City of Oulu

Circular Economy Roadmap Update and Integrated Action Plan

2025

AFRY

URBACT

Co-funded by the European Union

Interreg

OULU

Table of contents

Summary

In 2021, Oulu approved a circular economy roadmap with the goal of making Oulu the most learning circular economy city by 2030. This vision is based on close cooperation with businesses, residents, and other stakeholders, as well as leveraging digitalization. The roadmap is designed as a dynamic document that is regularly updated.

This report presents the results of the first update conducted during 2023–2025. The update was managed by the circular economy coordination group established in 2023, which includes representatives from various city departments and subsidiaries, as well as the University of Oulu and Oulu University of Applied Sciences. In the same year, the city of Oulu joined the European Union's LET'S GO CIRCULAR! – Paving the way for a circular transition of cities -project, which provides a framework and co-financing for updating the circular economy roadmap. Chapter 2 describes the process by which the update was carried out in more detail.

In the first phase of the update, the implementation of the roadmap's actions to date was assessed. The evaluation found that most of the actions have been implemented or partially implemented, indicating good progress in Oulu's circular economy efforts. The implementation review is discussed in more detail in Chapter 2, and a detailed breakdown is provided in Appendix 2. In the second phase, priorities and actions for 2025–2030 were defined. The update prioritized those focus areas and actions that are impactful, feasible, and broadly applicable to the city organization. The prioritized focus areas were defined as the built environment and material cycles, education and communication, public procurement, and land use and planning. Examples of planned actions include circular economy criteria for procurement, an annual circular economy event, and a model that develops the city as a platform for experiments and new circular economy business. The prioritized focus areas and actions are presented in Chapter 3.

As part of the update, a detailed action plan was prepared for the prioritized actions. The plan includes the objectives, phases, indicators, responsible parties, stakeholders, estimated budget, and potential risks for each action. Detailed descriptions of the action plans are provided in Appendix 1.

The progress of the roadmap and integrated action plan will be monitored and reported annually as part of Oulu's Environmental Program. The next update of the roadmap is planned for 2027, at which time the implementation of the roadmap will be reassessed and any necessary updates will be made. The monitoring and measurement of the roadmap are discussed in more detail in Chapter 4.

Throughout the process, the importance of broad cooperation and digitalization has been emphasized, and these factors are key enablers of success. The dynamic nature of the roadmap and regular updates ensure that Oulu can continue to develop into a sustainable, innovative, and learning circular economy city that promotes sustainable development and environmental responsibility.

Let's Go Circular! is an URBACT project uniting ten European cities to accelerate the circular economy transition. Led by the City of Munich (GE), the project includes the following member cities: Cluj-Napoca Metropolitan Area (RO), Corfu (GR), Granada (ES), Lisbon (PT), Guimaraes (PT), Malmö (SE), Oulu (FI), Riga (LV) and Tirana (AL). The project promotes transnational knowledge exchange and pilot actions. Its goal is to develop the Integrated Action Plan for Circular Economy for each city in collaboration with local stakeholders.

URBACT is a European Union program that helps cities work together to develop sustainable, integrated urban solutions. It promotes knowledge sharing, best practices, and participatory approaches involving local stakeholders.

1 Introduction

1.1 Background of the Roadmap Update

The Oulu urban area is the northern metropolitan area of Finland and the largest centre in the northern parts of the Nordic countries. The city of Oulu has about 215,000 inhabitants and is growing at a rate of over one percent per year. Oulu has developed into an attractive centre of expertise, where a diverse and international business life, as well as a strong economy and culture of cooperation, create a growth platform for new business activities.

The city of Oulu aims to grow sustainably – to maintain a good state of the environment, ensure the city's vitality, and be carbon neutral by 2035. To promote these goals, the Environmental Programme supporting the Oulu City Strategy has been developed, with one of its focus areas being "We act resource-wisely." In relation to this focus area, a circular economy roadmap was created to comprehensively guide the city's efforts in promoting the circular economy. The roadmap was approved in 2021. It was determined in the roadmap that responsible parties would regularly monitor the implementation of the roadmap's actions, with interim reviews scheduled for 2023 and 2026.

The city of Oulu has actively promoted the circular economy and has already implemented several actions described in the 2021 Circular economy roadmap. In 2023, the city of Oulu also joined the European Let's Go Circular! project, which promotes the transition of cities to a circular economy with the support and expertise of the LGC! network. This project provides a framework for the first update of the Circular economy roadmap.

The update also takes into account the changed operating environment. Oulu has a new City Strategy, and the Environmental programme was updated in 2023. Nationally, Finland's Circular Economy Roadmap 2.0, the national Circular economy action plan, and the Circular economy green deal guide towards a circular economy. New, updated, and evolving EU directives and national laws, including the Construction Act, the Land Use Act, and the Waste Act, have also influenced the prioritization of the update's focus areas.

The local circular economy coordination group (URBACT local group, members listed in chapter 5) has played a central role in this work. It consists of representatives from various departments and subsidiaries of the city. The group had convened regularly, and the action plan has been developed in three different workshops. In addition to the local coordination group meetings and workshops, other parts of the city subsidiaries and different levels of decision making has been involved through discussions and many commenting rounds. The project's stakeholders include various organizations and business units of the city of Oulu, such as the Oulu Innovation Alliance, the University of Oulu, and the Oulu University of Applied Sciences. The coordination group has guided the work and actively participated in its implementation.

1.2 Objective of the Roadmap Update

The objective of this work was to update the status of the implementation of the roadmap's actions and to refine certain parts of the roadmap into an integrated action plan according to the the Let's Go Circular! project framework. The integrated action plan focuses on areas and actions that broadly affect various units of the city and are currently the most important to promote from an impact perspective. The detailed action plan schedules concrete milestones and goals, along with responsible parties, for transitioning to a circular economy for these selected actions. Another goal was to identify concrete indicators for the actions to demonstrate the impact of the activities. These indicators will be followed up on a yearly basis, as a part of the Environmental programme monitoring programme.

2 Circular Economy Policy and Process of the Update

In the circular economy (Figure 1), materials are used efficiently and sustainably, remaining in circulation for a long time and safely. Products are also shared, rented, repaired, and recycled. Products-as-Services is part of the circular economy.

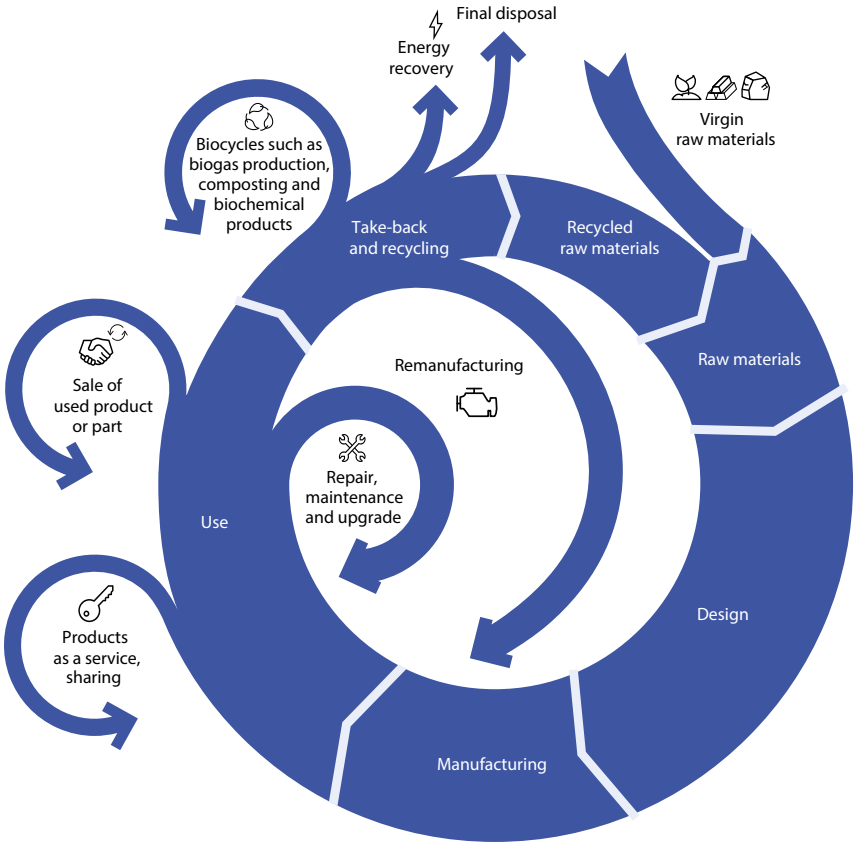
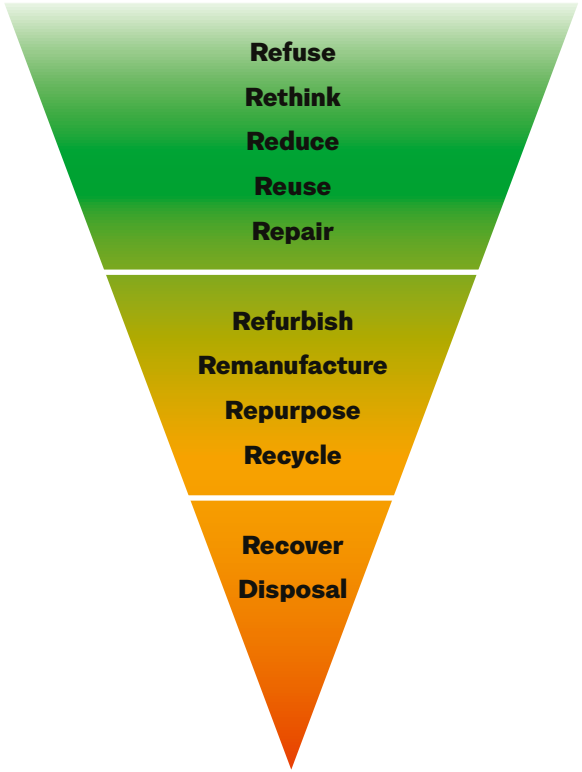


