **USD 25 trillion** by 2050 (Accenture, 2015[67]). • The global cost of illegal sand extraction is around **USD 350 billion** per year (Ramadon Porto Alegre, 2021[68])	• Resource efficiency policies and initiatives could cut resource use by **26%** by 2050 (UNEP, 2017[69]). • The adoption of the Global Circularity Protocol for Business can reduce global material consumption by up to **5%** between 2026 and 2050 (WBCSD, 2024[70]). • Recycling, lifespan extension, and circular practices could cut building material stocks and GHG emissions by approximately **30%** by 2060 (UNEP, 2024[25]).	• On average, the material footprint is **2.4** and **1.9 times** larger than domestic material consumption in Gothenburg (Germany) and Nantes-Saint-Nazaire (France) respectively (Bahers and Rosado, 2023[39]). • The costs of the overexploitation of aquifer services in the Segura River Basin (Spain) are estimated to amount to **EUR 37.9 million** per year (Water Europe, 2024[71]).
Pollution	The environmental costs of air, soil, and water pollution stem from extraction, processing, landfilling, incineration, and hazardous waste. Circular economy measures can minimise waste discharges into waterbodies, reduce GHG emissions, and enhance soil health with resource recovery.	• Resource extraction and processing account for **over 55%** of global GHG emissions (UNEP, 2024[25]). • The environmental costs of mining and processing 38 materials can go up to **EUR 5 trillion** per year, equivalent to 6.4% of global GDP (Arendt, Bach and Finkbeiner, 2022[28]). • A total of **EUR 2 trillion** over two decades is the estimated cost of cleaning PFAS or "forever chemicals" from the environment (FPP, 2024[72]).	• Waste reduction solutions such as segregation, composting, and recycling could reduce the waste sector's total emissions by **84%** (WEF, 2022[31]). • A circular economy could reduce the volume of plastics entering the ocean by **over 80%** by 2040 (UNEP, 2022[73]). • Waste reduction policies and investments in waste infrastructure can limit investment needs to end plastic leakage to only **USD 50 billion** by 2040 (OECD, 2024[74]).	• The adaptation costs to reverse rising selenium concentrations in Canadian and US waterways due to toxic runoff from British Columbia's Elk Valley coal mines have been estimated at **USD 6.4 billion** over the next 60 years (Wildsight, 2024[75]). • The economic cost of heavy metal pollution of surface water in Ebonyi State (Nigeria) could reach up to **USD 543.3 million** annually (Ugochukwu et al., 2022[76]).
Biodiversity loss	Biodiversity loss is triggered by habitat destruction, resource overexploitation, pollution, and climate change. Circular economy approaches, such as regenerative agriculture, resource efficiency, and waste prevention can ease pressure on ecosystems, protect habitats, and support nature recovery.	• The world lost an estimated **USD 4-20 trillion** per year in ecosystem services from 1997 to 2011 (OECD, 2019[77]). • **EUR 1.1 trillion** per year is the projected cost of biodiversity loss in Europe by 2050 (WWF, 2010[78]). • **90%** of biodiversity loss is caused by unsustainable resource extraction and processing (Günther et al.,, 2023[79]).	• Protecting nature could save the global economy roughly **USD 2.7 trillion** annually in avoided damages. • The bioeconomy contributes almost **EUR 2.4 trillion** annually to the EU economy and provides more than 17 million jobs to EU citizens (EUBA, 2021[80])	• Mining operations have had substantial negative effects on the Western Ghats' (India) biodiversity, jeopardising USD 612 million worth of ecosystem services in 2021 values (Shanmukha et al., 2024[81]; Balasubramanian and Sangha, 2023[82])

Source: Author's elaboration.

Economic growth and resilience of supply chains

A circular economy generates cost savings and earnings for cities and regions compared to linear consumption models. Circular practices in construction, mobility and energy efficiency reduce dependence on imported raw materials and energy, enhancing the resilience of supply chains in cities and regions. New circular economy business models can reduce the cost of services and boost access to shared resources for local residents in an affordable way. Moreover, the adoption of different end-of-life treatment practices can be beneficial for cities and regions, as the valorisation of the materials contained in waste streams generates secondary raw materials at little or no cost, reducing the demand for virgin raw materials and lowering the costs associated with waste disposal (Table 1.3). Nevertheless, in 2021, the EU circular economy[11] represented 2.1% of total EU GDP (1.6% in 2008, the latest year available), 2.2% of total employment (1.8% in 2009, latest year available), and attracted investment in tangible goods corresponding to 0.8% of GDP (0.9% in 2012, latest available data) (Eurostat, 2025[83]). In principle, circularity can increase GDP if greater resource efficiency enables goods and services to be produced more cheaply; remanufactured, renovated or refurbished products, or recycled materials, can be produced more cheaply than new products or virgin materials; and circular economy strategies stimulate innovation or investment and result in new jobs and technology that improve productivity (Ekins, 2024[22]) (Box 1.3).

Box 1.3. The micro and macroeconomics of the circular economy

The microeconomics

It has been argued that the economic principles underpinning the circular economy remain surprisingly underdeveloped. A common assertion in circular economy discourse is that "waste is a resource". However, in economic terms, waste is by definition a material with a zero or negative value that its current owner seeks to discard. While the same material may acquire value under different ownership, in a different location, or following some degree of processing, these transformations typically incur costs. These include information costs, as potential new owners must become aware of the material's availability, condition, and location; transaction costs associated with negotiating its transfer; logistical costs for relocation; and processing costs to modify the material. By incurring these costs, value is added, enabling waste to become a resource. Identifying viable pathways to enhance the value of waste materials so they can compete with virgin resources in the marketplace is a complex challenge. Where such opportunities do not exist, waste remains waste, requiring further spending on its management and disposal.

The macroeconomics

The microeconomic impacts of moves towards a circular economy may, if significant, also have macroeconomic impacts. Macroeconomic impacts can relate to the formal economy and the welfare impacts of informal economic activity, which may contribute to welfare while not increasing employment nor economic growth. The beneficial macroeconomic impacts of circular economy strategies are not intuitively obvious. For example, extending product lifespans may appear economically detrimental as it may reduce the sale of new products. However, the overall macroeconomic impact depends on how consumers allocate financial resources saved from delaying new purchases. They may spend them on other goods and services, stimulating different sectors of the economy, or invest them, contributing to long-term economic growth. Additionally, if durable products are primarily imported, extending their lifespan could reduce imports, further benefiting the domestic economy. These interactions make the macroeconomic impacts of the circular economy complex and multifaceted.

One way to assess the economic implications of circular economy strategies is to estimate the potential savings from resource efficiency investments. According to estimates, implementing available resource

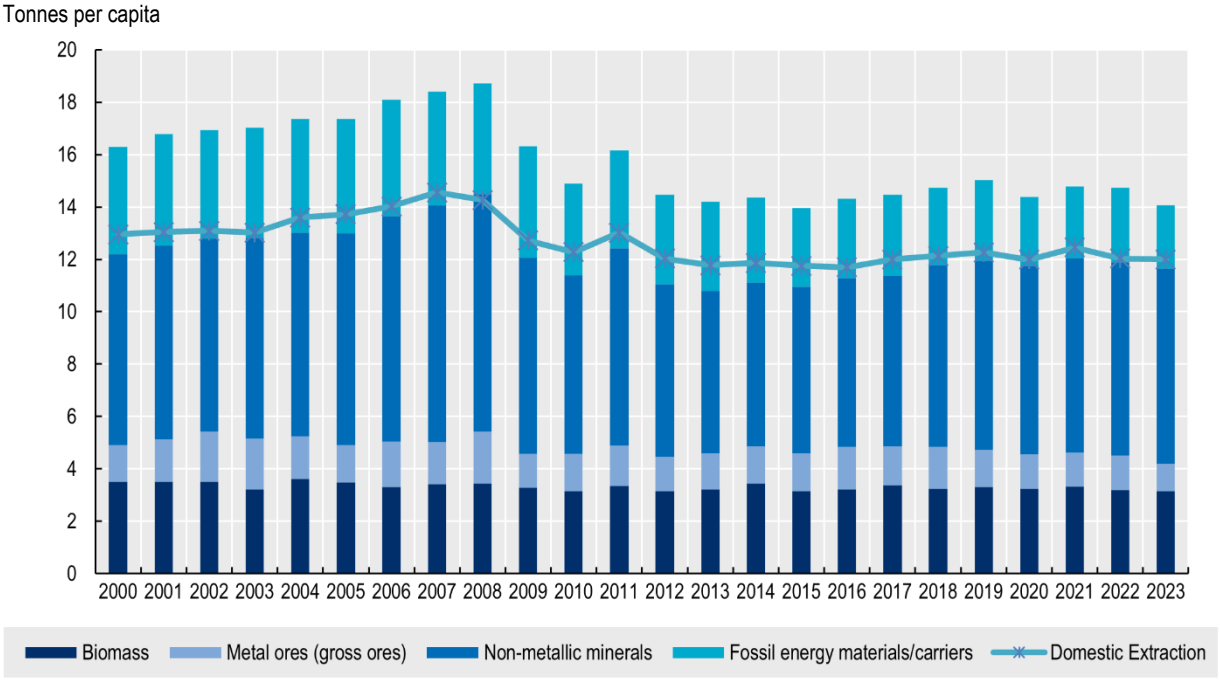
efficiency technologies globally could save private investors USD 2.9 trillion annually by 2030, with 70% of these investments yielding returns exceeding 10% per year. Economic growth linked to resource efficiency could also drive job creation, with estimates suggesting an increase of 9 to 25 million jobs worldwide (Dobbs et al., 2011[84]). However, these modelling results depend heavily on underlying assumptions, such as the type of economic model used (e.g., computable general equilibrium, macro-econometric, or system dynamics), the treatment of investment (including potential crowding-out effects), the availability of underused resources (especially labour), the skills required for circular activities, and the policy mechanisms driving resource efficiency.

Source: Ekins (2024[22]), Circular Priorities for Europe, unpublished paper prepared for the OECD Task Force for Circular Strategic Thinking.

Competitiveness

By increasing resource efficiency and the use of secondary materials in a way that reduces costs for its businesses, the EU could benefit economically through increased innovation, more resilient supply chains and reduced imports (Ekins, 2024[22]). According to the "Draghi Report", *The future of European competitiveness – A competitiveness strategy for Europe* (European Commission, 2024[85]) "Europe must bring down high energy prices while continuing to decarbonise and shift to a circular economy". Overall, the EU economy heavily relies on virgin raw materials for approximately 87% of its material consumption (World Bank, 2022[86]). Raw material consumption within the EU reached 14.1 tonnes per capita in 2023, down from 16.3 tonnes per capita in 2000. Of this, 54% consisted of non-metallic minerals, 23% of biomass material use, 18% of fossil energy materials and 5% of metal ores (Figure 1.15).

Figure 1.15. Raw material consumption by material categories in the EU-27, 2000-2023



Sources: Eurostat (2025[87]), Material footprints - main indicators, https://ec.europa.eu/eurostat/databrowser/view/ENV_AC_RME/default/table?lang=en; Eurostat (2024[88]), Material flow accounts, https://ec.europa.eu/eurostat/databrowser/view/env_ac_mfa/default/table?lang=en.

The level of raw material consumption varies considerably across the EU, ranging from around 9-10 tonnes per capita in countries such as Italy, the Netherlands and Spain to around 30-40 tonnes per capita in Estonia, Finland and Romania (World Bank, 2022[86]). Non-metallic minerals are the largest material category, mostly used in the construction industry in cities and regions. Globally, the secondary raw materials market has grown, but the primary material market still dominates. In 2022, the global volume of trade in primary materials was 3.7 times higher than that of secondary materials. This represents a decrease compared to the fivefold difference observed in 2002. The economic value generated by the trade of secondary materials including scrap plastics, metals, used paper, and second-hand clothing increased by 417% over the same period, reaching USD 462 billion in 2022 (CircularEconomy.Earth, 2024[89]).

As recognised in the "Letta Report" *Much more than a market – Speed, Security, Solidarity* (2024[90]), the transition to a circular economy could significantly strengthen the EU's resilience and security of supply. In 2023, the EU imported 47.2% of its metal and 73.3% of its fossil energy materials (Eurostat, 2024[91]). The 2023 EU Critical Raw Materials Act, which aims to secure the EU's supply of selected critical raw materials, set targets for increasing recycling (25%) (European Commission, 2023[92]), ensuring that by 2030, the EU does not rely on a single third country for more than 65% of its supply of any critical raw material (European Commission, 2023[92]). Currently, 98% of the EU's supply of rare earth elements comes from China, 98% of its boron from Türkiye, and 71% of its platinum from South Africa. Such concentration strengthens the urgency of shifting towards a circular economy, which can ensure resource efficiency and increase security of supply (European Council, 2024[93]). By promoting local resource loops that emphasise the reuse, recycling and repurposing of materials, the circular economy can reduce import dependency and insulate EU industries from external shocks in critical raw material markets such as price volatility and geopolitical tensions.

EC projections suggest that demand for critical materials is expected to increase significantly by 2050. This increase is likely to be mainly driven by the projected growth of the EU e-mobility sector, a key sector for EU cities, many of which have climate neutrality objectives by 2030 evidenced by growing investments (European Commission, 2025[94]). The EU sources 100% and 82% of its demand for lithium and cobalt respectively from a limited number of non-EU countries, making it highly exposed to supply risks (European Commission, 2023[95]). By 2030, EU demand for lithium is projected to increase 12-fold and 21-fold by 2050 compared to 2020 levels; demand for platinum to increase 30-fold by 2030 and 200-fold by 2050; and demand for lithium-ion batteries, which are essential for electric vehicles and energy storage, is projected to multiply by a factor of 21 by 2050 (European Commission, 2024[96]).

Demand for rare earth metals in EU wind turbines is also estimated to increase by 5.5 times by 2050 (Joint Research Centre, 2023[97]). Some EU cities are investing in e-mobility, resulting in a growing number of privately owned electric vehicles (EV) in 2022, including 76 000 in Vienna (Austria), 35 000 in Copenhagen, Denmark, 24 000 in Berlin, Germany, 20 000 in Paris, France, and 9 000 in Amsterdam, Netherlands. By the end of 2025, Copenhagen aims to have publicly accessible charging points within 250 metres of all multi-storey buildings. Similarly, Vienna has installed more than 950 EV charging points, with an average of one every 400 metres. Vienna also offers subsidies for businesses to invest in electric vehicles and buses, promoting e-mobility as a viable and inclusive solution (Continental, 2023[98]).

Recent disruptions in supply chains, highlighted during the COVID-19 pandemic and exacerbated by Russia's war of aggression against Ukraine, have highlighted the EU's structural dependencies and their potentially damaging effects on its economy. Disruptions in the supply of energy and essential commodities such as steel, aluminium, copper, and industrial minerals can strain key industries, including construction and transport. For example, in 2020, 57.5% of the energy available in the EU was produced outside its Member States (European Council, 2024[99]). The EU energy import dependency rate, which measures the extent to which a country or a region is dependent on imports for its energy consumption, stood at 62.5% in 2022 (Eurostat, 2024[100]). The energy landscape has also been affected by Russia's war of aggression

against Ukraine and the subsequent loss of pipeline natural gas. While energy prices have fallen from their peaks, EU companies still face electricity prices that are 2-3 times those in the US and natural gas prices that are 4-5 times higher. There are also strategic dependencies in the area of critical technologies for the digitalisation of the EU economy. The EU currently relies on foreign countries for over 80% of digital products, services, infrastructure and intellectual property (European Commission, 2024[101]). In 2023, cities accounted for 75-80% of energy consumption and around 70% of GHG emissions (Harris et al., 2020[102]). Urban energy demand is expected to rise as global urbanisation rates are projected to climb from 56% in 2024 to around 70% in 2050 (IEA, 2024[103]).

Faced with these multisided challenges, the EC launched its Clean Industrial Deal (CID) in February 2025, which outlined concrete actions for European industries' growth with decarbonisation as a key driver. These includes lowering energy prices, creating high quality jobs and the right conditions for companies to thrive with a focus on energy-intensive industries and the clean tech sector. Circularity is another major aspect of the CID, which highlights that maximising the EU's limited resources and reducing overdependencies on third-country suppliers for raw materials is crucial for a competitive and resilient market. Under the CID, the EC will (i) set up a mechanism enabling European companies to come together and aggregate their demand for critical raw materials, (ii) create an EU Critical Raw Material Centre to jointly purchase raw materials on behalf of interested companies, creating economies of scale and offering leverage to negotiate better prices and conditions, and (iii) adopt a Circular Economy Act in 2026 to accelerate the circular transition and ensure that scarce materials are used and reused efficiently, reducing global dependencies and creating high quality jobs. The aim is to increase the circular material use rate from 11.8% in 2023 to 24% by 2030 (European Commission, 2025[104]).

Economic recovery

The circular economy can help households tackle the cost-of-living crisis by promoting energy efficiency, reducing reliance on new materials, and encouraging practices like repair and reuse, which lower household expenses. Between 2021 and 2022, households across the EU faced price increases of 18% on average for housing, water and energy; 12.1% for transport; and 11.9% for food and non-alcoholic beverages (Eurostat, 2023[105]). According to the European Parliament's (2023[106]) Eurobarometer, the rising cost of living was the most pressing concern for 93% of EU citizens. Almost half (46%) of the EU population reported a decline in their standard of living due to the combined impacts of the COVID-19 pandemic and Russia's war of aggression against Ukraine. In 2022, households made up almost 26% of the EU's final energy consumption, four-fifths of which was used for heating, cooling, and water heating (Eurostat, 2024[107]). Through energy-saving initiatives, such as improved insulation and efficient appliances, households can reduce heating, cooling, and water heating costs, which are key drivers of living expenses. Additionally, by supporting second-hand markets and repair activities, the circular economy enables households to extend the life of products, reducing the need for new purchases and further mitigating the financial burden caused by rising prices in housing, food, and energy. However, smaller household sizes imply reduced material efficiency as common household services, including appliances and installations, are shared across a smaller number of individuals (Ivanova et al., 2021[108]). In 2023, 36.7% of the 200 million households residing in the EU were single adult households (Eurostat, 2024[109]).

Table 1.3. Estimated economic value and impacts of inaction on the circular economy

	Rationale	Costs of inaction	Co-benefits of action	Examples
Efficiency and productivity	Low resource use efficiency and productivity can result in higher production costs and increased demand for raw materials, but also lead to lost economic value and missed opportunities for cost savings and revalorisation when materials are disposed of rather than recirculated.	• The EU could be foregoing net savings of **EUR 600 billion** or **8%** of annual business turnover due resource inefficiency (EESC, 2016[110]). • More than **USD 500 billion** of value is lost every year due to the underuse and lack of recycling of clothing (EMF, 2017[111]). • EU materials lose around 60% of their value per use cycle, costing **EUR 87 billion** annually (Climate-KIC, 2020[112])	• Closed-loop innovations for water systems could save Europe up to **EUR 3 billion** annually and create **13 000** jobs (Water Europe, 2024[71]). • Virgin raw material costs of up to EUR **6 billion** each year could be reduced in the EU by reusing **546 million tonnes** of aggregates (SWECO, 2020[113]).	• The Basque Country (Spain) aims to boost material productivity by **30%** and cut waste generation by **10%** in 2022-2024 (Euskadi, 2021[114]). • In Hong Kong, the reuse of concrete slurry waste in the production of partition wall blocks could save **USD 4 million** in landfill disposal costs per year (Hossain et al., 2021[115]).
Business potential	Missed business opportunities refer to the opportunity cost of not adopting circular business models that could otherwise generate new revenue streams and lower operational costs across sectors.	• Failing to transition to a sustainable, low-carbon, and circular bioeconomy risks forfeiting a **USD 7.7 trillion** business opportunity for bio-based products by 2030 (WBCSD, 2020[116]). • The Middle East region holds around **USD 20 billion** in untapped market potential in the waste management sector by 2030 (PwC, 2023[117]).	• Global revenue related to circular transactions is forecast to reach approximately **USD 650 billion** by 2026 (Statista, 2023[118]). • Circular food systems could unlock **USD 2.7 trillion** in savings for cities by 2050 (EMF, 2021[119]), • Circular business models in fashion could be worth **USD 700 billion** by 2030 (EMF, 2021[120]).	• The city of Toronto (US) has procurement contracts worth **CAD 2.7 billion** per year, an opportunity for suppliers with circular economy business models and offerings (EMF, 2024[121]). • In 2021, the total turnover of circular industries in the region of Flanders (Belgium) was **EUR 22 billion** (Circular Flanders, 2022[122]).
Trade	**A raw material trade deficit refers** to the cost of continued dependence on imported raw materials, which exposes economies to price volatility and supply chain disruptions. Circularity reduces dependence on imports through material recovery and reuse.	• In 2023, the total trade value of raw materials between the EU and the rest of the world was **EUR 165 billion**, with a trade deficit of **EUR 29 billion** (Eurostat, 2024[123]). • Without adopting efficient practices, the EU risks missing out on a potential **GBP 90 billion** improvement in its trade balance and the creation of **160 000 new jobs** (EESC, 2016[110]).	• Increasing metal recovery by 10% can reduce imports of metallic raw materials by **3.3%** (Dussaux and Glachant, 2018[124]). • Exports of solid waste and secondary raw materials generate annual revenues of more than **USD 23 billion** for countries in Latin America and the Caribbean (IaDB, 2024[125]).	• China is a net importer of both raw materials and intermediate goods with a trade deficit of over **USD 700 billion** in 2021 (JRC, 2023[126]). • In 2015, Chinese cities (Beijing, Chongqing, Shanghai, Tianjin) mostly consumed materials imported from the rest of China (**53%**) and the rest of the world (**35%**) rather than their own cities (**12%**) (Jin et al., 2021[127]).
Supply Chain	Climate-related events such as floods and droughts can disrupt supply chains, causing production delays, resource shortages and economic losses. Circular sourcing, local production, and material reuse could help mitigate these risks.	• The global food supply chain accounts for an estimated **one-third** of total anthropogenic GHG emissions (WEF, 2023[128]). • Disruption to global supply chains due to climate change could cost **USD 25 trillion** by 2060 (Sun et al., 2024[129]).	• Reducing food loss and waste in the food supply chain – from farm to retail – could generate annual cost savings of **USD 365 billion** by 2030 (WEF, 2020[130]). • A circular food supply chain could reduce GHG emissions by **49%** by 2050 (EMF, 2021[119]).	• In 2022, a drought in the Mississippi River (United States) urged the closure of some navigation routes, costing USD 20 billion in supply chain impacts and economic damage (WEF, 2023[131]).

Source: Author's elaboration.

Technological progress and research and development (R&D)

Digitalisation

The rapid growth of the global smart city market has the potential to enhance urban efficiency and sustainability with relevance to the circular economy. This market is estimated to reach over USD 1 024 billion by 2027 (Table 1.4) (OECD, 2024[132]). Digital technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and blockchain can enable better resource tracking, waste management, and sharing economies in cities and regions. In the United States alone, cities are expected to invest USD 41 trillion over the next two decades to upgrade and benefit from digital technologies (OECD, 2023[133]).

Through AI, IoT, big data analytics, cloud computing, blockchain, online platforms, and 3D printing, digitalisation is a key enabler of the digital, green, and circular transitions by reducing emissions and increasing material efficiency. The introduction of new digital solutions to optimise industrial production is expected to improve energy and resource efficiency by over 20% at all stages of production (Wuppertal Institut, 2022[134]). Several digital technologies have potential applications for the circular economy.

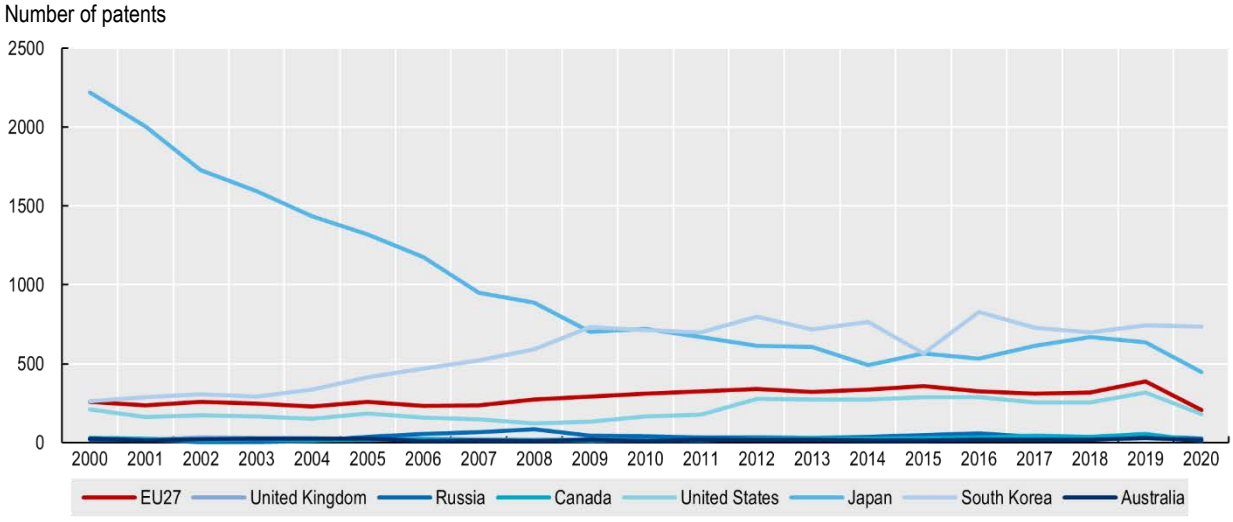
- Radio Frequency Identification (RFID) systems, which integrate sensors, identification technology, and internet connectivity, can be attached to waste and recycling containers. These tags support the implementation of pay-as-you-throw waste systems and optimise municipal waste collection.
- Real-time data, stored and processed in the cloud, can facilitate seamless communication between trucks, containers, recycling facilities, and secondary material retailers. This data enables the monitoring of container status, including material content, fill levels, and maintenance needs. It also supports route management, fleet productivity, and safety assurance, while improving the sorting, reuse, and recycling of materials in a more cost-effective and efficient manner (Barteková and Börkey, 2022[135]).
- 3D printing can facilitate the recovery of up to 80% of raw materials from end-of-life vehicles for reuse in manufacturing (Barteková and Börkey, 2022[135]).
- Blockchain technology can improve material circularity by enabling the tracking and monitoring of materials and components throughout the supply chain, ensuring that they can be reused, remanufactured or, when no longer viable, recycled or composted. It also offers opportunities in water and waste management, such as improving the traceability of processes used to transform waste materials for productive use, including applications in agriculture (EMF, 2022[136]).
- Digital passports supported by databases can serve as digital records that accompany physical products throughout their lifecycle, from design to end-of-life (Walden, Steinbrecher and Marinkovic, 2021[137]). These passports provide detailed, auditable information on product composition, including material types and grades. By offering insights into product composition, they enhance disassembly processes at scrapyards, improve material recovery while maintaining quality and properties, and increase the potential for reuse. When implemented through blockchain technology, digital passports ensure data immutability, foster trust, and eliminate information asymmetries along value chains. From a producer's perspective, they provide greater control over materials throughout a product's lifecycle (Barteková and Börkey, 2022[135]).
- Digital twins (i.e. a 3D virtual reality version of a production process or a product) can be used in textiles, food, and consumer goods to support sustainable product development by minimising material waste and improving recyclability (OECD, 2019[138]). Digital twins facilitate real-time monitoring of product conditions, allowing businesses and consumers to optimise maintenance schedules and prevent premature disposal. In the construction sector, Berlin's Urban Mining Hub uses digital twins to map material compositions in buildings, ensuring that resources can be effectively recovered and reused at the end of their lifecycle rather than lost to demolition.

While digital technologies offer new opportunities for enhancing environmental management and protection, they also pose challenges to sustainability by increasing resource consumption and electronic waste. In 2022, OECD countries generated around 18 kg per capita of e-waste (i.e. electric and electronic equipment discarded as waste without intent of reuse), with less than half being properly collected and recycled. Some countries such as Canada, Japan and the UK collect and recycle less than 30% of their e-waste (OECD, 2025[139]). Beyond its environmental impact, unrecovered e-waste also represents a significant economic loss, with an estimated USD 91 billion global worth of valuable tech materials discarded annually (UNITAR, 2024[140]).

Material innovation

The development of biodegradable, recyclable, and renewable materials can accelerate the transition to a circular economy. In particular, the availability of biodegradable material for different uses in cities and regions is increasingly reducing plastic use. The global market for biocomposites[12] is expected to reach USD 56 billion by 2032, with the EU27 representing around 12% of the total market (Bisresearch, 2024[141]). Biocomposites, emerging as sustainable materials, have been employed for applications in aerospace, automobiles, packaging, or electronics. In the cement industry, alternatives to clinker can reduce CO_2 emissions by up to 70% compared to traditional concrete (Vinci SA, 2023[142]). In the city of Amsterdam, the Netherlands, 20% of housing projects must be constructed from bio-based materials from 2025 (Dezeen, 2021[143]). However, such alternatives are forecast to replace a marginal share – 1% and 5% of total cement in 2030 and 2050 respectively – due to the low availability of raw materials at the scale required, reducing overall CO_2 emissions by just 0.5% in 2050 (GCCA, 2024[144]). While the market for circular materials is expanding, the EU's contribution to innovation in the circular economy remains limited. Between 2000 and 2020, the number of patents related to recycling and secondary raw materials in the EU stagnated, lagging behind China, Japan and Korea, while only marginally surpassing the United States (Figure 1.16).

Figure 1.16. Patents related to recycling and secondary raw materials, 2000-2020



Note: This chart excludes China, which had around 6 000 patents in 2020, a 5 823% increase since 2000.
Source: Eurostat (2025[145]), *Patents related to recycling and secondary raw materials*, https://ec.europa.eu/eurostat/web/circular-economy/monitoring-framework.

Table 1.4. Estimated technological value and consequences of inaction on the circular economy

	Rationale	Costs of inaction	Co-benefits of action	Examples
Technology	In a linear economy, the adoption of new technologies accelerates e-waste generation through rapid obsolescence, limited repairability, and high consumption, leading to increased environmental and resource challenges. In a circular economy, technology can help reduce or revalorise waste by promoting repairability, recycling, and sustainable design, extending product lifespans.	• Around **USD 70 billion** in market opportunities could be lost by 2030 without investment in waste-to-energy technology (ESWET, 2024[146]). • **USD 91 billion** in valuable tech metals (i.e. iron, copper and gold) are lost to the economy due to insufficient e-waste recycling (UNITAR, 2024[140]). • E-waste can generate up to **USD 78 billion** in externalised costs to the population and the environment due to lead and mercury emissions, plastic leakage and GHG emissions (UNITAR, 2024[140]).	• The integration of carbon capture and storage and waste-to-energy facilities in Europe has the potential to capture up to **70 million tonnes** of CO_2 annually (CEWEP, 2022[147]). • With e-waste management technologies, around **USD 28 billion** worth of recovered metals are brought back into the economy and **USD 23 billion** of monetised value of GHG emissions are avoided (UNITAR, 2024[140]).	• The city of Seoul (Korea) set up 6 000 automated bins equipped with scales and RFID to weigh food waste, reducing food waste by **47 000 tonnes** between 2013 and 2019 (WEF, 2019[148]). • Since 2003, the E-Waste Reuse and Recycling Programme from the Ecology Center in New York City (US) has diverted over **10.5 million pounds** of unwanted electronics from landfills or incineration (Les Ecology Center, 2024[149]).
Digitalisation	Digitalisation can lead to increased energy consumption, resource depletion, and e-waste generation. In a circular economy, digital tools can enhance resource efficiency, reduce the obstacles of green business models and accelerate the effective delivery of circular economy policies, while increasing cost savings, transparency, traceability and trust.	• Despite global spending on the digital transformation set to reach **USD 3.4 trillion** by 2026, **70%** of these initiatives fail to deliver their intended results (IDC, 2023[150]; BCG, 2020[151]). • Failing to invest in digital transformation today could mean missing out on a share of the **USD 1 trillion** smart city market by 2027 (OECD, 2024[132]). • AI-related water withdrawals are estimated at 4.2-6.6 billion m^3 in 2027, equivalent to 4-6 times the annual water withdrawal of Denmark (OECD, 2023[152]).	• Digitalisation could deliver **20%** of the emission cuts needed to achieve net zero by 2050 (WEF, 2022[153]) • New digital solutions for optimising industrial production are expected to improve energy and resource efficiency by **over 20%** at all stages of production (Wuppertal Institut, 2022[134]). • 3D printing can facilitate the recovery of up to 80% of raw materials from end-of-life vehicles for reuse in manufacturing (Barteková and Börkey, 2022[135]).	• As of 2024, the city of Edinburgh (UK) has installed **11 000** smart sensors in a range of communal and litter bins to help save money, protect the environment and become a smart city (Edinburgh Council, 2024[154]). • In 2024, over 3 300 residents across 52 municipalities joined a new digital platform for mobile eco-parks in Consorci Mare (Spain), recording 5 168 organic waste contributions in exchange for rewards (Cadenaser, 2025[155]).
Material innovation	The lack of or limited innovation in materials contributes to resource depletion, waste generation, and environmental harm, limiting sustainability and efficiency efforts. Circular economies drive innovation in sustainable design and materials, reducing waste and ensuring the competitiveness of businesses in a rapidly evolving market.	• Neglecting biocomposites and biomaterials means forfeiting a share in the **USD 56 billion** market by 2032 (Bisresearch, 2024[141]). • **95%** of the value of plastic packaging, worth **USD 120 billion** annually, is lost to the economy (EMF, 2019[156]). • Failing to innovate on low-carbon building materials means continued reliance on concrete, with cement production alone driving **7% of global CO_2 emissions** (UNEP, 2023[157])	• Biological applications, including the production of materials, chemicals, and energy alone could have a direct annual economic benefit of up to **USD 4 trillion** globally by 2040 (McKinsey, 2020[158]). • On average, bio-based products emit **45%** less GHG emissions than their fossil equivalents (JRC, 2024[159]).	• In the city of Helsinki (Finland), the construction of a building with mass timber is expected to reduce CO_2 emissions by **2 795 tonnes** compared to a building made of steel (WEF, 2023[160]). • The shift to bio-based alternatives in construction could save up to **35 million tonnes of CO_2 equivalent** by 2050 in Brazilian cities (Correa de Melo et al., 2023[161]).

Source: Author's elaboration

Regulatory and policy frameworks

EU regulatory and policy landscape

The evolution of EU circular economy policy reflects a shift from a focus on waste management to a comprehensive life-cycle approach that integrates eco-design, citizen awareness, and urban action. The EU's circular economy journey started with the 2011 Roadmap for a Resource-Efficient Europe, which set targets to ensure the efficient use of water, land and marine resources and ecosystem services and to support the transition to a green economy (European Commission, 2011[162]). Building on this Roadmap, the European Commission (EC) adopted its first Circular Economy Action Plan (CEAP) in 2015. It contained 54 actions covering the entire life cycle of products (e.g. production, consumption, waste management and secondary raw materials) and five priority areas (plastics; food waste; critical raw materials; construction and demolition; biomass and bio-based products), and review of fertiliser legislation. The EC allocated EUR 10 billion in public funding to the transition between 2016 and 2020 and concluded that all 54 actions of the plan had been delivered or implemented by March 2019 (European Commission, 2019[163]).

The 2015 CEAP included four legislative proposals to amend the Waste Framework Directive[13], the Packaging Waste Directive[14], the Landfill Directive[15], and Directives[16] on end-of-life vehicles, waste batteries and accumulators, and waste electrical and electronic equipment, which had all been adopted by 2018. Under this new regulatory framework, EU Member States were required to move from a 50% recycling target for all municipal waste to 60% by 2025 and 65% by 2030; from a 60% target for recycling or energy recovery to 65% by 2025 and 75% by 2030; and to reduce landfilling to a maximum of 10% of municipal waste by 2035. As part of the 2015 CEAP, the EC adopted the 2018 European Strategy for Plastics, which established new mandatory requirements for recycled content and waste reduction measures for key products (e.g. packaging, construction materials and vehicles) and aimed to ensure that all plastic packaging placed on the EU market would be reusable or easily recyclable by 2030 (European Commission, 2018[164]). A new Circular Economy Action Plan was adopted by the EC in 2020, aligned with the 2019 EU Green Deal, which aims to achieve climate neutrality in the EU by 2050. The 2020 CEAP included 35 actions to improve product design, focusing on seven key value chains: (i) electronics and information and communication technology (ICT); (ii) batteries and vehicles; (iii) packaging; (iv) plastics; (v) textiles; (vi) construction and buildings; and (vii) food, water and nutrients. It also set an aspirational target of doubling the EU's circular material use rate (i.e. the proportion of material recycled and fed back into the economy) from 11.7% in 2020 to 23.4% by 2030 (European Commission, 2020[165]). However, according to EU statistics, the circular material use rate reached 11.2% in 2020, below the 11.7% target, which was achieved in 2023 (11.8%) (Eurostat, 2025[37]).

The 2020 CEAP proposed to extend the scope of the Eco-design Directive from requirements on energy consumption to a wider range of products; a new legislative initiative to replace single-use packaging, tableware and cutlery with reusable products in food services; and launched the EU Strategy for Sustainable and Circular Textiles to strengthen competitiveness and innovation in the sector while boosting the EU market for textile reuse (European Commission, 2023[166]). This led to an amendment of the Waste Framework Directive and the introduction of mandatory and harmonised Extended Producer Responsibility (EPR) schemes for textiles in EU Member States (European Commission, 2023[167]). Following the adoption of the 2020 CEAP, the EC proposed minimum mandatory GPP criteria and targets in sectoral legislation and introduced the EU Ecolabel to identify products and services with a reduced environmental life cycle impact, as well as the Energy Label, which helps consumers to choose products that save energy and money (European Commission, 2020[168]).

The 2020 CEAP dedicated a section to cities, highlighting its commitment to harnessing the potential of EU financing and funding instruments to support investments at subnational level and ensure that all regions benefit from the transition. Circular economy solutions would be tailored to the EU's outermost

regions and islands, characterised by their dependence on imports of resources and products, high waste generation fuelled by tourism, and waste exports. The 2020 CEAP mentioned the role of the Just Transition Mechanism as part of the European Green Deal Investment Plan and InvestEU to support projects focusing on the circular economy. It also highlighted the role of the European Urban Initiative, the Intelligent Cities Challenge Initiative, and the Circular Cities and Regions Initiative in supporting cities and designated the European Circular Economy Stakeholder Platform as the place for stakeholders to exchange information. Between 2021 and 2028, the EC pledged to mobilise at least EUR 1 trillion in sustainable investments to achieve the goals set by the European Green Deal, including the circular economy (Table 1.5) (EC, 2020[169]).

The shift towards a more systemic approach has also been reflected in the EU's monitoring framework for the circular economy. In fact, the framework developed in 2018 did not include indicators on repair, reuse, sharing, product durability, and design standardisation, which can help substitute parts of products rather than the whole product (Joint Research Centre, 2023[97]). In May 2023, the revised EU Circular Economy Monitoring Framework was launched to track progress in the transition to a circular economy. It includes new indicators, such as material footprint, resource productivity, and GHG emissions from production activities, aligning with the European Green Deal and other sustainability objectives. Cities and citizens play a crucial role in this expanded approach. The EU has sought to empower citizens through measures such as the "right to repair" and the Digital Product Passport, which enhances transparency by providing information on materials, environmental impact, and disposal options. Public awareness campaigns and platforms connecting consumers with repair services and refurbished goods further illustrate the EU's efforts to engage individuals in the transition.

The circular economy has also been embedded in broader policy objectives. The European Green Deal and the Fit for 55 package link circularity with climate neutrality goals, recognising the role of sustainable production and consumption in reducing GHG emissions. Sectoral strategies such as the Plastics Strategy recommend the integration of circular principles in high-impact industries such as textiles, electronics, and construction. The Chemicals Strategy for Sustainability (2020[170]) underlines the importance of a clean circular economy to promote secondary raw materials while ensuring the safety of both primary and secondary materials and products. The 2020 New Industrial Strategy for Europe emphasises the importance of integrating circular economy principles in the industrial sector to reduce Europe's dependence on raw materials, increase secondary material use and promote innovation in sustainable production. The EC also included the circular economy in the Competitiveness Compass (2025[171]), a strategy to lead the development, manufacturing and marketing of future technologies, services and clean products in the EU. It projects a substantial increase in the EU remanufacturing market's circular potential, with a forecast 223% rise from EUR 31 billion in 2021 to EUR 100 billion in 2030. This growth is expected to generate 500 000 new jobs (World Bank, 2022[172]).

The circular economy is expected to become increasingly important in the EC's current work programme. Within the EC's 2024-2029 mandate, the circular economy was explicitly included in the portfolios of two executive vice-presidents (for a clean and competitive transition, and for prosperity and industrial strategy) and a commissioner for climate, net zero and clean growth, as well as a new commissioner for environment, water resilience and a competitive circular economy. A new Circular Economy Act expected by the end of 2026 is expected to help create stronger market demand for secondary materials and a single market for waste, particularly in relation to critical raw materials. In addition, the updated bioeconomy strategy and the forthcoming EU Water Resilience Strategy will incorporate circular economy principles, while the New European Bauhaus will focus on innovation, bio-based materials and circularity, housing and the built environment, financing and community building across the EU (EC, 2024[173]).

