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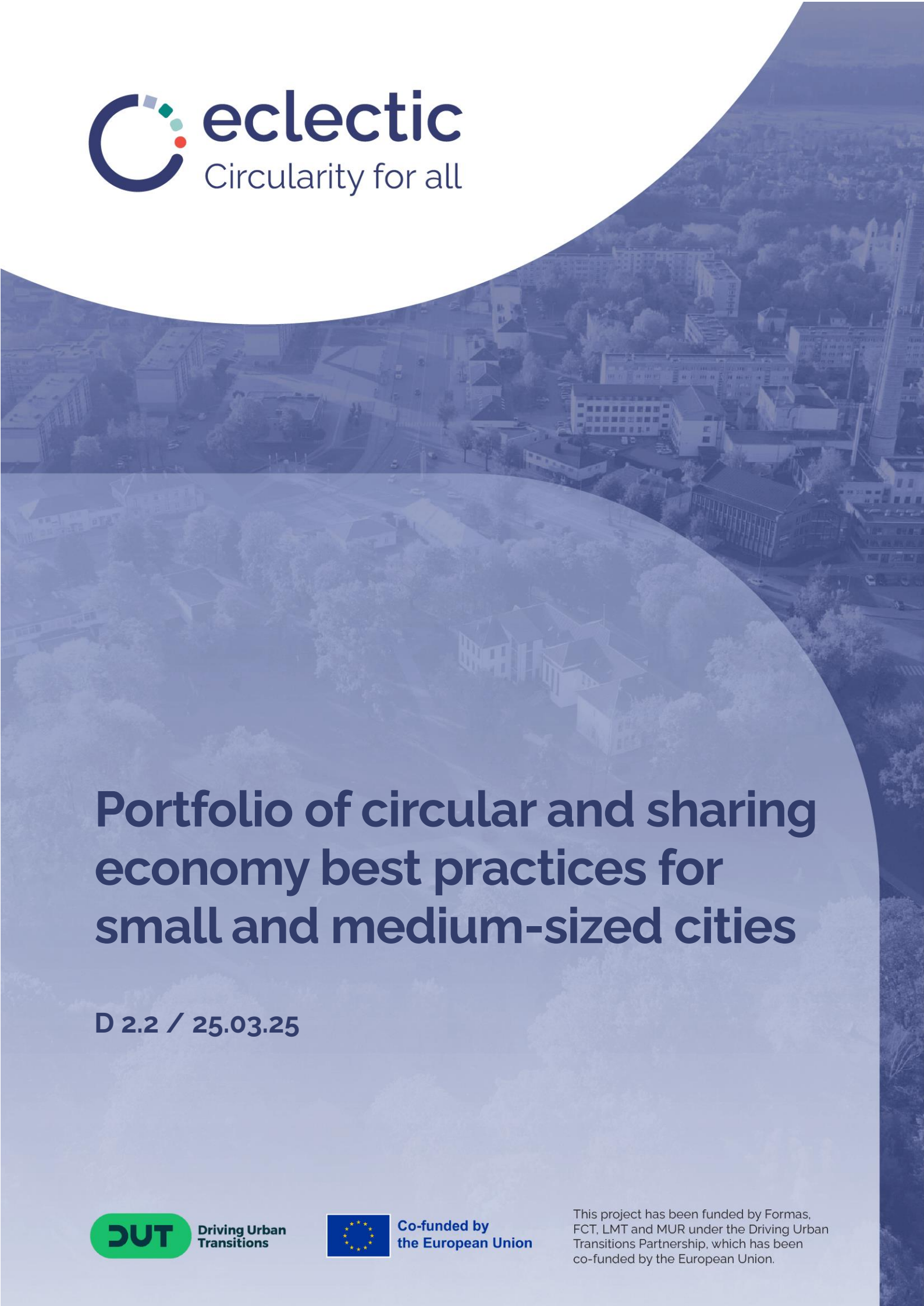

Portfolio of circular and sharing economy best practices for small and medium-sized cities

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Driving Urban Transitions

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Document Overview

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Lead author and contact	Mariana Gonçalves, University of Coimbra mariana.mg@dem.uc.pt
Contributors	Nelson Soares, University of Coimbra Rita Garcia, University of Coimbra, Itecons
Reviewers	Chiara Pellegrini, Eurac Research
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Revision History

Date	Version	Author	Description
17-03-2025	1.0	Mariana Gonçalves Nelson Soares Rita Garcia	First version
18-03-2025	1.1	Chiara Pellegrini	- Comments on Sections 2 and 3.
25-03-2025	1.3	Mariana Gonçalves Nelson Soares Rita Garcia	Clarification about the scientific article in preparation detailing the methodology and practices. Other clarifications.