Figure 1. Description of the circular economy (Finnish Government, 2021).

The circular economy is a new economic model that produces economic well-being within the limits of the planet's carrying capacity. It effectively utilizes digitalization and renews societal structures and operating models. The circular economy is a means to reduce the use of natural resources. Transitioning to a circular economy does not only mean recycling materials. When examining value addition, most of it is created much earlier in the value chains. Instead of the traditional waste hierarchy (reduce, reuse, recycle, recover, dispose), it is worth examining the earlier stages of material cycles and considering the means to promote value addition in these stages. The hierarchy of processing products and the materials and energy embedded in them according to the circular economy can be presented, for example, as shown in Figure 2. The challenge is that currently many actions focus on the lower levels, such as recycling, instead of focusing on higher levels, such as reuse, repair, and remanufacturing. Moving to higher levels is important because they offer greater environmental benefits and even economic savings. However, this transition requires a step-by-step approach, where each step is considered, and the necessary infrastructures and operational models are developed. This way, the transition can be sustainable and effective.



Refuse: Eliminate the need for the product by giving up its functionality or by achieving the same functionality in another way.

Rethink: Utilize the product more efficiently by sharing it with multiple parties (sharing) or by finding multiple uses and ways to use it.

Reduce: Increase the efficiency of machines and equipment in the production process or use fewer raw materials for the same product.

Reuse products that are no longer in use in the same purpose but by another user.

Repair faulty products so that their original functionality is preserved.

Refurbish: Update old products to meet today's requirements.

Remanufacture: Utilize the functional components of the product in the manufacture of new, similar products.

Repurpose: Use the product or its components in the manufacture of a new, different product.

Recycle: Use the materials of the product in the manufacture of new products.

Recover: Utilize the energy embedded in the materials by incineration.

Disposal: Send to final disposal (e.g., landfill) only waste for which there is no utilization option.

Figure 2. Hierarchy of product processing in the circular economy (adapted from Amsterdam Circular 2020–2025 Strategy, 2020, p. 12)

2.1 Key Policy for Circular Economy

Vihreään siirtymään ja kiertotalouteen kuuluu kattava joukko erilaisia The green transition and circular economy include a comprehensive set of various legislative changes and detailed action programmes at the EU, national, and local levels. The EU Circular Economy Action Plan significantly promotes the circular economy. Additionally, the circular economy criteria published in November 2023 under the EU Taxonomy Regulation, along with the CSRD and CSDD directives, impose their own requirements on economic activities aligned with the circular economy. The ISO 59000 series of standards for the circular economy, on the other hand, standardizes circular economy terminology and supports the promotion of the circular economy within organizations (SFS 2024).

The national circular economy action plan was approved, and to support the achievement of its goals, Finland's Circular Economy Green Deal was published in 2024 (Ministry of the Environment 2024a). The Green Deal is a voluntary strategic commitment where participating entities commit to reducing the use of natural resources and promoting a low-carbon circular economy. The Construction Act (751/2023) will be reformed at the beginning of 2025. The aim is to streamline construction and promote emission reductions and the circular economy by setting requirements for reporting the carbon footprint and carbon handprint of buildings and considering low-carbon aspects in planning (Ministry of the Environment 2024b). In the fall of 2024, a working group appointed by the Ministry of the Environment began preparing a new Circular Economy Law (Government of Finland 2024). The Circular Economy Act will replace the current Waste Act.

In the regional Smart Specialization Strategy of Northern Ostrobothnia 2021–2025, climate action, including the circular economy, has been identified as one of the focus areas. Actions to achieve the goals have been recorded in the Northern Ostrobothnia Climate Roadmap. In the updated 2024 Climate Roadmap of Northern Ostrobothnia, the goal "Towards a Carbon-Neutral Northern Ostrobothnia!" remains, with one of the key themes being "Smart bio- and circular economy as the foundation of climate work" (Council of Oulu Region, 2024).

The city of Oulu is committed to several programs, plans, and declarations promoting sustainable development and the circular economy, such as the European Circular Cities Declaration, the cities' commitment to promoting biodiversity, the Sustainable Energy and Climate Action Plan (SECAP), and the European Covenant of Mayors for Climate and Energy.

2.2 Oulu Circular Economy Roadmap

In the Circular Economy Roadmap approved in 2021, the vision for the circular economy by 2030 was defined as: **"Oulu is the most learning circular economy city. We develop and implement sustainable lifestyles in cooperation with businesses, residents, and other stakeholders."** The overall structure of the Circular Economy Roadmap is depicted in the image below (Figure 3). The focus areas selected were energy, the built environment, material cycles, and the food system, with horizontal, cross-cutting themes being education and learning, public procurement, the sharing economy, and land use and planning. Key success factors identified for the overall implementation of the roadmap included business cooperation, broader regional cooperation, leveraging procurement partnerships, and digitalization.

The timeline and goals of Oulu's Circular Economy Roadmap extend to 2030. The goals are to be achieved gradually by implementing the concrete actions created to achieve them.

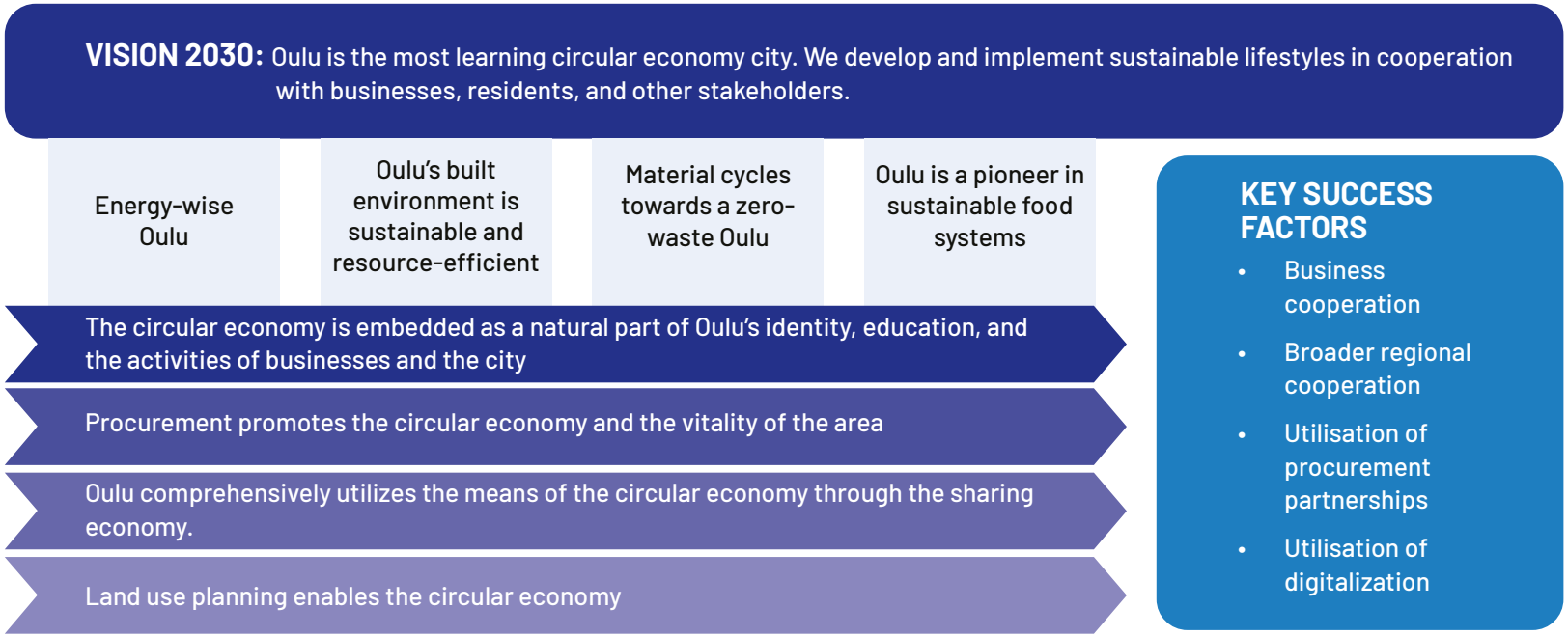


Figure 3. Vision 2030 of Oulu's Circular Economy Roadmap, focus areas, cross-cutting themes, and key success factors

2.3 Process of Updating the Oulu Circular Economy Roadmap

When creating the Circular Economy Roadmap, it was designed to be a dynamic document (Figure 4), where goals and actions can be updated as needed based on new information. Initially, the most important task was to strengthen circular economy expertise within the city's various organizations. In the next phase of the roadmap, the lessons learned will be utilized in the planning and implementation of new circular economy models and projects. The results of implemented pilot projects addressing various themes of the circular economy will also be shared and utilized as efficiently as possible.