Table 1.5. Estimated governance value and consequences of inaction on the circular economy

	Rationale	Costs of inaction	Co-benefits of action	Subnational examples
Policies	Delaying the policy transition raises costs through economic disruptions, stranded assets and climate damages, while circular economy policies can cut waste, drive innovation, and boost economic resilience.	• Sticking to current policies could lower global GDP by up to **7%** by 2050 compared to an orderly shift to net zero (OECD, 2025[174]).	• Resource efficiency policies and initiatives could deliver annual economic benefits of **USD 2 trillion** globally by 2050 (UNEP, 2017[175]).	• The City Council of Barcelona, Spain, created **6 580 new jobs** a year on average through green or circular economy policies between 2016 and 2019 (Barcelona Activa, 2023[176]).
Assets	Assets relying on non-circular models may become stranded as policies shift towards net zero. Circularity mitigates these risks by unlocking economic opportunities, reducing carbon emissions, and generating new jobs through resource-efficient investments and innovation.	• Between **USD 117-557 trillion** in stranded assets could materialise by 2050 if fossil fuel investments continue and net-zero policies are delayed or abandoned (Chester et al., 2024[177]). • Around **USD 10.8 trillion** in stranded assets could be faced by the buildings sector under delayed policy action (IRENA, 2017[178]).	• Globally, around **USD 10 trillion** could be saved on the value of stranded assets by following the REmap policy scenario, with the EU saving up to **USD 1.5 trillion** (IRENA, 2017[178]). • Around **30 giga tonnes of CO_2 emissions** per year could be saved by following the REmap scenario (IRENA, 2018[179]).	• Integrating rooftop photovoltaics and electric vehicles in Hanoi (Vietnam) could result in nearly **USD 7.4 billion** in stranded assets. Despite these losses, the transition could create **5 000** new jobs in the PV supply chain and reach a net present value of **USD 4.7 billion** (Trang and Kobashi, 2024[180]).
Incentives	A linear economy drains resources through harmful subsidies, fueling depletion and inefficiencies. Incentives for circular practices unlock sustainable investments, driving innovation and resilience.	• Globally, around **USD 2.6 trillion** a year is spent on environmentally harmful subsidies, equivalent to **2.5%** of global GDP, from which around 40% goes to fossil fuels and 10% to construction (Business for Nature, 2024[181])	• The EC has pledged to mobilise at least **EUR 1 trillion** in sustainable investments, including the circular economy, between 2021-2028 (EC, 2020[169]). • European Investment Bank lending to circular economy projects has increased in recent years, amounting to **EUR 3.4 billion** in total over the past 5 years, with a record level of EUR 1.1 billion in 2022 (EIB, 2023[182]).	• The state of Saxony, Germany, introduced a repair bonus for businesses for a total of **EUR 2.5 million** between 2023 and 2024 (Repair, 2023[183]). • In 2025, the City of Paris launched a call for projects, offering circular economy initiatives up to **EUR 50 000** in operating grants and **EUR 20 0000** in investment grants (City of Paris, 2025[184]).
Procurement	Unsustainable procurement practices drive resource depletion, increase costs, and expose supply chains to significant risks. Green procurement can facilitate material recovery, reuse, and sustainable sourcing.	• Public procurement is responsible for **7.5 billion tonnes** of direct and indirect GHG emissions, roughly 15% of the global total (WEF, 2022[185]).	• Greener public procurement, in aggregate, will boost global GDP by around **USD 6 trillion** and create around **3 million net jobs** by 2050 (WEF, 2022[185]). • If governments worldwide eliminate the 15% of global carbon emissions they cause through public procurement by 2050, society could save up to USD **930 billion** annually in GHG-related costs (WEF, 2022[185]).	• The city of Helsinki, Finland, saved **25%** of costs compared to previous contracts by using circular criteria in public procurement (ICLEI, 2020[186]). • In 2021, **30%** of the Paris Region's Procurement Contracts include a Circular and Environmental Provision (Paris Region, 2024[187]). • In the Amsterdam Metropolitan Area, public procurement will be 50% circular by 2025 and 100% circular by 2050 (City of Amsterdam, 2020[188]).

Source: Author's elaboration

Jobs and societal engagement

Cities and regions are setting up circular economy business models that generate jobs in recycling, remanufacturing, and green tech sectors. Changes in consumer demand and grassroots movements in recent years advocate for waste reduction, repair culture, and sustainable practices. In addition, societal engagement is pushing for more transparency and justice in waste management practices (Table 1.6).

Job opportunities

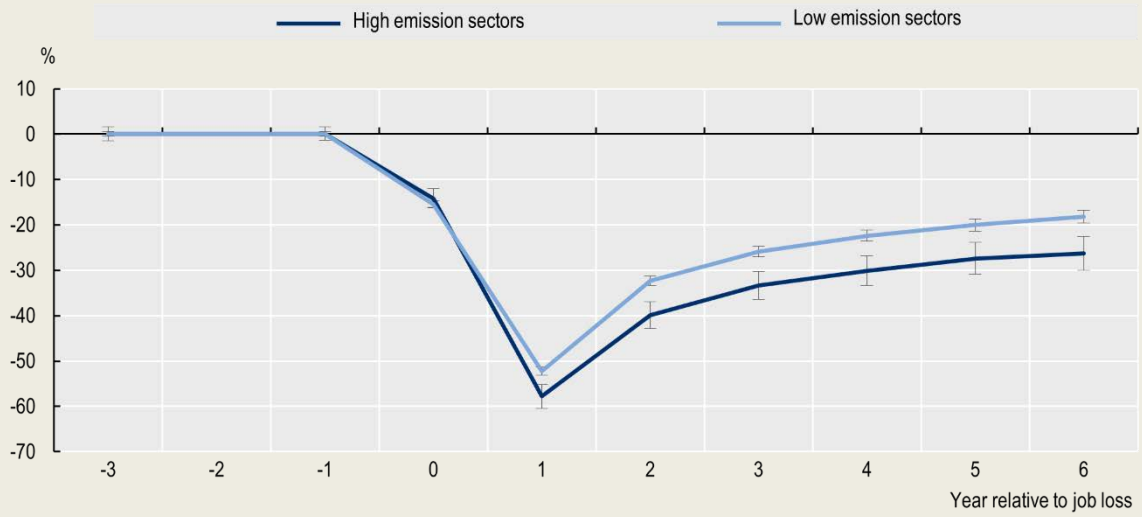
The circular economy has the potential to create 18 million net green jobs worldwide in recycling, repair and reuse activities and 2.5 million new jobs in the EU by 2030 (OECD, 2021[189]) (IISD, 2020[190]). In the EU, over 4 million people worked in circular economy sectors in 2023, 60% of which were based in France, Germany, Italy, Poland and Spain (Eurostat, 2023[2]). However, when measured as a share of total employment, the increase is minimal (1.9% of total employment in 2009 and 2.1% in 2021) (Eurostat, 2022[191]). In 2018, 11% (140 000 jobs) of total employment in the Amsterdam Metropolitan Area (the Netherlands) were categorised as circular – with the workforce excelling in areas of circular design, repair service and the use of digital technology (Amsterdam Economic Board, 2018[192]) – and there were more than 17 000 jobs in the circular economy in the Basque Country, Spain (Ihobe, 2022[193]). However, in the majority of EU cities, circular economy jobs do not yet represent more than 20% of total employment, such as in Milan, Italy (9.6% of total employment and 84 267 jobs), Vienna, Austria (9.6% of total employment and 72 753 jobs), Copenhagen, Denmark (20% of total employment and 101 355 jobs) (Circle Economy, 2025[194]).

Projections indicate that the circular economy is poised to create 700 000 jobs between 2015 and 2030, with more than half of this target (368 115 jobs) already achieved by 2023 (European Commission, 2018[3]; Eurostat, 2023[2]). Estimates suggest that resource efficiency and circular economy policies in the EU could lead to employment gains of up to 2% by 2030 and 7% by 2050. By 2030, these policies are expected to generate the greatest employment gains in sectors such as secondary steel reprocessing, retail, and repair services, while the largest reductions in employment are projected in manufacturing and mining (Laubinger, Lanzi and Chateau, 2020[195]). As such, it will be crucial to address significant regional disparities in employment in circular business models, for example, through re- and up-skilling activities (ESPON, 2020[196]). Specifically, people in low-skill occupations will face requirements to acquire new skills for green occupations, in particular process skills – critical thinking, monitoring and active learning – and complex problem-solving skills (OECD, 2024[197]). The average cost of re- and up-skilling new workers in the green economy could represent up to 1.7% of the GDP of EU countries (European Commission, 2022[35]). As such, behind the positive net effects, the radical transformation of the EU's circular economy will require significant changes in the labour market, with possible income losses for certain categories of workers (Wilts, 2024[198]) (Box 1.4).

Box 1.4. Losers and winners in green jobs

The OECD Employment Outlook shows that workers who are forced to quit high-emission jobs and shift to green, low-emission occupations suffer an income loss of 29% on average over the next six years of their employment (Figure 1.17). Similar systematic assessments are still lacking for the circular economy but available studies anticipate increases in sectors such as waste management, where average incomes are significantly lower compared to industry jobs. As a result, similar or even higher income losses could be expected.

Figure 1.17. Income losses after forced shifts from high-emission to low-emission sectors



Source: OECD (2024[197]), OECD Employment Outlook 2024: The Net-Zero Transition and the Labour Market, https://doi.org/10.1787/ac8b3538-en.

The concrete impacts of the shift from high-emission to low-emission occupations will significantly differ between cities and regions. In a study for ESPON, the Wuppertal Institute and others have shown how, for example, the share of employment in circular business models varies not only between the EU Member States but also across regions. The OCED Employment Outlook highlights that the gap between current and future qualification requirements is much higher for low-skill occupations compared to high-skill qualifications. However, the development of circular skills in the EU currently focuses on creating new courses and services at university and technical college levels.

Source: OECD (2024[197]), OECD Employment Outlook 2024: The Net-Zero Transition and the Labour Market, https://doi.org/10.1787/ac8b3538-en; Wilts (2024[198]), Options for the European Commission to support circularity in cities and regions, unpublished paper prepared for the OECD Task Force for Circular Strategic Thinking.

Societal engagement and justice

Recent shifts in EU consumer preferences underline growing demand for sustainable products and services in line with circular economy principles. As awareness of environmental issues grows, consumers are increasingly demanding that companies offer products that are durable, repairable and environmentally friendly. This demand not only reinforces the regulatory push towards a circular economy but also establishes it as a societal imperative. Social engagement is on the rise, reflected in growing awareness of the need for more sustainable consumption practices. By 2025, second-hand sales are expected to account for 12.6% of total online sales in Europe, which represents more than double the market share of 5.7% in 2020 (RetailDetail, 2024[199]). Research indicates that in 2024, 65% of EU citizens recognised the impact of environmental issues on their daily lives, expressed concern about increasing waste generation, and were willing to take personal steps to reduce waste. There is also a considerable willingness among EU citizens to adopt more sustainable consumption habits. Furthermore, consumers are willing to pay more for products that are easier to repair and recycle and that are produced sustainably. However, this figure has decreased from 72% in 2007 to 59% in 2024, potentially due to inflation rates, which may have

reduced households' capacity to afford more expensive sustainable products. Concerns about waste issues have increased from 27% in 2007 to 58% in 2024 (EEA, 2024[200]).

Studies suggest that there is widespread support for climate action. For example, one study estimates that 69% of the global population is willing to contribute 1% of their personal income to climate action and 89% call for increased political action (Andre et al., 2024[201]). Moreover, there is extensive approval of pro-climate social norms, with 86% of respondents endorsing such norms. Countries with stronger approval rates are found to have implemented significantly more climate change-related measures. Concerns about harmful chemicals in daily products further illustrate the link to circular economy principles. In 2024, more than four out of five EU citizens (84%) were concerned about the impact of these chemicals on both health and the environment. Significantly, 72% of Europeans considered the chemical safety of products when making purchasing decisions, indicating a preference for safer, sustainable options. This trend is reinforced by the fact that 59% of the EU population shows a willingness to pay a premium for products that are easier to repair and recycle and are produced in an environmentally sustainable way, highlighting the role of consumer behaviour in driving the transition to a circular economy (European Commission, 2024[202]).

Waste disposal, resource extraction, and other activities that result in environmental degradation affect the most vulnerable communities. For instance, a study has found that waste incinerators in the UK are three times more likely to be built in low-income areas and neighbourhoods (Unearthed, 2020[203]), exposing residents to higher levels of noise, litter, traffic, odours and air pollution, potentially leading to health-related issues. Illegal dumping, hazardous waste mismanagement, and illicit waste exports not only degrade the environment but also pose serious health risks, particularly for those in low-income areas with limited access to proper waste infrastructure. In 2020, annual revenue for the trafficking of hazardous and non-hazardous waste in the EU reached EUR 1.8 billion and EUR 10.3 billion, respectively (Europol, 2022[204]). Between 2019 and 2023, illegal dumping cost the Dublin City Council, Ireland, more than EUR 5.2 million to remove (Dublin City Council, 2024[205]).

Social inclusion is key to combating waste crimes, as community sources provide vital intelligence to support waste enforcement efforts. For instance, since 2013, the city of Los Angeles (US) has maintained the MyLA311 platform to enable residents to report issues like illegal dumping directly to city departments (LACITY, 2021[206]). Significant regional disparities exist in illegal waste dumping across the EU. In 2024, the number of illegal dumps containing plastic waste ranges from just 8 in Ireland to over 10 000 in Romania (Statista, 2024[207]). Social inclusion is key to a just transition in the plastics value chain, enabling a circular economy. Waste reduction policies and additional investments in waste sorting and recycling could limit additional costs to end plastic leakage to only USD 50 billion globally by 2040, compared to business-as-usual costs of USD 2.1 trillion between 2020 and 2040. Yet the social costs of plastic pollution and the distributional consequences of inaction for different household groups still require further research (OECD, 2024[74]).

Table 1.6. Estimated social value and consequences of inaction on the circular economy

	Rationale	Costs of inaction	Co-benefits of action	Subnational examples
Jobs	In a linear economy, jobs are largely concentrated in resource extraction, production, and waste disposal, whereas a circular economy drives employment in sustainable industries like recycling, remanufacturing, and repair. However, the transition also incurs costs for re-skilling and up-skilling workers to adapt to new circular practices and skills.	• On average, the cost of re- and up-skilling new workers in the green economy could represent up to **1.7% of the GDP** of EU countries (European Commission, 2022[35]). • The skills gap in the green economy will rise to **7 million** green energy workers by 2030, especially in solar, wind, and biofuels technologies (BCG, 2023[208]).	• The circular economy could create **18 million** net green jobs worldwide by 2030 (IISD, 2020[209]). • In the EU alone, the circular economy has the potential to create **2.5 million** new jobs by 2030 (WRAP, 2021[210]).	• A circular model in the city of London, UK, could generate a total of **GBP 24.2 billion** and create **515 000** circular jobs by 2030 (ReLondon, 2022[211]). • Between 2010 and 2021, the number of jobs in circular industries in Flanders (Belgium), focusing on repair, waste management, second-hand goods and building restoration, increased by 15% to reach a total of **44 949 circular jobs** in 2021 (Circular Flanders, 2024[212]).
Health	Health impacts from pollution refer to the socio-economic costs and health risks of air, soil, and water pollution from landfills, incineration, and hazardous waste. The circular economy minimises waste, promotes safer resource management, and reduces landfill reliance, lowering risks of respiratory illnesses and waterborne diseases.	• Resource extraction and processing cause **40%** of air pollution-related health impacts, costing 200 million disability-adjusted life years annually (UNEP, 2024[25]). • The cost of the health damage caused by air pollution is estimated at **USD 8.1 trillion** a year (World Bank, 2022[213]). • In 2019, the global cost of lead exposure in children and adults was estimated at **USD 6 trillion** (Larsen and Sánchez-Triana, 2023[214]).	• By 2050, the circular economy can reduce and even reverse waste-related health impacts by **153%** compared to 2020 (UNEP, 2024[25]). • Shifting to a circular food system could lower the healthcare costs associated with pesticide use by **USD 550 billion** globally and save **290 000 lives** from outdoor air pollution per year by 2050 (EMF, 2019[215]).	• The estimated cost of waste in the US healthcare system reached up to **USD 935 billion**. The projected potential savings from interventions that reduce waste, excluding savings from administrative complexity can go up to **USD 286 billion** (Shrank, Rogstad and Parekh, 2019[216]).
Crimes	The absence of adequate waste disposal services and infrastructure, lack of enforcement, weak regulatory frameworks, and insufficient public awareness can drive unlawful dumping, handling, or trade of waste materials, including unauthorised landfill use, illegal waste exports, and improper hazardous waste treatment, exacerbating health risks, social inequalities, and community well-being. A circular economy creates incentives to recycle, improves waste infrastructure and enhances transparency.	• Up to **90%** of the world's electronic waste, worth nearly **USD 19 billion**, is illegally traded or dumped each year (UNEP, 2015[217]). • In 2020, annual revenue for the trafficking of hazardous and non-hazardous waste in the EU reached **EUR 1.8 billion** and **EUR 10.3 billion,** respectively (Europol, 2022[204]).	• Countering illicit waste trafficking and illegal mining can help recover up to **USD 12** and **48 billion** annually respectively, currently lost to criminal networks (FATF, 2021[218]). • Addressing open dumping could help reduce 31% of the total waste sector GHG emissions globally (UNODC, 2022[219]).	• More than 60 000 instances of illegal dumping cost Dublin City Council more than **EUR 5.2 million** to remove between 2019 and 2023 (Dublin City Council, 2024[205]). • The annual cost of direct damage to native vegetation from illegal dumping reached **AU 800 000** in New South Wales, Australia (CIE, 2021[220]). • In Beijing, China, the social cost of incineration and landfilling in 2021 was estimated at **CHN 10.17 billion** and **CHN 915 million,** respectively (Jiang, Leng and Xi, 2024[221]).

Source: Author's elaboration

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Notes

[1] The EU Taxonomy is a classification system that helps companies and investors identify "environmentally sustainable" economic activities to make sustainable investment decisions. Environmentally sustainable economic activities are those which "make a substantial contribution to at least one of the EU's climate and environmental objectives, while at the same time not significantly harming any of these objectives and meeting minimum safeguards."

[2] The 16 EU Taxonomy economic sectors include: (1) Accommodation activities, (2) Arts, entertainment and recreation, (3) Construction and real estate activities, (4) Disaster risk management, (5) Education, (6) Energy, (7) Environmental protection and restoration, (8) Financial and insurance activities, (9) Forestry, (10) Human health and social work activities, (11) Information and communication, (12) Manufacturing, (13) Professional, scientific and technical services, (14) Services, (15) Transport, (16) Water supply, sewerage, waste management.

[3] NDCs are national climate action plans by each country under the Paris Agreement. A country's NDC outlines how it plans to reduce greenhouse gas emissions to help meet the global goal of limiting temperature rise to 1.5C and adapt to the impacts of climate change (UN, 2025[222]).

[4] The CMUR corresponds to the total share of material recycled and fed back into the EU economy, i.e. the circular use of materials in overall material use, known as the circular material use rate or the circularity rate.

[5] The EU uses the NUTS (Nomenclature of Territorial Units for Statistics) classification to define regions for statistical purposes. It categorises each country into three levels: NUTS 1 (Major socio-economic regions), NUTS 2 (Basic regions for regional policies), NUTS 3 (Small regions for specific diagnoses).

[6] Decoupling occurs when the growth rate of an environmental pressure (e.g. DMC) is less than that of its economic driving force (e.g. GDP) over a given period. Decoupling can be either absolute or relative. Absolute decoupling occurs when the environmental variable is stable or decreases while the economic driving force grows. Relative decoupling occurs when the rate of change of the environmental variable is less than the rate of change of the economic variable.

[7] The Environmental Kuznets Curve hypothesises that environmental degradation initially increases with rising per capita income. However, beyond a certain income threshold, environmental impact begins to decline as societies prioritise sustainability. This shift is driven by increased investments in infrastructure, stricter environmental regulations, and a greater societal willingness to pay for improved environmental quality.

[8] Mismanaged plastic waste (MPW) refers to the transport of macroplastics from global rivers to the ocean. Beyond a certain economic level, rising prosperity can improve waste management, allowing growth to benefit the environment and reduce ocean pollution.

[9] Municipal and packaging waste recycling targets are the following: 55% preparing for reuse and recycling of municipal waste, 65% recycling of all packaging waste, and material-specific packaging waste recycling targets of 75% for paper and cardboard, 70% for glass, 50% for aluminium, 50% for plastic and 25% for wood.

[10] The end values are not SDGs targets. The OECD index is calculated based on best performers rule, according to which the OECD estimates an unweighted average using the top performer region of each country. For example, if a region achieves a municipal waste rate below 366 kg it means it achieved the end value.

[11] Represented by recycling, repair and reuse as proxies of the circular economy.

[12] Biocomposites are materials composed of two or more distinct constituent materials (one being naturally derived) that are combined to yield a new material with improved performance over individual constituent materials (Rudin and Choi, 2013[223]).

[13] Amending Directive 2008/98/EC on waste.

[14] Amending Directive 1999/31/EC on the landfill of waste

[15] Amending Directive 94/62/EC on packaging and packaging waste

[16] Amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment.

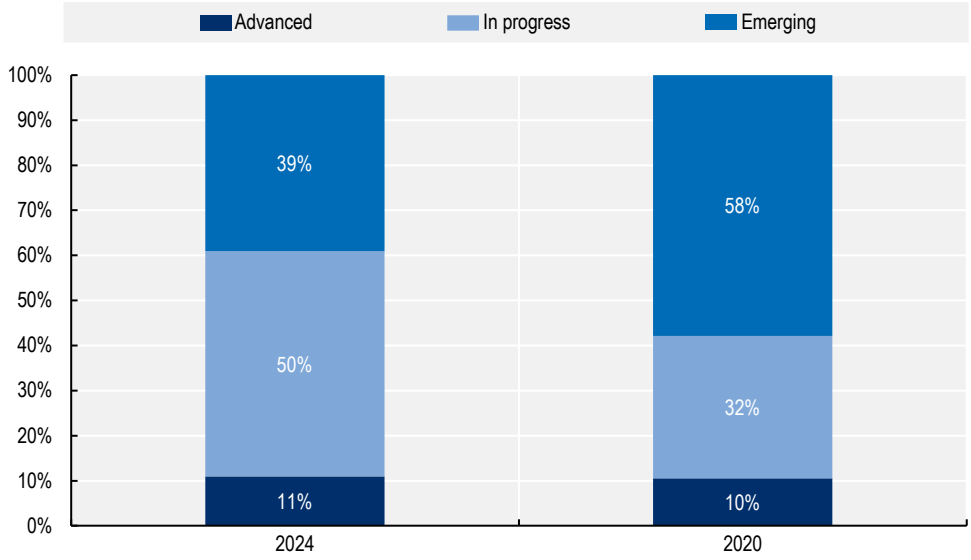
2 The state of the art of the circular economy in cities and regions in the EU

This chapter provides an overview of the state of the art of circular economy policies at the subnational level, including existing regulations, economic incentives and funding programmes. The analysis builds on the results of the OECD Survey across 64 cities and regions across the EU Member States, the United Kingdom and Norway. The chapter clusters surveyed cities and regions in three groups (strategy, innovation and partnership-driven) to highlight common features and provide relevant examples of circular economy practices in place.

Setting the scene: levels of advancement, goals and responsibilities

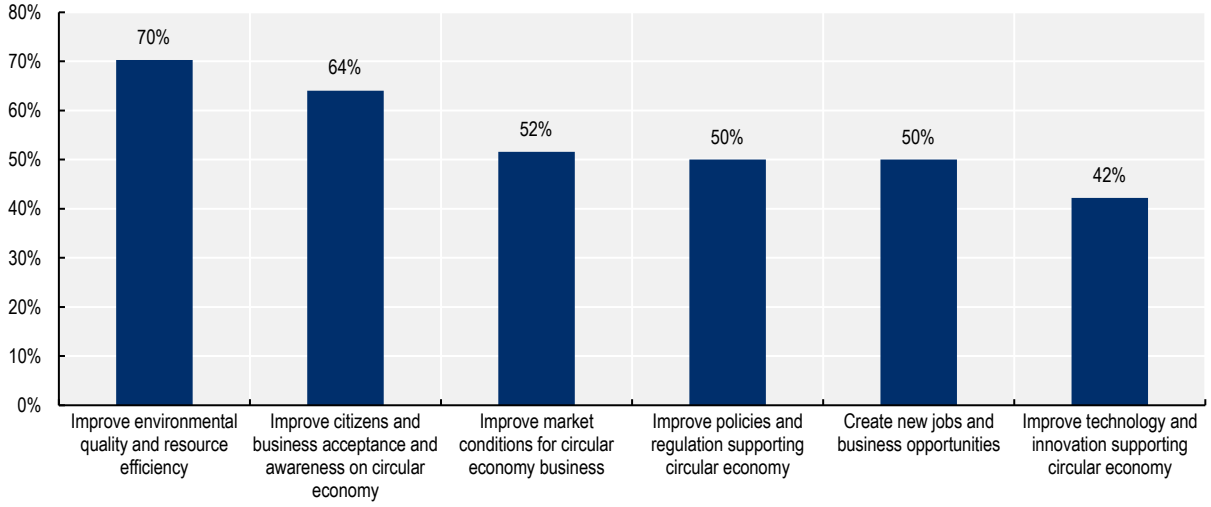
Most cities and regions responding to the OECD survey (2024[1]) perceive themselves as making progress on their transition to a circular economy. Only 11% of the surveyed cities and regions defined themselves as "advanced", while 50% described themselves as "in progress" (compared to 32% in 2020[1]), and 39% as "emerging" (Figure 2.1, Table 2.5). While the transition to circular economy can have multiple goals, the OECD survey (2024[1]) reveals that cities and regions prioritise environmental quality and resource efficiency (70%), followed by improving citizen and business acceptance and awareness on the circular economy (64%), and improving market conditions for circular economy businesses (52%) (Figure 2.2).

Figure 2.1. Share of surveyed cities and regions by stage of the circular economy transition



Note: Results based on a sample of 64 (2024) and 38 (2020, excluding non-EU and non-UK respondents) respondents that responded "Advanced", "In progress" and "Emerging" to the question "What is the level of advancement of the transition from linear to circular in your city or region?" (respondents who answered "Newcomers" and "Not in place" in 2020 survey are categorised under "Emerging" in this figure); "Advanced" are those cities and regions that have developed strategies or roadmaps and engaged a variety of stakeholders. Cities and regions "In progress" are those taking action towards the circular economy, following ad hoc initiatives. Cities or regions in this cluster have recently set specific programmes on the circular economy and/or are starting their implementation. Cities and regions "Emerging" are those recognising the relevance and potential of the circular economy and exploring options for implementation.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*; OECD (2020[2]), *OECD Survey on the Circular Economy in Cities and Regions*, OECD, Paris.

Figure 2.2. Share of surveyed cities and regions by circular economy goals

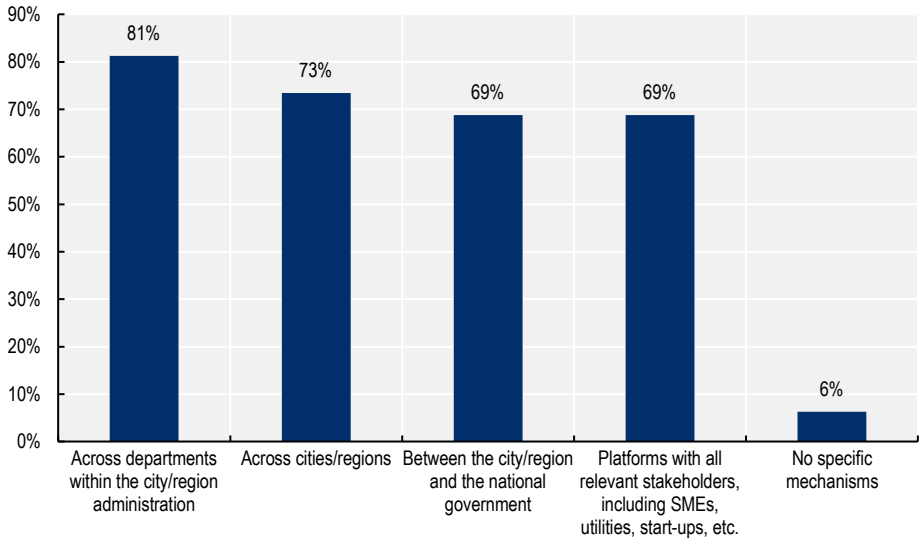


Note: Results based on a sample of 64 respondents that responded "top priority" to the question "Which of the following goals represent a priority for a more effective, efficient and inclusive circular economy in your city / region in the future?".
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Responsibilities to achieve these goals are shared across levels of government. At the national level, ministries of the environment or other equivalent bodies have a central role in the circular economy in more than half of the surveyed cities and regions (OECD, 2024[1]). For example, in Bulgaria, Czechia, Finland and Greece, the Ministry of the Environment is the main entity responsible for the circular economy, such as the Ministry for Ecological Transition and Demographic Challenge in Spain. In other cases, ministries responsible for adjacent environmental or energy issues play major roles in the circular economy, such as the Ministry of Climate (Estonia), the Ministry of Energy Affairs (Hungary), and the Ministry of Natural Resources and Spatial Planning (Slovenia). Given the interdisciplinary nature of the circular economy, some countries have developed co-ordination bodies across ministries. For example, an inter-ministerial commission was created in Spain to develop a circular economy strategy towards 2030. In 2019, a National Delegation for the Circular Economy was created in Sweden as a government advisory body that brings together representatives from the public sector, business, and academia (OECD, 2020[3]).

At the regional level, the circular economy is driven by public environmental organisations, waste management agencies, and economic development organisations (OECD, 2024[1]). Surveyed regional governments have mainly allocated the responsibility of guiding the circular transition to regional councils (Turku, Finland, through the Regional Council of Southwest Finland); publicly funded, non-profit environmental organisations (Scotland, United Kingdom, through Zero Waste Scotland); and public waste agencies (Flanders, Belgium, through the Public Flemish Waste Agency). In surveyed cities, the circular economy is often led by environmental departments. Beyond these departments, responsibilities are shared across economic development, urban planning, sustainability, and waste management agencies. The city council or central municipal administration also holds responsibilities. Dedicated circular economy offices and managers have been set in large cities (e.g., Amsterdam, the Netherlands; London, United Kingdom; Munich, Germany). Circular economy managers are responsible for promoting and implementing circular initiatives and building relationships with external actors (OECD, 2020[3]).

Figure 2.3. Share of surveyed cities and regions by type of co-ordination mechanisms



Note: Results based on a sample of 64 respondents that responded "Yes" and "No" to the question "Are there co-ordination mechanisms for the circular economy?".
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

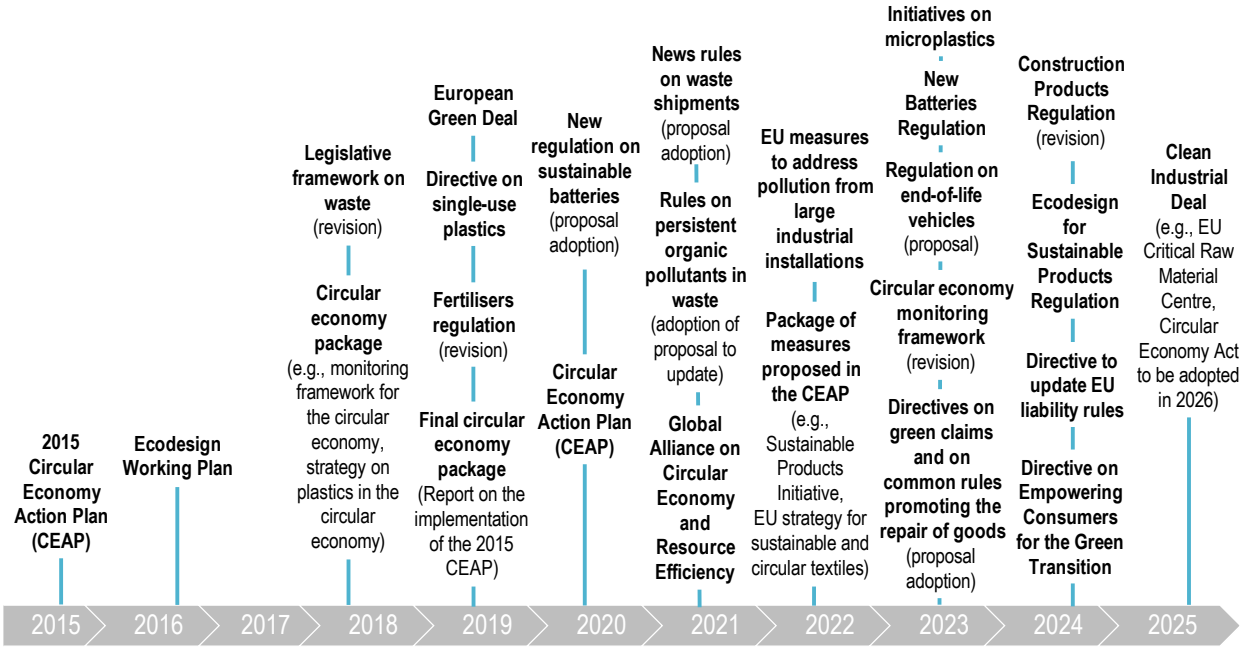
Co-ordination is critical to the circular transition, as the cross-cutting nature of the circular economy requires working across silos (OECD, 2020[3]). Among surveyed cities and regions, co-ordination across municipal departments is the most common mechanism (81%), followed by those across cities and regions (73%), between cities or regions and their national government (69%), and with other relevant stakeholders including SMEs, utilities, and start-ups (69%) (Figure 2.3). Some cities have created dedicated horizontal working groups (e.g., Castile and León region, Spain; Oulu, Finland). In Gothenburg, Sweden, co-ordination officers are responsible for driving their respective strategies while co-ordinating key stakeholders (City of Gothenburg, 2021[4]).

Leveraging tools for the circular economy

Regulation

Some countries and regions have legislative frameworks promoting the circular economy (e.g., circular economy acts, bills, laws, etc.), which are often influenced by EU legislation such as the Circular Economy Action Plan 2020 and the Waste Framework Directive (Box 2.1; Figure 2.4). For instance, regulatory framework for the circular economy in the Western Region, Ireland, also aligns with national (e.g., the Circular Economy and Miscellaneous Provisions Act 2022) and EU directives (See Chapter 4). These frameworks aim to guide policy and practice towards waste reduction and more circular practices in the region. In 2019, Castilla-La Mancha, the region home to Guadalajara, introduced a Circular Economy Law, the first legislation of its kind in Spain. This law aims to promote a more innovative, competitive, and sustainable development model in the region. Luxembourg's Waste Management Law provides a basis for the country's circular economy transition and aims to promote prevention, reuse, recycling, and other forms of waste recovery.

Figure 2.4. Timeline of relevant EU regulations on circular economy initiatives



Source: European Commission (2025[5]), Circular economy, https://environment.ec.europa.eu/topics/circular-economy_en.

The transition to a circular economy is also promoted by sectoral regulation. For example, Helsinki's building regulations, which came into force in 2023, incorporate carbon neutrality and biodiversity goals and promote the circular economy through measures such as material selection and a rule allowing the building control authority to require a demolition plan before any demolition work begins. The types of instruments commonly observed across sectors include setting circular purchasing criteria, implementing "product as a service" models, requiring separate collection of waste, banning advertisements for products that hinder the transition to a circular economy, mandating reporting requirements, and prescribing the inclusion of circular economy considerations in environmental and territorial plans as well as impact assessments (Table 2.1).

Table 2.1. Sectoral legal instruments in five product chains selected by the Netherlands' National Circular Economy Programme 2023-2030

Sectors and themes	Selected examples of instruments
Building	
Timber construction	• Request life cycle costs as a sub-award criterion in tender or procurement to favour timber construction projects with lower life cycle costs. • Inclusion of timber construction in municipal environmental program and vision. • Mandate demolition notifications which provide the municipality with insight into the amount of wood available for reuse in construction.
Infrastructure	• Inclusion of sustainable requirements in a Rationalisation and Automation of Civil Engineering, Water and Road Construction (RAW) specification to oblige the contractor to adhere to and report on them. • Inclusion of mitigating measures from the environmental impact assessment in the environmental permit.
Industrial estates	• Designation of locations for circular activities (e.g. a material hub, repair / recycling facilities) in the environmental plan. • Inclusion of pre-protection rules in the environmental ordinance to prevent activities that hinder transition to a circular economy (e.g., carbon-intense industrial activities) being permitted.
Home	• Inclusion of aesthetic criteria in the environmental plan to promote circular housing construction (e.g., mandating wooden, green or natural appearance using biobased or recycled materials, etc.).

Consumer goods	
Consumer textiles	• Mandatory separate presentation of textiles in the waste regulation to promote recycling of textiles. • An advertising ban for fast fashion to deter over-consumption due to fast turnover of clothes.
Workwear	• Purchasing criteria for circular workwear to stimulate innovation and to make effective circular purchases. • Outsourcing workwear "as a service" to make one company responsible for the clothing throughout its entire life cycle for maintenance, repair and, reuse at the end of the contract.
Mattresses	• Return guarantee in the purchase contract as an agreement between seller and buyer to promote recycling. • Requesting circularity via sub-award criteria at purchasing.
Furniture	• Waste ordinance mandating furniture as a separate category of household waste to promote separate collection.
Electric appliances	• Tendering electrical equipment "as a service" to make one company remains responsible for maintenance and repair.
Biomass and food	
Food waste	• Annual reporting requirement for business (e.g., restaurants, hotels, etc.) to provide information about the amount of food waste and plan to prevent and minimise such waste. • A variable waste tax to encourage households to throw away less food.
Protein transition	• Purchasing and tendering policy including criteria for protein transition (e.g., favour plant-based proteins). • Banning advertisement of meat and fish in public spaces to deter consumption of animal proteins.
Manufacturing industry	
Solar panel	• Inclusion of mitigating measures from the environmental impact assessment in the environmental permit. • Subsidy scheme for high-quality recycling facilities and second-hand solar panels.
Wind turbines	• Promoting circular wind turbines through environmental program, territorial plan, and tenders for land allocation.
Plastics	
Artificial grass fields	• Requirement to apply life cycle analysis as sub-award criteria in tender procedure.

Source: Municipality of Amsterdam (2020[6]), CircuLaw: Regulations for a circular economy, https://www.circulaw.nl/

Box 2.1. Timeline of relevant EU regulation on the circular economy

Since 2015 the EC set up several Directives and strategies to help in the move from a linear to a circular economy, as described in the table below.

Date	Action/Initiative	Targets (examples)
December 2015	2015 Circular Economy Action Plan (CEAP), which includes 54 actions and four legislative proposals to amend the following Directives: • Waste Framework Directive. • Packaging Waste Directive. • Landfill Directive. • Directives on end-of-life vehicles, on waste batteries and accumulators, and on waste electrical and electronic equipment.	• Recycling rate of municipal waste: 65% by 2030. • Recycling rate of packaging: 75% by 2030. • Landfill rate less than 10% of municipal waste by 2030. • Reuse and recycling rate of 85% and reuse and recovery of 95% by an average of weight per vehicle.
November 2016	Eco-design Working Plan 2016-2019.	
January 2018	Circular economy package: • Monitoring framework for the circular economy. • Report on critical raw materials and the circular economy. • Strategy on plastics in the circular economy. • Analysis and policy options to address the interface between chemicals, products and waste legislation, including how to reduce the presence and improve the tracking of chemicals of concern in products.	• 100% of plastics recyclable by 2030. • Plastics recycling rate: 50% by 2025 and 55% by 2030.
July 2018	Amendment of the following Directives into force:	• Recycling rate of municipal waste: 55%

	• Waste Framework Directive. • Packaging Waste Directive. • Landfill Directive. • Directives on end-of-life vehicles, on waste batteries and accumulators, and on waste electrical and electronic equipment.	by 2025, 60% by 2030, 65% by 2035. • Recycling rate of packaging: 65% by 2025 and 70% by 2030. • Landfill rate less than 10% of municipal waste by 2035.
March 2019	Final circular economy package: report on the implementation of the 2015 CEAP.	
June 2019	Revised fertilisers regulation.	
July 2019	Directive on single-use plastics.	• Separate collection for plastic bottles: 77% by 2025 and 90% by 2029 • Recycled content in PET bottles: 25% by 2025 and 30% by 2030
December 2019	European Green Deal.	• Carbon neutrality by 2050. • 55% less of greenhouse gas (GHG) emission by 2030 compared to 2019. • Renewable energy share of 32% in the energy mix by 2030.
March 2020	Circular Economy Action Plan (CEAP), which includes 35 actions.	• Double the EU's circular material use rate from 2020 (achieve a rate of 23.4% by 2030)
December 2020	New regulation on sustainable batteries (proposal adoption).	
February 2021	Launch of the Global Alliance on Circular Economy and Resource Efficiency (GACERE).	
October 2021	Rules on persistent organic pollutants in waste (adoption of proposal to update).	
November 2021	News rules on waste shipments (proposal adoption).	
March 2022	Package of measures proposed in the circular economy action plan: • Sustainable Products Initiative, including the Eco-design for Sustainable Products Regulation (proposal adoption). • EU strategy for sustainable and circular textiles. • Revised Construction Products Regulation (proposal adoption). • Directive on Empowering Consumers for the Green Transition (proposal adoption).	
April 2022	Revised EU measures to address pollution from large industrial installations: • Industrial Emissions Directive (revision). • European Pollutant Release and Transfer Register (E-PRTR) (revision).	
November 2022	Measures proposed in the circular economy action plan: • EU rules on Packaging and Packaging Waste (revision). • Communication on a policy framework for biobased, biodegradable and compostable plastics.	• Recycled content in packaging, such as 65% for single-use plastic bottles by 2040
March 2023	Directives on green claims and on common rules promoting the repair of goods (proposal adoption).	
May 2023	Circular economy monitoring framework (revision).	
July 2023	Regulation on end-of-life vehicles (proposal); New Batteries Regulation.	• Recycling rate of 65% for lithium, 80% for nickel-cadmium, 75% of lead-acid and 50% for other batteries by 2025. • Recycled content rate of 6% for lithium

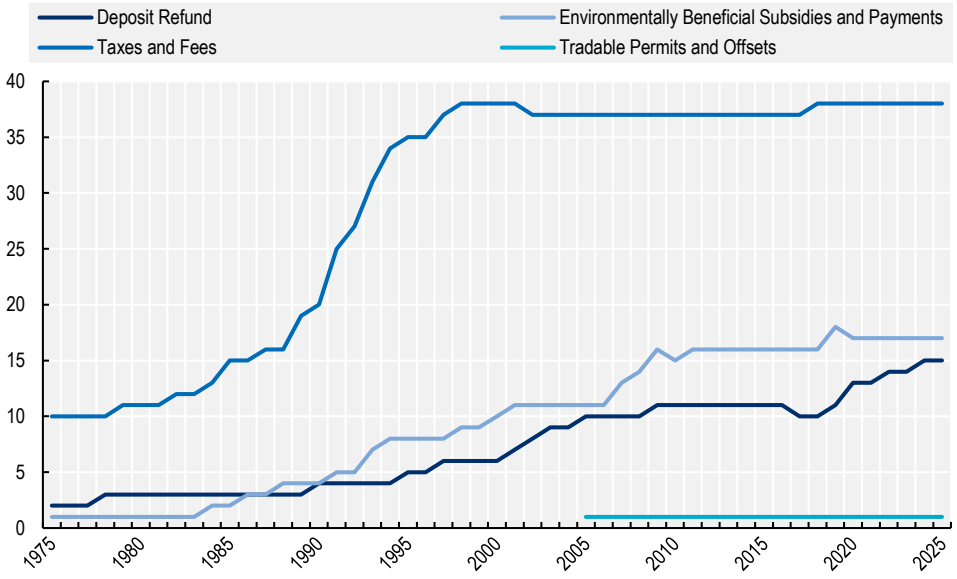
		and nickel, 85% for lead and 16% for cobalt batteries by 2031.
September-October 2023	Initiatives on microplastics: • REACH restriction addressing intentionally added microplastics. • Regulation on preventing pellet losses to reduce microplastics pollution (proposal).	
March 2024	Directive on Empowering Consumers for the Green Transition.	
July 2024	Eco-design for Sustainable Products Regulation.	• Recycled plastic rate in packaging products: 25% by 2025, 30% by 2030.
October 2024	Directive to update EU liability rules.	
November 2024	Construction Products Regulation (revision).	• 100% of construction products with a Digital Product Passport, which includes technical specifications, environmental data, and traceability information.
February 2025	Clean Industrial Deal: • EU Critical Raw Material Centre. • Circular Economy Act (to be adopted in 2026).	• 24% of materials circular by 2030

Source: European Commission (2025[5]), Circular economy, https://environment.ec.europa.eu/topics/circular-economy_en.