About the project

Cities concentrate high-density socio-economic activities, consuming 70% of global resources, producing 60-80% of anthropogenic greenhouse gas (GHG) emissions, and generating waste of resources, energy, and water. This is a critical issue, but at the same time, an opportunity.

Circular economy models can reduce this waste and reduce human environmental impacts.

ECLECTIC brings circular economy from theory to action in cities, by improving the understanding of cities as complex multi-level ecosystems with inputs, outputs, and resource flows. The project designs, implements, and monitors strategic action plans for circular economy in cities, taking care to address vulnerable groups needs and reduce inequality in selecting circular models benefiting them.

Four city-region living labs (CiRLabs) located in Italy, Lithuania, Sweden and Portugal will be the testing sites where circular practices will be investigated and discussed with stakeholder. i. In the CiRLabs, stakeholder engagement processes will be the means to identify needs and visions and select circular economy strategies that fit them. KPIs will be defined to measure the circular economy action plans.

Outputs will include four scientific papers, three reports, four actionable reports, a toolbox, workshops and trainings.

Project partners

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Executive Summary

This report identifies and presents a portfolio of over 20 circular and sharing economy practices successfully implemented in diverse urban contexts. The list provides some examples deriving from an extensive literature review to be reported in a forthcoming scientific publication. The 20 examples highlight practical and adaptable models for integrating circular economy principles into different sectors relevant for the urban metabolism of the CiRLabs involved in the ECLECTIC project. By identifying these practices, the report is a practical resource for local decision-makers and stakeholders, offering insights and inspiration to drive circular transformation across sectors in cities of varying sizes and needs.

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1 Introduction

The circular economy plays a central role in achieving climate-neutral and sustainable cities, and it can significantly contribute to fulfilling commitments of the European Union (EU) Green Deal and the United Nations 2030 Sustainable Development Goals [1]. EU cities have launched a wide range of circular economy (CE) initiatives and plans in recent years, and many solutions have been identified that can potentially increase circularity and resource efficiency (e.g., closing material loops and extending products' lifespan). Building on these efforts, providing cities with concrete examples of successful CE solutions implemented in diverse urban contexts is essential. The primary objective of this report is to identify, classify, and present a portfolio of 20 circular and sharing economy practices. These were drawn from an extensive literature review, offering practical examples to serve as models for implementing CE practices in urban settings. This report aims to provide decision-makers in the four CirLabs and beyond with knowledge and inspiration to drive circular transformation in cities of varying sizes and contexts by showcasing adaptable solutions.

2 Methods

A systematic literature review was conducted to identify best practices in circular and sharing economy for small and medium-sized cities. Scopus was selected as the primary database, yielding over 2,000 results. Following a thorough screening process, we identified over 200 circular and sharing economy best practices examples from more than 180 documents. These practices were then compiled into a list and classified according to the sector/activity, methodology, governance, participation, flows and stocks, circular loop, scope, and monitoring.

The criteria for selecting the 20+ circular and sharing economy best practices (presented in section 3) comprised the following:

1. Alignment with the sectors/activities of interest of each CiRLabs region as defined by the stakeholders in each CirLab (Table 1);
2. Applicability to a specific product category(ies) and ability to be modeled using the assessment framework developed in Work Package 1 (WP1).

Additionally, an effort was made to include at least one best practice (per sector/activity) featuring a monitoring strategy, either by quantifying changes or by establishing indicators for future tracking (denoted as "M" in Table 2).

Further details about the review methodology are included and further discussed in a scientific article in final preparation for submission to an international journal.