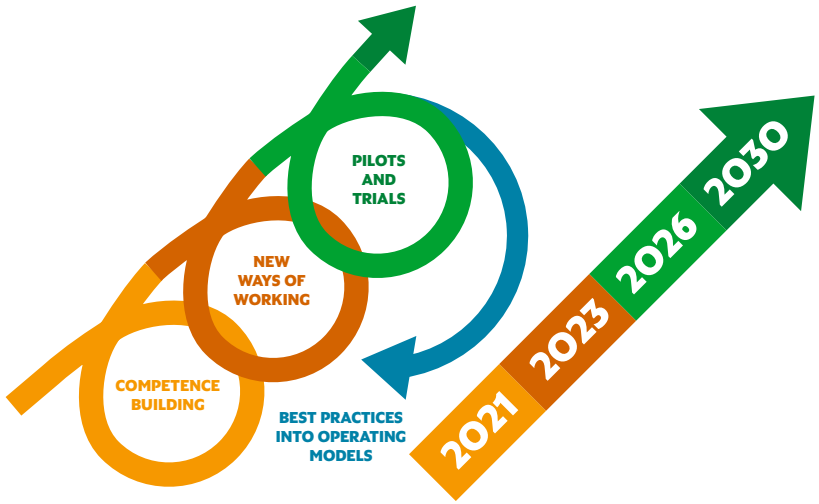


Figure 4. Dynamic structure of Oulu's Circular Economy Roadmap.

The 2023-2025 update of the roadmap was carried out in collaboration with the city of Oulu, its subsidiaries, and other key regional stakeholders, such as representatives from education and research institutions. The work was led by the local circular economy coordination group, whose members represent various units of the city. Additionally, representatives from the University of Oulu and Oulu University of Applied Sciences were involved. The composition of the working group is presented in section 5. The group's collaboration has promoted communication between different departments and levels of government and helped create a common understanding of the state of the circular economy and the prioritized actions in the city.

The update was carried out as part of the Let's Go Circular! project, with consultants from AFRY supporting the work. The project provided a framework and objectives for the work. The goal of the roadmap update was particularly to prioritize and refine the actions of the circular economy roadmap, focusing mainly on actions common to different departments. From the more than one hundred actions described in the original circular economy roadmap, about ten impactful actions were clarified, refined, and further developed. It is important to note that the original circular economy roadmap, with its identified focus areas and action packages, still serves as the background. Several actions are being promoted within departments and using other more detailed action plans.

The update of the roadmap began with a review of the implementation status of the circular economy roadmap's actions. The responsible parties and the coordination group evaluated the implementation of the actions. The actions were identified as implemented, to be developed, to be accelerated, or no longer necessary for some reason. The results of the review are presented in section 2.4.

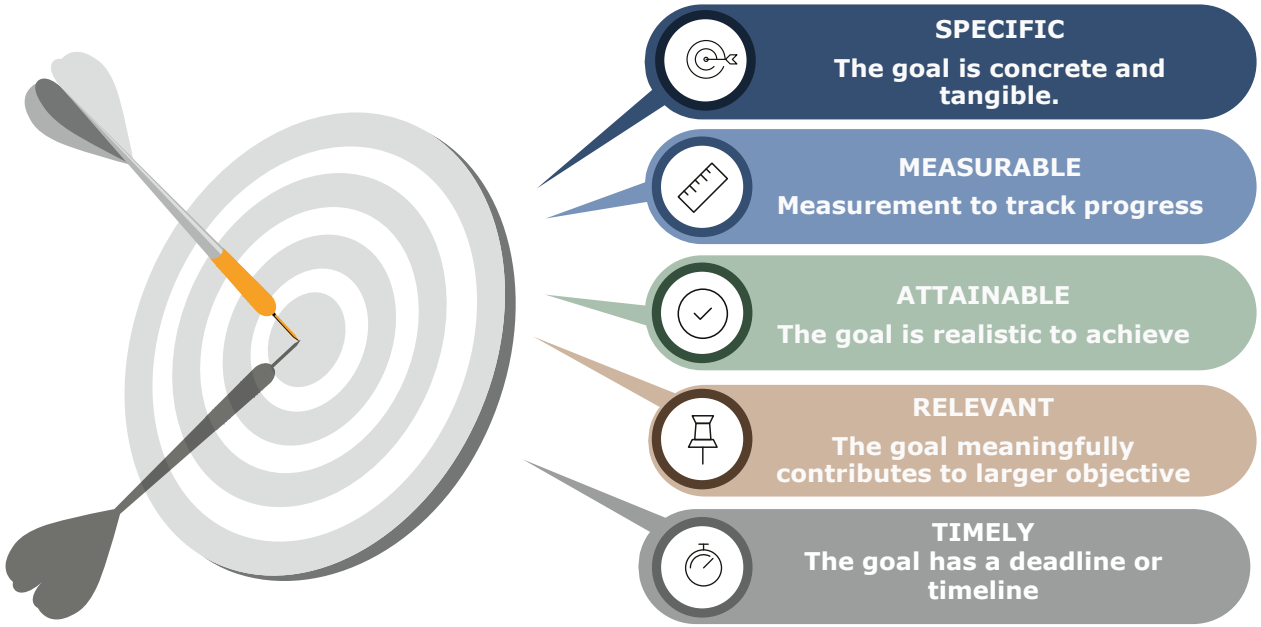


Figure 5. SMART objectives.

After identifying the implementation status of the actions, the focus areas of the circular economy roadmap and the related actions that had not yet been implemented were prioritized. The criteria for prioritization were "impactful, attainable, common to many departments" focusing particularly on actions to be accelerated and continued. Additionally, important new actions that met the criteria above were identified. After prioritizing the actions, SMART goals (figure 5), phases, indicators, responsible parties, stakeholders, budget, and potential risks were defined for them.

The process of updating the roadmap is presented in the image below (Figure 6).

Figure 6. Process of updating the roadmap.

The circular economy coordination group was established, consisting of representatives from various city administration departments and subsidiaries. In 2023, the City of Oulu joined the European Union's Let's Go Circular! project. This project provides a framework for the first update of the circular economy roadmap.

The implementation of the roadmap was assessed in 2023 under the leadership of the coordination group. Based on the roadmap's implementation, Oulu's work to promote the circular economy has been effective, as the vast majority of actions were considered implemented and/or partially implemented.

The focus areas of the circular economy roadmap and the related actions that had not yet been implemented were prioritized. The criteria were "impactful, feasible, common," focusing particularly on actions to be accelerated and continued.

An integrated action plan was defined for the prioritized actions, including the goals, phases, indicators, responsible parties, stakeholders, estimated budget, and potential risks. The actions are:

The draft of the roadmap will be circulated for comments among city departments and stakeholders at the end of 2024 and beginning of 2025.

The approval of the roadmap update will be done by the coordination group and peer-reviewed in the Let's Go Circular! Project 2025.

In the updating process, both the Oulu Circular Roadmap priority areas and the LGC! Network's focus themes were considered. In the circular economy roadmap, the following priority areas, common to several city departments, were emphasized based on the prioritisation: procurement, education and communication, land use and planning, material cycles, and the built environment. As the priority areas align with the LGC! Network themes, as depicted in figure 7, the actions in these priority areas were prioritised.