Economy and finance

Economic instruments can help achieve environmental policy goals more cost-effectively. These instruments can support the transition to circular practices by generating price signals that promote eco-design, reuse, recycling, and material recovery, minimising resource use and waste (Box 2.2). Economic instruments seek to address the market failure of environmental externalities by incorporating the external costs of production and consumption through taxes or by creating property rights and proxy markets for environmental services. The use of these instruments to pursue circular economy objectives has grown steadily in OECD countries over the past 50 years (Figure 2.5). Taxes were used by 31% of surveyed cities and regions as a financial resource for the transition towards the circular economy, while tariffs and other user charges were employed by 25% of respondents (Figure 2.6). Examples of taxes include municipal taxes on waste disposal, such as those in the Canary Islands, Spain. Tariffs and other user charges include waste management fees collected by local waste authorities, such as in Jyväskylä, Finland. Since 2013, the Eurométropole of Strasbourg, France, implemented a special fee on non-household waste produced by local businesses relative to the quantity of waste they generate, derived from the Household Waste Removal Tax (TEOM), a tax ancillary to French property tax.

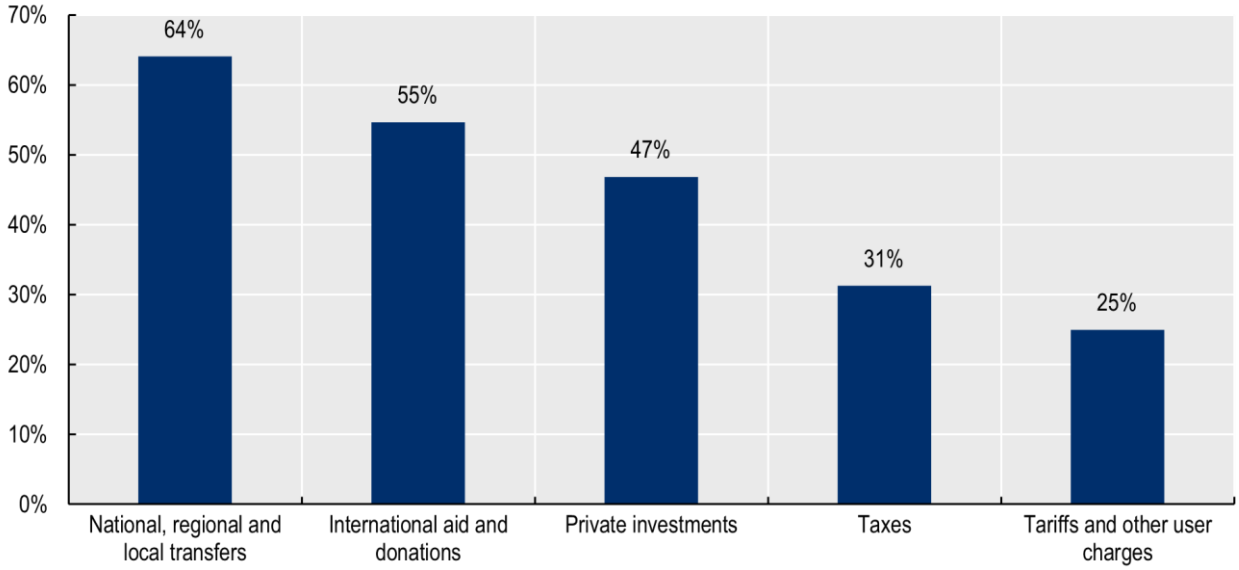
Figure 2.5. Number of OECD countries with economic instruments for the circular economy, 1975-2025



Source: OECD (2025[7]), *Policy Instruments for the Environment (PINE) Database*, OECD, Paris

With respect to financial resources for the circular economy, 64% of surveyed cities and regions report using national, regional, and local transfers (Figure 2.6). These include special recovery programmes such as France Relance, which allocates funds for circular economy projects like biowaste collection in the Eurométropole of Strasbourg, France. EU funds (see Chapter 4) are used by more than half (55%) of the sample. Although the private sector is considered a driving force for the circular transition, only 47% of surveyed cities and regions regarded the private sector as a potential financial resource. Examples of such investments include those through public-private partnerships (e.g., Podravje, Slovenia), agreements for co-financing to promote new management infrastructures (e.g., Basque Country, Spain), and direct support from circular economy-driven companies, like Polygreen Limited's initiatives in Tilos, Greece. In the EU, private investment in the recycling, repair, reuse and rental and leasing sectors increased by 21% between 2012 and 2021, reaching EUR 122 million in 2021 (Eurostat, 2025[8]). Around USD 334 billion had been invested in circular economy solutions globally by 2023 (EMF, 2024[9]).

Figure 2.6. Share of surveyed cities and regions by type of financial and economic measure



Note: Results based on a sample of 64 respondents that responded "Yes" to the question "How does your city/region gather or expect to gather the financial resources needed to foster the transition towards the circular economy?".
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Box 2.2. Typology of economic instruments for a circular economy

Economic instruments can be classified into two major categories: price-based and performance-based (Table 2.2). Price-based economic instruments directly alter the relative price of products and services (e.g., through taxes and charges). They can also set a price for a behaviour without an established market price (e.g., through deposit refund systems and advance disposal fees). Conversely, performance-based economic instruments involve the government assigning businesses the responsibility of meeting circular economy performance targets or goals, which translates into prices to incentivise behavioural change. An example of performance-based economic instruments are tradeable permit systems, which create an industry-wide environmental objective and allow firms to co-ordinate via a tradeable permit market. This mechanism enables polluters with low emission levels to mitigate impacts cost-effectively and sell permits to polluters with higher emission levels.

Table 2.2. Typology of economic instruments for a circular economy

Type	Description
Price-based economic instruments	
Taxes and charges	Taxes and charges on goods and services elicit behavioural changes by increasing costs. As a consequence, they discourage the consumption and production of targeted products or activities. The level of a tax or a charge can be based on the social cost of the activity or physical characteristics (e.g. weight of the consumable).
Subsidies	Subsidies encourage behavioural change by reducing costs for targeted products or increasing benefits for targeted activities. They directly increase the relative cost of polluting products and activities, or they can increase the use of products or activities that have a positive impact on the environment.

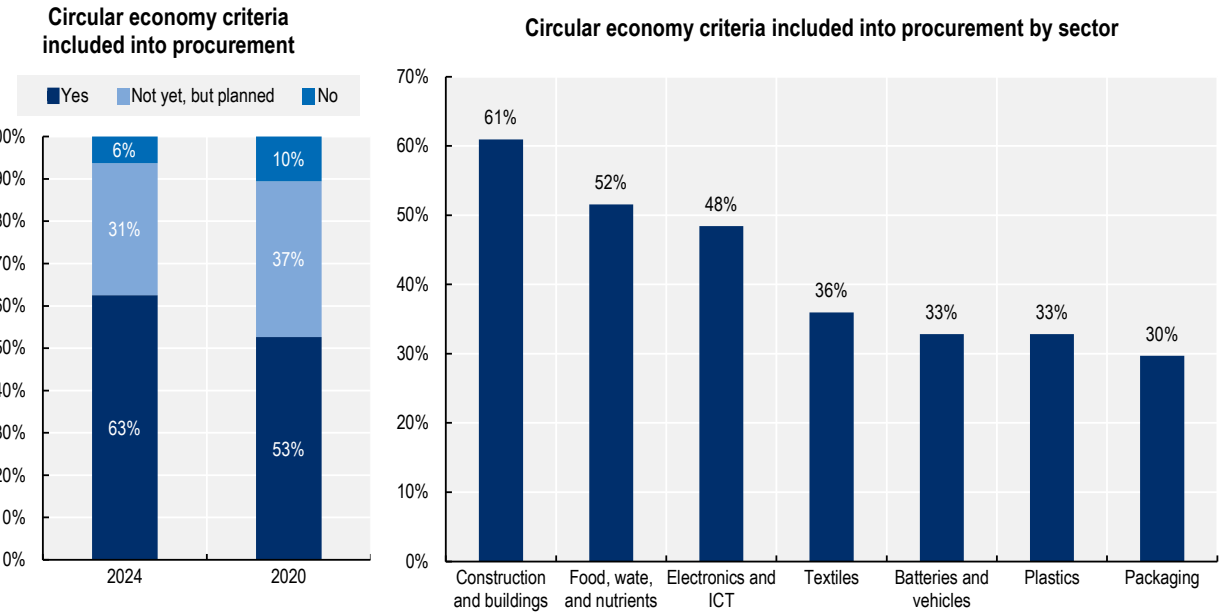
Deposit refund systems (DRS)	A system in which an initial payment (deposit) is made by a customer at the point of purchase, which is then refunded when the product or packaging is physically returned to the collection scheme by the customer. DRS set a price for participating in the collection scheme, creating an incentive for customers to participate.
Advance disposal fees (ADF)	ADF are charged on products at the point of sale based on the estimated waste management costs. Governments or producer responsibility organisations that collectively fulfil EPR obligations set an ADF that creates a cost/price for end-of-life collection and recovery services.
Performance-based economic instruments	
Tradeable permits and tradeable compliance certificates	Tradable permits allocate limited emission or resource exploitation rights to firms. They have two key characteristics: (i) a "cap" (a quantity limit) on the pollution that is being regulated and (ii) a trading system that allows individual firms to split the cap among them. The overall cap ensures the desired overall outcome in a cost-effective way (via trading).
Extended Producer Responsibility (EPR) and take-back schemes	EPR policy is a group of economic instruments that raise revenues and set incentives for the collection and recovery of material. EPR links product design to end-of-life costs by assigning producers the financial and sometimes operational responsibility of products at the post-consumer stage. The most common EPR policy instrument are mandatory take-back schemes, which oblige firms to meet targets for the collection and processing of the products they produce. This creates incentives for firms to find ways to reduce the end-of-life costs of their products and to meet their EPR requirements more efficiently.
Green Public Procurement (GPP)	GPP directs the purchasing power of public agencies to incentivise markets to innovate and to award suppliers who offer more environmental or circular modes of supply. In the first instance, GPP increases demand for targeted products, increasing their price in the short term. In the medium to long term, GPP can send a price signal that could encourage producers to increase the supply of more sustainable materials and products.

Source: OECD (2024[10]), Economic Instruments for the Circular Economy in Italy: Opportunities for Reform, OECD Publishing, Paris; Svatikova, K., A. Brown and P. Börkey (2025[11]), Economic instruments for a resource efficient and circular economy, OECD Publishing, Paris.

Public procurement

Public procurement is one of the most powerful tools for advancing the circular economy. A total of 63% of surveyed cities and regions include circular criteria in procurement (Figure 2.7), up from 53% in the 2020 survey, highlighting progress in incorporating circular criteria in procurement processes in European cities and regions (OECD, 2020[3]). More than eight out of ten (81%) survey respondents indicated having set requirements to foster efficient material use and reuse, quality and maintenance in tenders, while more than two-thirds reported stimulating a dialogue between the main actors, procurement officials, and potential contractors (67%) (OECD, 2024[1]). Less than 40% of respondents (39.1%) identified "applying life cycle analysis to consider the long-term impacts of each purchase" and "creating a monitoring and evaluation framework to analyse procurement policy results" as key public procurement objectives to support the transition towards a circular economy.

Figure 2.7. Share of surveyed cities and regions including circular criteria into procurement and by sector



Note: Results based on a sample of 64 (2024) and 38 (2020, excluding non-European respondents) respondents that responded "Yes", "Not yet, but planned" and "No" to including circular criteria into procurement.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*; OECD (2020[2]), *OECD Survey on the Circular Economy in Cities and Regions*, OECD, Paris.

Construction is the main sector (61%) used by cities and regions to integrate circular economy criteria in public procurement (Figure 2.7). Measures undertaken include acknowledging the potential of this sector for public procurement in local strategies (City of Vitoria-Gasteiz, 2024[12]), forming working groups to promote reuse (Eurométropole of Strasbourg, France), and mandating circular criteria through subnational regulation such as the use of recycled building materials in public works (Castile and León, Spain). Innovative pilots have also been implemented, including using recycling materials from existing buildings in new constructions (Gothenburg, Sweden). However, cost often remains the predominant consideration in procurement decisions, highlighting a gap between policy aspirations and practical implementation.

Half of the surveyed cities and regions apply circular economy criteria to food, water, and nutrients (52%) and electronics and ICT (48%) (Figure 2.7). In the food sector, actions include reducing waste and single use packaging, introducing deposit-return systems, opting for non-bottled water, and implementing compulsory criteria for drinking water conservation. Some cities, such as London, have introduced measures to monitor carbon emissions per plate and established criteria related to food provenance and waste reduction.

In the electronics and ICT sector, procurement criteria often include the reparability (e.g. technical assistance, availability of spare parts and consumables) and recyclability of products (e.g. take-back options for the collection and recycling of electronics). Energy efficiency is also a key consideration, alongside measures for the repurposing and reuse of ICT equipment or the extraction of minerals and materials from redundant devices. Procurement contracts for recycled IT equipment are also common, often requiring bidders to present a strategy to extend the equipment's useful life, promote responsible reuse, and reduce harmful substances in both the equipment and production chains.

Approximately one-third of survey respondents reported applying circular economy criteria to other product categories, including textiles (36%), plastics (35%), and batteries and vehicles (33%) (Figure 2.7). In the textiles sector, measures include conducting pre-studies to promote longevity and quality in products (Gothenburg, Sweden) and collaborating with social and non-profit organisations for textile collection and purchasing professional clothing made with organic cotton (Eurométropole of Strasbourg, France). Other actions include using recycled materials in towels and requiring providers to minimise waste and recycle end-of-use products efficiently (Jyväskylä, Finland), as well as renting rather than acquiring uniforms (Torres Vedras, Portugal).

For plastics, initiatives range from banning single-use plastics in public administrations and procurement (North Holland, Netherlands; Roubaix, France) to establishing criteria for recyclability (Glasgow, United Kingdom), sourcing plastics from recycled materials (Castile and León, Spain), and replacing plastics with renewable or recyclable alternatives (Wiltz, Luxembourg). In the batteries and vehicles category, cities and regions have introduced both binding and voluntary criteria promoting shared vehicles and have explored leasing or hire-purchase models to ensure vehicles are reusable.

Lastly, some respondents highlighted the inclusion of circular economy criteria in the furniture sector. Notable actions include framework agreements for reused furniture, furniture repair, and circular services (Glasgow, United Kingdom; Jyväskylä, Finland), as well as the procurement of recycled office furniture.

Clustering cities and regions

By analysing the results of the OECD Survey (OECD, 2024[1]) across 64 cities and regions in the EU, three types of cities and regions with similar characteristics in their approach to transitioning to a circular economy emerge: strategy-driven, innovation-driven, and partnership-driven.

- Strategy-driven (cluster 1): cities and regions that have adopted circular economy initiatives (e.g., strategy, action plan, road map, programme) and monitor progress and impacts.
- Innovation-driven (cluster 2): cities and regions that promote pilots and experimentations with the idea of scaling them up, include circular economy criteria into the purchasing process, and building new capacities and skills.
- Partnership-driven (cluster 3): cities and regions that foster partnership across business, civil society, academia and strengthen and collaborate with other cities or regions.

These clusters serve to identify common practices across cities and regions in the EU and identify relevant examples. They are not mutually exclusive, but they can complement each other (i.e. in some cases, a city or region can be in multiple clusters) (Table 2.3).

Table 2.3. Clustering cities and regions according to similar features

Cluster categorisation	Surveyed cities and regions	Strategy driven	Innovation driven	Partnership driven
Cluster 1	Prague (Czechia), Kouvola (Finland), Tilos (Greece), Niederanven (Luxembourg), Ljubljana (Slovenia)	✓	×	×
Cluster 2	Berlin (Germany), Western Region (Ireland), Florence (Italy), Møre and Romsdal (Norway), Valladolid (Spain)	×	✓	×
Cluster 3	Krefeld (Germany), Milan (Italy), Esch-sur-Alzette (Luxembourg), Bodø (Norway), Matosinhos (Portugal), Torres Vedras (Portugal), Valongo (Portugal), Canary Islands (Spain), Malmö (Sweden)	×	×	✓
All clusters	Flanders (Belgium), Turku (Finland), Wiltz (Luxembourg), Haarlem (Netherlands), Metropolitan Region Amsterdam (Netherlands), Guimarães (Portugal), Basque Country (Spain),	✓	✓	✓

	Valencia (Spain), Gothenburg (Sweden), Glasgow (United Kingdom), London (United Kingdom)			
No cluster	Sofia (Bulgaria), Lääne-Harju (Estonia), Tallinn (Estonia), Haar (Germany), Munich (Germany), Central Macedonia (Greece), Budapest (Hungary), Genoa (Italy), Torino (Italy), Braga (Portugal), Podravje (Slovenia), Granada (Spain), Guadalajara (Spain), Manresa (Spain), Vitoria-Gasteiz (Spain)	✗	✗	✗
Cross-cutting clusters	Leuven (Belgium), Mikkeli (Finland), Eurométropole of Strasbourg (France), Roubaix (France), Västra Götaland (Sweden)	✓	✓	✗
	Helsinki (Finland), Jyväskylä (Finland), Lappeenranta (Finland), Oulu (Finland), Päijät-Häme (Finland), Amsterdam (Netherlands), The Hague (Netherlands), Bratislava (Slovak Republic), Castile and León (Spain)	✓	✗	✓
	Brussels (Belgium), Helsinki-Uusimaa (Finland), Tampere (Finland), Tilburg (Netherlands), Zuid-Holland (Netherlands)	✗	✓	✓

Note: ✓ = categorised in the cluster, ✗ = Not categorised in the cluster; Cities and regions with "Yes" in the Strategy-driven have circular economy initiatives (e.g., strategy, action plan, road map, programme), and monitoring progress made and impacts of its circular economy strategy; Cities and regions with "Yes" in the Innovation-driven are where pilots and experimentations on the circular economy take place, circular economy criteria is included into the purchasing process, and promoting capacity building; Cities and regions with "Yes" in the Partnership-driven are promoting partnership (e.g., agreed-upon collaboration among organisations or citizen fora), with mechanisms of co-ordination across cities and regions; This clustering is based on perception-based survey (i.e. survey responses are respondents' subjective answers) and fact checked where possible.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Strategy-driven cities and regions

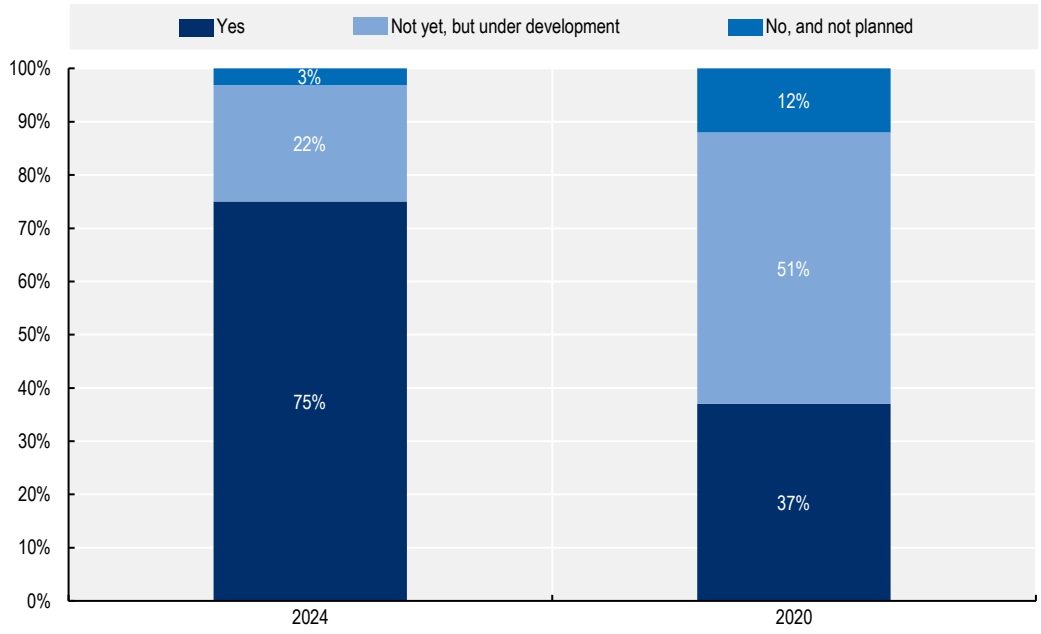
Nearly half of surveyed cities and regions are categorised as strategy-driven (Table 2.4). As of 2023, 24 EU Member States had adopted circular economy strategies, roadmaps and action plans (European Environment Agency, 2024[13]). A total of 75% of the surveyed cities and regions reported having circular economy initiatives in place, including dedicated strategies (Figure 2.8, Table 2.5). This marks significant progress since 2020, when only one-third had adopted circular economy measures (OECD, 2020[3]). Furthermore, 47% of cities and regions have allocated a dedicated budget for the circular economy (Figure 2.9). Among those that self-evaluate as being at an advanced stage of the circular transition, over 70% have such funding in place. In contrast, in 2020, only around one-third (32%) of surveyed European cities and regions had a dedicated budget for the circular economy (OECD, 2020[3]). This suggests a growing trend towards financial commitment to the circular economy at the subnational level in Europe.

Table 2.4. Strategy-driven surveyed cities and regions

Strategy driven surveyed cities and regions		
Flanders (Belgium)	Turku (Finland)	Guimarães (Portugal)
Leuven (Belgium)	Eurométropole of Strasbourg (France)	Bratislava (Slovak Republic)
Prague (Czechia)	Roubaix (France)	Ljubljana (Slovenia)
Helsinki (Finland)	Tilos (Greece)	Basque Country (Spain)
Jyväskylä (Finland)	Niederanven (Luxembourg)	Castile and León (Spain)
Kouvola (Finland)	Wiltz (Luxembourg)	Valencia (Spain)
Lappeenranta (Finland)	Amsterdam (Netherlands)	Gothenburg (Sweden)
Mikkeli (Finland)	Haarlem (Netherlands)	Västra Götaland (Sweden)
Oulu (Finland)	Metropolitan Region Amsterdam (Netherlands)	Glasgow (United Kingdom)
Päijät-Häme (Finland)	The Hague (Netherlands)	London (United Kingdom)

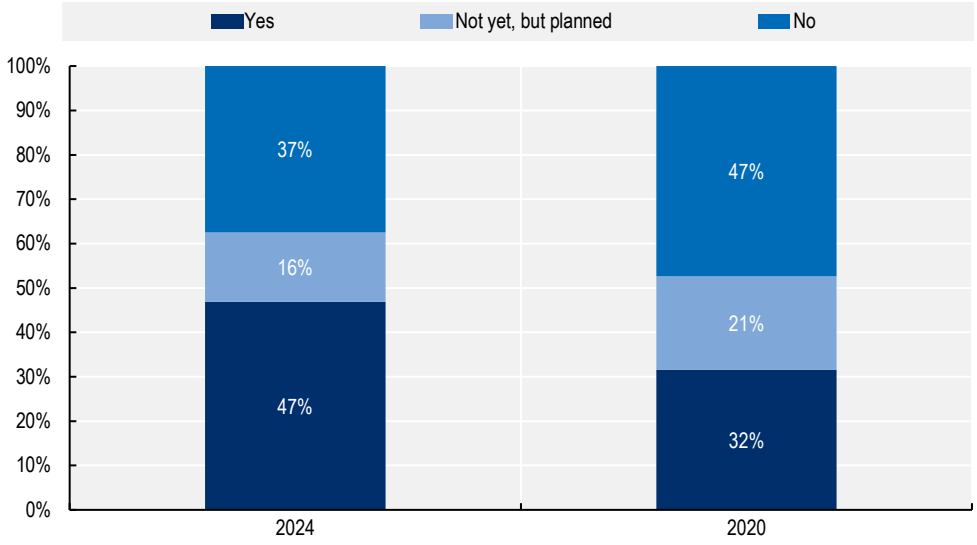
Note: Results based on a sample of 64 respondents that responded "Yes" to the question on the existence of a circular economy initiative (e.g. a strategy, plan, programme, road map, etc.), and "Yes" to monitoring progress made and impacts of their circular economy strategy.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Figure 2.8. Share of surveyed cities and regions with circular economy initiatives in place



Note: Results based on a sample of 64 (2024) and 38 (2020, excluding non-European respondents) respondents that responded "Yes", "Not yet, but under development" and "No, and not planned" to the question on the existence of a circular economy initiative (e.g. a strategy, plan, programme, road map, etc.).
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*; OECD (2020[2]), *OECD Survey on the Circular Economy in Cities and Regions*, OECD, Paris.

Figure 2.9. Share of surveyed cities and regions with a dedicated budget for the circular economy

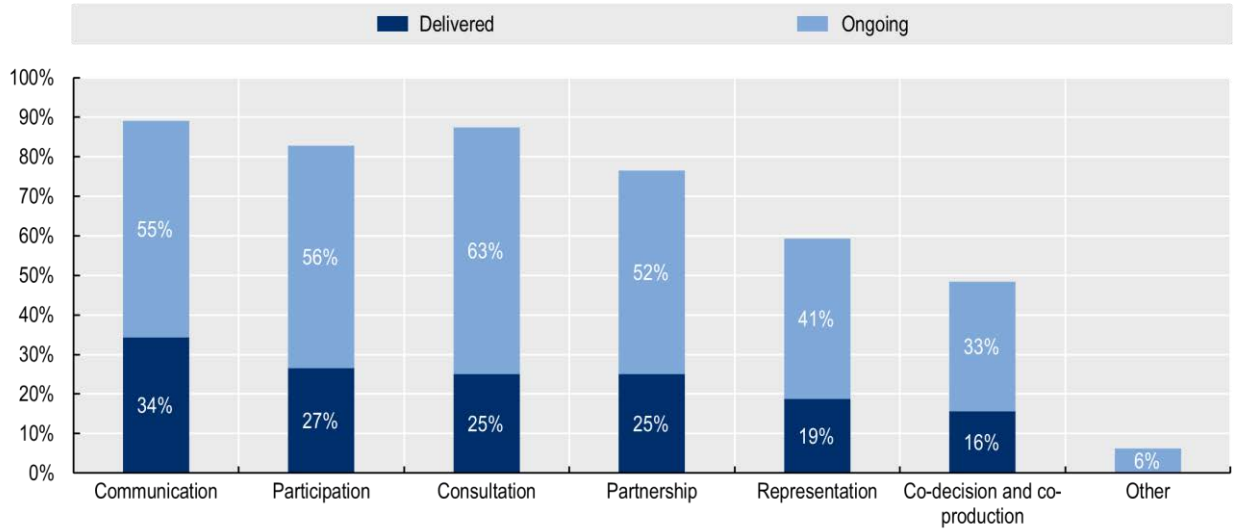


Note: Results based on a sample of 64 (2024) and 38 (2020, excluding non-European respondents) respondents that responded "Yes", "Not yet, but planned" and "No" to existence of a dedicated budget for circular economy activities.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)* (2020[2]), *OECD Survey on the Circular Economy in Cities and Regions*, OECD, Paris.

Goal setting

Circular economy strategies can be developed and further updated through stakeholder consultation processes, although "co-production" is currently the least used form of stakeholder engagement (Figure 2.10). Stakeholder groups can help define goals and priorities. In the case of the Eurométropole of Strasbourg, France, the Zero Waste and Circular Economy Partnership Committee meets once a year, providing an opportunity for stakeholder consultation on the circular economy roadmap. Turku, Finland, adopted a bottom-up approach to the Circular Turku roadmap. The process involved consultations with over 200 stakeholders, ranging from local businesses to research institutions, public companies, and national and regional actors. ICLEI (Local Governments for Sustainability) and the Finnish Innovation Fund Sitra also supported the creation of the roadmap. A baseline assessment study was conducted in preparation for this roadmap, identifying more than 700 circular economy stakeholders, 270 of which were businesses engaged in the circular economy.

Figure 2.10. Share of surveyed cities and regions by type of stakeholder engagement mechanism



Note: Results based on a sample of 64 respondents that responded "Yes, delivered", "Yes, ongoing" to the question regarding promotion of engagement related to circular economy by type of stakeholder. These numbers show a slight increase from the 2020 survey for European cities and regions[2] (28% for communication, 17% for partnership, 14% for participation, 14% for co-decision and co-production initiatives, 11% for representation), which may indicate a growing trend of stakeholder engagement through these types of stakeholder engagement mechanisms in European cities and region, while the share of those who conducted consultations slightly decreased (31% in 2020) (OECD, 2020[3]).
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Circular economy strategies may have multiple goals and targets, for example:

- **More efficient resource use and "sufficiency"**: In the Basque Country, Spain, the Euskadi 2030 Circular Economy Strategy set three targets: increase material productivity by 30%, increase the circular material use rate by 30%, and reduce the waste generation rate per unit of GDP by 30%. The city of Jyväskylä, Finland, has embraced a resource-wisdom approach to safeguarding the environment and enhancing well-being. The Resource-Wise Jyväskylä 2040 Programme envisions a city that achieves zero emissions, zero waste, and sustainable resource use, while fostering conditions for long-term well-being (City of Jyvaskyla, 2024[14]). Considering sufficiency *("sobrieté"* in French) as one of the key dimensions of the Strategy for a Circular Economy in Normandy[3] *(Stratégie pour une économie circulaire en Normandie*), France implies (i) integrating eco-

efficiency and "*sobrieté*" into investments and the organisation of industrial sectors; (ii) recognising companies that have achieved a good level of performance and commitments in terms of "*sobriété*"; (iii) promoting innovation and the development of logistical services to provide eco-efficient solutions based on the "*sobriété*" approach (Region of Normandy, 2020[15]).

- **Improved waste management**: Waste reduction is the most frequently mentioned objective among surveyed cities and regions (e.g., Amsterdam, Netherlands; Basque Country, Spain; Eurométropole of Strasbourg, France; Jyväskylä, Finland; Prague, Czechia). In Prague, Czechia, waste is a key focus area, with the strategic objective to reduce the production of mixed municipal waste by 50% before 2030 (City of Prague, 2022[16]). This strategic objective is supported by specific sub-objectives such as increasing the sorting rate of municipal waste to 60% in 2025 and 65% by 2030.
- **Carbon neutrality**: In Oulu, Finland, the Climate Roadmap and Circular Economy Roadmap under the Environmental Programme 2026 defined achieving carbon neutrality by 2035 as the main objective, with four focus areas: developing sustainability, acting resource-wisely, drawing strength from nature, and promoting environmental responsibility (City of Oulu, 2023[17]). The Circular Economy Strategy (2021/2030) for the Castile and León Region, Spain, has set a quantitative objective to reduce GHG emissions from production sectors (industrial processes, agriculture and livestock, waste treatment and disposal) by 25% by 2030 (Castile and León Region, 2021[18]).
- **Social inclusion**: The Circular Economy Route Map, approved in 2020 in Glasgow[4], United Kingdom, prioritises ensuring that the transition to a circular economy benefits local communities by localising the economy. This approach aims to ensure social inclusion, justice, and wellbeing, while opening up opportunities for employment and wealth creation within those communities (City of Glasgow, 2020[19]). The Eurométropole of Strasbourg, France, promotes innovative projects serving the circular economy in collaboration with local stakeholders and workers in its roadmap (Eurométropole of Strasbourg, 2024[20]).

Table 2.5. Circular economy initiatives, perceived level of advancement, and dedicated budget, 2015-2025

Country	National circular economy initiatives (e.g., strategy, plan, programme, road map, etc.)	City / region		Local / regional circular economy initiatives (e.g., strategy, plan, programme, road map, etc.)	Level of advance-ment	Dedicated circular economy budget
Belgium	Federal Roadmap for a Circular Economy (2016)	Brussels	Region	Regional Strategy of Economic Transition 2022-2030 (2022)	In progress	✓
		Flanders	Region	Flanders circular in 2050	Advanced	✓
		Leuven	City	Circular Economy Strategy	In progress	✓
Bulgaria	Strategy and Action Plan for the transition to a circular economy for the period 2022-2027 (2022)	Sofia	City	Not yet, but under development	In progress	✗
Czechia	Strategic Framework of the circular economy of Czechia 2040 (2021)	Prague	City	Circular Prague 2030	In progress	✓
Estonia	Circular economy white paper (2023)	Lääne-Harju	City	Green municipality initiative	In progress	✗ (but planned)
		Tallinn	City	Not yet, but under development	In progress	✓
Finland	Leading the Cycle – Finnish Road Map to a Circular Economy 2016-2025 (2016); Material Flows of Finland's National Economy: Impacts, Actual Development and Circular Economy Scenarios for 2035 (2024)	Helsinki	City	Action Plan for the Circular and Sharing Economy (2023)	In progress	✗
		Helsinki-Uusimaa	Region	Regional Climate Roadmap	Emerging	✗
		Jyväskylä	City	Resource-wise Jyväskylä 2040 Programme	In progress	✗
		Kouvola	City	Environment 2030 – The City of Kouvola's Environmental Programme (2020)	Emerging	✗
		Lappeenranta	City	City of Lappeenranta Circular Economy Roadmap 2019	In progress	✗
		Mikkeli	City	Climate Programme 2022-2035 (2022)	Emerging	✓
		Oulu	City	Circular Economy roadmap 2030	In progress	✗ (but planned)
		Päijät-Häme	Region	Päijät-Häme Roadmap towards Circular Economy (2017) Green Transition Programme (2024)	Advanced	✗
		Tampere	Region	Not yet, but under development	Emerging	✓
		Turku	City	Circular Turku - A Roadmap Toward Resource Wisdom	In progress	✓
France	Circular Economy Roadmap of France (2018)	Eurométropole of Strasbourg	City	Roadmap: Circular economy of the Eurométropole of Strasbourg	In progress	✓
		Roubaix	City	Circular economy strategy for the period 2022 - 2026 (2022)	Emerging	✓
Germany	German Resource Efficiency Programme (2020); The National Circular Economy Strategy (2024)	Berlin	City	Not yet, but under development	In progress	✓
		Haar	City	Guidelines for Sustainability in Construction and Planning	Emerging	✗
		Krefeld	City	Sustainability Strategy for North Rhine–Westphalia from 2020 (2020)	In progress	✗
		Munich	City	Not yet, but under development	In progress	✗
Greece	National Circular Economy Strategy (2018);	Central Macedonia	Region	Not yet, but under development	In progress	✗ (but planned)

	New National Circular Economy Action Plan (2022)	Tilos	City	Just Go Zero Tilos initiative	In progress	✗
Hungary	Not yet, but under development	Budapest	City	Not yet, but under development	Emerging	✗
Ireland	Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)	Western Region	Region	Connacht Ulster Waste Management Plan 2015-2021 National Waste Management Plan for a Circular Economy 2024-2030	In progress	✗
Italy	Towards a Model of Circular Economy for Italy: Overview and Strategic Framework (2017); National Circular Economy Strategy (2022)	Florence	City	Not yet, but under development	In progress	✗ (but planned)
		Genoa	City	C-City project	In progress	✗ (but planned)
		Milan	City	Circular Economy action Plan focused on fashion and design (2024)	In progress	✗
		Torino	City	No, and not planned	Emerging	✗
Luxembourg	National plan for waste and resource management (2018); National Circular Economy Strategy (2021)	Esch-sur-Alzette	City	Not yet, but under development	Emerging	✗
		Niederanven	City	Integrated energy and climate plan Luxembourg 2021-2030 (2018)	In progress	✗ (but planned)
		Wiltz	City	Circular Economy Charter (2018)	Advanced	✓
Netherlands	A Circular Economy in the Netherlands by 2050 (2016); National Circular Economy Programme 2023-2030 (2023)	Amsterdam	City	Amsterdam Circular Strategy 2020-2025 Implementation Agenda for a Circular Amsterdam 2023-2026	Emerging	✓
		Haarlem	City	Circular Economy Action Programme (2023)	Advanced	✓
		Metropolitan Region Amsterdam	Region	MRA Circular Economy programme 2021-2026 Circular economy implementation agenda 2024	Emerging	✓
		The Hague	City	Circular economy work agenda 2023-2026	Emerging	✓
		Tilburg	City	Tilburg Circular 2021-2025 (2020) Implementation programme Tilburg Circular 2022 – 2025 (2021)	Emerging	✓
		Zuid-Holland	Region	Building a Circular Zuid-Holland Together: Circular Zuid-Holland Updated Strategy, 2023-2027 (2023)	Emerging	✓
Norway	National Strategy for a Green, Circular Economy (2021)	Bodø	City	Climate and energy plan for Bodø 2019-2031 Procurement strategy 2023-2026	Emerging	✗
		Møre and Romsdal	Region	Not yet, but under development	Emerging	✓
Portugal	National Action Plan for the Circular Economy (PAEC) (2017); New National Action Plan for the Circular Economy 2024-2030 (PAEC 2030) (consultation closed in 2024)	Braga	City	Not yet, but under development	Emerging	✗
		Guimarães	City	RRRCICLO – Circular Economy at Guimarães (2022)	Advanced	✓
		Matosinhos	City	Waste Prevention Strategy of Matosinhos City	Emerging	✗ (but planned)
		Torres Vedras	City	No, and not planned	Emerging	✗
		Valongo	City	Not yet, but under development	In progress	✗
Slovak Republic	A joint OECD-EC report - Closing the loop in the Slovak Republic: A roadmap towards circularity for competitiveness, eco-innovation and sustainability (2022)	Bratislava	City	Strategy for Municipal Waste Management (2021)	Advanced	✗

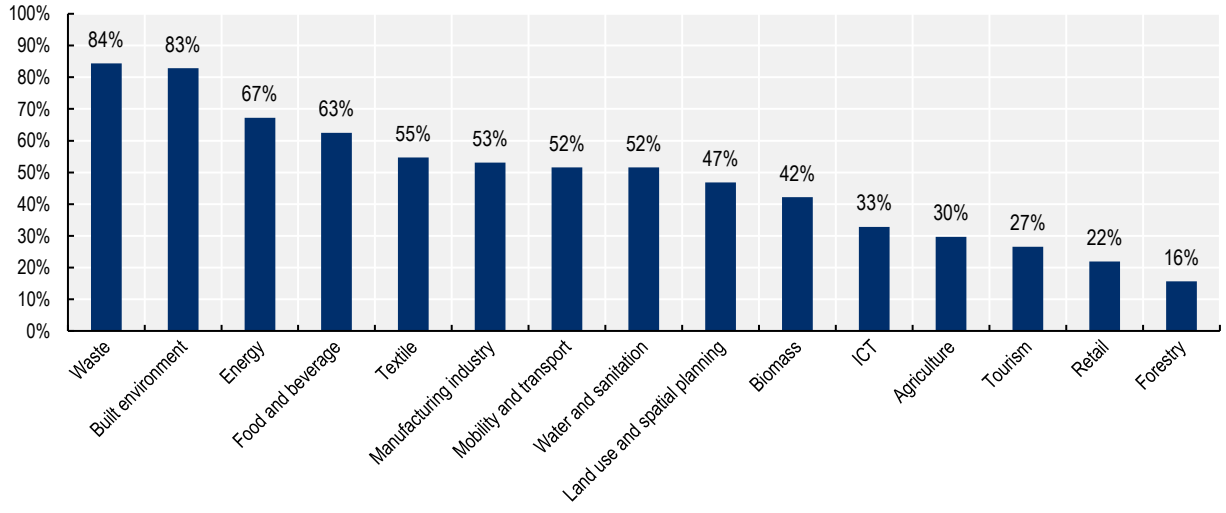
Slovenia	Roadmap towards the Circular Economy in Slovenia (2018).	Ljubljana	City	Circular Potentials of Ljubljana 2021-2027, with a view to Ljubljana, Circular City 2045	In progress	✓
		Podravje	Region	Regional strategy for a transition to circular bioeconomy: Podravje 2023-2030	In progress	✗
Spain	Spanish Strategy for Circular Economy: España Circular 2030 (2020); Circular Economy Action Plan I 2021–2023 (2021); Circular Economy Action Plan II 2024-2026 (2024).	Basque Country	Region	Euskadi 2030 Circular Economy Strategy	In progress	✗ (but planned)
		Canary Islands	Region	Canary Islands Strategy for Circular Economy 2021-2030	Emerging	✓
		Castile and León	Region	Circular Economy Pact in Castile and Leon (2024)	In progress	✓
		Granada	City	Local Action Plan for the promotion of the circular economy in the construction sector	Emerging	✗ (but planned)
		Guadalajara	City	Circular Economy Strategy (2021-2030) of Castilla-La Mancha	Emerging	✗
		Manresa	City	Not yet, but under development	Emerging	✓
		Valencia	Region	Comprehensive waste plan of the Valencian community; Law on Waste and Contaminated Soil for the Promotion of the Circular Economy in the Valencian Community (2022)	Emerging	✓
		Valladolid	City	Valladolid Circular Economy Roadmap (2017-2018)	In progress	✗
		Vitoria-Gasteiz	City	2030 Strategy and Local Action Plan To Drive The Circular Economy In Vitoria-Gasteiz	Emerging	✓
Sweden	National Strategy for the transition to a CE (2020); Circular Economy Action Plan for the Transformation of Sweden (2021); Sweden's action plan for plastics - part of the circular economy (2022).	Gothenburg	City	Gothenburg City's environmental and climate programme 2021-2030 (2021)	Advanced	✓
		Malmö	City	Not yet, but under development	In progress	✓
		Västra Götaland	Region	Regional Development Strategy for Västra Götaland 2021 – 2030 (2021)	In progress	✓
United Kingdom	England: Not yet, but under development (taskforce formed); Scotland: Scotland's circular economy and waste route map to 2030 (2024); Wales: Beyond Recycling - a strategy to make the circular economy in Wales a reality (2021); North Ireland: Circular Economy Strategy for Northern Ireland (drafted, consultation closed in 2023).	Glasgow	City	Circular Economy Route Map for Glasgow 2020	In progress	✗ (but planned)
		London	City	London's Circular Economy Route Map (2017)	In progress	✓

Note: Local / regional circular economy initiatives is according to the survey results based on a sample of 64 respondents that responded "Yes", "Not yet, but under development" and "No, and not planned" to the question on the existence of a circular economy initiative as well as their descriptions; Level of advancement is according to the survey results based on a sample of 64 respondents that responded "Advanced", "In progress", and "Emerging" to the question: "What is the level of advancement of the transition from linear to circular in your city or region?"; Dedicated circular economy budget is according to the survey results based on a sample of 64 respondents that responded "Yes", "Not yet, but planned" and "No" to the existence of a dedicated budget for the circular economy; ✓ = dedicated budget for the circular economy exists, ✗ = dedicated budget for the circular economy does not exist.