Table 1. Sectors/activities of interest of each CirLabs

CirLabs	Sectors/Activities
Bolzano	Construction
Coimbra	Agriculture; Food; Forestry; Health; Household; Mobility; Tourism
Gothenburg	To be defined after the 1st CirLab meeting
Jovana	Public procurement

3 Portfolio of 20+ circular economy and sharing economy best practices

Based on the established criteria, Table 2 presents a selection of best practices to include in the portfolio. These practices were categorized according to (i) sector/activity, (ii) type of action aligned with the ISO framework [2,3,4,5], and (iii) type of strategy. A succinct description of each practice is also provided.

Table 2. Selection of circular and sharing economy practices applied at a regional level

N°	Sector(s)/activities	Action (ISO framework)	Strategy	Practice	Description	Key benefits for CE	Ref.
1	Agriculture, Energy, Household, Food, Forestry	Material and energy recovery	Biowaste valorization	Producing fertilizers and energy from biowaste (M)	Biogas generation for energy and nutrient-rich byproducts to support algae and hydroponic systems for biofuels, feed, and bioproducts.	Avoids landfill disposal, increases renewable energy generation and waste-to-resource. May contribute to reducing environmental impacts.	[6 -8]
2	Agriculture	Sharing to intensify use	Sharing spaces	Establishing community gardens	Involves creating shared spaces where people can grow plants, fruits, vegetables, and flowers together.	Creates community engagement, lowers food costs, and increases self-sufficiency.	[9]
3	Food, Household	Reduce, reuse and repurpose	Reduce waste	Establishing a food-sharing place to donate and exchange surplus food/food approaching its expiration date (M)	Sharing programs to facilitate donations or exchange of surplus food and support communities. *May be applied in agriculture.*	Reduces waste generation, increases resource efficiency, and reduces food insecurity.	[10]
4	Food	Material recovery	Nutrient recovery	Recovering nutrients from food waste to produce fertilizers (M)	Use food scraps as compost or fertilizer to enrich soil and support sustainable, local food production.	Improves soil health, promotes sustainable agriculture, and reduces reliance on synthetic fertilizers. May contribute to reducing environmental impacts.	[11]

N°	Sector(s)/activities	Action (ISO framework)	Strategy	Practice	Description	Key benefits for CE	Ref.
5	Construction	Design for circularity	Design for disassembly	Designing construction products and/or buildings for easy disassembly (M)	Designing construction systems that can be easily taken apart, reused, or recycled at the end of their lifecycle. *May be applied to other industries (e.g., furniture, electronics, automobile).*	Facilitates disassembly, enhances product lifespan, and supports recycling and reuse.	[12-15]
6	Construction	Design for circularity	Pre-fabrication	Off-site prefabrication of building components or entire sections	Components are produced off-site in a controlled environment and then assembled on-site.	Reduces construction time frame, labor costs, and on-site disruption; improves quality control and efficiency.	]12-15]
7	Construction	Design for circularity	Modularity systems	Adopt modular design	Utilize modular construction (a subset of prefabrication) to produce sub-assembly components, panels, or fully assembled units transported and assembled on-site.	Reduces construction time frame and costs, improves design flexibility, and allows for easier future upgrades or modifications.	[15]
8	Construction	Design for circularity	Buildings reuse	Promoting Adaptative Reuse of old buildings	Repurposing old buildings for new functions, preserving structure.	Conserves resources, reduces waste generation, preserves history, and saves costs.	[15]

N°	Sector(s)/activities	Action (ISO framework)	Strategy	Practice	Description	Key benefits for CE	Ref.
9	Construction	Recycling	Recycling of construction and demolition waste	Recycling building materials into aggregates to produce concrete (M)	Recycling construction and demolition waste (e.g., concrete, bricks, and tiles) to create new aggregates for construction	Reduces waste generation and virgin materials extraction. May contribute to reducing environmental impacts.	[16-18]
10	Construction, Food, Household	Reduce, reuse and repurpose	Reuse	Establishing secondhand markets (M)	Spaces or digital platforms where pre-owned goods are sold at lower prices than new items.	Reduces waste generation, promotes cost savings, extends product lifespan, and encourages reuse and recycling.	[19-21]
11	Construction	Material Recovery/ Reduce, reuse and repurpose/ Recycling	Reuse and/or recycle of materials	Create material passports for buildings to track and manage materials	Documenting and monitoring the materials used through a digital or physical system, with detailed information on the material's origin, composition, lifecycle, and potential for reuse or recycling.	Reduces waste generation and virgin materials extraction. May contribute to reducing environmental impacts and purchasing costs.	[13,23-24]
12	Energy	Sharing to intensify use	Energy efficiency	Establishing energy symbioses by sharing surplus energy	Individuals and businesses (e.g., energy communities or prosumers) trade surplus renewable energy within a decentralized network.	Increases energy efficiency, reduces costs, empowers local communities, and promotes renewable energy use through decentralized sharing.	[25]