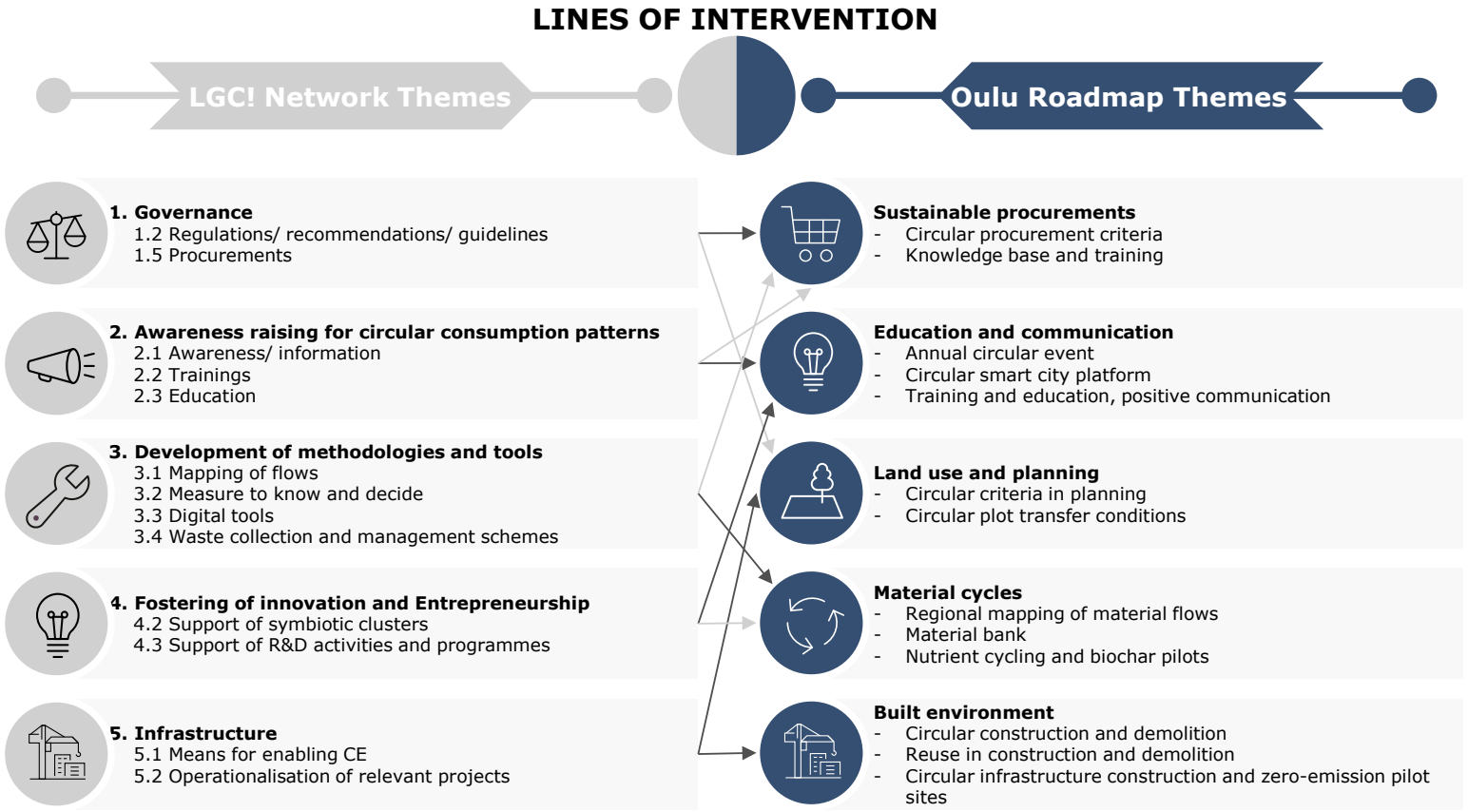


Figure 7. Lines of intervention aligning LGC! network's themes with the priority areas in the Oulu Circular Roadmap.

2.4 Implementation of Oulu's Circular Economy Roadmap

The city of Oulu has actively started promoting the circular economy using the circular economy roadmap. The roadmap includes 8 different themes, which are divided into goals and actions to promote their implementation. There are a total of 123 actions, and their implementation was reviewed by the circular economy coordination group at the end of 2023. Based on the implementation of the roadmap, Oulu's work to promote the circular economy has been effective, as most of the measures were considered to have been implemented and/or partially implemented.

The measures of the circular economy roadmap are divided into 8 different themes: Energy, procurement, sharing economy, education and communication, land use and planning, material cycles, built environment, and food system. Especially the measures related to education and communication, as well as material cycles and energy, have been at least partially implemented according to the review. Many measures, for example in the theme of education and communication, are ongoing and continuous. A few measures related to procurement and the built environment have not yet been implemented according to the review, although most of these have also been advanced.

The review of the implementation (Figure 8) shows that the roadmap has been well received in the City of Oulu, and the actions listed in the programme have been actively implemented. The review of the roadmap implementation for 2023 is presented in Appendix 2

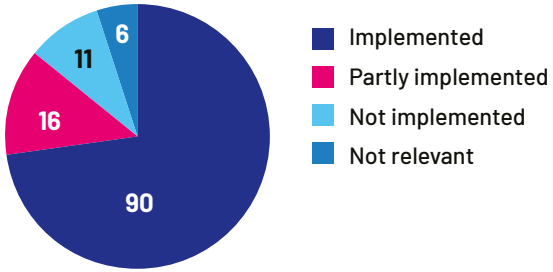


Figure 8. Implementation status 2024 of the actions in Oulu Circular Economy Roadmap 2021.

2.5 Key Findings and Lessons Learnt from Implemented Actions

The implemented actions of the roadmap provide lessons for the future on how circular economy thinking can be integrated into city operations. Since the work is still in its early stages, many actions focus on the lower levels, such as recycling, instead of focusing on higher levels, such as repair and remanufacturing. Moving to higher levels is important but requires a step-by-step approach. Pilots alone do not create the transition, but they provide valuable information on how circular economy practices can be incorporated into general operational models even after the projects.

Pilot areas and projects, such as "From Tahkokangas to Circular Economy," have emphasized the importance of continuous learning and adaptation in circular economy projects. The Circular Economy Handbook 2022 provided guidelines and best practices for integrating circular economy principles into urban planning. The pilot of the plot allocation plan introduced a circular economy condition, which encouraged innovative and sustainable building practices.

Events like the Circular Economy Arena and Biochar Day have promoted collaboration and knowledge sharing among different stakeholders. The pilot of the Circular Economy Arena at the Northern Industry Fair demonstrated strong interest in the topic and created new partnerships. Biochar Day brought together companies, research institutions, and cities, leading to innovative ideas for the use of biochar.

The MASSA project analyzed the management of materials and mass flows in the city of Oulu, which helped develop management and utilization plans for the most significant identified material and mass flows. These initiatives show that integrating circular economy principles into urban planning and procurement is possible and beneficial.

More details on the implemented actions and key lessons from the pilots are presented in Appendix 2.

3 Oulu circular economy roadmap update and integrated action plan

In the circular economy roadmap, the following priority areas, common to several city departments, were emphasized based on the prioritisation: procurement, education and communication, land use and planning, material cycles, and the built environment (Figure 9). From the actions in these priority areas, those considered the most impactful and feasible were selected for more detailed planning. It should be noted that the priority areas energy, sustainable food system, and sharing economy, which were excluded from more detailed examination in the update, are also important and are promoted through other programmes by their responsible organisations.

After prioritising the actions, goals, phases, indicators, responsible parties, stakeholders, budget, and potential risks were defined for them. The selected actions vary in level and extend over different time frames. The priority areas of the roadmap update and summaries of their action packages are presented in sections 3.1–3.5. Detailed actions are described in Appendix 1.