Source: OECD (2024[11]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*; European Environment Agency (2024[13]), Country profiles on Circular Economy in Europe (2024), https://www.eionet.europa.eu/etcs/etc-ce/products/country-profiles-on-circular-economy-in-europe; other literature review on respective circular economy initiatives.

Among the sectors, waste is the top priority for a long-term circular economy vision in the surveyed cities and regions (84%), followed closely by the built environment (83%) (Figure 2.11). These two sectors were also most frequently included in the circular economy initiatives among the surveyed cities and regions in 2020 (OECD, 2020[3]).

Figure 2.11. Share of surveyed cities and regions prioritising sectors in circular economy strategies



Note: Results based on a sample of 64 respondents that selected sectors responding to the question: "Which sectors are prioritised for a circular economy long term vision in your city/region?".
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

For some surveyed cities and regions, waste management initiatives (e.g., strategy, plan) act as a substitute for or as a flagship of the circular economy strategy (e.g., Bratislava, Slovak Republic; Valencia, Spain), highlighting the importance of the waste sector in the transition to a circular economy. For example, Bratislava has set goals to build effective waste management infrastructure, including recycling and reuse centres, and to shift to a pay-as-you-throw system. Within the waste sector, plastics management is included in circular economy strategies and initiatives in several surveyed cities and regions. Many cities are implementing measures to promote circularity by supporting product design, reuse, and recycling. The Euskadi 2030 Circular Economy Strategy by the Basque Country, Spain, not only sets the aforementioned quantitative targets but also includes complementary objectives related to two of the value chains prioritised by the European Commission: reducing food waste generation by half and ensuring that 100% of plastic packaging is recyclable. The strategy is specified in the Strategic Plan for the Circular Economy and Bioeconomy of Euskadi 2024, which outlines 53 specific actions. This plan includes eleven lines of action, one of which focuses on plastic consumption. London's Circular Economy Route Map, a key strategic document in its transition to becoming a circular city, also identifies plastics as one of the priority focus areas, alongside the built environment, food, textiles, and electricals (ReLondon, 2019[21]). In Helsinki, Finland, the Action Plan for the Circular and Sharing Economy, approved in 2023, defines three focus areas: construction, procurement and environmental awareness and sustainable consumption. For each focus area, circular economy goals towards 2035 are established. To achieve these goals, 23 measures are defined in the programme (e.g., piloting solutions to reduce the use of plastic, using recycled plastic or other materials in construction, and mapping plastic flows) (City of Helsinki, 2023[22]).

The built environment is also often observed as a priority area for circular economy strategies. For example, in 2020, Amsterdam became the first city to commit to becoming a 100% circular economy by

2050, aiming to halve its use of new raw materials by 2030. Its five-year circular economy strategy to achieve this goal is based on the Doughnut Economics model (2017[23]), which seeks to achieve economic development while staying within planetary boundaries[21]. The city's nine strategic circular economy ambitions focus on three key value chains: consumer goods, the built environment, and food and organic waste streams (City of Amsterdam, 2020[24]). The Implementation Agenda 2023-2026 contains more than 70 activities that the municipality will develop together with various stakeholders, such as entrepreneurs, social initiatives and residents (City of Amsterdam, 2023[25]). In the case of Leuven, Belgium, the built environment is the main focus of the Circular Economy Action Plan due to the sector's high impact on carbon dioxide (CO_2) emissions in the city. Leuven also identifies plastics as one of the breakthrough projects in its climate city portfolio. In the case of Turku, Finland, the Circular Turku roadmap focuses on construction, along with food, mobility, energy, and water.

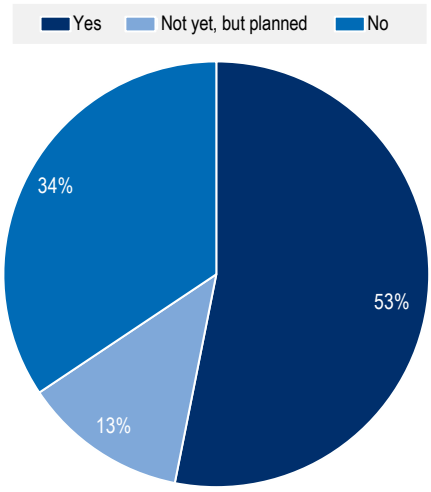
Another area often seen as a priority for circular economy initiatives is energy. The Green Transition Programme of Päijät-Häme, Finland, replaces previous similar roadmaps, such as the Climate Roadmap and the Circular Economy Roadmap, combining their goals and approaches. The goals of the programme are (i) making Päijät-Häme carbon neutral by 2030, (ii) achieving a circular economy, and (iii) preserving natural biodiversity. These goals are pursued by promoting measures in energy, transport, material cycles, forests and land use, and a sustainable food system.

In addition to sectoral priorities, common cross-cutting priority areas are observed across surveyed cities and regions. For example, improving product design to extend the useful life of products was mentioned by multiple respondents, such as Basque Country, Spain; and Gothenburg, Sweden. Other common priority areas identified include sharing (e.g., Amsterdam, Netherlands), eco-packaging (e.g., Niederanven, Luxembourg), sustainable supply (e.g., London, United Kingdom), and responsible consumption (e.g., Eurométropole of Strasbourg, France). While these cross-cutting priorities include initiatives to improve circularity by targeting upstream and midstream phases (See Chapter 1), strategies tend to focus on the downstream phase in cities and regions where the waste management initiatives (e.g., strategy, plan) act as a substitute for or a flagship of the circular economy strategy.

Building capacities

Circular strategies or initiatives highlight the skillsets and policies required for future circular economy-related jobs. A total of 53% of surveyed cities and regions are implementing capacity-building initiatives as a necessary condition to advance in the circular economy transition (Figure 2.12). In Ljubljana, Slovenia, the circular strategy recognises the importance of craftsmanship skills, such as roles in repair shops and maintenance, which extend the life cycle of products. Their initiatives to promote green jobs related to the circular economy include education and the exchange of good practices to foster these skills across generations (City of Ljubljana, 2022[26]). The Flanders region, Belgium, has identified STEM skills (science, technology, engineering, and mathematics), including digital skills, as crucial for accelerating the transition to a circular economy. In addition to STEM competencies, multidisciplinary and cross-functional skills are essential for exploiting information and thinking critically and creatively to solve problems. To address the labour market mismatch between the supply and demand for such profiles, aSTEM centre was established. This one-stop-shop for knowledge assurance across all domains has accelerated the outflow of STEM profiles in Flanders, supporting the regional circular transition (Flanders Circular, 2021[27]).

Figure 2.12. Share of surveyed cities and regions promoting capacity building for the circular economy



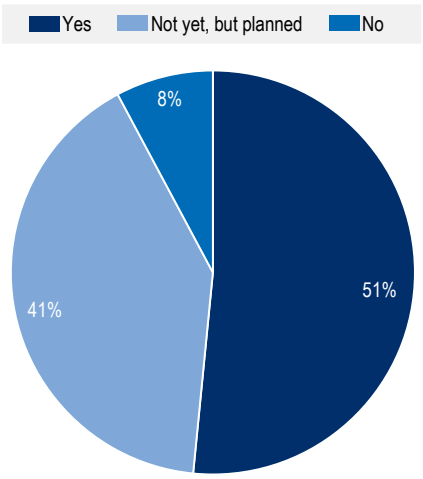
Note: Results based on a sample of 64 respondents that responded "Yes", "Not yet, but planned" and "No" to promotion of capacity building and/or training programmes for circular economy.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Various circular economy strategies at national, regional, and local levels recognise the role of SMEs in the transition to a circular economy. SMEs have been implementing resource efficiency measures, such as minimising waste, saving energy, water, and materials, recycling and reusing materials or waste, and offering green products and services. ReLondon hosts and supports a community of over 700 circular SMEs and startups. In Amsterdam, the Netherlands, the city supports the Circular Workspace, where students, teachers, and researchers work to make SMEs more circular. Educational institutions benefit from working on concrete cases from the business world, while SMEs are encouraged to embrace circularity (City of Amsterdam, 2023[25]).

Monitoring progress

According to the survey, over half of respondents (51%) are monitoring the progress and impacts of their circular economy strategies, while 41% are planning to do so (Figure 2.13).

Figure 2.13. Share of surveyed cities and regions monitoring progress and impacts of circular economy strategies



Note: Results based on a sample of 64 respondents that responded ""Yes", "Not yet, but planned" and "No" to monitoring progress made and impacts of their circular economy strategy.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

In the case of the Flanders region in Belgium, the Circular Economy Monitor Flanders (CE Monitor) was created as an extensive, multi-layered circular economy monitoring framework. It provides indicators at both the macro and intermediate levels, as well as figures for specific product groups, to show progress towards a circular economy in the region. The macro-level indicators offer insights into regional consumption of materials, water, soil, and space, as well as emissions. At the intermediate level, the CE Monitor measures four systems of need: housing, food and water, consumer goods, and mobility. The CE Monitor also includes several socio-economic indicators, such as employment in the circular economy, employment in reuse shops, and employment in the repair sector (Circular Flanders, 2021[28]) (European Environment Agency, 2024[29]).

In 2022, Amsterdam published its Amsterdam Circular Monitor, a live database and dashboard tracking material flows through the city. The monitor provides an overview of the city's transition to a circular economy and identifies areas needing more effort to achieve the goals of halving primary raw material use by 2030 and becoming 100% circular by 2050. It features statistics on material mass and ecological impacts, enabling policymakers to make evidence-based decisions. For example, the monitor revealed that material use accounts for up to 80% of Amsterdam's CO_2 emissions and highlighted the significant impacts in the city's circular strategy themes: food, consumer goods, and the built environment (City of Amsterdam, 2020[30]). In Helsinki, Finland, the Circular Economy Watch website shares information on the progresses of measures in construction, procurement, and environmental awareness and sustainable consumption (City of Helsinki, 2023[31]).

Innovation-driven cities and regions

More than two-fifths (42%) of surveyed cities and regions are categorised as innovation-driven and aim to promote pilots and experimentations with the idea of scaling them up, including circular economy criteria into the purchasing process, and building new capacities and skills (Table 2.6). Most of the survey respondents (90%) use pilots and experimentation as a way to foster the circular economy (Figure 2.14).

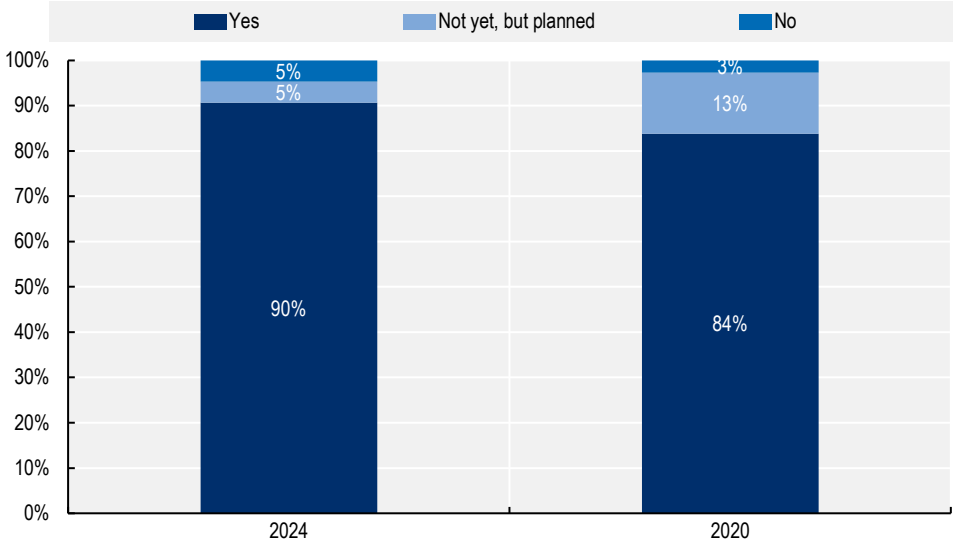
Circular economy projects often begin as pilots and experiments to test ideas and quickly learn from successes and failures, which can then inform better practices. This presents an opportunity to create new knowledge and information, but also poses a challenge in terms of the capacity required to design and implement sustainable, efficient, and effective circular economy policies (OECD, 2020[3]). Circular economy innovation in surveyed cities and regions can primarily be categorised as technological innovation, material innovation, product innovation, or social innovation.

Table 2.6. Innovation-driven surveyed cities and regions

Innovation-driven surveyed cities and regions		
Basque Country (Spain)	Helsinki-Uusimaa (Finland)	Tampere (Finland)
Berlin (Germany)	Haarlem (Netherlands)	Tilburg (Netherlands)
Brussels (Belgium)	Leuven (Belgium)	Turku (Finland)
Eurométropole of Strasbourg (France)	London (United Kingdom)	Valencia (Spain)
Flanders (Belgium)	Metropolitan Region Amsterdam (Netherlands)	Valladolid (Spain)
Florence (Italy)	Mikkeli (Finland)	Västra Götaland (Sweden)
Glasgow (United Kingdom)	Møre and Romsdal (Norway)	Western Region (Ireland)
Gothenburg (Sweden)	Roubaix (France)	Wiltz (Luxembourg)
Guimarães (Portugal)		Zuid-Holland (Netherlands)

Note: Results based on a sample of 64 respondents that responded "Yes" to the existence of pilots and experimentations for the circular economy, "Yes" to including circular criteria into procurement, and "Yes" to promotion of capacity building and/or training programmes for circular economy.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Figure 2.14. Share of surveyed cities and regions using pilots and experimentations to foster the circular economy transition



Note: Results based on a sample of 64 and 37 (2020, excluding non-European respondents) respondents that responded "Yes", "Not yet, but planned" and "No" to the existence of pilots and experimentations for the circular economy.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU);* OECD (2020[2]), *OECD Survey on the Circular Economy in Cities and Regions*.

Technological innovation in the circular economy involves the development and implementation of advanced technologies to enhance circularity. For example, the Urban Mining Hub in Berlin, Germany,

focuses on recovering valuable materials from urban waste through advanced sorting and processing technologies to extract metals, plastics, and other materials for reuse in various industries. Another example of such innovation is the breakthrough project focused on roadside grass in Zuid-Holland, Netherlands. Instead of viewing roadside grass as waste, this project explores its potential as a valuable resource to transform roadside grass into products such as paper and furniture, demonstrating a radical shift in thinking and resource utilisation (OECD, 2024[1]).

Material innovation in the circular economy focuses on designing more durable materials and innovative use of secondary material. The Urban Infra Revolution in The Zero Waste Housing initiative in Berlin, Germany integrates zero-waste principles into residential construction, ensuring new housing developments are designed with sustainability in mind (City of Berlin, 2022[32]). France's Eurométropole of Strasbourg has initiated experiments in circular construction. In 2022, materials from the deconstruction of a former military hospital were repurposed for outdoor spaces, while collaboration with Toulouse Metropolis is testing new methodologies for local material reuse (OECD, 2024[33]). One notable project on material innovation in Valencia, Spain, is the LIFE CERAM initiative, which focuses on achieving zero waste in ceramic tile manufacturing. This project has successfully produced ceramic pieces using 100% recycled ceramic waste, significantly reducing the environmental impact of the tile industry (OECD, 2024[1]).

Social innovation encompasses community-based initiatives towards greater circularity. In London, United Kingdom, "Circular Neighbourhood" projects were conducted as a place-based initiative to engage local residents and businesses in changing their behaviours and business practices. Examples include Heston in the Loop (covering all materials and circular behaviours), the Bexley project on food waste in partnership with two food waste-saving applications and convening a network of local authorities and non-profit organisations running various forms of circular neighbourhoods across London. Møre and Romsdal, Norway, has implemented a food rescue initiative through the "Food Joy" pilot, which focuses on reducing food waste in health institutions and central kitchens. Notably, Hatlane Care Centre achieved a remarkable reduction in food waste of over 50%, showcasing the project's success and potential for broader application (OECD, 2024[1]).

Partnership-driven cities and regions

Almost three-quarters (77%) of surveyed respondents are promoting partnerships across cities and regions (Figure 2.10). For clustering, nearly half of surveyed cities and regions are categorised as partnership-driven, which foster partnership across business, civil society, and academia and strengthen and collaborate with other cities or regions (Table 2.7). Co-operation and sharing of best practices among cities and regions serve as a source of inspiration for developing circular economy initiatives and fostering skills. For example, Zero Waste Scotland collaborated with Circular Amsterdam to develop a Circular Economy Jobs & Skills research project, which provides vital learning and guidance opportunities for Glasgow, United Kingdom. The project defined seven key circular elements for "directly circular jobs", categorised into "core circular jobs" and "enabling circular jobs". "Indirectly circular jobs" were also identified, referring to all other sectors that offer services to circular job activities and create supporting circular activities (e.g., education, government, and professional services) (Glasgow City Council, 2020[34]). The Portuguese government launched the National Circular Cities Initiative (*Iniciativa Nacional Cidades Circulares* - InC2) in 2018, with the aim of promoting collaboration across cities, strengthen multi-level governance, improve access to finance and promote innovative circular economy practices in urban areas. In particular, InC2 supported four circular city networks comprising eight municipalities each and structured around key thematic areas, with a EUR 1.5 million budget from the Environment Fund (2019-2023), (DG Territorio, 2024[35]). Compared to an innovation-driven cluster, a partnership-driven cluster has a slightly higher proportion of respondents from rural areas[22], indicating that local circular transitions in non-urban areas rely more on and leverage partnerships with other cities and regions beyond their own capacity.

Table 2.7. Partnership-driven surveyed cities and regions

Partnership-driven surveyed cities and regions		
Amsterdam (Netherlands)	Helsinki (Finland)	Oulu (Finland)
Basque Country (Spain)	Helsinki-Uusimaa (Finland)	Päijät-Häme (Finland)
Bodø (Norway)	Haarlem (Netherlands)	Tampere (Finland)
Bratislava (Slovak Republic)	Jyväskylä (Finland)	The Hague (Netherlands)
Brussels (Belgium)	Krefeld (Germany)	Tilburg (Netherlands)
Canary Islands (Spain)	Lappeenranta (Finland)	Torres Vedras (Portugal)
Castile and León (Spain)	London (United Kingdom)	Turku (Finland)
Esch-sur-Alzette (Luxembourg)	Malmö (Sweden)	Valencia (Spain)
Flanders (Belgium)	Matosinhos (Portugal)	Valongo (Portugal)
Glasgow (United Kingdom)	Metropolitan Region Amsterdam (Netherlands)	Wiltz (Luxembourg)
Gothenburg (Sweden)	Milan (Italy)	Zuid-Holland (Netherlands)
Guimarães (Portugal)		

Note: Results based on a sample of 64 respondents that responded "Yes" to promoting partnership in relation to the circular economy and "Yes" to the co-ordination mechanisms for the circular economy across cities/regions exist.
Source: OECD (2024[1]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Nearly half of respondents among surveyed cities and regions reported having participated in EU stakeholder engagement initiatives, promoting partnerships and various forms of collaboration across cities and regions (OECD, 2024[1]). For instance, the Valencia region in Spain participates in the Circular Cities and Regions Initiative (CCRI) (Box 2.3), which aims to enhance synergies among projects, share knowledge, and highlight best practices. This involvement has enabled various stakeholders, particularly technological institutes and universities, to attend events, engage with other stakeholders and potential partners, and participate in EU-funded innovation projects related to the circular economy. European cities and regions are also involved in the Circular Cities Declaration, which aims to provide a shared vision of what a "circular city" is and establish a community of committed organisations to share their experiences, challenges and successes (European Union, 2020[36]). The founding signatories include several surveyed cities and regions, such as Helsinki, Lappeenranta, Oulu, Tampere and Turku, Finland; Wiltz Luxembourg; Guimarães, Portugal; and Malmö, Sweden.

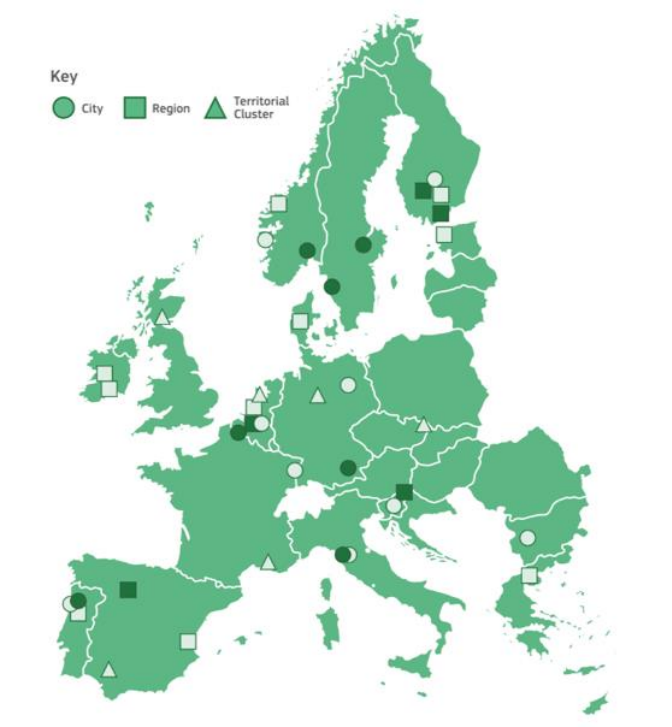
Box 2.3. Circular Cities and Regions Initiative (CCRI)

Officially launched in 2021 and funded by the EU's Directorate-General for Research and Innovation, the Circular Cities and Regions Initiative (CCRI) focuses on implementing a circular economy across cities and regions in the EU. It contributes to the policy objectives of the European Green Deal (2019). The CCRI is largely supported by the EU's research and innovation funding programme (Horizon 2020 and Horizon Europe) to achieve two objectives: showcase circular systemic solutions; and test circular business and governance models at the territorial level. Combining knowledge sharing with technical and financial support, the initiative supports stakeholders across Europe's cities and regions, including regional and local authorities, industry representatives, research and technology organisations and civil society over the whole life cycle of local circular economy initiatives.

The CCRI selected 12 pilots and 25 fellows from different EU Member States (Figure 2.15) to benefit from tailored technical support and participation in four thematic working groups (i) resource management; (ii) bioeconomy; (iii) circular buildings; (iv) industrial symbiosis and circular economy in industries). The CCRI also collaborates with Associated Partners to further spread good practices and support the CCRI Pilots and Fellows (e.g. OECD, European Investment Bank, Ellen MacArthur Foundation, European Institute of Technology and Innovation Circular Economy Community, the

European CCD, the Flemish Institute for Technological Research) to deepen collaboration and advance on the circular economy while ensuring good co-ordination.

Figure 2.15. Map of the Pilots and Fellows of the Circular Cities and Regions Initiative (CCRI)



Note: A total of 12 cities and regions are participating as Pilots, and 25 as Fellows.
Pilots include Asker (City, Norway), Capannori (City, Italy), Castile and Leon (Region, Spain), Flanders (Region, Belgium), Gothenburg (City, Sweden), Guimarães (City, Portugal), Helsinki-Uusimaa (Region, Finland), Munich (City, Germany), Podravje-Maribor (Region, Slovenia), Roubaix (City, France), Tampere Region (Region, Finland) and Uppsala (City, Sweden).
Fellows include: Bergen (City, Norway), Berlin (City, Germany), Central Denmark (Region, Denmark), Central Macedonia (Region, Greece), Communitat Valenciana (Region, Spain), Comunidade Intermunicipal Viseu Dão Lafões (Region, Portugal), Ea éco-entreprises (Territorial Cluster, France), Eurométropole of Strasbourg (City, France), Grosuplje (City, Slovenia), Ireland-West (Region, Ireland), Jyväskylä (City, Finland), Lääne-Harju (Region, Estonia), Leuven (City, Belgium), Lucca (City, Italy), Matosinhos (City, Portugal), Metropolitan Region of Amsterdam (Territorial Cluster, Netherlands), Møre and Romsdal (Region, Norway), Päijät-Häme (Region, Finland), Regrada Trinec (Territorial Cluster, Czechia), Sofia (City, Bulgaria), Southeast Lower Saxony (Territorial Cluster, Germany), Southern Region Waste Planning Authority (Region, Ireland), Technological corporation of Andalusia (Territorial Cluster, Spain), Zero Waste Scotland (Territorial Cluster, United Kingdom), Zuid-Holland (Region, Netherlands).
Source: European Commission (2023[37]), The Circular Cities and Regions Initiative, https://circular-cities-and-regions.ec.europa.eu/about

Many local and regional governments also created partnerships and fostered collaboration as part of the European Circular Economy Stakeholder Platform (ECESP), launched in 2017 as a joint initiative by the European Commission and the European Economic and Social Committee. As a “network of networks”, it highlights cross-sectoral opportunities and provides a space for sharing solutions, identifying challenges, and giving feedback to policymakers. For instance, the leadership group on textiles has organised discussions on key issues such as extended producer responsibility and circular design (European Union, 2019[38]), (European Environment Agency, 2024[39]). Among survey respondents, some regions such as Flanders, Belgium mentioned their participation in the ECESP by joining its leadership group on governance and the built environment (OECD, 2024[1]).

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Notes

[1] Although the 2020 survey results were recalculated exclusively for cities and regions in the EU and the United Kingdom, the samples of EU cities and regions in the 2020 survey differ from those in the 2024 survey.

[2] Although the 2020 survey results were recalculated exclusively for cities and regions in the EU and the United Kingdom, the samples of EU cities and regions in the 2020 survey differ from those in the 2024 survey.

[3] Normandy is not included in the cluster, but it is a relevant example in this field.

[4] As highlight in the OECD (2021[40]) report of The Circular Economy in Glasgow, United Kingdom, Glasgow is experiencing poverty and significant inequality within the city with almost half of its residents live in the 20% of most deprived areas in Scotland. This makes social component is critical for city of Glasgow.

[5] The environmental ceiling consists of nine planetary boundaries, beyond which lie unacceptable environmental degradation and potential tipping points in Earth systems. Moreover, the Doughnut Economics model sets twelve dimensions of the social foundation, derived from internationally agreed minimum social standards. Between social and planetary boundaries lies an environmentally safe and socially just space in which humanity can thrive (Raworth, 2017[23]).

[6] The proportion of respondents from rural areas was calculated based on the proportion of respondents with a population density smaller than 1 500 people per square kilometre. Additionally, in order to check the result is not dependent on the threshold of such population density, the average population density was calculated for each cluster, revealing that the innovation-driven cluster has a higher average population density than the partnership-driven cluster.

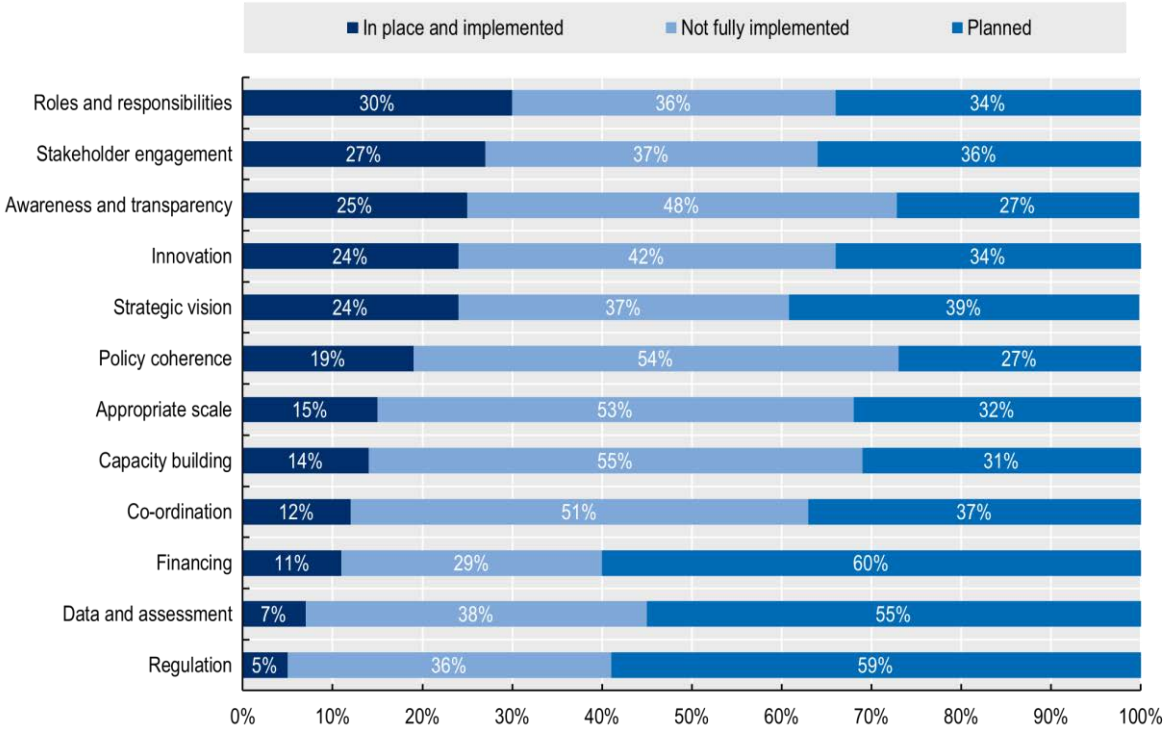
3 Multi-level governance of the circular economy: challenges and opportunities in cities and regions

This chapter identifies and analyses the main challenges for cities and regions to accelerate the circular economy transition thanks to the results of the OECD Scoreboard on the Governance of the Circular Economy, applied to 64 surveyed cities and regions. It provides 53 policy recommendations to make the 12 governance dimensions of the OECD Checklist for Action work in practice.

Introduction

A number of governance dimensions can enable the transition to the circular economy in cities and regions. The OECD (2020[1]) Checklist for Action identifies 12 factors for cities and regions to promote, facilitate and enable the circular economy (Box 3.1). These dimensions are not all making progress at the same pace in cities and regions, with some of them more advanced in their development and implementation. By using the OECD (2020[1]) Scoreboard on the Governance of the Circular Economy across 64 surveyed cities and regions, results show that for half of the sample, regulation, data and financing conducive to the circular economy are either planned or in development, suggesting room for improvement in those areas (Figure 3.1). The results for each governance dimension presented in this chapter reflect the self-perception of the surveyed cities and regions and do not represent the OECD's assessment. This chapter offers 53 policy recommendations aimed at ensuring the effective implementation of the 12 dimensions (Table 3.1).

Figure 3.1. Share of surveyed cities and regions by perceived level of implementation of the 12 dimensions of the OECD Checklist for Action

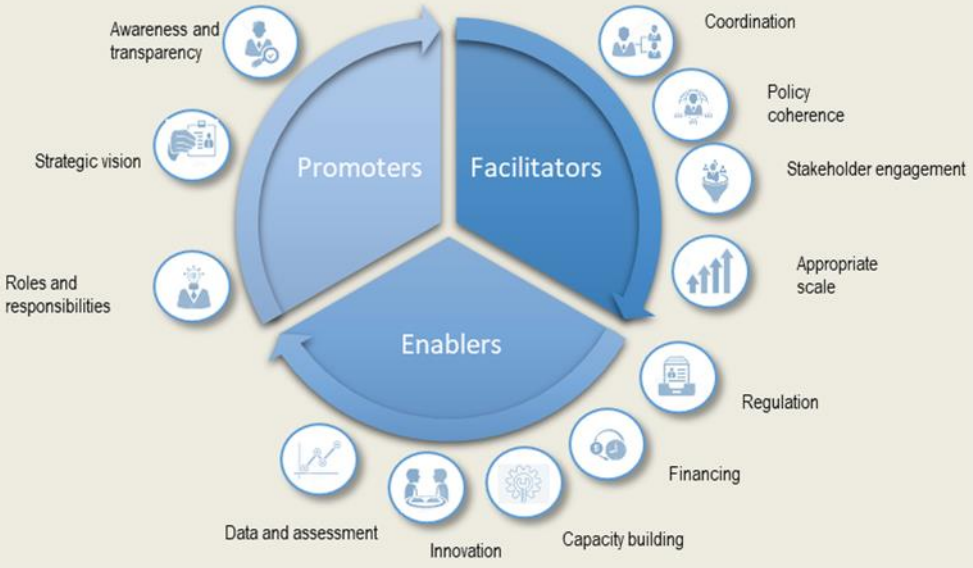


Note: Based on 64 responses to the questions on the level of advancement for each governance dimension. Survey respondents were invited to select one of the following options: "Planned", "In development", "In place, not implemented", "In place, partly implemented", "In place, functioning", "In place, objectives achieved" for each of the 12 governance dimensions. Responses selecting "not applicable" have been excluded from the graph. This graph clusters the responses as follows: (i) In place and implemented; (ii) Not fully implemented; (iii) Planned.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Box 3.1. The OECD Checklist for Action

The OECD (2020[1]) Checklist for Action supports decision-makers in *promoting* (by clarifying roles and responsibilities, developing a circular economy strategy, and enhancing a circular economy culture and transparency), *facilitating* (by fostering co-ordination, policy coherence, engaging stakeholders and implementing the circular economy at scale) and *enabling* (by adapting regulations, mobilising financing, building capacities, supporting innovation and generating data and assessment) the transition to the circular economy.

Figure 3.2. Visualisation of the OECD Checklist for Action

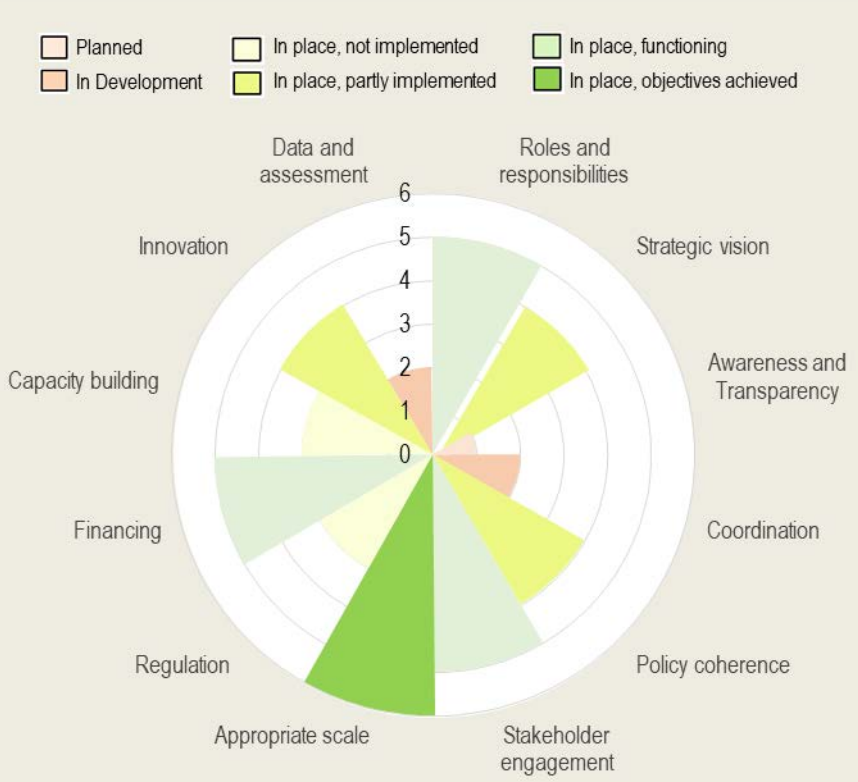


Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, OECD Urban Studies, OECD Publishing, Paris, https://doi.org/10.1787/10ac6ae4-en.

The Checklist for Action focuses on 12 key governance dimensions (Figure 3.2), namely: (i) Roles and responsibilities; (ii) Strategic vision; (iii) Awareness and transparency; (iv) Co-ordination; (v) Policy coherence; (vi) Stakeholder engagement; (vii) Appropriate scale; (viii) Regulation; (ix) Financing; (x) Capacity building; (xi) Innovation; (xii) Data and assessment.

The Checklist for Action is accompanied by the OECD (2020[1]) Scoreboard on the Governance of the Circular Economy, which helps governments identify the level of advancement towards the implementation of each of the 12 governance dimensions. Figure 3.3 shows the graph visualisation that provides an overview of the level of circularity of a city or region for each of the 12 circular economy governance dimensions of the checklist. This helps identify in which dimensions the city or region is best performing and where further action is needed. The figure presents the traffic light system visualisation (red for “Planned”, yellow for “Not fully implemented” and green for “In place and implemented”) that shows at a glance in which areas the government performing the self-assessment would need to improve.

Figure 3.3. Visualisation of the OECD scoreboard results



Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, OECD Urban Studies, OECD Publishing, Paris, https://doi.org/10.1787/10ac6ae4-en.

Table 3.1. List of policy recommendations for cities and regions in the EU

	Governance dimension	Key actions OECD 2020 Checklist	Policy recommendation
PROMOTERS	1. Roles and responsibilities	○ Establish clear roles and responsibilities. ○ Apply circular models within the government according to the "practice what you preach" principle. ○ Prevent waste generation in municipal events and daily activities. ○ Promote the use of secondary materials, sustainable products and build in a circular manner from roads to buildings. ○ Adopt business models shifting from ownership to services. ○ Implement green public procurement including circular economy principles.	○ Go beyond waste to break down silos and ensure that the circular economy is not confined to specific areas such as waste management departments. ○ Appoint a lead to assign clear leadership roles and ensure accountability and policy continuity. ○ Foster constructive dialogue to identify how circular economy practices can benefit the city/region in terms of cost saving, reduction of negative environmental impacts, material productivity. ○ Establish dedicated governance structures, such as multi-level committees that involve both policymakers and technical experts. ○ Adopt transition brokers as intermediaries between the government, the business and the civil society. ○ Be bold to lead by example.
	2. Strategic vision	○ Inform the strategy by an analysis of stocks and flows. ○ Map existing circular-economy-related initiatives. ○ Define clear and achievable goals, actions and expected outcomes. ○ Allocate necessary financial and human resources. ○ Share and co-create with stakeholders to build consensus and vision. ○ Link the strategy with various sectoral strategies. ○ Regularly monitor and evaluate results.	○ Clearly identify what a circular economy strategy is for. ○ Foster a whole-of-system approach. ○ Prioritise, be realistic and inclusive. ○ Share to change, by regularly communicating progress towards circular economy goals, making achievements and challenges publicly available.
	3. Awareness and transparency	○ Develop clear communication. ○ Create spaces for dialogues and practice exchange. ○ Set up communication campaigns. ○ Develop a dedicated website to share knowledge, good practices concerning the circular economy. ○ Organise events for knowledge sharing, networking and the promotion. ○ Use social media to provide quick updates and information. ○ Promote certificates, labels and awards	○ Develop "circular dialogues" for sectors lagging behind the circular transition. ○ Set up targeted awareness-raising initiatives. ○ Showcase best practices and use "circular ambassador". ○ Launch a people-centred campaign for the circular economy.