N°	Sector(s)/activities	Action (ISO framework)	Strategy	Practice	Description	Key benefits for CE	Ref.
13	Energy	Sharing to intensify use	Sharing energy	Renting solar systems	Individuals and businesses can access solar energy without upfront costs by renting panels, benefiting from renewable energy.	Promotes the use of renewable energy, reduces upfront costs, and increases energy efficiency.	[26]
14	Food	Reduce, reuse and repurpose	Reduce the use of single-use plastic	Changing from single-use packaging containers to reusable ones	Replace single-use containers with reusable containers in restaurants.	Avoids landfill disposal, and may contribute to reducing environmental impacts	[27]
15	Household	Maintenance and repair	Repair	Organizing/Promoting a repair café	Space where people can bring broken items to be repaired by volunteer experts, fostering social interaction and the sharing of tools and skills.	Reduces waste generation, increases product lifespan, and promotes skill-sharing and community engagement.	[28]
16	Mobility	Sharing to intensify use	Transport sharing	Adopt peer-to-peer (P2P) car sharing	Individuals share their private vehicles with others, enabling more efficient use of cars and promoting shared mobility.	Reduces traffic and vehicle ownership. May contribute to reducing environmental impacts and costs.	[29-32]

N°	Sector(s)/activities	Action (ISO framework)	Strategy	Practice	Description	Key benefits for CE	Ref.
17	Mobility	Sharing to intensify use	Transport sharing	Promote bike sharing	Individuals can rent out or lend their bicycles to others for short-term use, encouraging sustainable travel.	Reduces traffic and promotes active transportation. May lead to lower emissions.	[33-36]
18	Mobility	Sharing to intensify use	Transport sharing	Adopt business-to-business (B2B) car sharing	Companies share vehicles with other businesses, allowing them to rent cars for short-term use without owning or maintaining a fleet.	Reduces fleet ownership and maintenance costs. May contribute to reducing environmental impacts.	[37]
19	Public procurement	Policy and legal system/ Reduce, reuse and repurpose	Eliminate single-use plastic	Ban single-use plastic utensils at public events	Enforce a ban on all single-use plastic utensils at public events, encouraging the adoption of circular economy alternatives.	Reduces plastic waste generation and promotes sustainability practices. May contribute to reducing environmental impacts.	[27]
20	Tourism	Sharing to intensify use	Sharing tourism	Sharing of services - accommodation, transportation, and experiences - when traveling	A travel model using peer-to-peer platforms for shared accommodation, transportation, and experiences, fostering community-based tourism.	Promotes local economies and reduces the cost of traveling. May contribute to reducing environmental impacts	[38,39]

Notes: M- Practices mentioned in the literature that include monitoring components.

4 Conclusion

This report identified 20 circular and sharing economy best practices from an extensive literature review. These practical examples aim to inspire and guide decision-makers in the four CirLabs and beyond. The portfolio will serve as a starting point for discussions with stakeholders in the CirLabs, facilitating the co-selection of up to three practices. These practices will further be assessed in WP1 regarding their potential contribution to environmental goals.

A scientific article detailing and discussing both the review methodology and the practices identified is in final preparation for submission to an international journal.

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AUTONOME PROVINZ BOZEN SÜDTIROL
PROVINCIA AUTONOMA DI BOLZANO ALTO ADIGE
PROVINZIA AUTONOMA DE BULSAN SÜDTIROL

ktu kaunas university of technology 1922

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