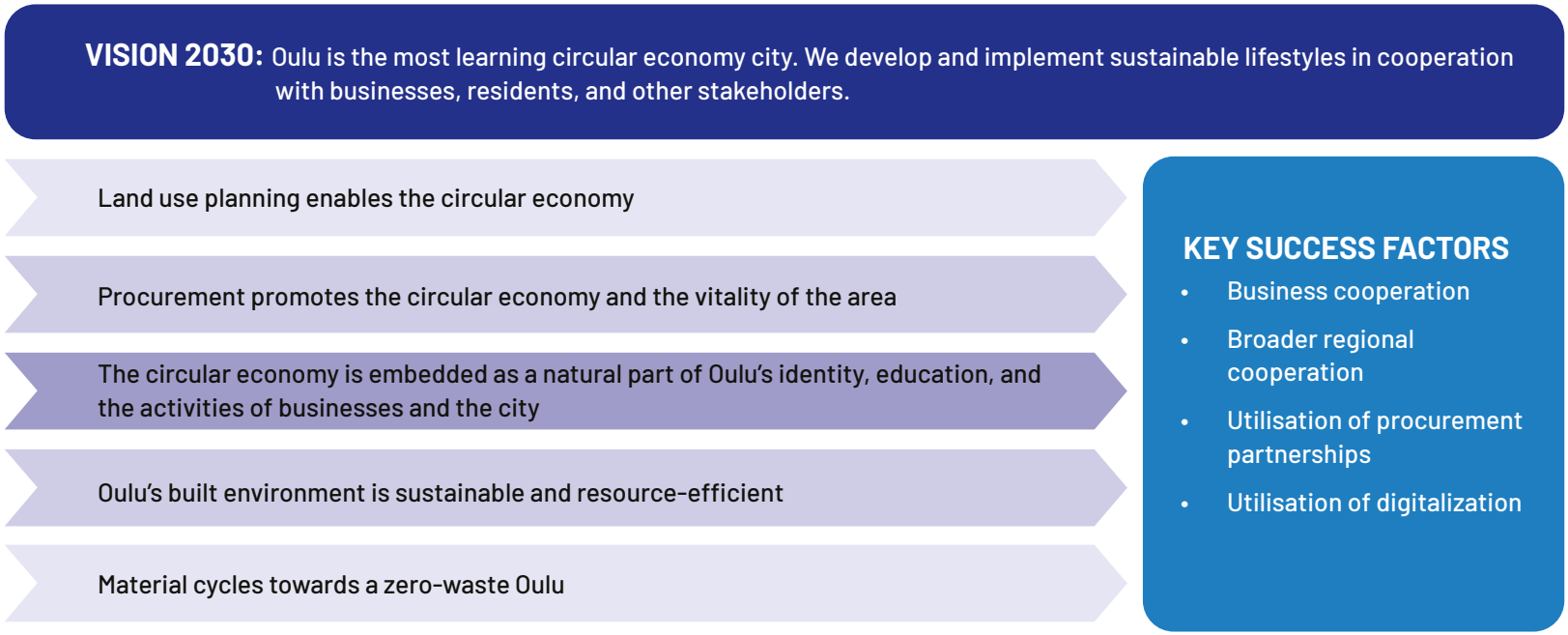


Figure 9. Vision of Oulu's Circular Economy Roadmap, focus areas of the IAP, and key success factors.

3.1 Sustainable Procurement

Through public procurement, the city can act as a promoter of the circular economy when procuring food, logistics equipment, energy solutions, or construction contracts, for example. Sustainable public procurement means purchases that consider environmental, social, and economic aspects.

GOAL 2030:

Procurement promotes the circular economy and the vitality of the region.

OBJECTIVE:

Strategic planning of procurement in accordance with the procurement policy program.

ACTION:

Circular economy criteria for procurement.

- Create circular economy criteria for procurement and identify procurements that can significantly promote the circular economy. Create an updatable knowledge base for circular economy criteria and example procurements and organize training for staff.
- Indicators: The procurement contracts that include circular economy criteria (no). Knowledge base created (Yes/No). Training sessions organized (no).

3.2 Education and Communication

Education and learning are at the heart of the transition to a circular economy. In the future, the basic principles of the circular economy must be a natural part of every level and program of education, from early childhood education to vocational studies, higher education, and adult education. In addition to education, the city must also promote a broader environment where it is easy for residents to make sustainable choices. The role of communication is significant in profiling as a circular economy city, and the need for circular economy communication and information sharing was recognized as important in all stages of the roadmap.

GOAL 2030:

The circular economy is embedded as a natural part of Oulu's identity, education, and the activities of businesses and the city. Oulu promotes a positive attitude towards the circular economy by communicating about it positively, inspiringly, and openly.

- The foundation of the circular economy is built through education and continuous learning.
- Cooperation, a culture of experimentation, and concrete actions strengthen Oulu's vitality.
- Oulu provides good examples and creates an environment where it is easy to make sustainable choices.

OBJECTIVE 1:

Profiling as a circular economy city

ACTION:

Annual circular economy event in the city.

- Develop and expand the Circular Economy Arena event and continue its activities annually. Also organize an event in schools annually to strengthen circular economy competence with pedagogical challenges, for example, in connection with the Circular Economy Arena.
- Indicators: Number of participants (no)

OBJECTIVE 2:

Acting as a test platform for new circular economy services and products

ACTION:

Create an operating model that develops the city to act as a platform for experiments and new circular economy business.

- Further develop a common operating model considering the experiences of previous circular economy-related pilots and other development platforms. Launch, test, and develop the operating model.
- Indicators: Operating model created (Yes/No), Number of piloting companies on the platform (no).

OBJECTIVE 3:

The city's staff is circular economy savvy. Sharing circular economy knowledge with residents.

ACTION:

Increasing the circular economy competence of Oulu residents.

- Incorporating circular economy themes into eco-support training. Continuing education for teachers and the creation and development of circular economy learning materials. Positive communication about the circular economy.
- Metrics: Number of sessions in eco-support training with circular economy themes. Implementation of the sustainable future learning stream (number of schools) and an annual follow-up survey for students. Media monitoring on the circular economy theme.

3.3 Land Use and Planning

In circular area development and construction, attention must be paid to the life cycles of buildings, infrastructure, and functions. The possibilities of the circular economy depend on the characteristics of the areas. Regional goals, boundary conditions, and criteria of the circular economy should be considered at all planning levels. Flexibility is also needed in planning from the perspective of climate impacts.

GOAL 2030:

Land use planning enables the implementation of the circular economy.

OBJECTIVE 1:

Land use planning promotes the adaptability, complementarity, and longevity of the urban structure and its parts, as well as the attractiveness of the areas.

ACTION:

In master and detailed planning work, examine the possibilities of implementing circular economy goals and, if necessary, include circular economy considerations in the planning work.

- Identify the key potential circular economy entities in the plan and utilize circular economy considerations in applicable planning work.
- Indicators: Number of plans where circular economy themes have been identified and how.

ACTION:

Introduce planning markings and building guidelines that promote and enable the circular economy and mass balance assessment.

- Introduction of planning markings and building guidelines that promote the circular economy.
- Indicators: Number of plans with circular economy markings (pcs), number of plans with mass balance calculation.

OBJECTIVE 2:

Promote the circular economy through plot transfer conditions.

ACTION:

Introduce plot transfer conditions and contract terms that promote the circular economy.

- Draft and implement circular economy conditions, test and expand the operating model, and use voluntary circular economy criteria as an incentive in plot transfers.
- Indicators: Circular economy criteria implemented in land allocation and expanded from pilot operations to part of the operating model (Yes/No).

3.4 Material Cycles

In the circular economy, it is essential to keep materials and their embedded value in circulation for as long as possible.

GOAL 2030:

Oulu is one of the pioneers in material cycles in Finland. We use natural resources sustainably. We produce recycled materials for the needs of society and utilize them exemplarily in our own operations. We coordinate and develop material management comprehensively.

- The recycling rate of municipal waste is systematically increased (material recycling rate is 65%)
- The recycling rate of construction and demolition waste is 75%
- The utilization rate of sewage sludge is high, almost 100%
- The utilization rate of soil masses is high
- We promote cooperation with our stakeholders and enable the creation of new business in the area

OBJECTIVE 1:

Enhance statistics and monitoring, and map and utilize material flows more efficiently.

ACTION:

Develop regional monitoring of waste and material flows and their recycling rates.

- Regional monitoring of waste flows and soil masses comprehensively.
- Indicators: Municipal solid waste (t and kg/resident) and recycling rates (%). Construction and demolition waste (t) and recycling rates (%), soil masses (t) and utilisation rates (%).

ACTION:

Develop and implement a material bank and a management and utilization plan for material flows.

- Develop a material bank, investigate interim storage locations. Draft a management plan for material flows.
- Indicators: Material bank in use and management plan created and implemented (Yes/No)

OBJECTIVE 2:

Enhance nutrient cycling.

ACTION:

Create an operating model for the use of biochar in stormwater purification and growing media.

- Compile knowledge from pilot experiences and experiments. Define the entire process from biochar procurement onwards.
- Indicators: Study completed (Yes/No), Pilot completed (Yes/No), Amount of biochar used (t).

3.5 Built Environment

Construction is one of the most material- and energy-intensive industries in the world, second only to mining. The circular economy is an important means to prevent climate change and enhance resource efficiency in the built environment. It is essential to comprehensively consider the circular economy from regional planning and construction to the use and demolition of spaces, and especially to extend the lifespan of buildings.

GOAL 2030:

In Oulu, the built environment is sustainable and resource-efficient, minimizing environmental impacts throughout its lifecycle.

- Design solutions prioritize low carbon emissions and adaptability throughout the lifecycle.
- Measures during use and maintenance support extending the lifecycle and reducing carbon emissions.
- Increase adaptability in all built environment solutions.
- Demolition is planned and considers the principles of the circular economy.

OBJECTIVE 1:

Promote resource-wise commercial and residential construction

ACTION:

Construction and demolition according to the principles of the circular economy.