	Governance dimension	Key actions OECD 2020 Checklist	Policy recommendation
FACILITATORS	4. Co-ordination	○ Strengthen co-ordination across levels of government. ○ Consider the following options: (i) Create ad hoc co-ordination bodies, such as committees, commissions, agencies or working groups. (ii) Organise ad hoc meetings for city-province-region-state co-ordination. (iii) Develop joint projects on the circular economy. (iv) Create shared databases and information systems. ○ Set contracts/deals with the national government as tools for dialogue, for experimenting, empowering and learning.	○ Establish a circular forum for municipalities. ○ Initiate and maintain an open dialogue with the national government. ○ Engage in international networks.
	5. Policy coherence	○ Identify synergies across policies and plans (e.g. climate adaptation, mobility, land use). ○ Strengthen co-ordination across policies and governmental departments (horizontal co-ordination). ○ Embrace adjustments throughout the policy cycle, with implications on how institutions, processes, skills and actors are organised.	○ Map sectoral initiatives to identify those that could benefit from circular economy principles. ○ Align circular economy principles with broader priorities. ○ Integrate the circular economy into climate action plans. ○ Recognise the circular economy as a driver of innovation and development.
	6. Stakeholder engagement	○ Engage with academia and research centres to build knowledge, experiments and carry out specific analyses on flow, stocks and material input and outputs. ○ Find solutions to close, narrow and slow the loops. ○ Create interactive online platforms to encourage stakeholders to exchange information with each other on their needs and monitor the activities and updates of the platform. ○ Provide opportunities for collaboration through multi-stakeholder platforms. ○ Stimulate demand for new solutions through joint actions between knowledge centres and the business sector. ○ Identify possible pilots and experimentations that would involve research and development (R&D) and university departments, based on the needs of the municipality or the regional government. ○ Collect academic and business proposals to put in place circular activities with social impact and consider support for implementation. ○ Create coworking spaces for cross-fertilisation amongst several actors.	○ Map stakeholders by considering their interests, influence, and potential contributions to a circular economy roadmap/strategy. ○ Create a community of experts. ○ Integrate circular economy concepts into existing stakeholder engagement initiatives. ○ Involve actors from industrial areas and startup incubators. ○ Support bottom-up initiatives by providing funding, technical assistance, amongst others. ○ Use a variety of engagement platforms. ○ Showcase progress and results.

	7. Appropriate scale	○ Facilitate territorial linkages between urban and rural areas. ○ Facilitate neighbourhood or community-based plans and initiatives. ○ Experiment circular economy projects at small scales (e.g. a university campus, a neighbourhood, a city district). ○ Identify industrial and urban symbiosis opportunities. ○ Evaluate partnerships with local or metropolitan service operators to apply the circular economy at the local level.	○ Create testbeds and living labs for circular economy solutions. ○ Start small and scale up. ○ Link urban and industrial symbiosis.

	Governance dimension	Key actions OECD 2020 Checklist	Policy recommendation
ENABLERS	8. Regulation	○Identify cases in which it is possible to adapt the regulation (e.g. land use, permits). ○Establish a dialogue with the national government on needed regulatory frameworks updates when the responsibility goes beyond that of cities and regions. ○Implement green public procurement. ○Establish clear requirements in tenders to foster the use of circular economy principles: (i) Apply a life cycle analysis approach. (ii) Carry out market analysis and stimulate demand. (iii) Stimulate a dialogue among the governmental departments and areas involved in promoting the circular transition. (iv) Consider dividing public tenders into lots that enable SMEs and local entrepreneurs to participate. ○Create a monitoring and evaluation framework for green public procurement.	○Use regulatory sandboxes. ○Streamline and harmonise permits to provide clear, standardised guidelines and timelines for the application of circular economy principles in the building, transport, food and other sectors. ○Introduce circular economy targets for circular practices in priority sectors such as construction, packaging, electronics, and textiles.
	9. Financing	○Facilitate access to finance and broaden the range of financial instruments for entrepreneurship. ○Liaise with the national government's departments to clarify existing funding opportunities and with other cities to learn about their experience in catalysing financial resources. ○Create a scheme to offer subsidised loans or credit guarantees to companies following circular economy principles, in co-operation with private and semi-public financial institutions. ○Explore putting in place rewards to companies through corporate income tax, reduced VAT on products labelled as circular.	○De-risk investments in early-stage circular ventures to encourage private-sector participation and accelerate the development of scalable solutions. ○Introduce green bonds. ○Facilitate access to EU and international funding through dedicated support structures. ○Implement "pay-as-you-throw" (PAYT) schemes.
	10. Capacity building	○Develop training programmes on the circular economy within municipal departments and for the private sector. ○Review and analyse the required skills and capacities for carrying out all the activities associated with designing, setting, implementing and monitoring the strategy.	○Make sure trainings are fit for purpose. ○Develop circular economy skills forecasts. ○Participate in peer learning networks.

		○Leverage AI to enhance circular economy workforce development.
11. Innovation	○Create spaces for experimentation. ○Stimulate demand by being a launching customer. ○Create stakeholder networks for material chains. ○Create incubators to promote circular economy projects. ○Establish a single window for the circular economy for businesses. ○Promote public-private partnerships.	○Engage with businesses as key allies in the transition to a circular economy. ○Foster collaboration between niche innovators and regime actors. ○Facilitate the scaling-up of circular business models. ○Support challenge-based innovation calls. ○Leverage technology. ○Create knowledge transfer hubs.
12. Data and assessment	○Collect data and information on the circular economy. ○Generate open data sources. ○Make relevant data publicly accessible, understandable and regularly updated. ○Monitor and evaluate targets and goals of a circular strategy in the short, medium and long terms. ○Use the monitoring framework to identify how “circular” the city/region is, what works, what does not work and what can be improved.	○Conduct resource mapping to optimise material flows and promote sustainable practices across industries and regions. ○Conduct urban metabolism analyses. ○Set up a governance structure to strengthen co-ordination amongst actors in charge of data collection. ○Prioritise indicators that best reflect the main trends related to the transition. ○Leverage digital tools and technologies for real-time data monitoring and decision-making.

Roles and responsibilities: Define who does what and lead by example

Roles and responsibilities reflect the capacities of governments to establish who does what in policymaking (e.g. priority setting and strategic planning) and implementation (e.g. financing and budgeting, data and information, stakeholder engagement). Clarifying these tasks can pave the way for subnational governments to act as a role model and lead by example, using circular economy principles (e.g. reuse, durability, reparability, purchase of second-hand or remanufactured products) in public policies (OECD, 2020[1]). Cities and regions responding to the survey indicate a certain level of progress towards the implementation of actions leading towards circular economy models, from preventing waste generation, using secondary material, etc. (22%), while others (27%) state the existence of a clear commitment and leadership (Table 3.2).

Table 3.2. How are surveyed cities and regions doing? Roles and responsibilities

Is the city (or region) a role model for the transition towards the circular economy?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
There is a political commitment to transition from a linear to a circular economy. Circular economy initiatives are planned.	The government is in the process of clarifying who does what and how to lead the transition towards the circular economy.	There is clear leadership and the government is identifying how to be a role model and lead by example.	The government starts implement a range of actions leading towards circular economy models, from preventing waste generation, use secondary material, etc.	There is commitment and leadership. The government is "putting in practice what it preaches" through concrete examples and activities.	The government adopts circular economy principles in all policies and activities. It is a role model for citizens and businesses and leads by example. Roles and responsibilities are clearly allocated across municipal/ regional departments.
Respondents					
Helsinki (FIN), Budapest (HUN), Esch-sur-Alzette (LUX), Torres Vedras (PRT), Bratislava (SVK), Canary Islands, Guadalajara (ESP), Västra Götaland (SWE)	Sofia (BGR), Berlin (DEU), Lääne-Harju (EST), Jyväskylä, Kouvola, Mikkeli (FIN), Central Macedonia (GRC), Genoa, Milan (ITA), Møre and Romsdal (NOR), Braga (PRT), Podravje (SVN), Amsterdam, Metropolitan Region Amsterdam (NLD)	Tallinn (EST), Krefeld (DEU), Western Region (IRL), Turin (ITA), Bodø (NOR), Granada, Valencia (ESP), Matosinhos (PRT),	Leuven (BEL), Helsinki-Uusimaa, Lappeenranta, Tampere Region (FIN), Eurométropole of Strasbourg (FRA), Haar (DEU), Florence (ITA), Valongo (PRT), Basque Country, Castile and León, Manresa, Vitoria-Gasteiz (ESP), Zuid-Holland Region, The Hague, Tilburg (NLD)	Brussels, Flanders (BEL), Prague (CZE), Oulu, Päijät-Häme, Turku (FIN), Roubaix (FRA), Munich (DEU), Tilos (GRC), Niederanven (LUX), Ljubljana (SVN), Valladolid (ESP), Gothenburg, Malmö (SWE), Haarlem (NLD), Glasgow, London (GBR)	Wiltz (LUX), Guimarães (PRT)
12%	**22%**	**14%**	**22%**	**27%**	**3%**

Note: Based on 64 responses to the question: "Roles and responsibilities: Is your city/region a role model for the transition towards the circular economy?" Survey respondents were invited to select one of the following options: "Planned", "In development", "In place, not implemented", "In place, partly implemented", "In place, functioning", "In place, objectives achieved". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]) OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Unclear roles and fragmentation of responsibilities across departments.** While there are several municipal and regional departments that oversee policies related to the circular economy (e.g. sustainability, municipal waste, social and solidarity economy), they often do not have a clear mandate on the circular economy. Mostly, they may engage in activities on an ad hoc basis without formalised roles. In the majority of cases, waste departments (often in the lead) are trying to expand their activities from collection and treatment to reduction and reuse, while non-waste sectors are minimally involved or excluded. This inconsistency limits the potential for cohesive and comprehensive action across sectors.
- **Overlapping responsibilities in waste management.** In many cities and regions, the decentralised nature of waste management, with overlapping responsibilities between municipalities, provinces and environmental agencies, exacerbates these challenges and leads to inefficiencies and inconsistent practices.
- **Inconsistent co-ordination across levels of government.** Guiding frameworks, such as national circular economy strategies, fail to specify "who does what", leaving gaps in operationalising the circular transition at subnational levels. Many cities and regions find that the roles of subnational authorities in implementing national circular economy strategies remain ambiguous, leading to inconsistencies in approach and delays in advancing co-ordinated efforts.
- **Weak political willingness and leadership.** When the circular economy is perceived as *an end per se* and not as *a means to an end*, local and regional governments may find it difficult to justify action and dedicate funds to it compared to other urgencies, such as health, social services and the environment. This may also be due to the lack of political willingness and leadership to advance with this systemic agenda on the circular economy.
- **Limited integration of circular economy criteria into public procurement policies**. Public procurement processes lack systematic inclusion of circular economy criteria, such as requirements for eco-design, reused materials, or circular business models (e.g., Product-as-a-Service or collective purchasing). While some voluntary criteria exist (e.g., encouraging bio-sourced or recycled materials), generally they do not provide sufficient incentives or mandates for adopting circular practices in public operations, limiting the role of cities and regions in leading by example.

Policy recommendations

Key actions

A Checklist for Action: Roles and responsibilities

- ✓ Establish clear roles and responsibilities.
- ✓ Apply circular models within the government according to the “practice what you preach” principle.
- ✓ Prevent waste generation in municipal events and daily activities.
- ✓ Promote the use of secondary materials, sustainable products and build in a circular manner from roads to buildings.
- ✓ Adopt business models shifting from ownership to services.
- ✓ Implement green public procurement including circular economy principles.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Go beyond waste to break down silos and ensure that the circular economy is not confined to specific areas such as waste management departments**. For instance, departments of finance or urban planning, could be best placed to take the lead and act as co-ordinators.
- **Appoint a lead to assign clear leadership roles and ensure accountability and policy continuity**. Appointed individuals or teams could act as focal points to drive the circular economy agenda forward and facilitate collaboration among stakeholders.
- **Foster constructive dialogue to identify how circular economy practices can benefit the city/region in terms of cost saving, reduction of negative environmental impacts, material**

productivity, etc. Once the departments that can play a role in the circular economy transition have been mapped (e.g. departments for entrepreneurship, innovation, strategic planning, and commerce) a regular dialogue between departments on topics like circular procurement can help sustain demand for circular services and ensure consistent policy implementation.

- **Establish dedicated governance structures**, **such as multi-level committees that involve both policymakers and technical experts**. They can provide a structured approach to decision-making, co-ordination, and progress monitoring.
- **Adopt transition brokers as intermediaries between the government, the business and the civil society** to (i) establish a circular economy programme, (ii) help build circular initiatives, (iii) upscale successful circular initiatives, and (iv) mainstream the circular economy.
- **Be bold to lead by example**. Cities/regions can undertake several activities to lead by example, although some may be experimental and only show results in the long term. The European Commission's Circular Economy Action Plan argues that "a whole new range of sustainable services, product-as-service models and digital solutions will bring about a better quality of life, innovative jobs and upgraded knowledge and skills". Some actions would consist of:
  - Designing public buildings and spaces for flexibility, adaptability, and long-term use, reducing the need for frequent redevelopment.
  - Encouraging the adoption of construction techniques that minimise resource use, incorporate recycled materials, and maximise energy efficiency.
  - Integrating circular business models into procurement practices, prioritising products with extended lifespans, repairability, and reuse potential.
  - Using Product-as-a-Service models in the operation and maintenance of municipal or regional assets, such as building equipment and furniture, to reduce waste and promote efficiency.

Good practices

- Establishing departments or programmes dedicated to the circular economy provides a centralised authority to co-ordinate initiatives, support local businesses, and remove barriers. In Rotterdam, the Netherlands, circular economy initiatives are the responsibility of the Rotterdam Circular support programme, led by the Rotterdam Municipal Executive and the Rotterdam Port Authority. Rotterdam Circular is responsible for the implementation of the Rotterdam Circularity Programme (2019-23). The tasks of the Rotterdam Circular include removing identified barriers to the circular transition, as well as setting requirements in public procurement processes to encourage entrepreneurs to supply circular products or services.
- Appointing a transition manager in six Dutch regions (Utrecht, Gelderland, Nijmegen, Friesland, Brabant, and the Amsterdam Metropolitan Area) between 2015 and 2018 led to the establishment of regional partnerships, such as collaboration between businesses and knowledge institutions in Friesland for the valorisation of organic waste, and the development of sector-specific pilot projects in Gelderland focusing on construction and demolition waste. Transition managers also facilitated systemic change by aligning regional priorities with circular economy principles, including creating long-term agendas and securing stakeholder commitment for initiatives such as circular procurement in the Amsterdam metropolitan area.

Sources: City of Rotterdam (City of Rotterdam, 2019[3]), From Trash to Treasure - Rotterdam Circularity Programme 2019-2023, https://rotterdamcirculair.nl/; Cramer, Jacqueline M. (2020[4]), The Function of Transition Brokers in the Regional Governance of Implementing Circular Economy—A Comparative Case Study of Six Dutch Regions, https://doi.org/10.3390/su12125015.

Strategic vision: Develop a circular economy strategy with clear goals and actions

Strategic vision refers to the development of a comprehensive circular economy strategy, building on (i) an analysis of stocks and flows; (ii) a mapping of existing circular economy-related initiatives; (iii) clear and achievable goals, actions and expected outcomes; (iv) budget and resources; (v) a shared understanding and co-creation with stakeholders to build consensus and vision; (vi) a monitoring and evaluation framework (OECD, 2020[1]). Survey responses reveal that there is room for improvement towards a circular economy vision with clear goals that are consistently achieved and monitored. In the most advanced of the cases, circular economy strategies are in place, but results are not yet determined (27%), while for the majority of respondents (39%) a strategic vision is still in the planning or development phase (Table 3.3).

Table 3.3. How are surveyed cities and regions doing? Strategic vision

Strategic Vision: Is a strategic vision for the transition towards the circular economy developed and implemented?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The government is planning to develop a circular economy strategy, based on clear political willingness, leadership and co-ordination across departments. The lead institution is mapping all concerned stakeholders to engage them in the circular transition.	The circular economy strategy is in development, through the performance of technical analyses of urban stocks and flows, mapping of the existing circular initiatives in various sectors, definition of goals and actions, stakeholder engagement mechanisms to co-create the strategy.	A circular economy strategy is in place, establishing priorities, goals and actions. Financial and human resources are being consolidated.	A circular economy strategy is in place and partially implemented. Stakeholders are engaged.	A circular economy strategy is in place. Actions are performed by public, private and non-profit actors. Financial, regulatory and other gaps are being checked and overcome, when possible.	A circular economy strategy is in place with specific goals consistently achieved and periodically monitored and revised.
Respondents					
Lääne-Harju (EST), Mikkeli (FIN), Haar (DEU), Møre and Romsdal (NOR), Braga, Torres Vedras (PRT), Guadalajara, Manresa (ESP)	Sofia (BGR), Tallinn (EST), Jyväskylä (FIN), Berlin, Krefeld, Munich (DEU), Central Macedonia (GRC), Budapest (HUN), Genoa, Turin (ITA), Valongo (PRT), Canary Islands, Granada (ESP), Malmö (SWE), The Hague (NLD)	Kouvola, Tampere Region (FIN), Podravje (SVN), Valencia, Vitoria-Gasteiz (ESP), Matosinhos (PRT)	Prague (CZE), Helsinki, Helsinki-Uusimaa, Lappeenranta (FIN), Eurométropole of Strasbourg, Roubaix (FRA), Western Region (IRL), Florence, Milan (ITA), Niederanven (LUX), Bodø (NOR), Bratislava (SVK), Basque Country, Castile and León (ESP), Västra Götaland (SWE), Amsterdam, Haarlem, Zuid-Holland Region (NLD)	Brussels, Flanders, Leuven (BEL), Päijät-Häme, Turku (FIN), Tilos (GRC), Wiltz (LUX), Ljubljana (SVN), Valladolid (ESP), Gothenburg (SWE), Metropolitan Region Amsterdam, Tilburg (NLD), Glasgow, London (GBR)	Oulu (FIN), Guimarães (PRT)
13%	**26%**	**10%**	**27%**	**21%**	**3%**

Note: Based on 63 responses to the question: “Strategic vision: Is a strategic vision for the transition towards the circular economy developed and implemented?” Survey respondents were invited to select one of the following options: “Planned”, “In development”, “In place, not implemented”, “In place, partly implemented”, “In place, functioning”, “In place, objectives achieved”. Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Lack of long-term vision and strategic framework.** Several cities and regions lack a stand-alone strategy for the circular economy, resulting in fragmented efforts and missed forward-looking targets. They may also focus on short-term, time-limited projects (e.g. specific pilots, EU-funded initiatives) that lack the scope for continuity. Finally, in some cases, existing frameworks are not fully articulated or implemented, lacking specific actions, timelines and integration into municipal and regional activities.
- **Difficulties in implementation.** Often strategies are not accompanied by the human and financial resources that would be required to implement and scale up circular economy projects and initiatives.
- **Insufficient engagement of local actors.** Some municipalities within a region often lack the capacity or engagement necessary to align with and implement circular economy goals at the regional level and they are often insufficiently engaged in circular economy strategies, leading to uneven implementation and limited impact at the local level. Additionally, efforts to engage local actors are often sporadic, and participation is not sufficiently supported through funding, technical assistance, or capacity building.
- **Lack of a systems approach.** Circular economy principles are often integrated into waste management plans and fail to adopt a systemic, cross-sectoral approach. For example, there may be little or no consideration to identify how the circular economy can help reduce greenhouse gas emissions or have a positive net effect on job creation provided that workers acquire the skills required by the green transition, as argued by the EC Action Plan.
- **Challenges in monitoring results.** Circular economy frameworks often lack practical and measurable indicators, with baselines and targets either undefined or not detailed enough for effective monitoring and implementation. The lack of robust data systems limits the ability to track progress and evaluate the impact of circular economy initiatives.

Policy recommendations

Key actions

A Checklist for Action: Strategic vision

- ✓ Inform the strategy by an analysis of stocks and flows.
- ✓ Map existing circular-economy-related initiatives.
- ✓ Define clear and achievable goals, actions and expected outcomes.
- ✓ Allocate necessary financial and human resources.
- ✓ Share and co-create with stakeholders to build consensus and vision.
- ✓ Link the strategy with various sectoral strategies.
- ✓ Regularly monitor and evaluate results.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Clearly identify what a circular economy strategy is for.** The circular economy**,** as a means to an end, can contribute to the goals of carbon neutrality, economic growth while pursuing a just transition, or boosting innovation and creating job opportunities. As such, a strategy should be able to identify goals and actions that, by managing resources and material in a circular way, would determine a broader social, economic and environmental vision for the city/region.
- **Foster a whole-of-system approach,** including upstream innovations (e.g. circular design, shared economy models) and downstream processes (e.g. repair, recovery, recycling) that cover the entire life cycle of products.
- **Prioritise, be realistic and inclusive.** Priority policy areas for circular economy implementation, such as the built environment, tourism, food and water, should be selected on the basis of their

potential to reduce environmental impacts, address pressing needs and support wider economic and governmental priorities. In addition, intermediate targets would allow for a gradual progress evaluation. Finally, as result of the co-creation process, it is important to identify the role of various stakeholders in implementing the shared vision.

- **Share to change**, **by regularly communicating progress towards circular economy goals, making achievements and challenges publicly available**. This transparency will help build trust among stakeholders, including citizens and businesses, and ensure that the public is informed about the impact of ongoing circular economy initiatives.

Good practices

- By constitutionally obliging authorities to facilitate resource efficiency and material loop closure, the Canton of Zurich, Switzerland, set a precedent for institutionalising circular economy practices.
- Specific targets within the 2019 strategy *Beyond Recycling: A strategy to make the circular economy in Wales a reality* helped the Welsh government (United Kingdom) determine a progressive direction for action: to reduce waste by 26%, avoidable food waste by 50%, zero waste to landfill, and increase recycling by 70% by 2023; to reach 33% reduction in waste and 60% in avoidable food waste by 2030. In 2050, the Welsh Government envisions a scenario where the county uses the equivalent to a one planet worth of resources, a 62% reduction in total waste and become net zero carbon.
- To support the implementation of its Circular Economy Roadmap, the Eurométropole of Strasbourg (EMS) and the French Agency for Ecological Transition (*Agence de l'environnement et de la maîtrise de l'énergie*, ADEME) signed the 2020-23 Waste and Circular Economy Contract of Objectives (*Contrat d'Objectifs Déchets et Économie Circulaire*, CODEC) in 2020, aiming to (i) mobilise economic players to action towards a circular economy, (ii) reduce household waste from 248 kg to 233 kg per capita in the 2018-23 period, and (iii) reduce the production of all managed and assimilated waste from 448 kg to 430 kg per capita in 2023 relative to 2018. The CODEC also identified key areas of intervention, including eco-design, industrial and territorial ecology, responsible consumption and the extension of products' lifecycles in the region.

Sources: Zero Carbon Academy (2023[5]), Circularity in cities: the case of Zurich, https://www.zerocarbonacademy.com/posts/circularity-in-cities-the-case-of-zurich; Welsh Government (2021[6]), Beyond Recycling - a strategy to make the circular economy in Wales a reality, https://www.gov.wales/written-statement-beyond-recycling-strategy-make-circular-economy-wales-reality; Eurométropole of Strasbourg (2024[7]), Roadmap: Circular economy of the Eurométropole of Strasbourg.

Awareness and transparency: Promote a circular economy culture and enhance trust

Awareness and transparency involve fostering a circular economy culture by raising awareness among citizens, businesses, and stakeholders; promoting sustainable production and consumption; and enhancing trust through transparent practices that remove cultural barriers and increase social acceptance. Almost 70% of cities and regions put in place dedicated awareness campaigns for stakeholder groups and some of them declare to be advanced in terms of awareness raising (Table 3.4).

Table 3.4. How are surveyed cities and regions doing? Awareness and transparency

Awareness and transparency: Is a circular economy culture promoted?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The government identifies means to raise awareness on the circular-economy-related opportunities. This can take the form of a social media campaign, events and communication campaign.	The government is establishing structured information points, such as a dedicated website and plans workshops with key stakeholders, to discuss obstacles and opportunities of the transition to the circular economy.	Communication campaigns, stakeholders mapping and the identification of spaces for dialogues for collaboration are identified but not yet operative.	The government puts in place dedicated awareness campaigns for stakeholder's groups and identifies ways to enhance collaboration, dialogue and strengthen the market space (e.g. through dedicated spaces, labels, certificates).	Information on the circular economy opportunities flows and stakeholders are informed. This information is regularly updated.	Stakeholders are informed, clear communication is in place. Producers and consumers are aware of the opportunities and of the means made available by the government to boost the transition towards a circular economy.
Respondents					
Mikkeli (FIN), Esch-sur-Alzette (LUX), Torres Vedras (PRT), Guadalajara (ESP)	Sofia (BGR), Prague (CZE), Lääne-Harju (EST), Haar, Krefeld, Munich (DEU), Budapest (HUN), Western Region (IRL), Genoa (ITA), Møre and Romsdal (NOR), Matosinhos, Valongo (PRT), Canary Islands (ESP)	Berlin (DEU), Helsinki-Uusimaa, Jyväskylä (FIN), Central Macedonia (GRC), Niederanven (LUX), Malmö (SWE)	Tallinn (EST), Kouvola, Lappeenranta, Päijät-Häme, Tampere Region (FIN), Eurométropole of Strasbourg, Roubaix (FRA), Florence, Milan, Turin (ITA), Bodø (NOR), Bratislava (SVK), Podravje (SVN), Castile and León, Granada, Valencia, Valladolid, Vitoria-Gasteiz (ESP), Gothenburg (SWE), Amsterdam, Zuid-Holland Region, The Hague, Tilburg (NLD), Glasgow (GBR)	Flanders, Leuven (BEL), Turku (FIN), Tilos (GRC), Wiltz (LUX), Braga, Guimarães (PRT), Ljubljana (SVN), Manresa (ESP), Västra Götaland (SWE), Metropolitan Region Amsterdam (NLD)	Brussels (BEL), Oulu (FIN), Basque Country (ESP), Haarlem (NLD), London (GBR)
6%	21%	10%	38%	17%	8%

Note: Based on 63 responses to the question: "Awareness and transparency: Is a circular economy culture promoted?" Survey respondents were invited to select one of the following options: "Planned", "In development", "In place, not implemented", "In place, partly implemented", "In place, functioning", "In place, objectives achieved". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Lack of awareness of what the circular economy is and how to get there**. The circular economy is still often perceived as a synonym for sustainable waste management or as a way to brand small-scale initiatives of reuse or service sharing (e.g. bikes). The lack of understanding of the circular economy by public administrations limits the integration of circular principles into urban development and environmental resource management.
- **Awareness campaigns focusing on waste management** (e.g. zero waste, repair) rather than the full range of circular economy upstream and downstream actions that would require collaborations and partnerships along different value chains. As a result, the business community is often unaware of the regulatory and economic instruments available to facilitate the transition, while citizens understand the concept of the circular economy as recycling.
- **Information fragmentation on circular economy opportunities**. Businesses struggle to identify available tools such as subsidies, grants and regulations to support the transition to a circular economy. There is often no centralised communication channel, such as a dedicated website or office, to provide consolidated resources and guidance on circular economy initiatives.
- **Limited support for responsible consumption and sustainable production.** Efforts to build trust and promote sustainable choices, such as the use of certificates, labels and awards, are either absent or under-utilised, reducing incentives for the uptake of circular solutions. Regional and local initiatives to raise awareness of circular economy principles, such as reuse centres or sustainable consumption guides, remain underdeveloped or unimplemented. Without mechanisms to meaningfully engage citizens, circular economy initiatives risk low participation and limited behaviour change.

Policy recommendations

Key actions

A Checklist for Action: Awareness and transparency

- ✓ Develop clear communication.
- ✓ Create spaces for dialogues and practice exchange.
- ✓ Set up communication campaigns to show the impacts of the circular economy, how citizens and different actors can contribute to it and share success stories.
- ✓ Develop a dedicated website to share knowledge, good practices concerning the circular economy.
- ✓ Organise events for knowledge sharing, networking and the promotion of the circular economy at the local level, as well as conferences and seminars at schools and universities.
- ✓ Use social media to provide quick updates and information on the topic and related events.
- ✓ Promote certificates, labels and awards that can enhance trust and lead to more conscious production and consumption choices.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Develop "circular dialogues" for sectors lagging behind the circular transition** and showcase the costs and benefits of the implementation of circular business models.
- **Set up targeted awareness-raising initiatives** (e.g. youth, tourists, business) to inform on how many resources are consumed per capita in the city/region, how waste is treated, and the benefits of reuse and reduced consumption.
- **Showcase best practices and use "circular ambassadors"** from companies to exemplify positive results in awareness-raising campaigns amongst businesses and investors.

- **Launch a people-centred campaign for the circular economy** building on traditional practices and local sectors, highlighting local heritage, knowledge, identity, and history. For example, the campaign could incorporate images of local actors, such as individuals and/ or companies' employees, the city/region can emphasise the role these stakeholders play in transitioning to a circular economy and inspire actionable steps. The campaign could focus on "R-strategies" such as reduce, reuse, repair, recycling, among others.

Good practices

- To raise awareness, the city of Ljubljana, Slovenia, designed a website in which 38 circular practices are listed. Measures concern retrofitting of public buildings, shared bicycle fleet, reuse of tyres and others.
- To promote sustainable consumption, Paris, France, launched in 2023 a city map to help residents find places to consume sustainably (e.g. repair shops, solidarity shops, resource centres, bicycle workshops).
- In 2024, the government of France announced a new sustainability label for electric and electronic equipment titled "Sustainability Index". Its objective, as part of France's law against waste, is to combat planned obsolescence by informing citizens on their choices of electronic equipment and holding producers accountable for product reparability and endurance. The Sustainability Index has been proposed as the evolution of the Repairability Index, introduced in 2021, and will progressively replace the latter, starting with washing machines and television sets in 2025. The index rates devices on a 0-10 scale based on two categories of criteria: Repairability, and Reliability. Repairability is assessed based on documentation, ease of disassembly, and the availability and price of spare parts. Reliability is measured by endurance, maintenance, and guarantee and quality assurance policies.
- Since 2022, Circular Flanders, Belgium, has provided the Circular Ambassador Programme, a 7-day training course allowing participants to work on circular cases in various fields, including bioeconomy, circular construction, chemicals and plastics, manufacturing industry, food chain and water cycles.

Sources: City of Ljubljana (2024[8]), Circular economy examples in the City of Ljubljana, https://www.ljubljana.si/en/ljubljana-for-you/environmental-protection/towards-circular-economy/examples-of-circular-economy/; City of Paris (City of Paris, 2023[9]), Resource centres, recycling centres, repairers, solidarity shops, mapping, https://cdn.paris.fr/paris/2019/07/24/dc4e4f012a6cc1d7ff585f8fe4de282f.pdf; Government of France (2025[10]), Indice de durabilité, https://www.ecologie.gouv.fr/politiques-publiques/indice-durabilite; Circular Flanders (2022[11]), Turnover in the circular economy, https://cemonitor.be/en/indicator/effects/socio-economic/turnover-in-the-circular-economy/.

Co-ordination: Implement effective multi-level governance

Co-ordination entails fostering collaboration across local, regional, and national levels of government to align objectives, address shared circular economy challenges, and prevent asymmetries or gaps in information among key actors. Survey results show that only 3% of cities and regions consider that co-ordination mechanisms across levels of government are functioning and leading to actions that are monitored and revised (Table 3.5). In 51% of cases co-ordination mechanisms existed but were not fully implemented or had an experimental basis.

Table 3.5. How are surveyed cities and regions doing? Co-ordination

Co-ordination: Are co-ordination mechanisms across levels of government (e.g. regional, national, supranational) to implement circular economy initiatives in place?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
Synergies across levels of government are identified, to align objectives and find solutions to regulatory, financial, information issues, amongst others.	Representatives from various levels of government are kept informed and specific circular economy co-ordination mechanisms across levels of government can be developed for regular updates.	Circular economy co-ordination mechanisms across levels of government are developed and opportunities for collaboration identified but not yet implemented.	Circular economy co-ordination mechanisms across levels of government are in place and representatives are working together on joint projects, pilots, experimentation.	Circular economy co-ordination mechanisms across levels of government are in place and deliver concrete results. Experiments are scaled up and consolidated.	Circular economy co-ordination mechanisms across levels of government are functioning and leading to actions, which are monitored and revised.
Respondents					
Mikkeli (FIN), Milan (ITA), Møre and Romsdal (NOR), Torres Vedras, Valongo (PRT), Canary Islands (ESP)	Leuven (BEL), Prague (CZE), Tallinn (EST), Jyväskylä (FIN), Budapest (HUN), Genoa, Turin (ITA), Braga, Matosinhos, (PRT), Bratislava (SVK), Podravje (SVN), Granada, Valencia (ESP), Tilburg (NLD), London (GBR)	Sofia (BGR), Berlin (DEU), Central Macedonia, Tilos (GRC), Florence (ITA), Basque Country (ESP), Malmö (SWE), Zuid-Holland Region (NLD)	Helsinki, Helsinki-Uusimaa, Kouvola, Lappeenranta, Oulu, Päijät-Häme, Tampere Region, Turku (FIN), Eurométropole of Strasbourg, Roubaix (FRA), Krefeld, Munich (DEU), Western Region (IRL), Niederanven (LUX), Castile and León, Guadalajara, Vitoria-Gasteiz (ESP), Gothenburg (SWE), Amsterdam, Haarlem (NLD), Glasgow (GBR)	Flanders (BEL), Wiltz (LUX), Bodø (NOR), Metropolitan Region Amsterdam, The Hague (NLD)	Brussels (BEL), Guimarães (PRT)
11%	26%	14%	37%	9%	3%

Note: Based on 57 responses to the question: "Co-ordination: Are co-ordination mechanisms across levels of government (e.g. regional, national, supranational) to implement circular economy initiatives in place?" Survey respondents were invited to select one of the following options: "Planned", "In development", "In place, not implemented", "In place, partly implemented", "In place, functioning", "In place, objectives achieved". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Limited vertical co-ordination.** Vertical co-ordination between national and subnational governments remains largely underdeveloped, with many strategies and action plans failing to incorporate formal mechanisms for such collaboration. Cities and regions signal that, in many cases, national frameworks do not adequately account for the roles of local governments or establish pathways for multi-level governance. Similarly, national and regional initiatives often overlook critical local challenges, such as resource management or waste classification, thereby limiting their impact. Local governments are frequently excluded from the design and implementation of national and regional circular economy strategies. This hinders their ability to align local priorities with broader goals and exacerbates the gap between strategic frameworks and practical application.
- Fragmented horizontal co-ordination. Horizontal co-ordination across regional and local departments is often ad hoc and project-specific, with few formal mechanisms to ensure systematic collaboration. For instance, local and regional departments tasked with circular economy responsibilities lack clear structures or consistent communication protocols, resulting in policy misalignments and inefficiencies.
- **Instability in governance structures.** Interdepartmental co-ordination groups, where they exist, are often temporary or lack the institutionalisation required for long-term impact. This reduces their ability to provide consistent support for circular economy initiatives. Also, the delayed establishment of dedicated co-ordination mechanisms, when foreseen in circular strategies, represents a challenge for implementing actions.

Policy recommendations

Key actions

A Checklist for Action: Co-ordination

- ✓ Strengthen co-ordination across levels of government.
- ✓ Consider the following options:
  - Create ad hoc co-ordination bodies, such as committees, commissions, agencies or working groups.
  - Organise ad hoc meetings for city-province-region-state co-ordination.
  - Develop joint projects on the circular economy.
  - Create shared databases and information systems.
  - Set contracts/deals with the national government as tools for dialogue, for experimenting, empowering and learning.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Establish a circular forum for municipalities** within metropolitan areas to foster dialogue and co-operation. The forum can identify shared challenges, prioritise actions and set common goals to enhance the co-ordination and scalability of circular economy initiatives. Regular meetings and collaborative workshops can ensure alignment on strategies, facilitate resource-sharing, and avoid duplication of efforts.
- **Initiate and maintain an open dialogue with the national government** to align circular economy policies, funding schemes, and regulations. Cities and regions could advocate for national-level support to enable experimentation, ensuring that innovative projects receive adequate resources and regulatory flexibility for implementation.
- **Engage in international networks** (e.g., EU circular economy platforms, OECD initiatives) to exchange knowledge and experiences. These platforms provide access to cutting-edge research, policy recommendations, and funding opportunities while fostering partnerships with like-minded governments and institutions. Engaging in such networks strengthens the capacity of local and regional authorities to implement circular economy strategies, align with global sustainability goals, and position themselves as leaders in the transition to a resource-efficient economy.

Good practices

- ReLondon, a circular economy partnership between the Mayor of London and London's boroughs, UK, has been running a built environment programme in 2024 to strengthen collaboration between London's 33 local authorities, the GLA and industry partners to accelerate the transition to a circular economy in the built environment. The programme is developing an evidence base for new policy, facilitating knowledge sharing and capacity building, and supporting practical implementation through action groups in partnership with industry. The programme aims to disseminate all circular economy actions undertaken by local authorities in recent years, set commitments to embed circular economy principles in public building projects, and develop the necessary physical and digital infrastructure to facilitate circular supply chains in Greater London.
- The Brussels Regional Programme for a Circular Economy (BRPCE) established a multi-level governance structure to enhance co-ordination among stakeholders. It comprises 111 measures across four strategic areas, including governance measures aimed at reinforcing co-operation between different levels of government. The BRPCE Steering Committee, composed of the prime minister, responsible ministers, and associated ministers, oversees implementation, meeting biannually or as needed to make key decisions. It includes regional partners such as Brussels Environment, Brussels Economy and Employment, and the Brussels Planning Agency, among others. Operational co-ordination is managed by an inter-agency committee involving Brussels Environment, impulse.brussels, Bruxelles-Propreté, and Innoviris, which oversee the programme's day-to-day execution.

Sources: ReLondon (2023[12]), *Built Environment, https://relondon.gov.uk/built-environment*, OECD (2023[13]), *The Circular Economy in Tallinn, Estonia*, https://doi.org/10.1787/06abc3de-en.

Policy coherence: Foster systems thinking

Policy coherence involves integrating circular economy principles into different policy areas, such as environmental, industrial and regional development policy. This systemic approach requires aligning policies, engaging different actors around common goals, and continuously adapting policies to drive system-level change. Based on the Scoreboard, cities and regions argue having identified synergies across policies, but in the best of cases, these synergies have only partially been implemented (54%) (Table 3.6).

Table 3.6. How are surveyed cities and regions doing? Policy coherence

Policy coherence: Is the circular economy initiative linked to other strategies, plans and programmes developed by the local or regional government (e.g. smart, green, sustainable, etc.)?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The circular economy can be a means to achieve objectives stated in existing strategies (e.g. green, carbon-neutral, etc.). These strategies are identified.	The government is developing co-ordination mechanisms to map needs and priorities across various departments in charge of policies for which circular economy principles and actions can help achieve the expected objectives (e.g. climate change, housing, energy, urban planning, etc.).	While needs, synergies and priorities are identified, implementation is lacking due to conflicting interests and a lack of a system thinking.	Coherence across policies and departments is in place, through co-ordination mechanisms, information sharing and joint projects. This concerns some sectors and, to a lesser extent, others.	Circular economy principles are embedded in strategies, plans and programmes, maximising synergies across municipal departments.	Departments favour co-ordination and link circular principles to key strategies as business as usual. Grey areas, overlaps, conflicting objectives are avoided. Results are monitored and checked for further improvement.
Respondents					
Helsinki (FIN), Haar (DEU), Budapest (HUN), Møre and Romsdal (NOR), Matosinhos, Torres Vedras (PRT), Manresa (ESP)	Jyväskylä (FIN), Berlin Krefeld (DEU), Central Macedonia, Tilos (GRC), Genoa (ITA), Valongo (PRT), Canary Islands (ESP), Zuid-Holland Region (NLD)	Leuven (BEL), Prague (CZE), Eurométropole of Strasbourg (FRA), Florence (ITA), Basque Country, Valencia, Vitoria-Gasteiz (ESP), Metropolitan Region Amsterdam (NLD)	Brussels, Flanders (BEL), Sofia (BGR), Tallinn (EST), Kouvola, Lappeenranta, Tampere Region (FIN), Roubaix (FRA), Munich (DEU), Western Region (IRL), Milan (ITA), Niederanven, Wiltz (LUX), Bodø (NOR), Braga (PRT), Castile and León, Granada, Guadalajara (ESP), Gothenburg, Malmö (SWE), Amsterdam, Haarlem, Tilburg (NLD), Glasgow, London (GBR)	Helsinki-Uusimaa, Oulu, Päijät-Häme, Turku (FIN), Turin (ITA), Bratislava (SVK), Podravje (SVN), Valladolid (ESP), Västra Götaland (SWE), The Hague (NLD)	Guimarães (PRT)
12%	15%	13%	41%	17%	2%

Note: Based on 60 responses to the question: “Policy coherence: Is the circular economy initiative linked to other strategies, plans and programmes developed by the local/regional government (e.g. smart, green, sustainable, etc.)?” Survey respondents were invited to select one of the following options: “Planned”, “In development”, “In place, not implemented”, “In place, partly implemented”, “In place, functioning”, “In place, objectives achieved”. Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Lack of cross-cutting perspective.** The circular economy is frequently treated as an additional policy priority rather than as a strategic, cross-cutting framework that could help achieve multiple objectives.
- **The waste-centric perspective of the circular economy.** In some cases, circular economy policies are limited to waste management and recycling, without extending to more transformative strategies such as reduction, reuse or resource refusal. This narrow focus limits the scope of circular economy initiatives and their contribution to regional objectives.
- **Misalignment across strategies**. Many cities and regions face the challenge of misalignment when integrating circular economy principles into their policy frameworks. This issue often arises when sectoral strategies, developed independently, fail to align their objectives and focus areas, leading to fragmented efforts and missed opportunities for comprehensive action.