- Create an operating model for circular economy-based demolition and update the circular economy principles in design guidelines. Use digital twins to collect/store qualitative and quantitative data on used materials and for lifecycle planning.
- Indicators: Circular economy demolition model created and in use (Yes/No), Construction and demolition planning guidelines updated (Yes/No), Utilization rate of construction and demolition waste (%).

ACTION:

Promoting reuse in renovation and new construction as well as in demolition.

- Conduct extensive and proactive demolition surveys. Study pilots and lessons learned elsewhere and implement pilot projects and experiments. Develop an operating model for the reuse of materials from demolished sites within the organization.
- Indicators: Reuse pilots (no), Circular economy demolition model created and in use (Yes/No)

OBJECTIVE 2:

Promote resource-wise infrastructure construction

ACTION:

Implement circular economy-based infrastructure construction pilots and zero-emission construction sites.

- Plan, implement, and monitor pilots. Create criteria, design guidelines, and reporting requirements based on pilot lessons.
- Indicators: Number of pilots (no), Use of recycled materials included in planning guidelines (Yes/No).

OBJECTIVE 3:

The city's built environment is long-lasting and low-emission

ACTION:

Consider longevity and energy efficiency in buildings.

- Develop lifecycle properties of buildings and set concrete goals in project planning. Focus on energy efficiency during the needs assessment phase of renovations. Utilize existing best practices and expertise throughout the city organization.
- Indicators: Circular economy demolition model created and in use (Yes/No).

4 Implementation, monitoring, and evaluation of the circular economy roadmap

Responsibility for implementing the measures of the circular economy roadmap and producing information lies with the sectors, municipal enterprises, and city-owned companies according to the integrated action plan (Appendix 1). Funding for the measures highlighted in the roadmap update and integrated action plan will be arranged partly within existing resources as part of the city's operations. For some measures, especially those involving pilot projects, external funding can be sought. Possible funding channels have already been identified and are presented in the table below (Table 1).

EU REGIONAL AND STRUCTURAL POLICY FUNDS AND PROGRAMMES	
ERDF European Regional Development Fund	Aims to create vitality, improve employment, support sustainable growth, and increase competitiveness. Programs: Innovative Finland and Carbon Neutral Finland.
ESF+ European Social Fund	Development projects supporting employment, skills, and inclusion.
JTF Just Transition Fund	Projects mitigating the socio-economic and environmental impacts of the low-carbon transition to ensure employment and sustainable regional economies.
Interreg, European Territorial Cooperation (ETC) Programs	Integration of cross-border cooperation areas and the formation and strengthening of networks between regions and cities. Several programs, e.g., URBACT.
Horizon Europe	Innovation projects supporting the green transition and digitalization.
EU Life Programme	Projects targeting the environment, nature conservation, and climate action.
EU REGIONAL AND STRUCTURAL POLICY FUNDS AND PROGRAMMES	
Investeu-Programme	InvestEU supports sustainable investments, innovations, and job creation. Funding areas: circular economy, research, innovations and digitalization, SMEs, social investments.
EU Innovation Fund	Innovative low-carbon technologies.
NATIONAL PROGRAMMES	
Business Finland	Funding for research, product development, and various business development needs. E.g., innovative public procurement, circular economy investments, bioeconomy, and cleantech.
Munifin (Municipality Finance Plc)	For the built environment of municipalities. E.g., funding for the green transition.
Ministeries	Various programs, e.g., projects supported by the Ministry of the Environment or Ministry of Education and Culture.
Agencies	Various programs, e.g., Traficom's mobility management projects, the Food Agency's support for private and public entities for natural resource and climate cooperation projects, and general environmental and climate investments.
Ely-Centres (Centre for Economic Development, Transport and the Environment)	Several programs and grants.

Table 1. Possible funding channels for implementing the circular economy action plan.

The target timeline for the actions is shown in the figure below (Figure 10). Many measures, such as considering longevity and energy efficiency in buildings, are ongoing efforts that are continuously being developed. The circular economy coordination group is responsible for monitoring and developing the implementation of the circular economy roadmap. It also reports on the progress of the work annually in conjunction with the environmental programme reporting. The monitoring considers the most relevant risks for the implementation of the measures and aims to anticipate and prevent these risks. The implementation of the roadmap is communicated regularly.

The next detailed interim monitoring of the roadmap implementation is planned for 2027. The evaluation will assess the progress of the roadmap implementation and the achievement of the set goals in relation to the actions implemented and their impacts by then. Based on the evaluation, necessary changes will be made, for example, to refocus and accelerate the roadmap's priorities and/or actions for the remainder of the programme period. The key indicators of the roadmap are presented in the table below (Table 2). The Circular Economy Coordination Group is responsible for monitoring and updates the main indicators as needed twice a year.

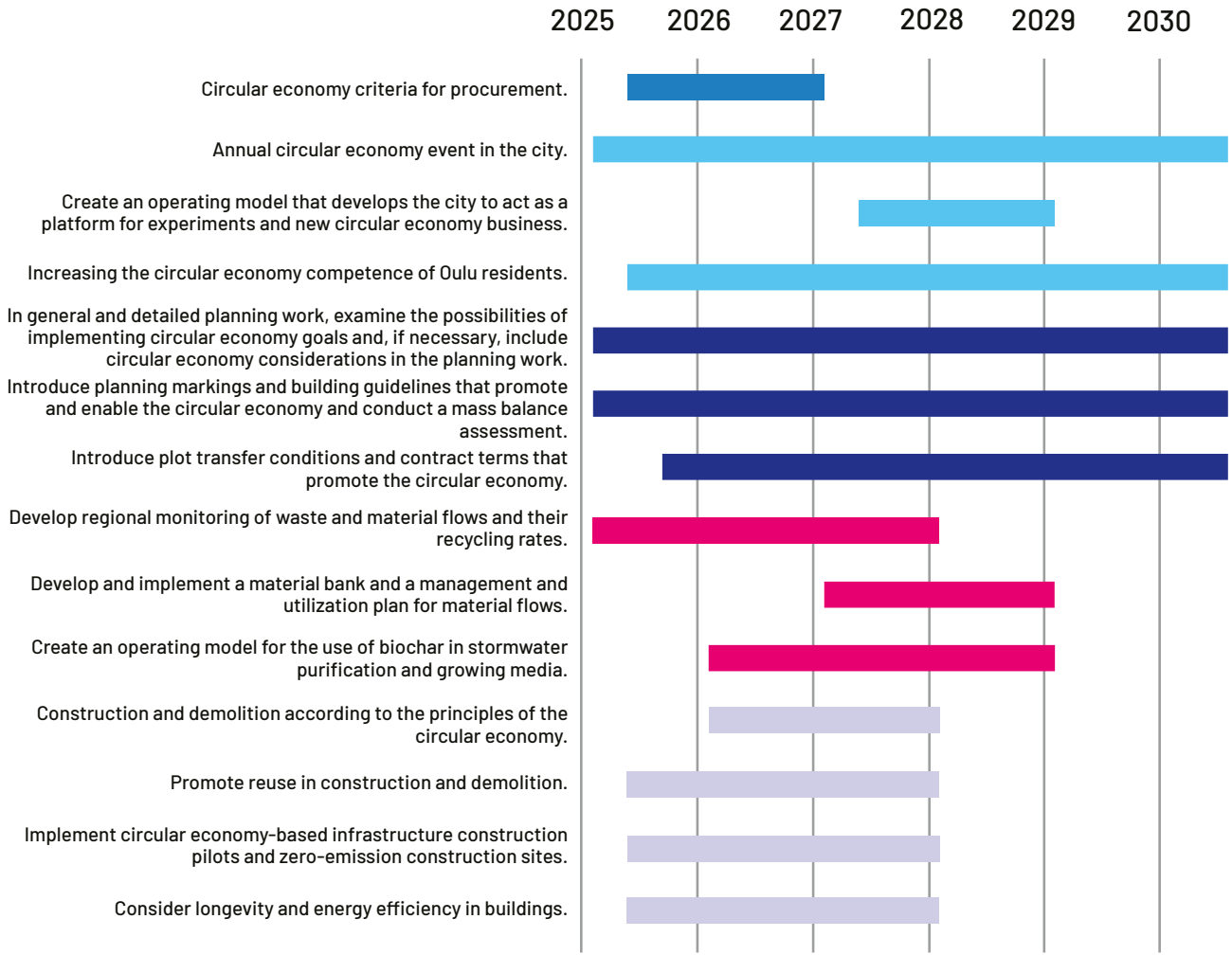


Figure 10. Planned timeline for the measures.

THEME	INDICATOR	MONITORING FREQUENCY
PROCUREMENT	Procurement contracts including circular economy criteria (no)	Annually
PROCUREMENT	Knowledge base on circular economy procurement criteria created (Y/N)	Annually
PROCUREMENT	Training sessions on circular economy procurement organized (no)	6 months
EDUCATION AND COMMUNICATION	Number of participants in Circular Economy Arena and school events (no)	Annually
EDUCATION AND COMMUNICATION	Operating model for the circular economy platform created (Y/N)	6 months
EDUCATION AND COMMUNICATION	Number of pilot companies on the circular economy platform (no)	6 months
EDUCATION AND COMMUNICATION	Number of sessions in circular economy-themed eco-support training (no) 12 months	Annually
EDUCATION AND COMMUNICATION	Sustainable learning stream in school and early childhood education annual plans (number of schools, survey)	Annually
EDUCATION AND COMMUNICATION	Media monitoring, publications on the circular economy theme (no)	Annually
PLANNING AND LAND USE	Number and qualitative description of plans where circular economy themes have been identified	Annually
PLANNING AND LAND USE	Number of plans with circular economy markings (no)	Annually
PLANNING AND LAND USE	Plans that have used mass balance calculations (pcs)	Annually
PLANNING AND LAND USE	Implementation of circular economy criteria in land allocation and expansion from pilot operations to part of the operating model (Y/N)	Annually
MATERIAL CYCLES	Total amount of municipal waste (t, kg/capita) and treatment methods (%)	Annually
MATERIAL CYCLES	Amount of soil masses and utilization methods and recycling rate (t, %)	Annually
MATERIAL CYCLES	Amount of construction waste (t) and treatment methods (%)	Annually
MATERIAL CYCLES	Study on the use of biochar in stormwater purification and growth substrates has been conducted (Y/N)	6 months
MATERIAL CYCLES	Pilot on the use of biochar in stormwater purification and growth substrates has been conducted (Y/N)	6 months
MATERIAL CYCLES	Amount of biochar used in stormwater purification and growth substrates in the city (t)	6 months
MATERIAL CYCLES	Management plan for the material bank created and implemented (Y/N)	6 months
BUILT ENVIRONMENT	Circular economy demolition model created and in use (Y/N)	6 months
BUILT ENVIRONMENT	Construction and demolition planning guidelines updated (Y/N)	Annually
BUILT ENVIRONMENT	Utilization rate of construction and demolition waste (%)	Annually
BUILT ENVIRONMENT	Reuse pilots in construction (number)	Annually
BUILT ENVIRONMENT	Circular economy demolition model created and in use (Yes/No)	Annually
BUILT ENVIRONMENT	Use of recycled materials included in planning guidelines (Yes/No)	Annually
BUILT ENVIRONMENT	Number of circular economy and zero-emission infrastructure construction pilots (no)	Annually
BUILT ENVIRONMENT	Lifecycle emissions, carbon footprint calculation in investment projects (kgCO2e/m^2/year)	Annually

Table 2. Monitoring Indicators of the Circular Economy Roadmap

4.1 Risk Mitigation Plan

In the development of the action plan, a systematic approach was taken to identify and assess potential risks. This process involved engaging with key stakeholders to gather diverse perspectives on possible challenges. Workshops and brainstorming sessions were conducted to identify specific risks associated with each action item and their potential impact and likelihood were assessed.

Mitigation strategies should be reviewed regularly as a part of the monitoring of the roadmap to ensure they remain effective and relevant. In addition to scheduled reviews, ad-hoc reviews will be conducted whenever significant changes occur, such as new regulations, technological advancements, or major project milestones. By regularly reviewing and updating mitigation strategies, the plan can remain resilient and adaptable to changing circumstances, ensuring successful implementation of circular economy initiatives.

Common risks for the action plan as well as theme-specific risks and the mitigation plan is presented in table 3. Action specific risks are identified in Appendix 1.

COMMON RISKS	RISK	MITIGATION
LIMITED HUMAN RESOURCES	Many actions require significant human resources, which may be limited.	Prioritize actions and allocate resources efficiently to ensure critical tasks are staffed adequately.
LACK OF STAKEHOLDER ENGAGEMENT	Insufficient involvement from key stakeholders, including city officials, businesses, and the community, can hinder the implementation of the plan.	Establish regular communication channels and engagement activities. Create stakeholder committees to ensure continuous involvement and feedback. Foster strong commitment and positive attitudes through regular communication and involvement of all stakeholders.
INSUFFICIENT FUNDING AND HUMAN RESOURCES	Several actions depend on securing adequate funding, which may not always be realized. Lack of adequate funding can delay or halt the implementation of various initiatives.	Develop robust funding strategies, including securing grants and partnerships to ensure financial stability. Secure funding through multiple sources, including government grants, private investments, and public-private partnerships. Regularly review and adjust the budget to ensure financial sustainability.

Table 3. Risk mitigation plan.

COMMON RISKS	RISK	MITIGATION
COMMITMENT AND ATTITUDE, CULTURAL RESISTANCE	Resistance to change from within the organization or the community can slow down progress. Ensuring commitment from all involved parties and overcoming potential resistance to change.	Implement change management strategies, including education and awareness campaigns. Highlight the benefits of circular economy practices to gain buy-in from all stakeholders. Foster strong commitment and positive attitudes through regular communication and involvement of all stakeholders.
INFORMATION FLOW AND SKILLS	Effective implementation often requires improved information flow and skill development among stakeholders.	Invest in training programs to enhance skills and improve information flow among stakeholders.

THEME-SPECIFIC RISKS	RISK	MITIGATION
PROCUREMENT	Low adoption of circular economy criteria in procurement contracts.	Provide training and resources to procurement officers on circular economy principles. Regularly review and update procurement guidelines to include circular economy criteria.
	Difficulty in allocating sufficient personnel for creating and implementing circular economy criteria.	Assign a dedicated team to oversee the development and maintenance. Prioritize actions and allocate resources efficiently to ensure critical tasks are staffed adequately. Set clear deadlines and milestones.
	Challenges in disseminating information and training staff effectively.	Schedule regular training sessions and ensure they are mandatory for relevant staff. Monitor attendance and effectiveness through feedback.
EDUCATION AND COMMUNICATION	Risk of not securing continuous funding for events and educational programs.	Develop robust funding strategies, including securing grants and partnerships to ensure financial stability. Secure funding through multiple sources
	Potential failure in effectively marketing events, leading to lower participation.	Utilize multiple communication channels to promote events. Collect and act on feedback to improve future events.
	External factors like pandemics could disrupt planned activities.	Ensure plans are adaptable to accommodate changes and unforeseen circumstances.

COMMON RISKS	RISK	MITIGATION
PLANNING AND LAND USE	Limited recognition of circular economy themes in plans.	Integrate circular economy principles into planning guidelines and provide training for planners.
	Miscommunication among stakeholders could lead to resource wastage.	Invest in training programs to enhance skills and improve information flow among stakeholders.
	Ensuring that plans are adaptable and not too rigid, which could hinder their long-term viability.	Ensure plans are adaptable to accommodate changes and unforeseen circumstances.
	Slow implementation of circular economy criteria in plot allocation.	Set clear policies and guidelines for plot allocation. Monitor and report on the implementation progress.
MATERIAL CYCLES	Difficulty in allocating resources and defining responsibilities for monitoring and managing material flows.	Assign roles and responsibilities, allocate sufficient resources. Standardize data collection methods and provide training and communicate with stakeholders. Regularly audit data for accuracy.
	Ensuring the quality and reliability of information on material flows and recycled materials.	Standardize data collection methods and provide training and communicate with stakeholders. Regularly audit data for accuracy.
BUILT ENVIRONMENT	Cost impacts and higher costs associated with implementing circular economy principles in construction and demolition.	Conduct thorough cost-benefit analyses to demonstrate the long-term savings and benefits of circular economy practices. Partner with other organizations, businesses, and educational institutions. Explore innovative financing options such as green bonds or impact investment funds.
	Scheduling risks and lack of coordination of projects may face delays, impacting overall timelines.	Utilize advanced project management tools and software to improve scheduling, track progress, and manage resources efficiently. Assign a dedicated team or coordinator to oversee the integration and coordination of various project components.
	Availability of materials and machines, and their lack of precise product information.	Engage with suppliers early in the project to ensure the availability of necessary materials and machines. Build strong relationships with reliable suppliers. Implement robust inventory management practices to keep track of available materials and machines. Provide training for procurement and construction teams on how to source and use materials and machines effectively.