Policy recommendations

Key actions

A Checklist for Action: Policy coherence

- ✓ Identify synergies across policies and plans (e.g. climate adaptation, mobility, land use)
- ✓ Strengthen co-ordination across policies and governmental departments (horizontal co-ordination)
- ✓ Embrace adjustments throughout the policy cycle, with implications on how institutions, processes, skills and actors are organised

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Map sectoral initiatives** (e.g., agriculture, water management, urban planning, tourism) **to identify those that could benefit from circular economy principles**. This mapping could assess existing initiatives that already refer to circular economy concepts and explore potential synergies, overlapping objectives, and complementary policies. This process would guide the integration of circular economy principles into broader local/regional development and innovation strategies.
- **Align circular economy principles with broader priorities**, such as climate action and regional development, to maximise impact and foster synergies across sectors. This alignment would position circularity as a central pillar for achieving sustainability, enhancing industrial competitiveness, and fostering inclusive economic growth.
- **Integrate the circular economy into climate action plans**. Cities aiming for ambitious goals like carbon neutrality can use the circular economy as a tool to reduce emissions, shift consumption patterns and ease pressure on natural resources. This alignment ensures that circular economy policies are not developed in isolation but become part of the overarching climate agenda.
- **Recognise the circular economy as a driver of innovation and development**. The circular economy could contribute to regional goals through dematerialisation, resource efficiency and nature regeneration.

Good practices

- The Province of Zuid-Holland, Netherlands, has integrated circular economy principles into its spatial strategy. The 2022 Circular Zuid-Holland Spatial Strategy, which promotes long-term multi-stakeholder collaboration, recognising that circular supply chains often cross municipal boundaries and are hindered by fragmented regulations.
- In France, the Eurométropole of Strasbourg (EMS) is leveraging the Areas Committed to Ecological Transition label, awarded by the ADEME, to guide municipalities in strengthening their circular economy strategies. The EMS has actively sought to enhance its rating, aiming to improve its score from one to three stars by 2024, reflecting a deeper integration of circular economy principles. In Ireland, the Northern and Western Regional Assembly has embedded circular economy objectives into its Regional Spatial and Economic Strategy (2020-2032). This strategy supports waste self-sufficiency, resilient infrastructure, and low-carbon urban development, aligning with broader national and European sustainability goals.
- The circular economy is identified as a means to contribute to environmental objectives and is integrated in many local/regional initiatives, including Valladolid in Spain (where the climate agreement includes the circular economy as a contribution to the 2030 decarbonisation mission, and implements circular economy principles into urban water, energy, waste and mobility sectors), Braga in Portugal (which integrated the circular economy in its Climate Action Plan, Energy Plan and Sustainable Climate Plan), Bodø in Norway (included in the Climate and Energy Plans, Waste Management and Municipal Master Plans), Møre and Romsdal in Norway (where the Environment, Climate and Energy Strategy 2023-2026 includes the circular economy as a focus area to reduce greenhouse gas emissions and minimise pressure on natural resources).
- Zuid-Holland, Netherlands has integrated circularity into its 2020-2023 *Clean Energy for Everyone implementation programme*, which aims to reduce carbon emissions by 49% by 2030, being one of the pillars of the production of energy from waste by implementing waste-to-energy solutions. The Province also plans to publish an integrated energy and industry strategy, embedding circularity within its sustainable industry framework. In Berlin, Germany, the Senate Department for Economy, Energy, and Public Enterprises commissioned a 2023 study on the potential of a circular industry, highlighting key enablers such as mandatory recycled material use and digital product passports.

Sources: City of Valladolid (City of Valladolid, 2023[14]), Acuerdo climatico de la ciudad de Valladolid, https://www.valladolid.es/es/actualidad/noticias/ayuntamiento-valladolid-aprueba-acuerdo-climatico-objetivo: City of Braga (City of Braga, 2024[15]), Braga Municipal Climate Action Plan, https://bragaverde.pt/wp-content/uploads/2024/05/pmac-braga_volume-ien.pdf; OECD (2024[16]), The Circular Economy in the Eurométropole of Strasbourg, France, https://doi.org/10.1787/34437543-en; OECD (2024[17]), The Circular Economy in Zuid-Holland, Netherlands, https://doi.org/10.1787/d568d66e-en; OECD (OECD, 2024[18]), The Circular Economy in Berlin, Germany, https://doi.org/10.1787/459defe7-en.

Stakeholder engagement: Facilitate collaboration among public, private and non-profit actors

Stakeholder engagement emphasises the promotion of collaboration between public, private and non-profit actors by facilitating the exchange of information, sharing of experiences and agreements. There is no prevalent model for stakeholder engagement, as according to the Survey sample, activities are either planned or in development (36%), in place, but either not implemented or not fully implemented (37%) or in place and functioning at various degrees (27%) (Table 3.7).

Table 3.7. How are surveyed cities and regions doing? Stakeholder engagement

Stakeholder engagement: Is collaboration across the public, private and non-profit sectors fostered to boost the transition?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The government is planning to promote collaboration with knowledge institutions, businesses and start-ups to work on prioritised areas related to the circular economy at the local or regional level.	The government is establishing a dialogue with businesses and knowledge institutions to find innovative circular solutions to local or regional problems that require knowledge building and entrepreneurial initiative (e.g. from material sorting to a modular building).	Agreements are established but collaboration is not yet implemented.	Collaboration with knowledge institutions and private and non-profit actors are in place and partly implemented. As such, results are not yet achieved or only partially achieved with specific stakeholder's categories.	The collaboration is paving the way for an ecosystem in which knowledge institutions, government, businesses and civil society find fertile ground for collaboration, beyond specific projects. As such, this collaboration is supported by the government through the creation of coworking shared spaces for cross-fertilisation amongst several actors and the organisation of events and workshops.	Stakeholders are actively engaged in the transition towards a circular economy, as its implementation is a shared responsibility. The government facilitate contacts and collaboration.
Respondents					
Sofia (BGR), Jyväskylä (FIN), Western Region (IRL), Braga, Torres Vedras (PRT), Guadalajara (ESP)	Lääne-Harju (EST), Tampere Region (FIN), Berlin, Haar (DEU), Central Macedonia, Tilos (GRC), Budapest (HUN), Genoa (ITA), Esch-sur-Alzette, Niederanven (LUX), Møre and Romsdal (NOR), Matosinhos, Valongo (PRT), Ljubljana, Podravje (SVN), Amsterdam (NLD)		Brussels (BEL), Prague (CZE), Tallinn (EST), Kouvola, Oulu (FIN), Eurométropole of Strasbourg, Roubaix (FRA), Krefeld, Munich (DEU), Florence, Turin (ITA), Bratislava (SVK), Canary Islands, Castile and León, Manresa, Valencia, Vitoria-Gasteiz (ESP), Gothenburg, Malmö (SWE), Metropolitan Region Amsterdam, Zuid-Holland Region, Tilburg (NLD), London (GBR)	Flanders (BEL), Helsinki-Uusimaa, Lappeenranta, Päijät-Häme, Turku (FIN), Milan (ITA), Wiltz (LUX), Basque Country, Granada, Valladolid (ESP), Västra Götaland (SWE), Haarlem, The Hague (NLD), Glasgow (GBR)	Leuven (BEL), Bodø (NOR), Guimarães (PRT)
10%	**26%**	**0%**	**37%**	**22%**	**5%**

Note: Based on 62 responses to the question: "Stakeholder engagement: Is collaboration across the public, private and not-for-profit sectors fostered to boost the transition?" Survey respondents were invited to select one of the following options: "Planned", "In development", "In place, not implemented", "In place, partly implemented", "In place, functioning", "In place, objectives achieved". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Low business and citizen engagement**. Despite existing initiatives, involving businesses and citizens in the circular economy remains a significant challenge for most cities and regions. Overall, although universities, research centers, and technological institutes are engaged in promoting the circular economy, their involvement is often restricted to isolated initiatives rather than being integrated into broader multi-stakeholder frameworks.
- **Limited engagement beyond small-scale initiatives**. Outside of specific sectors where the integration of circular economy principles is more widely implemented (e.g. the built environment in some cities and regions), where some companies independently adopt circular practices, fostering broad participation across industries and communities remains a significant hurdle for cities and regions.
- **Ineffective multi-stakeholder mechanisms**. Mechanisms designed to foster stakeholder co-operation, such as advisory councils or participation platforms, have not prioritised the circular economy or made full use of stakeholder networks. Tools such as interactive maps for stakeholder engagement are not fully exploited and remain relatively unknown. In some cases, mechanisms involve fewer stakeholders than originally planned, excluding key groups such as consumer organisations, trade unions and neighbourhood associations. Initiatives such as webinars and onsite meetings often prove ineffective, and businesses and residents are not consistently represented in the decision-making processes for circular economy strategies.
- **Project-based engagement and lack of continuity**. Collaboration between governments, businesses and research institutions is often on an ad hoc or project-specific basis, limiting the development of a cohesive and active ecosystem to drive the transition to a circular economy. While some regions have achieved isolated successes in stakeholder engagement, these efforts lack continuity and are not based on open, sustained dialogue.

Policy recommendations

Key actions

A Checklist for Action: Stakeholder engagement

- ✓ Engage with academia and research centres to build knowledge, experiments and carry out specific analyses on flow, stocks and material input and outputs.
- ✓ Find solutions to close, narrow and slow the loops, for example digitalising information and data.
- ✓ Create interactive online platforms to encourage stakeholders to exchange information with each other on their needs and monitor the activities and updates of the platform.
- ✓ Provide opportunities for collaboration through multi-stakeholder platforms.
- ✓ Stimulate demand for new solutions (e.g. modular buildings) to be developed through joint actions between knowledge centres and the business sector.
- ✓ Identify possible pilots and experimentations that would involve research and development (R&D) and university departments, based on the needs of the municipality or the regional government (e.g. circular activities in sector such as mobility, tourism, food, waste, bioeconomy, etc.).
- ✓ Collect academic and business proposals to put in place circular activities with social impact and consider support for implementation (e.g. financial support for students).
- ✓ Create coworking spaces for cross-fertilisation amongst several actors.

Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.*

Make it right

- **Map stakeholders by considering their interests, influence, and potential contributions to a circular economy roadmap/ strategy**. As part of this exercise, it would be important to identify "less visible" actors with relevant capacities and resources for the circular economy transition.

- **Create a community of experts**. The community could include representatives from industries, as well as academia, NGOs and government bodies. Joint problem-solving sessions, the development of action plans and the establishment of evaluation and monitoring mechanisms would help to prioritise and implement circular economy actions.
- **Integrate circular economy concepts into existing stakeholder engagement initiatives**, such as those focused on waste management. Regular meetings could be used to identify leading actors in circular economy efforts and integrate them into broader strategic discussions, ensuring that both established and emerging stakeholders are involved.
- **Involve actors from industrial areas and startup incubators**, in the development of future circular economy strategies. These networks can provide innovative solutions and entrepreneurial insights to support the transition, particularly in areas such as business model innovation and sustainable product development. Consider establishing formal co-operation agreements with universities and research centres to support long-term circular economy research and innovation.
- **Support bottom-up initiatives by providing funding, technical assistance, amongst others**. Creating an enabling environment through simplified regulations, capacity-building programmes, and networking opportunities could ensure that bottom-up solutions contribute effectively to broader circular economy objectives while engaging citizens and businesses in meaningful ways.
- **Use a variety of engagement platforms** such as surveys, interviews, roundtable discussions and co-design workshops to gather local insights and ensure that the strategy reflects the needs and priorities of all stakeholders. Regular workshops, co-design sessions, and community forums will facilitate the identification of circular economy opportunities and ensure collective ownership of the transition process.
- **Showcase progress and results**. Transparent communication about achievements, challenges, and next steps of circular economy initiatives could ensure sustained engagement and a collective focus on overcoming barriers.

Good practices

- The increasing academic focus on the circular economy is evident in the rise of scientific publications on the topic, particularly in the EU27, where the share of related articles surged from 0.01% in 2010 to 1.29% in 2023. In Central Macedonia (Greece), the One-Stop Liaison Office fosters collaboration between universities, research centers, and industry, enhancing circular innovation pathways. Similarly, Berlin's House of Materialisation drives applied research on sustainable business practices, creating real-world applications for circular economy principles. Likewise, in the Valencia Region (Spain), the Network of Chairs for the Transformation of the Economic Model unites five regional universities to support public policy design and knowledge dissemination in critical areas such as circular water management, digitalisation, and climate change adaptation.
- In Bodø, Norway, the CityLab Stakeholder Platform (2019-2023) combined physical and virtual engagement methods, integrating 3D visualisations to facilitate community input on urban development. A dedicated information portal ensures structured feedback from citizens, civil society organisations, and local businesses, enhancing transparency and participatory governance.
- In Apeldoorn, Netherlands, a co-design process for public space renovation maps collaboration among stakeholders, leveraging digital tools to structure participation and communication strategies throughout project phases. Seville, Spain, has developed a centralised City Simulation Platform that integrates multiple software tools and datasets to advance circularity objectives. This includes a Construction and Demolition Waste Flow Optimisation Instrument, which supports efficient waste management, and a Wellbeing Monitoring Tool, which assesses the social impacts of circular interventions. By facilitating data exchange and promoting informed decision-making, these platforms enhance cities' ability to implement systemic circular economy strategies.

Sources: OECD (2024[19]), The Circular Economy in Central Macedonia, Greece, https://doi.org/10.1787/19f00380-en; OECD (2024[18]), The Circular Economy in Berlin, Germany https://doi.org/10.1787/459defe7-en; European Commission (2025[20]), Scientific articles on circular economy, https://www.eea.europa.eu/en/circularity/thematic-metrics/enabling/scientific-articles-on-circular-economy; CityLoops (2025[21]), CDW Replication Package 2, https://cityloops.eu/fileadmin/user_upload/RP2-stakeholder_engagement.pdf.

Appropriate scale: Adopt a functional approach

Appropriate scale involves implementing circular economy solutions at the most relevant level, across administrative boundaries, to strengthen urban-rural linkages and regional synergies. This includes supporting small-scale pilots, fostering industrial-urban symbiosis and working with service providers to effectively test and scale circular initiatives. Almost half (51%) of survey respondents reported that circular economy initiatives are experimented at various scales and favour urban-rural linkages, where appropriate and in some cases, they are embedded into a territorial approach (Table 3.8).

Table 3.8. How are surveyed cities and regions doing? Appropriate scale

Appropriate scale: Are circular economy initiatives implemented at the most appropriate scale?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
According to the characteristics of various sectors (e.g. mobility, built environment, water, etc.), the government is exploring how to facilitate collaboration across value chains and at the most appropriate scale.	The government supports the conceptualisation of circular demonstration projects, experiments and pilots at various scales and makes available spaces, areas, facilities and/or financial support.	Small-scale initiatives are identified, for example at the neighbourhood or community-based level. Functional approaches across urban and rural areas are taken into account.	Circular economy initiatives are experimented at various scales and favour urban-rural linkages, where appropriate.	Circular economy initiatives are embedded in a territorial approach, considering functional rather than administrative boundaries.	Circular economy initiatives are embedded in a territorial approach, considering functional rather than administrative boundaries. Results are monitored and follow-up initiatives are considered.
Respondents					
Sofia (BGR), Prague (CZE), Haar (DEU), Esch-sur-Alzette (LUX), Budapest (HUN), Braga (PRT), Canary Islands, Guadalajara, Manresa (ESP)	Berlin (DEU), Tampere Region (FIN), Tilos (GRC), Western Region (IRL), Genoa (ITA), Valongo (PRT), Basque Country, Valencia, Vitoria-Gasteiz (ESP), Amsterdam (NLD)	Jyväskylä (FIN), Eurométropole of Strasbourg (FRA), Central Macedonia (GRC), Milan (ITA), Møre and Romsdal (NOR), Ljubljana, Podravje (SVN), Granada (ESP), The Hague (NLD), Matosinhos (PRT)	Brussels (BEL), Tallinn (EST), Helsinki-Uusimaa, Kouvola, Lappeenranta, Päijät-Häme (FIN), Munich (DEU), Florence (ITA), Niederanven, Wiltz (LUX), Torres Vedras (PRT), Bratislava (SVK), Castile and León, Valladolid (ESP), Gothenburg, Malmö (SWE), Haarlem, Metropolitan Region Amsterdam, Tilburg, Zuid-Holland Region (NLD), London (GBR)	Flanders, Leuven (BEL), Oulu, Turku (FIN), Roubaix (FRA), Krefeld (DEU), Bodø (NOR), Guimarães, (PRT), Glasgow (GBR)	
15%	**17%**	**17%**	**36%**	**15%**	**0%**

Note: Based on 59 responses to the question: “Appropriate scale: Are circular economy initiatives implemented at the most appropriate scale?” Survey respondents were invited to select one of the following options: “Planned”, “In development”, “In place, not implemented”, “In place, partly implemented”, “In place, functioning”, “In place, objectives achieved”. Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Limited territorial approach.** Many circular economy initiatives are confined to micro or meso-level projects, without a broader territorial scope. For example, in many regions, industrial symbiosis projects remain restricted to industrial areas and have not expanded into commercial areas or neighborhoods, preventing the full realisation of a territorial approach to circular economy transition.
- **Barriers to circular supply chains.** Circular supply chains, which often span multiple municipalities or regions, face logistical challenges due to the multiplicity of permits required for the transport of secondary materials. This hampers the efficient functioning of circular supply chains and reduces the effectiveness of circular economy strategies. This fragmentation limits the functionality of circular supply chains and discourages businesses from adopting circular practices on a larger scale.
- **Waste management challenges.** In some cities and regions, waste management systems are inefficient and contribute to resource mismanagement. Waste management practices remain siloed and often focus narrowly on recycling or waste treatment, such as incineration, which may occur outside the region. Fluctuating costs for waste incineration further complicate waste management, diverting focus from strategies to reduce waste generation and reuse materials. Moreover, the lack of harmonised methodologies and targets for waste sorting, collection and treatment across jurisdictions undermines the scalability of circular economy practices.
- **Limited upscaling.** Pilot projects, such as in the building sector, are often experimental and restricted to specific areas. In many cases, not only do they fail to address the broader requirements of a holistic circular economy, such as resource reuse, lifecycle extension, and secondary material markets, but they also lack the scale and integration needed for systemic impact.

Policy recommendations

Key actions

A Checklist for Action: Appropriate scale

- ✓ Facilitate territorial linkages between urban and rural areas.
- ✓ Facilitate neighbourhood or community-based plans and initiatives.
- ✓ Experiment circular economy projects at small scales (e.g. a university campus, a neighbourhood, a city district).
- ✓ Identify industrial and urban symbiosis opportunities.
- ✓ Evaluate partnerships with local or metropolitan service operators to apply the circular economy at the metropolitan level.

Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.*

Make it right

- **Create testbeds and living labs for circular economy solutions.** These spaces should enable the development, testing and scaling of innovative technologies and business models aimed at closing, narrowing and slowing material loops. Cities can designate specific neighbourhoods or districts as innovation hubs where businesses, residents, and researchers can test new circular practices, such as material-sharing platforms, decentralised recycling systems, or bio-based materials.
- **Start small and scale up** by launching small-scale circular economy initiatives in specific areas such as university campuses, neighbourhoods, or local districts, with the idea of scaling them up. These pilots would serve as testing grounds to assess the feasibility, scalability and impact of circular economy strategies before wider implementation.
- **Link urban and industrial symbiosis** by identifying and developing synergies between urban development projects and existing industrial symbiosis clusters, focusing on the exchange of materials, energy and space. Options could include projects such as the use of industrial waste

heat for district heating, the establishment of shared composting facilities for nutrient recovery, or the promotion of local remanufacturing of textile waste.

Good practices

- Since 2013, three symbiotic clusters have been created in the Eurométropole of Strasbourg (EMS) - CLES, Rhenan Ecoparc and Plaine des Bouchers. Created in 2013, *Coopérations Locales et Environnementales en Synergies (CLES)* is an industrial symbiosis complex that brings together 32 companies from the Port of Strasbourg. From 2020, 23 companies within the existing *Rhenan Ecoparc* have identified more than 70 possible symbiotic links between themselves through workshops. In 2023, the EMS launched an initiative to create a new industrial symbiosis network in the south of its territory (*Plaine des Bouchers*), but no further official information is available on this project.
- ECO3 is a public-private partnership established in 2014 and led by the City of Nokia, Finland, based on collaboration between private companies and universities. By 2020, the ECO3 network will include 28 partner organisations from different industries. Since the start of industrial symbiosis activities, an estimated EUR 70 million in committed investments have been achieved and around 200 jobs have been created. ECO3 uses urban inputs and outputs in its operations: for example, the integration of a biogas plant in ECO3 triggered a tender for gas-powered vehicles in the city and the construction of two private filling stations for commercial use.
- In 2023, the Region of Central Macedonia invested EUR 2.3 million in the construction of the first industrial symbiosis park (i.e. Circular Economy Park) in Thessaloniki, which is expected to connect more than 60 industrial companies by 2027. To guide the early development of the park, the region has launched an action plan for the period 2023-2027. The action plan foresees a series of steps: (i) defining the boundaries of the symbiotic system, (ii) recording and categorising the input and output flows of the participating industrial units, (iii) identifying possible symbiotic actions, (iv) checking the compatibility and possible synergies between the companies, (v) creating cohabitation scenarios for sharing space and resources, and (vi) evaluating the scenarios. The regional government plans to launch the industrial symbiosis area by 2027.
- In 2022 the Møre and Romsdal County Council launched the *2023-2026 Strategy for Environment, Climate and Energy (Fylkesstrategi for miljø, klima og energi)*. The County Council supports five industrial symbiosis pilot projects: one to test the potential for regional algae production using CO_2 from an incineration plant; one on the exchange of by-products across business; two on the optimisation of resources in the and Sunndal Industrial parks; one to facilitate circular value chains for aluminium. These pilot projects are supported by the Skaparkraft project, which has allocated EUR 1.5 million per year from 2022 to 2032 for the development of circular value chains.
- Since 2020, the Region of Valencia has been trying to stimulate innovation and material exchange between companies. Projects led by the Technological Institute for Metalworking, Furniture, Wood, Packaging and Related Industries (AIDIMME) have identified opportunities for cross-sector collaboration by creating an intelligent digital ecosystem, developing diagnostic and feasibility analysis tools (e.g. Circulariza), promoting industrial symbiosis potential and facilitating co-operation. Recent projects have focused on more specific issues, such as the recovery of valuable materials from industrial waste, including wastewater, heavy metals (chromium, copper) or automotive catalysts. AIDIMME developed and launched SIMBYLAY, a

free web platform where companies in any sector can sell or donate their surpluses to other companies. Similarly, but with a focus on the hospitality sector, the ECO-ONE platform developed by the Hotel and Tourism Business Association of the Region of Valencia (HOSBEC) allows hotels to sell and buy second-hand furniture. In addition, the Valencia Innovation Capital initiative, developed by the Valencia Region Foundation for Strategic Promotion, Development and Urban Promotion, uses the city as a testing ground, bringing together actors (e.g. technology centres, SMEs) to develop solutions to urban challenges.

Sources: Lander Svendsen (2021[22]), Guide: How can municipalities support the development of industrial symbiosis, https://symbiosecenter.dk/wp-content/uploads/2021/01/Guide-how-can-municipalities-support-the-development-of-industrial-symbiosis-final-version.pdf; Thessaloniki Chamber of Industry (2023[23]) Action plan for the creation of a circular economy park in Sindos; Municipality of Paterna (2025[24]); Simbiosis Industrial, https://www.lokinn.com/sinergias/paterna-ciudad-empresas; ECO-ONE (2020[25]), La primera plataforma de compra y venta de muebles entre hotels, https://eco-one.es/mercado-segunda-mano/?utm_source=newsletter&utm_medium=email&utm_campaign=hosbec.

Regulation: Identify the regulatory instruments that need to be adapted to foster the transition to the circular economy

Regulation means adapting regulatory frameworks to support the transition to a circular economy and includes clarifying regulatory uncertainties, allowing local adaptation, encouraging experimentation and using tools such as Green Public Procurement (GPP) to promote eco-efficiency and eco-design while guiding market transformation. Responses to the survey report that the majority of cities and regions are in the phase of identifying regulatory barriers or adapt regulation towards the circular transition (Table 3.9).

Table 3.9. How are surveyed cities and regions doing? Regulation

Regulation: Is regulation fit to foster the transition to a circular economy?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The government identifies regulatory gaps, obstacles and considers solutions.	The government develops or adapts regulation to enhance the transition towards a circular economy (e.g. plastic, energy use, secondary material). Stakeholders are consulted.	The update of regulations for various or specific sectors (e.g. from land planning to food) is in place but not yet implemented.	Regulation is conducive of circular economy practices in an experimental way. It can be further scaled up.	Regulation is fit to foster the circular economy transition in various sectors.	Regulation is fit to foster the circular economy transition. A dialogue across levels of government is established when responsibilities are shared. Results are monitored and initiatives scaled up.
Respondents					
Sofia (BGR), Prague (CZE), Helsinki (FIN), Tilos (GRC), Budapest (HUN), Turin (ITA), Esch-sur-Alzette (LUX), Braga, Torres Vedras (PRT), Amsterdam, The Hague, Tilburg (NLD)	Leuven (BEL), Jyväskylä, Lappeenranta, Mikkeli (FIN), Eurométropole of Strasbourg (FRA), Berlin, Haar, Munich (DEU), Central Macedonia (GRC), Genoa (ITA), Wiltz (LUX), Møre and Romsdal (NOR), Matosinhos, Valongo (PRT), Podravje (SVN), Canary Islands, Vitoria-Gasteiz (ESP), Gothenburg, Malmö, Västra Götaland (SWE), Metropolitan Region Amsterdam, Zuid-Holland Region (NLD)	Päijät-Häme (FIN), Florence (ITA), Niederanven (LUX), Granada, Valencia (ESP)	Brussels, Flanders (BEL), Tallinn (EST), Helsinki-Uusimaa, Kouvola, Tampere Region, Turku (FIN), Roubaix (FRA), Western Region (IRL), Bratislava (SVK), Basque Country, Castile and León, Valladolid (ESP), Haarlem (NLD), Glasgow, London (GBR)	Oulu (FIN), Guimarães (PRT), Guadalajara (ESP)	
21%	**38%**	**9%**	**27%**	**5%**	**0%**

Note: Based on 58 responses to the question: “Regulation: Is regulation fit to foster the transition to a circular economy?” Survey respondents were invited to select one of the following options: “Planned”, “In development”, “In place, not implemented”, “In place, partly implemented”, “In place, functioning”, “In place, objectives achieved”. Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Fragmented regulatory landscape and barriers.** Both public and private actors face significant challenges in navigating the complex and often fragmented regulatory frameworks that define waste management and circular economy initiatives. Companies transitioning to circular business models face regulatory barriers when trying to use recovered materials as substitutes for virgin materials. The complex processes for obtaining end-of-waste classification or by-product status, combined with stringent certification requirements, discourage companies from adopting circular solutions. Existing regulations, including building codes, taxation and certification standards, predominantly favour linear economic practices. The lack of systemic alignment with circular economy principles, such as reuse, reduce and rethink resource use, undermines the effectiveness of regulatory frameworks and perpetuates a reliance on waste management over prevention and resource reuse.
- **Implementation and enforcement issues.** Despite the existence of legal frameworks, such as commercial waste regulations or green public procurement laws, their implementation remains limited in many cities and regions due to enforcement challenges and capacity issues, resulting in low compliance rates. In many cases, efforts to introduce mechanisms such as pay-as-you-throw (PAYT) systems are hampered by legal delays and a lack of supporting digital infrastructure.
- **Limited integration of Life Cycle Analysis (LCA).** Public procurement frameworks, while capable of integrating LCA criteria, often lack the internal capacity and clear guidance to do so effectively, resulting in missed opportunities to promote sustainable design and production practices.

Policy recommendations

Key actions

A Checklist for Action: Regulation

- ✓ Identify cases in which it is possible to adapt the regulation (e.g. land use, permits) at the local level.
- ✓ Establish a dialogue with the national government on needed regulatory frameworks updates when the responsibility goes beyond that of cities and regions.
- ✓ Implement green public procurement.
- ✓ Establish clear requirements in tenders to foster the use of circular economy principles:
  - Apply a life cycle analysis approach.
  - Carry out market analysis and stimulate demand.
  - Stimulate a dialogue among the governmental departments and areas involved in promoting the circular transition.
  - Consider dividing public tenders into lots that enable SMEs and local entrepreneurs to participate in tenders.
  - Create a monitoring and evaluation framework for green public procurement.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Use regulatory sandboxes** to allow businesses and innovators to trial new processes, products, and business models under a controlled and supportive regulatory environment. This approach encourages experimentation while safeguarding environmental and social standards. The sandbox could be tailored to accommodate circular practices such as industrial symbiosis, material recovery innovations, and product-as-a-service models. Insights gained from the sandbox can inform permanent regulatory frameworks that remove barriers to scaling successful circular solutions.
- **Streamline and harmonise permits to provide clear, standardised guidelines and timelines for the application of circular economy principles in the building, transport, food and other sectors**. This would reduce administrative burdens and encourage businesses to adopt circular

practices. Digital platforms can further enhance efficiency by enabling real-time tracking and submission of required documentation.

- **Introduce circular economy targets for circular practices in priority sectors such as construction, packaging, electronics, and textiles**. These targets should focus on waste reduction, material recovery rates, and the integration of secondary materials into production. For instance, public procurement requirements could consider minimum recycled content in packaging or require construction projects to achieve specific levels of material recovery in the end-of-life phase. Regular monitoring and enforcement mechanisms should ensure compliance and provide data to refine future policies.

Good practices

- In the United States, innovative policies are emerging at subnational level to increase producer responsibility and material recovery. Washington is set to become the first state to implement Extended Producer Responsibility (EPR) for solar panels in 2025, requiring manufacturers to fund the collection and recycling of photovoltaic panels. This initiative is expected to strengthen recycling markets, particularly for aluminium and glass, which are key components of solar panels. At the same time, efforts are being made to include solar panels in existing certification standards for recyclers to promote responsible materials management. Similarly, California's Plastic Pollution Prevention and Packaging Producer Responsibility Act requires that all single-use packaging and plastic food service ware sold in the state be recyclable or compostable by 2032. The law also sets targets for 65% recycling of these materials and a 25% reduction in their sale, encouraging a more circular approach to plastic use.
- In 2024, the city of Valencia, Spain, launched an Urban Sandbox initiative to use urban spaces, infrastructure and events as testing grounds for innovation and circular economy projects for companies to develop new technologies or business models. These companies can carry out trials and test solutions before making significant investments. Examples of projects tested in the Urban Sandbox include a beach cleaning robot, which works in a similar way to domestic robots but is adapted for beach environments. Designated beach zones have been used to trial this technology. Another initiative involves retrofitting urban streetlights to serve a dual purpose, providing lighting and acting as charging stations for electric vehicles. In addition, sports facilities are being used to test new products and services aimed at reducing energy consumption while maintaining or improving quality and comfort standards.
- The Province of Zuid-Holland, Netherlands, uses a variety of tools to promote sustainable practices, such as sustainable public procurement criteria, and a web tool to help organisations apply the ISO 20400 on Socially Responsible Purchasing. These tools are complemented by procurement strategies, support for buyer groups (e.g. research, knowledge, purchasing advice) and the Circular Procurement Acceleration Network (*Versnellingsnetwerk Circulair Inkopen*, VCI in Dutch). VCI connects public organisations to one another to facilitate the integration of circular principles into their procurement activities, from understanding what circularity means in procurement to selecting the right products.
- The Berlin Tendering and Procurement Act (BerlAVG) and the subsequent Administrative Regulation on Procurement and the Environment (VwVBU) of 2021 contain comprehensive measures for green procurement, including information on environmental requirements, design guidelines and a list of procurement restrictions, such as disposable beverage packaging, disposable cutlery and tableware, and cardboard packaging with less than 70% recycled content. In addition, the VwVBU incorporates a Life Cycle Cost Analysis (LCA) for electrical equipment, road vehicles, data centres and passenger and freight elevators. The LCA analysis

takes into account energy consumption, carbon and other pollutant emissions. While the current regulation has the potential to further reduce waste generation, it is not necessarily conducive to more innovative circular business models in internal procurement processes; the current regulation does not include or favour circular business models in procurement.

Sources: RSS (2023[26]), Local Government Funding for Solid Waste, https://apps.ecology.wa.gov/publications/documents/2307047.pdf; Valencia City Council (2024[27]), Valencia Innovation Capital Sandbox, https://www.valencia.es/web/sandbox/cas/inicio; IEEP (2017[28]), EPR in the EU Plastics Strategy and the Circular Economy: A focus on plastic packaging, https://zerowasteeurope.eu; OECD (2024[18]), The Circular Economy in Berlin, Germany, https://doi.org/10.1787/459defe7-en; OECD (2024[17]), The Circular Economy in Zuid-Holland, Netherlands, https://doi.org/10.1787/d568d66e-en.

Financing: Help mobilise financial resources and allocate them efficiently

Financing involves the mobilisation and efficient allocation of financial resources by facilitating access to different financial instruments, such as grants and venture capital, to support circular businesses, considering available budgets and funding opportunities. For 60% of surveyed cities and regions, financial instruments and/or a dedicated budget for circular economy initiatives and projects are planned or in development. (Table 3.10).

Table 3.10. How are surveyed cities and regions doing? Financing

Financing: Are financial resources mobilised and efficiently allocated?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
Financial instruments and/or a dedicated budget for circular economy initiatives and projects are planned.	The creation of a dedicated budget and/or the setup of financing mechanisms for the circular economy are in development (e.g. multi-annual budgets).	Financial instruments are in place but resources not yet allocated.	Financial instruments are in place and partly implemented. Private sector financing is mobilised, if need be.	Financial instruments are in place and functioning (e.g. schemes to offer subsidised loans or credit guarantees to circular economy companies, in co-operation with private and semi-public financial institutions).	Financial instruments are well functioning and impacts are monitored (e.g. promoting systematic recognition of good practices through project audits).
Respondents					
Sofia (BGR), Prague (CZE), Jyväskylä, Kouvola (FIN), Haar (DEU), Budapest (HUN), Western Region (IRL), Wiltz (LUX), Braga, Torres Vedras (PRT), Podravje (SVN), Guadalajara (ESP), Västra Götaland (SWE)	Leuven (BEL), Helsinki-Uusimaa, Lappeenranta (FIN), Roubaix (FRA), Berlin, Munich (DEU), Central Macedonia, Tilos (GRC), Florence, Turin (ITA), Møre and Romsdal (NOR), Matosinhos, Valongo (PRT), Basque Country, Canary Islands, Granada, Manresa, Vitoria-Gasteiz (ESP), Gothenburg (SWE), The Hague (NLD), Glasgow (GBR)	Bratislava (DEU), Valencia (ESP), Amsterdam (NLD)	Flanders (BEL), Tallinn (EST), Oulu, Päijät-Häme, Tampere Region (FIN), Eurométropole of Strasbourg (FRA), Genoa (ITA), Niederanven (LUX), Bodø (NOR), Valladolid (ESP), Malmö (SWE), Metropolitan Region Amsterdam, Zuid-Holland Region (NLD), London (GBR)	Brussels (BEL), Turku (FIN), Castile and León (ESP), Haarlem, Tilburg (NLD)	Guimarães (PRT)
23%	**37%**	**5%**	**24%**	**9%**	**2%**

Note: Based on 57 responses to the question: "Financing: Are financial resources mobilised and efficiently allocated?" Survey respondents were invited to select one of the following options: "Planned", "In development", "In place, not implemented", "In place, partly implemented", "In place, functioning", "In place, objectives achieved". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Limited financial power and competencies.** Local and regional authorities often lack direct financial powers to provide structural support for circular economy activities. In many cases, financial support to businesses and organisations is limited by national or EU schemes, which restrict local authorities to ad hoc, project-based funding or temporary exemptions. Municipalities may also face fiscal constraints, such as the golden rule, which limits borrowing to capital investment. As circular economy initiatives often generate financial returns over an extended period of time, they may not meet traditional investment criteria, making it more difficult to secure funding.
- **Lack of a dedicated, long-term budget or ring-fenced funding for circular economy initiatives**. While some frameworks, such as environmental funds or landfill taxes, have been envisaged or introduced, these mechanisms are not always operational, remain centrally managed or are insufficiently responsive to local needs. The absence of such funding streams leads to reliance on ad hoc or external sources, such as European programmes, which are not necessarily guaranteed in the long term. In some cases, circular economy activities are also redirected from waste management budgets, which focus primarily on downstream solutions, such as reducing landfill, rather than upstream initiatives such as separate collection, eco-design or prevention.
- **Challenges in mobilising private investment.** Access to private finance remains a major challenge for circular economy initiatives. Private investors perceive the sector as highly risky due to the need to finance entire value chains rather than individual companies, as well as the competitive disadvantage of circular activities compared to dominant linear models.

Policy recommendations

Key actions

A Checklist for Action: Financing

- ✓ Facilitate access to finance and broaden the range of financial instruments for entrepreneurship.
- ✓ Liaise with the national government's departments to clarify existing funding opportunities and with other cities to learn about their experience in catalysing financial resources.
- ✓ Create a scheme to offer subsidised loans or credit guarantees to companies following circular economy principles, in co-operation with private and semi-public financial institutions.
- ✓ Explore putting in place rewards to companies through corporate income tax, reduced VAT on products labelled as circular.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **De-risk investments in early-stage circular ventures to encourage private-sector participation and accelerate the development of scalable solutions.** For example, Public-Private Partnerships (PPPs) can support the development of innovative solutions, such as circular industrial parks or resource-sharing platforms, that require substantial initial investment but offer significant long-term benefits.
- **Introduce green bonds** to finance infrastructure projects such as modular construction initiatives, and sustainable transport systems. Tying bond issuance to measurable circular economy outcomes could help improve accountability, while attracting environmentally conscious investors. These bonds could be implemented to regenerate natural capital (e.g. restoring degraded soils); develop circular design to reduce waste and pollution; develop production processes that rely on or produce recycled resources; improve resource efficiency in supply chains; implement reverse logistics, including collection, segregation and recycling; and develop innovative technologies that enable circular business models (e.g. digital marketplaces) (Intesa Sanpaolo, 2024[29]).

- **Facilitate access to EU and international funding through dedicated support structures**, such as advisory units or liaison offices, can help stakeholders navigate complex funding applications and maximise financial resources for circular initiatives. Additionally, governments can leverage co-financing mechanisms and partnerships with financial institutions to de-risk circular investments and ensure long-term economic viability.
- **Implement "pay-as-you-throw" (PAYT) schemes** to incentivise citizens to reduce waste and foster reuse. The PAYT modulates waste management fees paid by users based on the amount of waste delivered to the waste management system (OECD, 2016[30]). It would provide an economic incentive for consumers to reduce and sort waste adequately at the source, reducing the amount of waste managed by local and regional authorities and improving the quality of collected recyclate, which could be used, for instance, to manufacture secondary material.

Good practices

- Green bonds offer city governments a viable mechanism to diversify their funding sources, reducing their reliance on public finances or the conventional banking system. This approach enables cities to finance projects that are in line with sustainability goals and might otherwise remain unfunded.
  - Toronto, Canada, has launched a green bond programme to help achieve its goal of net-zero greenhouse gas emissions by 2040. The programme channels green bond funds into the city's capital budget to support projects that integrate circular economy practices. Examples include using recycled or alternative materials in construction, adopting rental and maintenance-based consumption models, and upgrading infrastructure with advanced sustainable technologies.
  - Cape Town, South Africa, used a ZAR 1 billion green bond to address a severe water crisis between 2015 and 2018. The bond funded critical water management projects aimed at building resilience to future water shortages. To diversify its investor base, Cape Town also encouraged local residents to invest, promoting community engagement in sustainable urban development.
  - In the US, San Francisco has used green bonds to finance critical low-carbon and climate-resilient initiatives since 2015. Examples of financed initiatives include the rehabilitation of the Mountain Tunnel, an integral part of the Hetch Hetchy Regional Water System, which supplies drinking water to 2.7 million residents in the Bay Area.
  - In Norway, the Norwegian Agency for Local Government, part of the Ministry of Local Government and Regional Development, has issued green bonds to support municipal projects aimed at promoting a low-carbon and climate-resilient transition. These bonds have financed initiatives in several sectors, including energy-efficient building upgrades and improved waste management systems.
- Lisbon, Portugal, allocated funds for participatory budgeting exclusively earmarked for environmentally friendly projects, amounting to EUR 2.5 million for the 2019-21 cycle. A total of 16 out of 251 proposals concerned the implementation of circular economy criteria into built environment projects.
- In 2020, the city of Cleveland, United States, introduced the Circular Cleveland initiative, which included the Circular Cleveland Community Grants amounting to USD 40 771 from 2020 to 2023. The Circular Cleveland Grant Making Committee, composed of local residents engaged in circular economy efforts, selected recipients of funds based on their adherence to circular economy principles, community involvement and potential for initiative replication. Grant

recipients used the funds to divert waste from landfills, reduce pollution, sustain the use of products and materials, and restore natural systems.

- Between 2021 and 2024, the Netherlands offers subsidies for circular economy breakthrough projects that provide a total budget of EUR 400 000 for orchestrated efforts of 3-5 years. This subsidy requires an existing consortium of chain partners, a signed ambition document and an action plan to achieve a circular value chain. The subsidy is meant to implement the consortium's action plan. The subsidy is aligned to the priority value chain included in the Dutch strategy A Circular Economy in the Netherlands by 2050 (i.e. plastics, consumption goods, construction, and manufacturing). The subsidy has been granted for projects in the construction, manufacturing, and textile industries.
- In 2022, the city of Tübingen, (Germany) introduced a citywide tax on single-use plastic items as part of a broader strategy to promote reuse. The tax applies to EUR 0.50 for single-use food and drink packaging, including disposable coffee cups, food trays and takeaway boxes, and EUR 0.20 for single-use cutlery and straws. The tax on a single meal is capped at EUR 1.50. Data on the impact remains scarce, but city officials reported that an analysis of public waste bins in January 2022 showed a reduction of around 15%.

Sources: City of Toronto (2025[31]), Green Debenture Program, https://www.toronto.ca/city-government/budget-finances/city-finance/investor-relations/green-debenture-program/; WEF (2023[32]), What are Municipal Green Bonds and how are global cities using them to finance green projects?, https://www.weforum.org/stories/2023/11/heres-how-3-cities-are-using-municipal-green-bonds-to-finance-climate-infrastructure/; C40 (2022[33]), How to decide if green bonds are right for your city, https://www.c40knowledgehub.org/s/article/How-to-decide-if-green-bonds-are-right-for-your-city?language=en_US; OECD (2022[34]) Aligning Regional and Local Budgets with Green Objectives: Subnational Green Budgeting Practices and Guidelines; Sustainable Cleveland (2024[35]), What is Circular Cleveland?, http://www.sustainablecleveland.org/circular_cleveland; OECD (2024[18]), The Circular Economy in Berlin, Germany, https://doi.org/10.1787/459defe7-en; Zero Waste Europe (2022[36]), The Story of Tübingen, https://zerowasteeurope.eu/wp-content/uploads/2024/11/Tubingen-Case-Study.pdf.

Capacity building: Adapt human and technical resources to the challenges at hand

Capacity building focuses on strengthening human and technical resources through targeted training for public administrations, the private sector and civil society. It supports technical expertise, policy development and the implementation of circular economy tools while fostering knowledge sharing and co-operation through networks and city-to-city learning initiatives. Only 14% of surveyed cities and regions have specific capacity-building programmes in place, tailored to different needs and stakeholders and able to develop new skills and technical competencies (Table 3.11).

Table 3.11. How are surveyed cities and regions doing? Capacity building

Capacity building: Does human and technical capacity match the challenges for setting and implementing a circular economy system?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The government is reviewing and analysing the required skills and capacities for carrying out all activities associated with implementing the circular economy.	Specific capacity-building, training or educational programmes for the circular economy are planned. They can be related to green public procurement, resources management, etc.	Some initial capacity-building experiences for the circular economy are in place but they are still fragmented and soft (e.g. workshops, seminars).	Existence of specific capacity-building programmes on the circular economy and/or activities associated with specific aspects of the circular economy and related sectors.	Specific capacity-building programmes are in place. They are result-oriented and tailored to different needs and stakeholders. They focus on developing new skills and technical competencies.	Specific capacity-building programmes are implemented. They contribute to creating new skills, technical competencies and new jobs opportunities.
Respondents					
Prague (CZE), Jyväskylä (FIN), Haar, Munich (DEU), Braga (PRT), Canary Islands, Guadalajara (ESP)	Helsinki-Uusimaa (FIN), Krefeld (DEU), Western Region (IRL), Genoa, Turin (ITA), Esch-sur-Alzette (LUX), Budapest (HUN), Valongo (PRT), Granada (ESP), Gothenburg (SWE), Amsterdam (NLD)	Sofia (BGR), Berlin (DEU), Tallinn (EST), Päijät-Häme (FIN), Eurométropole of Strasbourg (FRA), Central Macedonia, Tilos (GRC), Møre and Romsdal (NOR), Matosinhos, Torres Vedras (PRT), Podravje (SVN), Valencia (ESP), Malmö (SWE), Metropolitan Region Amsterdam, Zuid-Holland Region (NLD)	Brussels, Flanders, Leuven (BEL), Helsinki, Kouvola, Lappeenranta, Tampere Region (FIN), Roubaix (FRA), Florence (ITA), Niederanven (LUX), Bodø (NOR), Castile and León (ESP), Västra Götaland (SWE), Haarlem, The Hague, Tilburg (NLD), Glasgow, London (GBR)	Oulu, Turku (FIN), Wiltz (LUX), Bratislava (SVK), Basque Country, Valladolid, Vitoria-Gasteiz (ESP)	Guimarães (PRT)
12%	**19%**	**25%**	**30%**	**12%**	**2%**

Note: Based on 59 responses to the question: “Capacity building: Does human and technical capacity match the challenges for setting and implementing a circular economy system?” Survey respondents were invited to select one of the following options: “Planned”, “In development”, “In place, not implemented”, “In place, partly implemented”, “In place, functioning”, “In place, objectives achieved”. Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Insufficient human resources.** Many local and regional authorities lack sufficient, long-term and dedicated human resources to implement circular economy initiatives. This lack of staff, which is exacerbated in smaller municipalities, undermines the enforcement, intergovernmental co-ordination and stakeholder engagement necessary for systemic change.
- **Limited skills in public administrations.** Public officials often lack specialised training in circular economy principles, and existing capacity-building efforts are limited to basic awareness-raising sessions. These initiatives do not provide advanced skills in cross-sectoral co-ordination, data-driven decision-making and strategic planning. This skills gap also limits the ability of regional and local authorities to align their actions with national and EU circular economy objectives. As a result, efforts to integrate broader circular concepts such as resource optimisation, extended asset lifecycles and systemic innovation remain underdeveloped.
- **Lack of skills in the private sector**. The private sector faces challenges in developing a skilled workforce capable of driving circular economy practices. Current education and training initiatives dedicated to professionals from the private sector often focus on general environmental practices without explicitly linking them to a circular economy framework, leaving a gap in sector-specific expertise. While human capital development agendas emphasise the importance of a skilled workforce, they often do not directly address the specific competencies required for the circular economy.
- **Under-exploited public-private collaboration.** Knowledge hubs and centres of competence focused on circular economy practices, while effective in supporting private businesses, are poorly integrated with public sector initiatives. This disconnect reduces opportunities for knowledge exchange, technical support, and the alignment of public and private efforts towards circular economy goals.

Policy recommendations

Key actions

A Checklist for Action: Capacity building

- ✓ Develop training programmes on the circular economy within municipal departments and for the private sector.
- ✓ Review and analyse the required skills and capacities for carrying out all the activities associated with designing, setting, implementing and monitoring the strategy.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Make sure training is fit for purpose by:**
  - Being tailored to specific departmental needs, highlighting roles in supporting new business models, job creation, and workforce development.
  - Framing the circular economy as a systemic approach beyond waste management, encompassing resource efficiency and sustainable economic growth.
  - Addressing circular economy strategies, including refuse, reduce, redesign, and reuse, as well as business models like product-as-a-service and sharing systems.
  - Including hands-on knowledge of analytical tools, such as Life Cycle Assessment and Material Flow Analysis, to improve policy design and implementation.
  - Being designed for regional and municipal staff in collaboration with academia and local entrepreneurs.
  - Including practical and conceptual training, objectives, and monitoring mechanisms to strengthen skills critical to the transition.

  - Being updated regularly to reflect the evolving landscape and ensure consistency in shared knowledge, particularly for remote and underserved municipalities to avoid leaving any city or region behind in the transition.
- **Develop circular economy skills forecasts** in collaboration with key partners (e.g. chambers of commerce, business associations) to map existing capacities and anticipate future needs. This will ensure that education and training programmes are aligned with the needs of the private and social sectors.
- **Participate in peer learning networks** that can enable knowledge exchange on circular economy practices. Mentorship programmes and structured dialogues between frontrunners and learning cities can accelerate capacity-building. Networks such as the Circular Cities and Regions Initiative (CCRI) exemplify this approach.
- **Leverage AI to enhance circular economy workforce development**, analyse labour market trends, predict job displacement, identify up and re-skilling needs, promote circular business models, optimise supply chains, and enhance training programmes. Key partners (e.g., academia, industry leaders, and innovation hubs) could ensure that workers are equipped with AI and digital skills relevant to circular economy roles.

Good practices

- The EIT Campus, funded by the European Institute of Innovation and Technology (EIT) and the European Union, offers a wide range of programmes in innovation, sustainability and entrepreneurship. These educational initiatives aim to support the skills transition needed for a greener and healthier Europe. The platform includes courses that combine artificial intelligence (AI) with the circular economy. Topics covered include (i) Data analysis, to improve knowledge of supply chains and product lifecycles; (ii) Predictive maintenance and resource optimisation, to analyse the performance of machinery and equipment; (iii) Circular design and product lifecycle management, to promote sustainable product development; (iv) Supply chain optimisation, using AI to identify efficient routes, reduce transport emissions and minimise excess inventory; and waste management and recycling, using AI-powered robots and machines to sort and process recyclable materials, improve resource recovery and drive a circular economy.
- AISkills4CT, a project co-funded by the Erasmus+ programme, aims to equip agri-food professionals with targeted knowledge and skills in AI technologies. The initiative supports the development of a circular food chain models by integrating environmental, social, economic and digital dimensions. The main objective of the project is to raise awareness and train agri-food professionals on the use of AI along supply chains, enabling a digital transformation of their industries, with a particular focus on how AI could facilitate and support the implementation of circular economy principles.

Sources: EIT Campus (2023[37]), 5 top professional domains that combine AI and circular economy skills, https://eit-campus.eu/blog/5-top-professional-domains-that-combine-ai-and-circular-economy-skills; AISkills (2024[38]) AISkills4CircularTransition, https://www.aiskills4ct-erasmus.eu/;

Innovation: Support business development

Innovation in the circular economy involves sustainable technologies as well as new partnerships and business models. Local and regional governments can foster innovation by creating experimental spaces, stimulating demand as "launching customers", building stakeholder networks, supporting incubators for circular projects and providing centralised services to reduce transaction costs and encourage entrepreneurial involvement in the transition. A total of 43% of surveyed cities state that the enabling environment for supporting circular business innovation is in place (e.g. regulation, funds), implemented on an experimental basis (e.g. with the municipality acting as a launching customer) and in some cases for both large and small enterprises (Table 3.12).

Table 3.12. How are surveyed cities and regions doing? Innovation

Innovation: Are tools in place to support circular business innovation?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The government identifies urban or regional problems (e.g. waste sorting, modular building, packaging, etc.) that can be solved through innovative approaches (e.g. new business models) and is preparing calls for projects to foster circular business models.	The government calls start-ups and businesses to provide solutions to urban or regional problems through transparent selection processes. If the solution provided by a project proves successful, the local or regional government can invest in it or becomes its launching customer, for example.	The enabling environment for supporting circular business innovation is in place (e.g. regulation, funds) but not yet implemented.	The enabling environment for supporting circular business innovation is in place (e.g. regulation, funds), implemented on an experimental basis (e.g. launching customer).	A variety of instruments to support the transition towards the circular economy for both big and small enterprises are in place (e.g. networks, spaces, incubators, etc.)	The enabling environment for supporting circular business is in place (e.g. regulation, funds) and functioning. The local or regional government provides additional tools, such as co-creation spaces, networks, single window for businesses and capacity-building programme.
Respondents					
Leuven (BEL), Sofia (BGR), Jyväskylä (FIN), Munich (DEU), Western Region (IRL), Esch-sur-Alzette (LUX), Torres Vedras, Valongo (PRT), Canary Islands (ESP)	Haar (DEU), Tilos (GRC), Genoa (ITA), Budapest (HUN), Matosinhos (PRT), Bratislava (SVK), Podravje (SVN), Granada (ESP), Gothenburg (SWE), Amsterdam (NLD)	Päijät-Häme (FIN), Florence (ITA), Guadalajara, Valencia (ESP), Malmö (SWE), Metropolitan Region Amsterdam (NLD)	Tallinn (EST), Helsinki-Uusimaa, Kouvola, Lappeenranta, Tampere Region, Turku (FIN), Roubaix (FRA), Berlin, Krefeld (DEU), Turin (ITA), Niederanven, Wiltz (LUX), Møre and Romsdal (NOR), Basque Country, Castile and León (ESP), Västra Götaland (SWE), Zuid-Holland Region (NLD), Glasgow (GBR)	Flanders (BEL), Eurométropole of Strasbourg (FRA), Central Macedonia (GRC), Milan (ITA), Bodø (NOR), Valladolid, Vitoria-Gasteiz (ESP), Haarlem, The Hague, Tilburg (NLD), London (GBR)	Brussels (BEL), Oulu (FIN), Guimarães (PRT)
16%	**18%**	**10%**	**32%**	**19%**	**5%**

Note: Based on 57 responses to the question: "Innovation: Are tools in place to support circular business innovation?" Survey respondents were invited to select one of the following options: "Planned", "In development", "In place, not implemented", "In place, partly implemented", "In place, functioning", "In place, objectives achieved". Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Little dialogue between subnational governments and business actors to identify barriers to the expansion of markets for circular products and ways to address those barriers.** According to the EC Action Plan, the sustainability challenge posed by key value chains requires urgent, comprehensive and co-ordinated actions, that will contribute to the response to the climate emergency and will feed into the EU Industrial Strategy, as well as into the biodiversity, Farm to Fork and forest strategies. Companies often act in isolation and according to their level of ambition. They are not always aware of circular economy funding and programmes when they exist, and they are disconnected from the territory in which they operate.
- **Lack of a market for circular products and services.** Efforts to stimulate demand for circular products and services remain underdeveloped. Apart from isolated examples (e.g. the use of recycled concrete in construction), there is a lack of systematic initiatives to match producers of circular goods and services with potential buyers or users, which hinders the growth of circular markets across different sectors.
- **Limited ability to drive innovation.** Shortfalls in funding, regulatory incentives, incubators, networks and public-private partnerships limit the ability to drive innovation and entrepreneurship in line with circular economy goals. In addition, the innovation agendas of cities and regions are not necessarily linked to the circular economy. While innovation ecosystems exist, their connection to circular economy objectives is often minor or non-existent.
- **Lack of mechanisms to support start-ups in scaling up their operations**. Without adequate support, emerging circular businesses struggle to achieve market viability and long-term impact. While pilot projects for circular economy initiatives are often launched, challenges remain in scaling them up to wider applications. Small and medium-sized enterprises (SMEs) face significant burdens from lengthy, bureaucratic application processes and increasing data requirements for environmental reporting, which strain their limited capacities.

Policy recommendations

Key actions

A Checklist for Action: Innovation

- ✓ Create spaces for experimentation.
- ✓ Stimulate demand by being a launching customer.
- ✓ Create stakeholder networks for material chains.
- ✓ Create incubators to promote circular economy projects.
- ✓ Establish a single window for the circular economy for businesses.
- ✓ Promote public-private partnerships.

Source: OECD (2020[1]), *The Circular Economy in Cities and Regions: Synthesis Report*, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Engage with businesses as key allies in the transition to a circular economy**, facilitating open dialogue across sectors to identify industry-specific challenges and co-develop tailored circular economy solutions.
- **Foster collaboration between niche innovators and regime actors**, breaking existing path dependencies across them. To this end, for example, cities and regions can stimulate a dialogue between niche actors and procurement officers to seek innovative ideas and provide economic incentives.
- **Facilitate the scaling-up of circular business models.** Support businesses with the potential to scale up business practices after the pilot phase by navigating administrative processes, providing technical and regulatory guidance, and facilitating business support services.

- **Support challenge-based innovation calls** for small and medium-sized enterprises to address market needs and societal challenges, including within the plastics value chain.
- **Leverage technology** by exploring how digitalisation, including artificial intelligence, can optimise supply chains, marketing and logistics.
- **Create knowledge transfer hubs** to ensure effective knowledge exchange between academia and business on circular economy practices and include specialised research streams in academic networks focused on strategic sectors for circular models.

Good practices

- The Two Banks District in Paris, France, is the first "circular district" in Paris to bring together businesses to co-create innovative solutions for the management, operation and development of their activities on a 350-hectare site. The Two Banks District relies on a digital collaboration platform that connects large companies, entrepreneurs, NGOs, citizen groups and policymakers to share best practices and co-create solutions. More than 30 companies can share equipment and services, recycle and upcycle waste in a synergistic way, reduce single-use food packaging, use carpooling services and manage waste collectively.
- Wallonia, Belgium, has piloted a challenge-based innovation call to support small and medium-sized enterprises in addressing market needs and societal challenges in the plastics value chain. By focusing on a specific challenge and identifying the most promising solutions, the challenge-based approach has guided stakeholders in prioritising their efforts and investments, ensuring that resources are directed to the areas of greatest need.
- To promote the circular economy, the city of Almere in the Netherlands, in collaboration with the province of Flevoland and the Dutch central government, launched the UpCycle City ideas competition in 2017. The competition encouraged start-ups, businesses and research institutes to develop innovative business cases for resource reuse and sustainable investment plans. Two winners emerged, one proposing a reuse initiative for local street furniture and the other planning to set up a concrete plant using mineral streams from the city. Both winners received EUR 3 million in co-funding over 3 years to implement their respective projects.
- In the Basque Country, Spain, the Basque Ecodesign Center (BEdC) operates as a partnership among private firms, industrial clusters and the Basque government. Its aims to position the Basque Country as a leader in eco-design in the European Union. The main focus of the BEdC is the development of innovative technical projects on eco-design, including (i) the integration of life cycle thinking in supply chains, (ii) environmental assessment and improvement of organisations and buildings through a life cycle approach, (iii) research into and pilots of new circular business models and (iv) projects aiming to change consumption patterns.

Sources: IHOBE (2025[39]), Basque Ecodesign Center, https://www.basqueecodesigncenter.net; (Les Deux Rives (2020[40]), Les Deux Rives, Quartier circulaire, lesdeuxrives.paris; Wallonia Clusters (2020[41]), Call for Projects: Benefit from EUR 15k to take up a circular economy challenge related to plastics, https://clusters.wallonie.be/federateur/en/news/call-projects-benefit-15k-eu-take-circular-economy-challenge-related-plastics; Amsterdam InChange (2025[42]), Week of the Circular Economy #1: Upcyclecentre Almere, https://amsterdamsmartcity.com/updates/news/week-of-the-circular-economy-1-upcyclecentre-alm.

Data and assessment: Generate an information system and assess results

Data and assessment involve the creation of comprehensive information systems to monitor, assess and improve circular economy policies and strategies. This includes the collection of environmental, social and sector-specific data, such as resource flows, waste streams, circular job creation and existing initiatives, to improve policy making and support the transition to a circular economy. More than half of survey respondents (55%) struggle with data, which is either not yet collected or in development **(**Table 3.13**).**

Table 3.13. How are surveyed cities and regions doing? Data and assessment

Data and assessment: Are data and information collected and available to explore circular economy-related opportunities?					
Planned	In development	In place, not implemented	In place, partly implemented	In place, functioning	In place, objectives achieved
The government plans to collect data conducive to circular economy-related decisions (e.g. inventory of empty buildings, circular economy-related initiatives, circular jobs, etc.).	The collection of data by sector or type of activity is in development, thanks to the collaboration of various stakeholders.	Inventories and/or dataset are available and circular-economy-related policies and decisions are likely to be informed by robust and up-to-date data.	Data are being systematically collected and shared in a user-friendly manner.	Data is publicly available and citizens and businesses informed of the opportunities related to circular business models and behaviours. Digital tools are used to stimulate collaboration and interaction across stakeholders (e.g. open data, web portal).	Data is systematically used and updated to inform the public policy design and implementation and promote circular business models.
Respondents					
Leuven (BEL), Sofia (BGR), Prague (CZE), Berlin, Haar (DEU), Esch-sur-Alzette (LUX), Møre and Romsdal (NOR), Braga, Torres Vedras (PRT), Canary Islands, Castile and León, Guadalajara, Valencia (ESP), The Hague (NLD)	Jyväskylä, Helsinki-Uusimaa, Tampere Region, Turku (FIN), Munich, Krefeld (DEU), Tilos, Central Macedonia (GRC), Turin, Genoa, Milan (ITA), Wiltz (LUX), Valongo, Matosinhos (PRT), Podravje (SVN), Gothenburg (SWE), Haarlem, Tilburg (NLD), Glasgow (GBR)	Päijät-Häme (FIN), Eurométropole of Strasbourg, Roubaix (FRA), Budapest (HUN), Valladolid (ESP), Metropolitan Region Amsterdam, Zuid-Holland Region (NLD)	Brussels (BEL), Tallinn (EST), Kouvola, Lappeenranta (FIN), Florence (ITA), Western Region (IRL), Niederanven (LUX), Bodø (NOR), Bratislava (SVK), Basque Country, Granada, Vitoria-Gasteiz (ESP), Malmö, Västra Götaland (SWE), Amsterdam (NLD)	Flanders (BEL), Oulu (FIN), London (GBR)	Guimarães (PRT)
24%	**31%**	**12%**	**26%**	**5%**	**2%**

Note: Based on 58 responses to the question: “Data and assessment: Are data and information collected and available to explore circular economy-related opportunities?” Survey respondents were invited to select one of the following options: “Planned”, “In development”, “In place, not implemented”, “In place, partly implemented”, “In place, functioning”, “In place, objectives achieved”. Responses selecting "not applicable" have been excluded from the chart.
Source: OECD (2024[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Gaps

- **Data gaps in monitoring material efficiency and consumption footprint.** This gap highlights a lack of understanding of why the transition to a circular economy is needed. As a consequence, there is a limited sense of urgency, and the circular economy is often seen as a way to brand waste-related actions. The EC Action Plan calls for analysing how the impact of circularity on climate change mitigation and adaptation can be measured in a systematic way; improving modelling tools to capture the benefits of the circular economy on greenhouse gas emission reduction; improving circularity metrics and indicators on resource use, including consumption and material

footprints to account for material consumption and environmental impacts associated to production and consumption patterns to assess the progress towards decoupling economic growth from resource use and its impacts in the EU and beyond. While data on waste management are currently available, data on resource use and material management are very rare, especially at the local and regional levels.

- **Data gaps on the social and economic impacts of circularity**, such as job creation, workforce distribution and the adoption of circular business models, are often unavailable.
- **Limited disaggregated data.** Statistics on municipal and industrial waste are often limited to national aggregates, providing little insight into regional or local progress. Key gaps include the lack of detailed data on resource flows, urban metabolism and material inputs and outputs.
- **Inconsistent methodologies** and different standards across statistical agencies exacerbate data gaps and make metrics incomparable.
- **Inadequate mechanisms to monitor the progress** of circular economy strategies. The lack of robust monitoring frameworks hampers evidence-based decision-making and policy adjustments. Data collection efforts often remain ad hoc and project-based, failing to establish a systemic and continuous approach.
- **Insufficient platforms for data exchange and collaboration**. The lack of dedicated platforms or information systems for resource exchange and circular economy data sharing is a significant gap. Such platforms are essential for fostering collaboration between businesses, industries, municipalities and other stakeholders, enabling synergies to be identified and circular practices to be scaled up.

Policy recommendations

Key actions

A Checklist for Action: Data and assessment

- ✓ Collect data and information on the circular economy.
- ✓ Generate open data sources.
- ✓ Make relevant data publicly accessible, understandable and updated regularly.
- ✓ Monitor and evaluate targets and goals of a circular strategy in the short, medium and long terms.
- ✓ Use the monitoring framework to identify how "circular" the city or the region is and what works, what does not work and what can be improved.

Source: OECD (2020[1]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Make it right

- **Conduct resource mapping to optimise material flows and promote sustainable practices across industries and regions**. This data would serve as a baseline for long-term circular economy planning and local market development.
- **Conduct urban metabolism analyses** to quantify local/regional resource flows, evaluate environmental impacts, and support policy development for circular economy practices. Such analyses could:
  - Incorporate methodologies like material flow analysis, lifecycle assessments, and input-output analyses.
  - Identify key resource flows (e.g., energy, biomass, and construction waste) and unsustainable consumption patterns using tools such as geographic information systems (GIS).
  - Engage stakeholders to validate findings and prioritise interventions that align with regional development goals.

  - Use results to inform policy on resource efficiency, secondary resource valorisation, and market development for circular products and services.
- **Set up a governance structure to strengthen co-ordination amongst actors in charge of data collection,** to avoid overlapping efforts and bridge the data gaps.
- **Prioritise indicators that best reflect the main trends related to the transition** towards a circular economy and that can better adjust to the strategic objectives of the city/region.
- **Leverage digital tools and technologies for real-time data monitoring and decision-making**: smart technologies, artificial intelligence, IoT (Internet of Things), and data analytics can help monitor resource flows and environmental impacts. These digital tools can track material usage, waste generation, waste recirculation and energy consumption, offering a dynamic, up-to-date view of local resource flows.

Good practices

Cities, regions and national governments conduct material flow analysis at two different levels: macro and meso levels. At the *macro scale*, metabolism or flow analysis serves to guide large-scale policymaking, assess trends in resource use, and pinpoint key sectors and value chains where interventions are most needed. By examining material, water, and energy flows, countries and regions can develop strategies that address systemic inefficiencies and set priorities for circularity. At the *meso scale*, which focuses on specific sectors and value chains, metabolism analysis is used to identify inefficiencies within industries, redesign value chains, and inform sectoral and industrial policies. This level of analysis helps to uncover the potential for circular strategies within particular sectors, such as construction, textiles, or food, and highlights the flows of critical resources like nutrients and materials throughout these chains. At the *micro scale*, flow and metabolism analysis targets individual products, materials, or processes, optimising their design and assessing life cycle impacts. This scale looks at the use of materials and energy in production, consumption, and disposal, offering detailed insights that guide product-level improvements and reduce resource footprints.

Examples at macro level (countries, regions and cities):

- Mexico, as part of laying the groundwork for its forthcoming strategy, conducted a metabolic analysis of its economy in 2024. This analysis assessed the inputs, uses, and outputs of three key resource flows at the national level: (i) materials, including biomass, fossil fuels, metallic and non-metallic minerals, mixed products, and waste streams; (ii) water, covering water use by type and sector, such as industrial activities and electricity generation, as well as sources, including surface and groundwater; and (iii) energy, examining Mexico's electricity mix, disaggregated by energy source.
- The Basque Country, Spain; Flanders, Belgium; and the Northern Netherlands, Netherlands, carried out regional metabolism analyses in 2018, 2020, and 2018, respectively. The Basque Country focused exclusively on material flows (according to the European classification of materials: biomass, metal ores, non-metallic minerals, and fossil energy materials/carriers), while Flanders adopted a broader scope that included material, water, and energy flows, along with indicators such as the food material footprint, material productivity, constructed area, greenhouse gas emissions from the agricultural sector, water consumption in the agricultural sector, land use, household electronic and electrical equipment new to the market, and the share of industrial waste that gets a second life. In 2018, the Northern Netherlands Region carried out a material flow analysis to identify priority areas for the circular economy, revealing significant opportunities for circular economy activities across the provinces.

- Paris (France) and Amsterdam (Netherlands), conducted urban metabolism analyses in 2017. To enhance data-driven decision-making for its Circular Economy Plan 2017–2020, Paris identified the built environment, food, water, and energy sectors as highly strategic for the circular economy at the local level. In Berlin (Germany), the waste management concept requires a bi-annual material flow analysis of over 35 waste streams, including final treatment and environmental impact. In Rotterdam (Netherlands) priority flows that significantly impact the city's metabolism have been identified. Other cities, such as Manresa (Spain), which received European funds under the URBAN WINS (HORIZON2020) project, are currently developing their urban metabolism analysis.

Examples at the meso level (sectors and value chains):

- The Netherlands has analysed the textile and construction value chains as part of its national circular economy efforts.
- Castile and León (Spain) is developing a metabolism analysis of the food, water, and nutrients value chains under the European project REFLOW.
- Paris (France) mapped the food value chain, from production to transformation and distribution. The material flow analysis of Paris revealed that the majority of organic waste is not further used.
- Vejle (Denmark) conducted a metabolism analysis of the plastics value chain.
- London (UK), sets indicators and conducts analyses on material flow and carbon footprint for food and fashion sectors, as well as jobs and skills related to the circular economy.

Sources: OECD (2024[2]) OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU); Government of Mexico (2024[43]), Bases para la Elaboración de un Diagnóstico de la Estrategia Nacional de Economía Circular en México, https://www.gob.mx/semarnat/prensa/semarnat-presenta-las-bases-del-diagnostico-para-transitar-a-una-economia-circular; Circular Flanders (2025[44]), Circular Economy Monitor Flanders, https://cemonitor.be/; European Commission (2019[45]), Urban metabolism accounts for building Waste management Innovative Networks and Strategies, https://cordis.europa.eu/project/id/690047; (Statistics Netherlands, 2023[46]), Centrino (2025[47]) Building a local, circular food system in Paris, https://centrinno.eu/blog/building-local-circular-food-system/; Reflow (2021[48]), Urban metabolism for circular cities, https://reflowproject.eu/reflow-academy/reflow-webinar-1-urban-metabolism-for-circular-cities/.

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4 A territorial approach to the circular economy

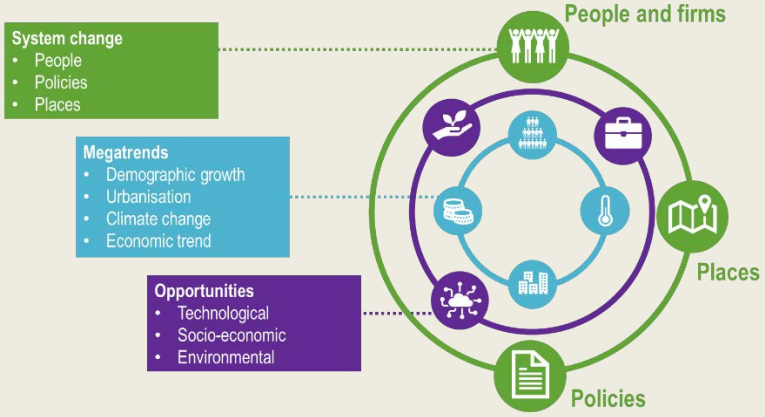
Cities and regions play a crucial role in accelerating the transition to a circular economy. However, the benefits of a fully integrated territorial approach remain to be unlocked. This chapter provides an overview of EU policies, legislation, and tools employed by cities and regions to foster the circular transition, and examines key challenges and potential solutions through the lens of the OECD 3Ps framework: People and Firms, Policies, and Places.

Cities and regions play a crucial role in accelerating the transition to a circular economy (Chapters 1 and 2) and enhancing the governance conditions required to support this transition (Chapter 3). However, the benefits of a fully integrated territorial approach remain to be unlocked. Such an approach would require adapting policies to local challenges, including through effective multi-level governance, and leveraging the role of subnational governments to integrate place-based considerations (OECD, 2024[1]). This chapter provides potential solutions through the lens of the OECD 3Ps framework: People and Firms, Policies, and Places (Box 4.1).

Box 4.1. The 3Ps framework: An integrated approach to accelerate the circular economy in cities and regions

The OECD 2020 Report on the Circular Economy in Cities and Regions introduced the 3Ps framework – People and firms, Policies, and Places – as a conceptual tool to guide the transition to a circular economy in an integrated manner across levels of government, stakeholders and territorial areas (Figure 4.1).

Figure 4.1. The OECD 3Ps framework: People and firms, Policies and Places



The 3Ps Framework has three core dimensions.

1. People and firms are at the centre of a cultural shift towards new business and governance models within a circular economy. Citizens make constant consumption choices and can influence production, while the business sector can determine the shift towards new business models (e.g. using secondary material, recycling, sharing, etc.). Knowledge institutions contribute to boosting innovation and research. Non- profit organisations are at the core of bottom-up initiatives in a wide range of sectors, such as food and the built environment, to raise awareness and build capacities.
2. Policies: The circular economy requires a holistic and systemic approach that cuts across sectoral policies. As somebody's waste can be someone else's resource, the circular economy provides the opportunity to foster complementarities across policies, such as environmental, regional development, agricultural and industrial ones.
3. Places: Adopting a functional approach going beyond the administrative boundaries of cities and regions is important for resource management and economic development. Cities and regions are not isolated ecosystems but spaces for inflows and outflows of materials, resources and products, in connection with surrounding areas and beyond. Therefore, for example, linkages across urban and rural areas (e.g. related to agriculture and forestry) are key to

promote local production and recycling of organic residuals to be used in proximity of where they are produced and avoid negative externalities due to transport. At the regional level, loops related to a series of economic activities (e.g. to the bioeconomy) can be closed and slowed.

The 3Ps framework has been pilot-tested in 10 OECD Policy Dialogues between October 2023 and April 2025 across diverse cities and regions, including Berlin (Germany), Central Macedonia (Greece), Jyväskylä (Finland), Matosinhos (Portugal), Møre and Romsdal (Norway), Sofia (Bulgaria), Strasbourg (France), the Valencia Region (Spain), West Ireland (Ireland), and Zuid-Holland (Netherlands).

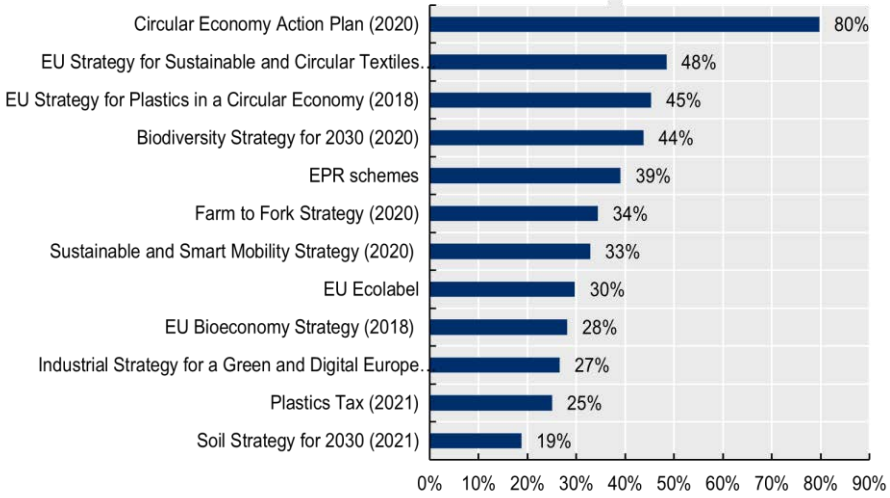
Source: OECD (2020[2]), The Circular Economy in Cities and Regions: Synthesis Report, https://doi.org/10.1787/10ac6ae4-en.

Uptake of EU policy instruments for the circular economy by cities and regions

Implementation of EU polices and laws by cities and regions

The Circular Economy Action Plan (CEAP), adopted in 2015 and updated in 2020, has been instrumental in driving progress on the circular economy across levels of government. Since the 2015 CEAP, 24 Member States have adopted national circular economy strategies, roadmaps and action plans (EEA, 2022[3]). The 2020 CEAP is identified as the most influential EU policy guiding cities and regions towards a circular economy, with 80% of surveyed respondents referencing the CEAP as a basis for their own visions (Figure 4.2). Although it primarily targets national governments, with limited references to the role of cities and regions, the CEAP serves as an inspirational framework for local initiatives. For example, it has been integrated into the preparation of municipal circular economy plans and acknowledged as strategic for key sectors. Its influence is evident in subnational initiatives including the Climate Pact of Luxembourg, the Climate Action Plan of Torres Vedras, Portugal, and climate neutrality goals (e.g. in Valladolid, Spain).

Figure 4.2. Share of surveyed cities and regions considering EC policies in their circular economy strategies



Note: Results based on a sample of 64 respondents that responded "Yes" to consideration of the respective EU policies and strategies as a frame of reference for its own circular economy strategy.
Source: OECD (2020[2]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).*

As part of the CEAP, the Circular Economy Monitoring Framework (CEMF) has been tracking progress towards the circular economy in the EU since 2018. Overall, the framework provides a set of 11 indicators and sub-indicators across five dimensions: (i) production and consumption, (ii) waste management, (iii) secondary raw materials, (iv) competitiveness and innovation, and (v) global sustainability and resilience (Table 4.1). In 2023, it was enriched with new indicators, for example, on material and consumption footprints. However, indicators are only available at the national level.

Table 4.1. The EU Circular Economy Monitoring Framework (CEMF) and its indicators

Production and consumption	Waste management	Secondary raw materials	Competitiveness and innovation	Global sustainability and resilience
Material consumption • Material footprint • Resource productivity • Green public procurement • Waste generation • Total waste generation • Waste generation — excluding major mineral waste • Municipal waste generation • Food waste • Packaging waste generation • Plastic packaging waste generation	Overall recycling rates • Recycling rate of municipal waste • Recycling rate of all waste excluding major mineral waste • Recycling rates for specific waste streams • Recycling rate of overall packaging • Recycling rate of plastic packaging • Recycling rate of WEEE separately collected • Secondary raw materials	Contribution of recycled materials to raw materials demand • Circular material use rate • End-of-life recycling input rates — aluminium • Trade in recyclable raw materials • Imports from non-EU countries • Exports to non-EU countries • Intra-EU trade	Private investment, jobs and gross value added related to circular economy sectors • Private investments • Persons employed • Gross value added • Innovation • Patents related to waste management and recycling	Global sustainability from circular economy • Consumption footprint • GHG emissions from production activities • Resilience from circular economy • Material import dependency • EU self-sufficiency for raw materials — aluminium

Source: Eurostat (2023[4]), EU Circular Economy Monitoring Framework, https://ec.europa.eu/eurostat/web/circular-economy/monitoring-framework

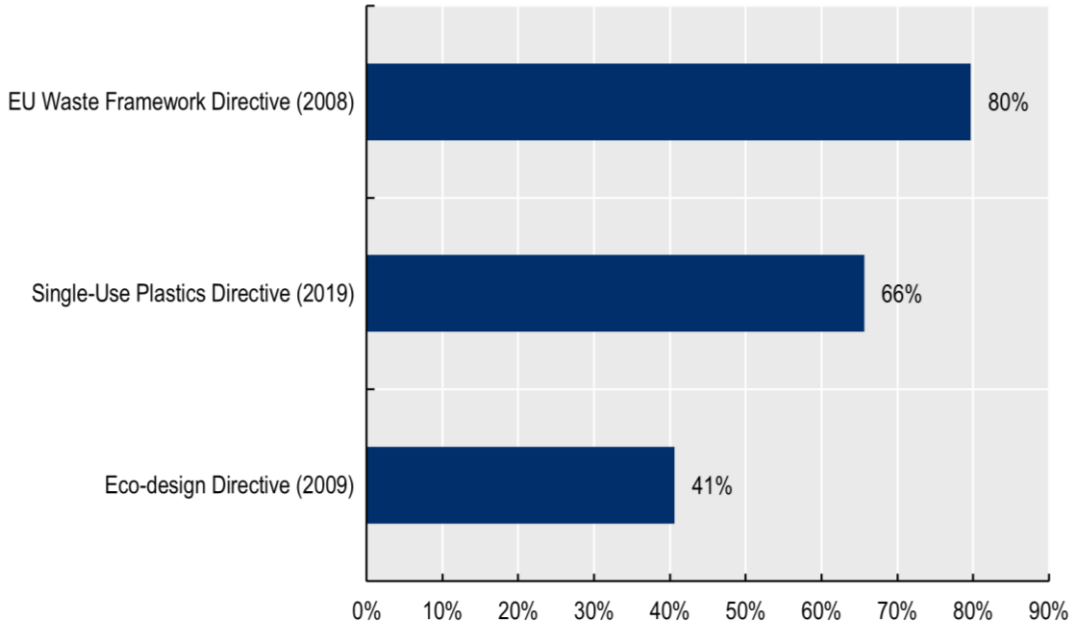
Beyond the CEAP, EU strategies on sustainable and circular textiles (48%), plastics (45%), and biodiversity (44%) are cited as sources of inspiration by under half of surveyed cities and regions (Figure 4.2). The Plastics Strategy has influenced measures such as reducing single-use plastics at city events (Bratislava, Slovak Republic), adopting guidelines to prevent single-use plastics (Prague, Czechia), and identifying plastics as a strategic waste stream for recycling and upcycling (The Hague, Netherlands). It has also inspired the design of targeted strategies, such as the Plastic Reduction Strategy (Glasgow, United Kingdom), which aims to eliminate unnecessary plastics by 2030, and the establishment of pacts to reduce plastic usage (e.g. the Portuguese Pact for Plastics signed by municipalities such as Valongo). The textiles strategy has informed initiatives such as the Fashion, Fact and Fun programme to support fashion companies (Gothenburg, Sweden) and the inclusion of sustainable and repairable textiles as a strategic sector in upcoming circular economy initiatives (Tallinn, Estonia). The biodiversity strategy has fostered discussions linking biodiversity with food consumption and inspired energy and recycling projects. It has also been incorporated into local environmental programmes (Kouvola, Finland) and served as a foundation for developing local biodiversity strategies (Valladolid, Spain).

Additionally, tools such as the EU Ecolabel are regarded as useful by one-third of respondents. The number of products certified with the EU Ecolabel has quadrupled over the past 15 years, from 21 300 in 2010 to over 98 000 in 2024, reflecting the growing adoption of sustainable practices across Europe (European Commission, 2025[5]). Public awareness and trust in the certification are also on the rise, with 38% of EU citizens recognising the EU Ecolabel. Moreover, 73% of Europeans consider a product's environmental impact as a key factor in their purchasing decisions, highlighting the certification's role in

influencing consumer behaviour and driving market demand for sustainable products (European Commission, 2023[6]).

When it comes to legislation, the EU Waste Framework Directive is the most influential EU directive relating to the circular economy for subnational governments, with four out of five (80%) surveyed cities and regions reporting its influence on their policies and initiatives (Figure 4.3). Although the Directive does not set targets for municipalities, the transposition of EU Directives and related targets into Member States' national law creates obligations for local governments. Approaches vary across countries, with some setting explicit recycling or waste management targets for municipalities, while others provide broader guidelines that allow flexibility in achieving national goals.

Figure 4.3. Share of surveyed cities and regions influenced by EC Directives for circular economy initiatives



Note: Results based on a sample of 64 respondents that responded "Yes" to influence of the respective EU legislation for circular economy policies/initiatives implemented in their city/region.
Source: OECD (2020[2]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

The Single-Use Plastics Directive is recognised by 66% of respondents as relevant at the subnational level (Figure 4.3). Similar to the Waste Framework Directive, its transposition into national legislation subsequently influences local and regional policies. The Directive is integrated in regional waste prevention and management plans (Basque Country, Spain), circular economy laws (Guadalajara, Castilla-La Mancha, Spain), dedicated plastics strategies (Canary Islands, Spain), and waste action plans (Torres Vedras, Portugal). Its implementation has led to mandatory rules for commerce (Valladolid, Spain) and stimulated discussions that raised awareness among local businesses (Vitoria-Gasteiz, Spain). It has inspired plastic management plans and influenced waste management operators (Bodø, Norway), prompted cities to reduce single-use plastics at events, festivals, and within administrations (Bratislava, Slovak Republic), and resulted in the establishment of targets to reduce disposable items, including plastics (Gothenburg, Sweden). Other initiatives include the development of plastic reduction guidelines (Prague, Czechia), the reuse of plastic products such as cups at cultural events (The Hague, Netherlands),

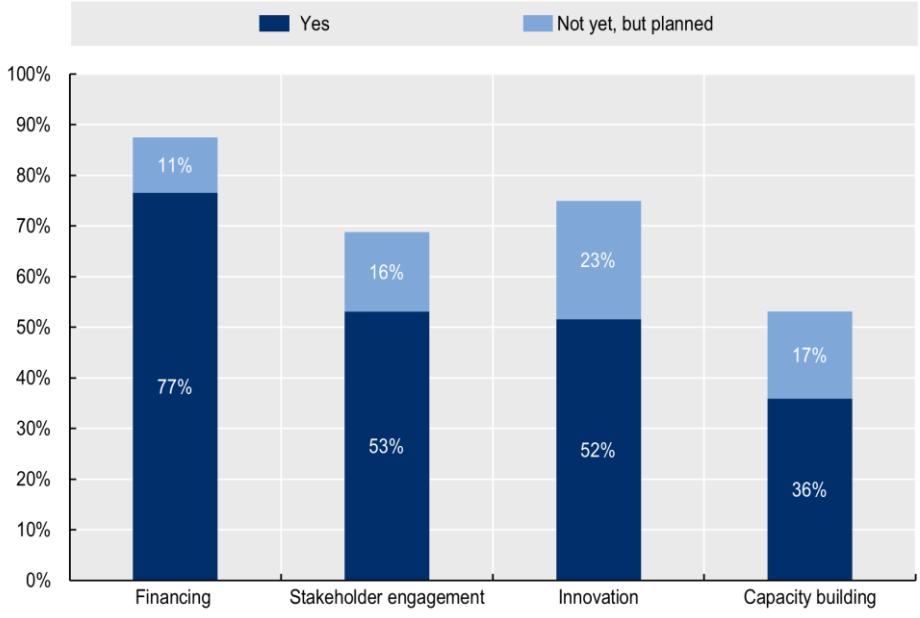
and overhauling the organisation of public events to limit plastic use (Lääne-Harju, Estonia; Tallinn, Estonia).

The Eco-design Directive seems less familiar to cities and regions, with only 41% of respondents acknowledging its influence on their circular economy policies and initiatives (Figure 4.3). Beyond its integration into national strategies and regulations, the Directive is reflected in subnational strategies and frameworks, such as the Euskadi 2030 Circular Economy Strategy (Basque Country, Spain), regional strategies (Canary Islands, Spain), and circular economy laws (Guadalajara, Castilla-La Mancha, Spain). The new Ecodesign for Sustainable Products Regulation enacted in 2024 aims to reduce the overall environmental and climate impacts of products on the EU market by ensuring products last longer, are easier to repair and recycle, contain fewer problematic chemicals and more recycled materials, and are more energy and resource-efficient (European Commission, 2024[7]).

EU funds and tools for circularity in cities and regions

Funding programmes play a crucial role in supporting the circular economy transition at the subnational level. More than three-quarters (77%) of surveyed cities and regions report benefitting from these programmes (Figure 4.4), notably Horizon Europe Horizon (e.g., Central Macedonia, Greece; London, United Kingdom), formerly Horizon 2020 (e.g., Bodø, Norway; Haarlem, Netherlands; Milan, Italy; Tilos, Greece), the LIFE programme (e.g., Päijät-Häme, Finland; Podravje, Slovenia), the InvestEU Fund, Interreg (e.g., Castile and León, Spain; Malmö, Sweden; Møre and Romsdal, Norway), and the European Regional Development Fund (ERDF) (e.g., Helsinki, Finland; Kouvola, Finland; The Hague, Netherlands).

Figure 4.4. Share of surveyed cities and regions leveraging EU circular economy initiatives



Note: Results based on a sample of 64 respondents that responded "Yes" and "Not yet, but planned" to benefiting from EC financial support for circular economy initiatives; taking part in any EU stakeholder engagement initiative; benefitting from EU programmes that support circular innovation and experimentation (e.g. pilot projects); or benefitting from EU programmes to build capacities and skills on the circular economy.
Source: OECD (2024[8]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Box 4.2. Key funding programmes supporting the transition to a circular economy in the EU

- **Horizon Europe** is the EU's research and innovation funding programme with a budget of EUR 95.5 billion until 2027. It aims to tackle climate change, make progress towards the UN Sustainable Development Goals and boost EU competitiveness and growth. The programme funds circular economy projects across sectors through research, innovation and piloting initiatives, with a focus on green and digital solutions. **Horizon 2020** preceded the programme for the period 2014-2020 with a budget of approximatively EUR 80 billion (European Commission, 2023[9]).
- **The LIFE programme** (2021-2027) allocates EUR 5.4 billion to environmental and climate change initiatives. One of its four sub-programmes focuses on the circular economy, co-financing projects related to resource recovery from waste and addressing issues such as water, air, noise, soil, chemicals management and environmental governance. LIFE has already allocated EUR 100 million and supported more than 80 circular economy projects (European Commission, 2023[10]).
- **The InvestEU fund** leverages public and private investment across sectors and uses a guarantee mechanism to attract private investment to circular projects. For example, the European Investment Fund (EIF) invested EUR 50 million in Infinity Recycling's Circular Plastics Fund from 2021 to 2027 to accelerate plastics circularity by promoting advanced plastics recycling and re-introducing plastics into the existing value chain. The budget guarantee signed with the EIF aims to increase the risk-bearing capacity and mobilise at least EUR 372 billion of additional investment (European Commission, 2023[11]).
- **Interreg Europe** encourages cross-border co-operation. It helps EU countries find joint solutions to a range of challenges, including those related to the environment, health, research, education, sustainable energy and transport. The Interreg NEXT co-operation programmes for 2021-2027 prioritise green and digital transitions while preserving natural heritage in regions such as the Barents Sea, the Baltic Sea, the Danube and Carpathian regions, the Black Sea basin and the Mediterranean basin (Interreg Europe, 2022[12]).
- The **European Regional Development Fund (ERDF)** aims to strengthen economic, social and territorial cohesion in the European Union by correcting regional disparities within the Union. For the period 2021-2027, the Fund enables investment to make European regions more competitive by promoting innovative and smart economic transformation and regional ICT connectivity, and a greener, low-carbon transition towards a net zero carbon economy and a resilient Europe by promoting a clean energy transition, green and blue investment and the circular economy. (European Commission, 2021[13]).

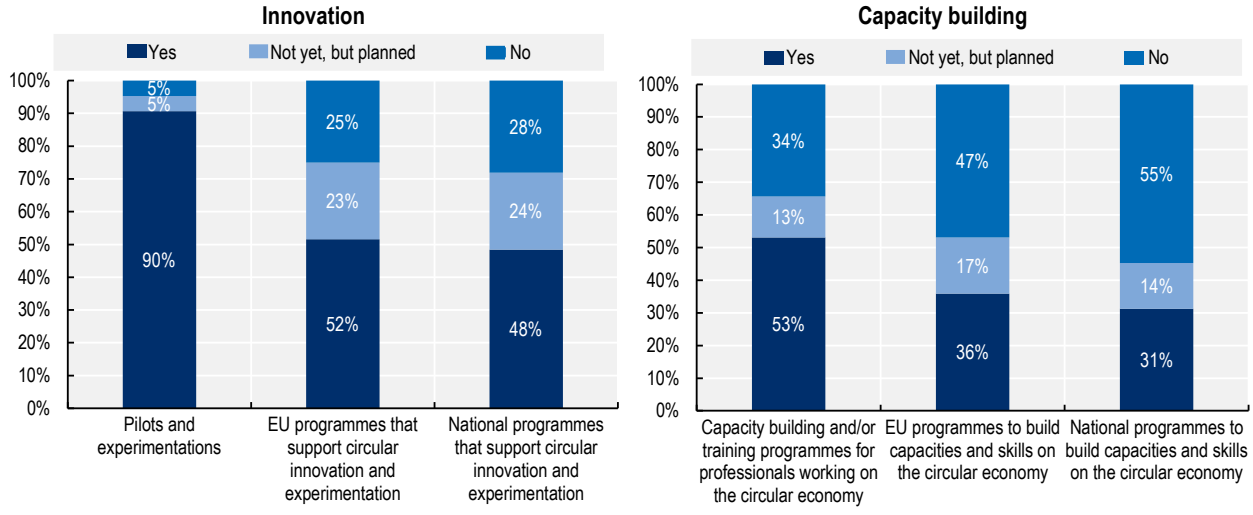
In addition, the **European Investment Bank (EIB)** provides direct and indirect financing to the public and private sectors, as well as financial and technical advisory services to improve the bankability and investment readiness of circular economy projects. Between 2018 and 2022, the EIB provided EUR 3.4 billion to co-finance 118 circular economy projects in various sectors (EIB, 2023[14]). The three main sectors financed by the EIB in 2018-2022 were industry and services (35%), agriculture and the bioeconomy (23%), and solid waste management (22%). The EIB offers Municipal Framework Loans to cities, which are multi-scheme credit lines for cities' circular investment programmes. The EIB also proposes strategic, technical and financial advisory to local actors. In collaboration with the European Investment Advisory Hub, the Bank launched the Circular City Funding Guide and the **Circular City**

Centre (C3), which operates as a resource centre within the EIB to support EU cities in their transition towards the circular economy transition.

Source: EIB (2022[15]), The C3 Circular City Advisory (CCA) Programmes; https://advisory.eib.org/_tools/resources/documents/c3-circular-city-advisory-programme-brief-draft-september-2022.pdf; European Commission (2023[16]), The Circular City Centre: The C3 Circular Cities Resources Inventory, https://circular-cities-and-regions.ec.europa.eu/support-materials/papers-and-reports/circular-city-centre-c3-circular-cities-resources-inventory; EIB (2023[17]), A Guide for Circularity in the Urban Built Environment, https://advisory.eib.org/_tools/resources/documents/a-guide-for-circularity-in-the-urban-built-environment-draft-january-2023.pdf.

Innovation and capacity building are cornerstones of the transition towards a circular economy at territorial level. Over half (52%) of surveyed cities and regions take part in EU programmes supporting circular innovation and experimentation (Figure 4.5). These include the CCRI (e.g., Flanders, Belgium; Helsinki-Uusimaa, Finland; Møre and Romsdal, Norway; Tampere, Finland) and the European Urban Initiative (e.g., Lappeenranta, Finland; Ljubljana, Slovenia; Maribor, Podravje Region, Slovenia). More than two-thirds (36%) of surveyed cities and regions take part in EU programmes and funding to build capacities and skills on the circular economy (Figure 4.5), such as URBACT's "Let's Go Circular!" project (e.g., Guimarães, Portugal; Granada, Spain; Malmö, Sweden; Munich; Germany; Oulu, Finland) and the Intelligent Cities Challenge (e.g., Esch-sur-Alzette, Luxemburg; Guimarães, Portugal; Granada, Spain; Sofia, Bulgaria). The latter provides advice and technical assistance to 136 cities to lead the green and digital transition. It addresses several sectors relevant to the circular economy, including waste, air pollution, water, technology, construction, and buildings.

Figure 4.5. Innovation and capacity building programmes in surveyed cities and regions



Note: Results based on a sample of 64 respondents responding to questions on the participation or promotion of innovation and capacity building programmes on the circular economy.
Source: OECD (2020[2]), *OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)*.

Challenges for a territorial approach to the circular economy

Despite progress, the transition to a circular economy in the EU is held back by structural, economic, and governance barriers across levels of government. Over-reliance on downstream waste management, misaligned economic incentives, disparities in access to funding, unequal economic benefits of the

transition across regions, and data limitations all challenge the ability of cities and regions to effectively transition towards a circular economy.

Over-reliance on downstream waste management

A decade after the first CEAP, the linear economy remains the norm and the circular economy the exception. EU policies have largely prioritised downstream measures such as recycling and waste recovery rather than upstream interventions to reduce resource use and prevent waste generation. Producers have minimal obligations to ensure their products are designed for durability, reuse, and material recovery, while policy targets continue to focus on waste disposal and recycling rather than reduction, repair, and reuse. For instance, the CEAP's target of doubling the circular material use rate by 2030 only measures the share of recycled and recovered materials, overlooking broader systemic shifts needed for circularity.

Progress towards waste management targets is uneven across Member States, with significant disparities in municipal and packaging waste recycling. In 2023, nine Member States[1] were on track to meeting the main recycling targets for municipal waste and packaging waste for 2025, while 18 risked falling short of achieving one or more targets relating to municipal and packaging waste and landfilling (European Commission, 2023[18]). The reuse and recycling of most materials continue to lag despite progress on aluminium, paper and glass – three among the eight most common recyclables with "well-functioning" secondary markets (EEA, 2023[19]). Markets for wood, plastics, biowaste, aggregates from construction and demolition waste, and textiles do not function well due to their small volume, weak demand, lack of competition with virgin materials, insufficient standardisation and inadequate technical specifications.

Additionally, the focus on ensuring sufficient waste treatment capacity has led to excess incineration infrastructure in several EU cities and regions. This overcapacity creates structural barriers to circularity by incentivising incineration over waste prevention and recycling. Municipalities with incineration plants often depend on waste processing fees to recover investment costs, potentially conflicting with waste reduction policies. The sunk costs of incineration infrastructure further discourage investment in alternative forms of waste treatment, while lower incineration fees discourage recycling. Historically, EU funding has focused on waste management infrastructure rather than waste prevention, reuse, and repair: between 2014 and 2020, over EUR 10 billion in EU funding earmarked for the circular economy was predominantly spent on waste management (European Court of Auditors, 2023[20]). The 2021-2027 funding cycle still allows Member States to allocate substantial resources to waste management rather than upstream interventions. This approach risks reinforcing existing inefficiencies rather than fostering systemic circularity.

Misaligned economic incentives

Despite progress on pricing negative environmental externalities, particularly carbon emissions (Box 4.3), current economic incentives still overwhelmingly foster linear resource use. Producers have little financial motivation to use secondary materials, which are often more costly and less readily accessible than virgin resources. Consumers face high costs for repair services, while local authorities prioritise low-cost compliance with statutory waste management targets, often resulting in mixed recycling streams and low-quality recyclables. Public procurement policies, while prioritising the lowest-cost options to preserve public finances, do not often include circular and sustainable criteria.

Box 4.3. The EU Emissions Trading System (ETS) and the Carbon Border Adjustment Mechanism (CBAM)

The EU Emissions Trading System (ETS), implemented in 2005, is an indirect carbon pricing mechanism that sets a gradually declining limit on greenhouse gas emissions from high-emitting sectors and allows companies to trade emission allowances within the system to comply with limits. Since its launch, the EU ETS has helped drive down emissions from electricity and heat generation and industrial production by 47%, while generating over EUR 200 billion in auction revenue for climate action at the EU and Member States level. As of 2027 or 2028, a new and separate ETS for fuel combustion in buildings, road transport and additional sectors (ETS2) will be implemented. In December 2022, the European Parliament and the Council of the EU reached a provisional agreement on the revision of the EU ETS. By July 2026, the EC is expected to assess and report on the feasibility of including waste-to-energy plants in the EU ETS, with the aim of including them by 2028 and a possible opt-out by December 2030.

To protect the global competitiveness of EU companies and avoid carbon leakage, the EC adopted the Carbon Border Adjustment Mechanism (CBAM) Regulation in 2023 as part of the Fit for 55 package, which ensures that imported goods bear a carbon cost equivalent to that of domestic production under the EU ETS. Sectors covered under the ETS, such as industry and construction, can further reduce their carbon footprint by embracing circular economy principles, such as increased recycling, resource recovery, and the use of secondary raw materials.

Source: European Commission (2024[21]), 2024 Carbon Market Report, https://climate.ec.europa.eu/news-your-voice/news/2024-carbon-market-report-stable-and-well-functioning-market-driving-emissions-power-and-industry-2024-11-19_en; European Parliament (2022[22]), Climate change: Deal on a more ambitious Emissions Trading System (ETS), https://www.europarl.europa.eu/news/en/press-room/20221212IPR64527/climate-change-deal-on-a-more-ambitious-emissions-trading-system-ets?mc_cid=f4f31d3687&mc_eid=a2fad960a4

Existing tax structures and subsidies further undermine circularity and sustainability objectives. Despite the EU and its Member States' long-standing commitment to phasing out environmentally harmful subsidies[2], several subsidies may harm the environment, including an estimated EUR 52 billion in fossil fuel subsidies (European Commission and VVA, 2022[23]). Overall, EU Member States currently allocate an estimated EUR 34-48 billion annually to subsidies that contribute to environmental degradation across all major sectors of the economy, including agriculture, forestry, fisheries, transport, and water infrastructure. (WWF and Trinomics, 2024[24])

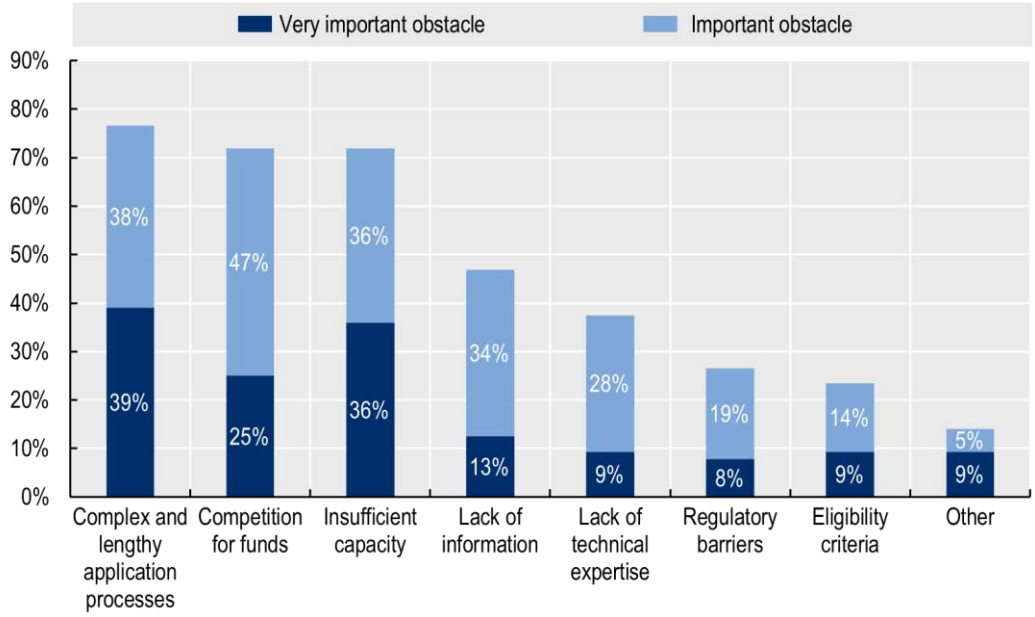
Furthermore, shifting the tax burden from direct sources such as labour to indirect sources such as consumption, pollution and carbon emissions is a priority for long-term growth (OECD, 2023[25]). The European Green Deal claims that it will create the context for broad-based tax reforms that include shifting the tax burden from labour to pollution (European Commission, 2019[26]). However, environmental taxes remain limited in EU Member States: in 2020, environmental taxes constituted less than 6% of all Member States' revenue from taxes and social contributions. Of these, more than three-quarters were taxes on energy, while just a fraction were taxes on pollution or the use of resources, with large variations across Member States (IEEP, 2021[27]).

Disparities in access to funding

Cities and regions face major hurdles in securing EU funding for circular economy initiatives. The most frequently cited challenges include complex application procedures (77%), intense competition for limited funds, and insufficient institutional capacity (72%) (Figure 4.6). These obstacles create a cycle in which well-resourced cities and regions obtain funding to advance circular initiatives, while those with weaker

capacities struggle to access funding and fall further behind. Despite recent adjustments to Horizon Europe's application and administrative processes, participant renewal rates remain low, with most beneficiaries having previously engaged in EU research and innovation programmes on the green transition (European Commission, 2024[28]). The programme's complexity, fragmented topics across multiple instruments, and large project scales hinder participation by smaller local authorities and SMEs. Varying eligibility and evaluation criteria and funding timelines further complicate knowledge transfer. While EU Missions[3] seek to broaden stakeholder engagement, they are not yet fully understood and used by local authorities and communities (European Commission, 2024[29]).

Figure 4.6. Challenges and obstacles to accessing EU funds in surveyed cities and regions



Note: Results based on a sample of 64 respondents that responded "Very important obstacle" and "Important obstacle" to the question "What are the main challenges and obstacles to accessing EU funds?".
Source: OECD (2020[2]), OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU).

Labour market disruptions and skills mismatches

While the circular economy is projected to yield net economic benefits across the EU, impacts will vary across regions, sectors, and social groups. The circular transition is expected to lead to job losses in resource-intensive sectors and job creations in less resource-intensive sectors such as sewerage, waste, and repair (European Commission, 2018[30]). The share of employment in circular business models varies between EU Member States and regions, with some benefiting from new opportunities while others face job displacement and skills mismatches (CIRCTER and ESPON, 2024[31]). Cities and regions that are not "net winners" of the circular transition may experience job and income losses, as well as a skills mismatch between workers' expertise in traditional linear roles and the demands of emerging circular economy positions. Workers in high-emission industries who lose their jobs experience an average drop in annual earnings of 36% over six years, compared to 29% in other industries (OECD, 2024[32]). Although assessments are lacking for the circular economy specifically, existing analyses anticipate job creation in the waste management sector, for example, where average incomes are significantly lower compared to the industrial sector, potentially leading to similar losses in individual workers' incomes (Wilts, 2024[33]).

Current EU support mechanisms for the net-zero transition, notably the Just Transition Mechanism and Social Climate Fund, focus on phasing out carbon-intensive industries, while they do not address the labour market shifts required for a less resource-intensive economy (e.g. the re- and up-skilling of workers in sectors affected by the circular transition such as manufacturing and construction). Furthermore, most circular skills development initiatives are concentrated at higher education level (Wilts, 2024[33]), despite low-skilled workers facing a greater gap than high-skilled workers in meeting future qualification requirements (OECD, 2024[32]). Existing circular economy policies and legislation often lack a granular understanding of how the transition to a circular economy affects different regions and cities. Without territorial insights, policy interventions risk misalignment with local needs.

Lack of regional and local data

The lack of granular data at local and regional levels is a significant challenge for implementing a territorial approach to the circular economy. The EU Circular Economy Monitoring Framework (CEMF) and Eurostat primarily provide national-level data, limiting their usefulness for policymakers working at or with subnational levels of government. While some surveyed cities and regions (e.g. Budapest, Hungary; Castile and León Region, Spain; Lappeenranta, Finland) have adapted the CEMF to create their own indicators for tracking progress towards a circular economy, the applicability of CEMF and Eurostat data to cities and regions is limited. Many municipalities collect disaggregated data, but these are often not reflected in EU-level reporting. Yet data for some indicators, such as those relating to waste and recycling, are often initially collected at municipal or regional levels before being aggregated. In some cases, data are publicly available at a disaggregated level but are not reported as such in the CEMF or Eurostat. For example, the data source mapping in Henrysson et al. (2022[34]) showed that data in Sweden were available at municipal level for 8 out of 24 CEMF indicators. Without territorial data, EU policies risk misalignment with local conditions, making it challenging to track progress and tailor interventions effectively.

The 3Ps framework for a territorial approach to the circular economy

Addressing these challenges requires an integrated territorial approach that matches policies, legislation, economic instruments, data frameworks, funding programmes and other tools for the circular economy with local and regional realities. The EC, national and subnational governments, firms and citizens can take complementary measures to accelerate progress towards the circular economy across levels of government in the EU. Solutions are provided based on the OECD 3Ps Framework: people and firms, policies and places.

Figure 4.7. Recommendations for a territorial approach to the circular economy

Source: Author's elaboration

People and firms

Making the circular economy accessible and affordable to people

Provide consumers in cities and regions with easy access to clear, standardised and simple information on product durability, repairability, and recyclability: the EC has already set up several labels and certificates related to sustainability, such as the EU Ecolabel and Energy Label. However, there are no labels or certificates dedicated to the circular economy that would inform consumers about the origin, performance in use, lifetime and end-of-life of products, and that are known to and understood by

consumers to the point of influencing their choices (Laubinger and Börkey, 2021[35]). In line with the Ecodesign Directive and its emphasis on the "right to repair", repair services should be easily accessible and more affordable than buying new products. Separate collection instructions for recycling should be easy to understand, and information on recycling and recovery outputs should be shared to increase trust and raise awareness of the environmental benefits of individual actions.

Enhancing the competitiveness of the circular economy

Address split incentives by phasing out environmentally harmful subsidies (e.g. in fossil fuels and agriculture): the EC could do this by applying the "Do No Significant Harm" criteria of the EU Taxonomy to EU and government budgets and excluding "Always Environmentally Harmful" activities from receiving public funding. The EU could continue working with Member States towards a legally binding framework to reduce environmentally harmful subsidies at EU and national levels. Because cities and regions also provide subsidies to citizens and businesses, the EC could provide guidelines for subnational governments on applying the EU Taxonomy to subsidy design and implementation. A gradual, co-ordinated and planned reduction of these subsidies at the national level would help align policies with circular economy and carbon neutrality objectives while freeing up fiscal resources for investments in resource and carbon-efficient economic activities.

Boost the competitiveness of circular businesses by pricing negative environmental externalities. This can be done through taxes, which would incentivise the use of secondary materials that are currently often more costly than virgin ones. Similar approaches could be applied to single-use products (to discourage their use) and to landfilling and incineration (to encourage recycling, reuse, and waste prevention). The EC could explore the introduction of EU-wide minimum tax rates on virgin materials and products, single-use products, and waste disposal methods such as landfilling and incineration to encourage reuse and recycling. The EC could also consider encouraging Member States to apply reduced or zero Value Added Tax (VAT) rates on circular materials, products and services, although limited pass-through to consumer prices and potential rebound effects on primary and secondary material consumption may diminish the expected environmental benefits of VAT exemptions (OECD, 2024[36]), and the 2024 revision of the EU VAT Directive would delay the legal basis for such measures for several more years. National authorities would be responsible for imposing taxes on virgin materials and products or setting higher fees for landfilling and incineration. A minimum tax on virgin materials used in construction aggregates could be a good starting point given that the construction sector is less prone to relocation (and material leakage as a result) than other industries.

Enable circularity in global trade by implementing a raw material border adjustment mechanism. The EU could investigate the scope to adopt a similar instrument to the Carbon Border Adjustment Mechanism (CBAM)[26], which is designed to tackle carbon leakage, to deal with material leakage. Concurrently, the EC could establish guidelines for targeted tax rebates for industries most exposed to international competition to help protect vulnerable sectors. Mainstreaming the adoption of material passports (e.g. as foreseen in the Batteries Regulation) in other sectors could help mitigate the risk of material leakage from extractive activities outside the EU while supporting more transparent value chains

Reduce the resource and carbon intensity of the economy by strengthening the EU Emissions Trading System (ETS)[27]: this could involve further lowering the cap on annual allowances or reducing the number of free allowances allocated to certain sectors such as manufacturing. Alternatively, an explicit carbon tax across all sectors could be introduced at the EU level, making CO_2-intensive products and materials (e.g. virgin plastics) more costly than relatively less CO_2-intensive ones. OECD (2023[37]) calls for extending carbon pricing to agriculture, which can incentivise more resource-efficient and regenerative approaches such as reducing food and biomass waste by repurposing agricultural residues for bioenergy and compost. The OECD also calls for greater harmonisation of carbon prices before raising them gradually, highlighting that industry continues to receive most emission allowances free of charge and that the uneven coverage

of the ETS across sectors and differences across national tax systems impose heterogeneous abatement incentives across countries and activities. Sectors covered by the ETS (e.g., industry and construction) can further reduce their carbon footprint by embracing circular economy principles such as increased recycling, resource recovery, and the use of secondary raw materials.

Facilitate the re-skilling and up-skilling of workers to equip them with the cross-cutting and sector-specific skills needed for the circular economy: firms play a role in fostering competencies in problem-solving, resource management, and social skills, alongside technical expertise in areas such as eco-design, life-cycle assessment, and circular business models. National governments and the EC can support the re-skilling and up-skilling of employees through partnerships with universities, vocational training centres, and industry associations, or by investing in training programmes and certification schemes.

Policies

Driving circularity upstream

Define policies on a sectoral basis, focusing on materials rather than waste management: these policies could cover key sectors such as water supply, sewerage, waste management and remediation, construction and real estate, services, manufacturing, and ICT. The aim would be for national governments to move from lower levels of the circular economy hierarchy (e.g. recycling) to higher levels (e.g. waste prevention), with clear targets on resource use reduction, environmental impact, economic output, and job creation. Synergies across value chains (electronics and ICT, batteries and vehicles, packaging, plastics, textiles, construction and buildings, and food, water, and nutrients) should be taken into account. A focus on product groups (e.g. electronic equipment or construction aggregates) could also be further considered as the EC intends to do with the forthcoming Circular Economy Act and has started doing with the Batteries Regulation.

Expand the stringency and scope of Extended Producer Responsibility (EPR) schemes beyond packaging: the EC could consider new EPR schemes covering other sectors than packaging and include eco-modulated fees from the outset for firms to design more repairable and durable products. Eventually, EPR schemes could move towards full producer ownership of materials, which would imply that companies selling products on the market are entirely responsible -financially or organisationally- for the appropriate management of materials at the end of product life cycles. Mandatory EPR schemes with eco-modulated fees and full product ownership would help reduce waste generation and improve the reuse and recycling of materials, reducing the amount of waste managed by local authorities and helping national governments to achieve statutory recycling and landfilling targets.

Strengthen Green Public Procurement (GPP), including circular criteria for new sectors and product groups: among the EU cities and regions surveyed, 61% report applying circular criteria to construction and buildings in public procurement, followed by food, waste and nutrients (52%) and electronics and ICT (48%). Circular economy criteria within Green Public Procurement (GPP) can help accelerate momentum for more sustainable and eco-friendly products and services that strengthen resilience to climate shocks and indeed economic, supply, shocks. While GPP may, but not necessarily, results in higher public procurement costs in the short term, it holds great potential to deliver longer term (economic and social) benefits including to the public purse, that offset short term costs. To support momentum, including on potential efforts for mandatory adoption, the EC and national governments could provide further guidance to subnational governments on circular criteria needed for specific products and services.

Prevent excess waste-to-energy capacity in treatment plants, discourage over-reliance on energy recovery, and promote waste reduction and recycling: this could include a new reporting requirement by the EC as part of current reporting requirements on municipal solid waste generation at regional level. These thresholds could be implemented gradually over time and would avoid further (over)investment in energy recovery facilities. Enforcing binding limits on energy recovery capacities in EU regions and cities

could eventually involve revising the Strategic Environmental Assessment Directive to include related targets. Because technical standards alone may not be sufficient, spatial planning strategies could also be adopted by local governments to ensure that incineration and energy recovery capacity align with actual national and regional needs. The EC could also gradually incentivise the restriction and eventually ban the incineration of recyclable material to further increase recycling rates. A first step in this direction was the introduction of a levy on non-recycled plastic packaging waste generated by Member States in 2021.

Embed the circular economy in EU Missions: these are a co-ordinated effort by the EC to pool the necessary resources in terms of research and innovation, policies and regulations, and other activities to bring concrete solutions to some of the EU's greatest challenges (e.g. the 100 Climate-Neutral and Smart Cities Mission). Given the limited influence of aspirational EU targets (e.g. doubling the circular material use rate by 2030) on local policymaking, this approach would make high-level goals more tangible and actionable for local and regional governments. For instance, setting a target for at least 100 cities to achieve 50% reusable packaging or reduce packaging waste by 50% would provide a clear and compelling objective and complement the Packaging and Packaging Waste Regulation. Targets should be straightforward and aligned with the competencies of local and regional authorities. For example, in line with the forthcoming Circular Economy Act, objectives such as achieving a given share of secondary raw materials in new buildings or public procurement could be considered, as well as more upstream targets related to reuse, repair, and refurbishment.

Continue shifting EU funding priorities from hard to soft infrastructure, ensuring that circular economy investments focus on upstream (e.g. waste prevention) and midstream (e.g. reuse and repair) activities: this could also support non-technological solutions, including capacity building, skills development, and knowledge-sharing initiatives, to overcome capacity gaps at the subnational level. Eventually, the EC could explore options to leverage other EU funding schemes for local, bottom-up projects, such as Cohesion and Modernisation funds, or tailored technical assistance through the Technical Support Instrument of the Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs (DG GROW).

Places

Ensuring a just and regionally balanced circular transition

Conduct territorial assessments to analyse the impact of the circular transition on economic output, employment, and skills across EU Member States: through these assessments, national governments could identify the current and future implications of the circular transition for industries, workforce groups and communities, and support the development of clear definitions to inform and guide future policymaking. National authorities should then ensure that the learnings of territorial impact assessments conducted at EU level effectively inform national circular economy policies, including innovation policies and re-skilling programmes. This would promote circular economy initiatives that are place-sensitive, i.e. that consider the territorially differentiated implications of the circular transition.

Support the EU regions most adversely affected by the circular transition: programmes such as the CCRI, Horizon Europe, Interreg, ERDF, LIFE, Erasmus+ and NextGenerationEU could allocate dedicated resources to regions facing structural challenges in adopting circular economy practices. This could include ringfencing a share of funds for regions lagging on the circular economy, providing targeted support to "net losing" regions (e.g. in applying to EU funding programmes), or identifying priority regions for investment as part of the forthcoming Start-up and Scale-up Strategy planned for the end of 2025. The disbursement of funds could be made conditional to the achievement of pre-determined targets by funding beneficiaries whenever this is possible. Administrative processes to access funds, especially to allow smaller, less well-resourced cities and regions to respond to the funding calls, could be simplified and more effective guidance can be provided. In addition, the EC and national authorities could encourage the expansion of the mandate of regional and local economic development agencies and public banks to support vocational

training, lifelong learning programmes, and local industries to ensure the alignment with capacity-building offers with labour market needs. Such efforts should focus on low-skilled workers, who face the greatest re-skilling and up-skilling challenges in adapting to circular economy demands.

Broaden the scope of the EU Just Transition Mechanism from the current focus on fossil fuel-extracting regions to those dependent on resource extraction and resource-intensive manufacturing: this would compensate cities and regions that do not belong to the category of "net winners" of the circular transition. In particular, tailored re-skilling and up-skilling programmes could be developed by the EC and national governments to equip workers with the competencies needed for circular economy practices, such as eco-design, reverse logistics, and sustainable material management. Special emphasis should be placed on low-skill occupations, where the gap between current and future qualification requirements is more pronounced compared to high-skill occupations (OECD, 2024[32]). More broadly, the EC forthcoming Circular Economy Act could provide a clear and predictable framework and ensure certainty in circular economy policy to encourage private investment in circular technologies, business models, and skills development.

Improving granular data for better decision-making

Feature subnational disaggregated indicators in the Circular Economy Monitoring Framework (CEMF): this can be done by publishing local and regional level data (e.g. on municipal waste, gross value added and employment) that is already collected by National Statistics Offices but available in the CEMF at aggregated national level. The CEMF could also integrate or refer to such indicators developed by complementary initiatives, such as the ESPON Thematic Action Plan on Climate Neutral Territories[28] (CIRCTER and ESPON, 2024[31]). The range of indicators with subnational disaggregated data available in the CEMF can be further expanded by exploring options to collect new indicators at the subnational level, and estimating regional values based on national data for indicators that are not yet collected at the subnational level (e.g. on material consumption), using data downscaling methodologies. National authorities can strengthen their own reporting on circular economy indicators to support place-sensitive circular economy strategies, evidence-based decision-making and progress tracking on circular economy goals by enhancing data collection methodologies, integrating digital tools, and standardising indicators to improve the accuracy of circular economy statistics. Additionally, investing in experimental data methods, such as big data analytics and remote sensing, could support the collection of new indicators at the subnational level.

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Notes

[1] Austria, Belgium, Czechia, Denmark, Germany, Italy, Luxembourg, The Netherlands, and Slovenia.

[2] Environmentally harmful subsidies cover direct subsidies as well as tax exemptions and reductions, reduced services charges, and other types of implicit and explicit subsidies.

[3] EU Missions are a novelty introduced by Horizon Europe (2021-2027) as a new way to bring concrete solutions to some of the EU's greatest challenges. The five missions include: (i) Adaptation to Climate Change: support at least 150 European regions and communities to become climate resilient by 2030, (ii) Cancer: working with Europe's Beating Cancer Plan to improve the lives of more than 3 million people by 2030 through prevention, cure and solutions to live longer and better, (iii) Restore our Ocean and Waters

by 2030, (iv) 100 Climate-Neutral and Smart Cities by 2030, and (v) A Soil Deal for Europe: 100 living labs and lighthouses to lead the transition towards healthy soils by 2030.

[4] To protect the global competitiveness of EU companies and avoid carbon leakage, the EC adopted the Carbon Border Adjustment Mechanism (CBAM) Regulation in 2023 as part of the Fit for 55 package, which ensures that imported goods bear a carbon cost equivalent to that of domestic production under the EU ETS.

[5] The EU Emissions Trading System (ETS), implemented in 2005, is an indirect carbon pricing mechanism that sets a gradually declining limit on greenhouse gas emissions from high-emitting sectors and allows companies to trade emission allowances within the system to comply with limits.

[6] ESPON Thematic Action Plan on Climate Neutral Territories has generated 10 downscaled circular economy indicators addressing key aspects such as material consumption, waste generation, and consumption footprint at the NUTS 3 regional level, filling critical subnational data gaps in the CEMF.

Annex A. List of respondents to the OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)

Table A A.1. List of respondents to OECD Survey: The Circular Economy in Cities and Regions in the European Union (EU)

#	Name	Country	Category	Respondents
1	Amsterdam	Netherlands	City	Danka Oosterhof, Senior Strategic Policy Advisor Circular Economy
2	Basque Country	Spain	Region	Jose Maria Fernandez, Head of Circular Economy Department
3	Berlin	Germany	City	Albrecht Fritze, Desk Officer Amélie Bonarius, Desk Officer Tamara Fischer, Desk Officer
4	Bodø	Norway	City	Eirik Lerum Vigerust, Adviser Christian Miguel Jurado Meza, Adviser
5	Braga	Portugal	City	Ana Cristina Costa, Environmental Technician
6	Bratislava	Slovak Republic	City	Ivana Males, Circular Economy Expert
7	Brussels	Belgium	Region	Anthony Naralingom, Head of Unit 'Economic Transition and inclusive entrepreneurship awareness'
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10	Castile and León	Spain	Region	Jesús Díez, Programes Director
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13	Eurométropole of Strasbourg	France	City	Lisa Herlédan, Circular Economy Officer
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18	Gothenburg	Sweden	City	Lina Forsman, Policy Advisor
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20	Guadalajara	Spain	City	Ramiro Bueno Martíne, President of Local Association of Circular Economy of Guadalajara
21	Guimarães	Portugal	City	Dalila Sepúlveda, Director of Department of Environment and Sustainability
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49	Tallinn	Estonia	City	Katarina Papp, Expert on Circular Economy
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54	Torino	Italy	City	Riccardo Saraco, Project manager
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59	Valongo	Portugal	City	José Manuel Ribeiro, Mayor of Valongo
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OECD Urban Studies

The Circular Economy in Cities and Regions of the European Union

The transition to a circular economy is critical for achieving sustainable development, resource efficiency, and building a resilient future for all. Over the past decade, the European Union (EU) has demonstrated an unprecedented commitment to advancing a circular economy, advocating for action at national, regional and local level. However, most economies remain predominantly linear. This report provides a comprehensive analysis of circular economy practices, challenges, and opportunities in cities and regions, building on a survey of 64 cities and regions of the EU, lessons learned from 10 place-based policy dialogues in specific cities and regions, and desk research. The report concludes with policy recommendations to accelerate a territorial approach to the circular economy for place-based policies that are aligned with EU-wide goals.

Circular Cities & Regions Initiative

Funded by the European Union

PRINT ISBN 978-92-64-98405-9
PDF ISBN 978-92-64-79604-1