5 Local circular economy coordination group responsible for updating the roadmap

Project Manager:

Petteri Tuuttila	Community and Environmental Services

Coordination Group Members

Mika Jutila	Community and Environmental Services
Johanna Järvi	Oulu Facility Services
Teemu Koskela	Syklo Oy
Päivi Kunnari	Oulu Region Environmental Services
Reetta Leinonen	Oulu Facility Services
Santeri Lokkila	Community and Environmental Services
Sari Matinheikki	Central administration
Tarja Niemelä	Oulu Facility Services
Satu Pietola	Community and Environmental Services
Sisko Repola	Community and Environmental Services
Helmi Riihimäki	Kiertokaari Oy
Tommi Riippa	Building Inspection
Aila Ryhänen	Business Oulu
Markus Savikuja	Oulu Waterworks
Pekka Tervonen	Oulu University
Jussi Tomberg	Education and Cultural Services
Tero Tuhkala	Community and Environmental Services
Sanna Tyni	Oulu University of Applied Sciences
Riikka Vainik	Oulu Region Environmental Services
Maria Vuorensola	Business Oulu

6 Conclusions

In 2021, the city of Oulu approved a circular economy roadmap. The vision for 2030 is that Oulu will be the most learning circular economy city, developing and implementing sustainable lifestyles in collaboration with businesses, residents, and other stakeholders. Key success factors identified were broad cooperation and the utilization of digitalization. The roadmap was designed to be dynamic, updated, and reviewed regularly. This report presents the results of the first update conducted during 2023–2025.

The update has taken into account the changed operating environment, the new city strategy, and the updated environmental program. The framework for the update was the European Union's Let's Go Circular! project, which Oulu joined in 2023. The circular economy coordination group, consisting of representatives from various departments and subsidiaries of the city, as well as Oulu University of Applied Sciences and the University of Oulu, played a central role in the update work.

In the roadmap update, the implementation status of the actions recorded in the roadmap was updated, and the roadmap was partially refined into an integrated action plan according to the models of the Let's Go Circular! project. The update work of the circular economy roadmap prioritized and refined those focus areas and measures that broadly affect various city units and are most important to promote from an impact perspective.

The selected focus areas and actions in the updated roadmap and actions are presented in the figure below (Figure 11).

Procurement promotes the circular economy and the vitality of the area
1. Circular economy criteria for procurement.

The circular economy is embedded as a natural part of Oulu's identity, education, and the activities of businesses and the city
2. Annual circular economy event in the city.
3. Create an operating model that develops the city to act as a platform for experiments and new circular economy business.
4. Increasing the circular economy competence of Oulu residents

Land use planning enables the circular economy
5. In general and detailed planning work, examine the possibilities of implementing circular economy goals and, if necessary, include circular economy considerations in the planning work.
6. Introduce planning markings and building guidelines that promote and enable the circular economy and conduct a mass balance assessment.
7. Introduce plot transfer conditions and contract terms that promote the circular economy.

Material cycles towards a zero-waste Oulu
8. Develop regional monitoring of waste and material flows and their recycling rates.
9. Develop and implement a material bank and a management and utilization plan for material flows.
10. Create an operating model for the use of biochar in stormwater purification and growing media.

Oulu's built environment is sustainable and resource-efficient
11. Construction and demolition according to the principles of the circular economy.
12. Promote reuse in construction and demolition.
13. Implement circular economy-based infrastructure construction pilots and zero-emission construction sites.
14. Consider longevity and energy efficiency in buildings.

Figure 11. Prioritised focus areas and actions of the Oulu circular economy update.

7 References

Sources are in Finnish.

Amsterdam Circular 2020–2025 Strategy, 2020. Online publication. https://www.amsterdam.nl/en/policy/sustainability/circular-economy/

European Commission, 2020. New Circular Economy Action Plan, For a Cleaner and More Competitive Europe. COM/2020/98 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN

European Commission, 2019. European Green Deal, COM/2019/640 final. https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1588580774040&uri=CELEX:52019DC0640

City of Oulu, 2024. City Strategy Oulu 2030. https://www.ouka.fi/media/9716/download

Council of Oulu Region, 2024. Climate Roadmap for Northern Ostrobothnia 2021–2030 2.0 - Towards a Carbon-Neutral Northern Ostrobothnia. https://www.pohjois-pohjanmaa.fi/wp-content/uploads/2024/08/Pohjois-Pohjanmaan-ilmastotiekartta-2021_2030-paivitys-elokuussa-2024.pdf

SFS, 2024. First ISO Standards for Circular Economy Published. https://sfs.fi/sfs-ry-standardointityo/ensimmaiset-kiertotalouden-iso-standardit-julkaistu/

Sitra, 2019. Critical Move – Finland's Circular Economy Roadmap 2.0. https://www.sitra.fi/hankkeet/kriittinen-siirto-kiertotalouden-tiekartta-2/

Sitra, 2016. Leading the Cycle - Finland's Roadmap to a Circular Economy 2016–2025. Sitra Reports 117. https://media.sitra.fi/2017/02/24032626/Selvityksia117-2.pdf

Sitra, 2018. What Do These Concepts Mean? Author Tuula Sjöstedt. https://www.sitra.fi/artikkelit/mita-nama-kasitteet-tarkoittavat/

Finnish Government, 2024. Amendment to the Waste Act Part III - Circular Economy Act 2024–2026. https://valtioneuvosto.fi/hanke?tunnus=YM030:00/2024

VNK, 2021. New Direction – Proposal for a Strategic Program for the Circular Economy.

Ministry of the Environment, 2024a. Strategic Program for the Circular Economy. https://ym.fi/kiertotalousohjelma

Ministry of the Environment, 2024b. Construction Act. https://ym.fi/rakentamislaki

Ministry of the Environment, Sitra & Tekes, 2010. ERA 17 - Time for an Energy-Smart Built Environment 2017. https://www.sitra.fi/julkaisut/era-17-energiaviisaan-rakennetun-ymparistön-aika-2017/

Appendix 1. Integrated Action Plan

Focus area: PROCUREMENT
Objective: Strategic planning of procurement in accordance with the procurement policy program.
Action: CIRCULAR ECONOMY CRITERIA FOR PROCUREMENT.

Cost estimation: 1 000–10 000 €
Internal work, possibly with an external trainer. Requires human resources.

Status: Planned

Action owner: Central administration and procurement managers.

Schedule: 2025–2026

DESCRIPTION	OUTPUT	INDICATORS
Create circular economy criteria and identify procurements that can significantly promote the circular economy. The criteria can include various requirements for different procurements, and the requirements can cover the entire lifecycle.	Circular economy criteria created, significant procurements identified, and circular economy criteria used in these procurements.	Amount of procurement contracts that include circular economy criteria (no). **Reporting: Central administration**
Create a knowledge base for circular economy criteria and example procurements (in Cloudia's criteria library), which is updated regularly.	Knowledge base created. Processes for updating the knowledge base established.	Knowledge base created (Yes/No). **Reporting: Central administration**
Engage management, procurement experts, and staff by organizing training.	Training organized, criteria implemented in procurements, circular economy goals achieved, and awareness and skills increased.	Training organized (no). **Reporting: Central administration**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Low/Medium. Limited human resources, information flow, skills, and attitudes.	Monetra, city subsidiaries, Hankinta-Suomi, suppliers	Procurement Programme, City Strategy, Environmental Programme, Finland's Circular Economy Strategic Programmme

Focus area: EDUCATION AND COMMUNICATION
Objective: Profiling as a circular economy city
Action: ANNUAL CIRCULAR ECONOMY EVENT IN THE CITY.

Cost estimation: Approximately 30 000 € per event (excluding salary costs).
Action owner: BusinessOulu, Community and Environmental Services, Education and Cultural Services

Status: Ongoing
Schedule: 2025 and ongoing

DESCRIPTION	OUTPUT	INDICATORS
Development and expansion of the KiertotalousAreena (Circular Economy Arena) event. Continue the event annually (every other year as a standalone event, every other year as part of the Northern Industry Fair). Ensure funding and continuity of the event beyond 2025 and integrate it into regular operations instead of project-based activities.	Promotion of the circular economy and increased awareness. Networking, dissemination of research results, for example, through research pre-events, regional marketing, and enabling dialogue.	Number of visitors and partners. **Reporting: Business Oulu**
Annual tool camp event that strengthens circular economy expertise with STEAM pedagogical challenges, for example, in connection with the Circular Economy Arena. Schools compete annually on circular economy themes, aiming to innovate and solve challenges.	Building circular economy expertise starting from early childhood education and continuing into adulthood in line with the Sustainable Future Learning Stream.	Entries in education and early childhood education plans and annual plans, review and development of implementation. **Reporting: Education and Cultural Services**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Low/Medium. Funding may not be realized (BO/KYP/SIKU). Failure in event marketing. Pandemics or similar unforeseen factors.	Sitra, Oulu Innovation Alliance, Business Finland, ELY, PPL, Universities/Colleges, VTT, OSAO, Education and Culture/Oulu City, ICT Oulu, Ministries, Association of Finnish Local and Regional Authorities, Chamber of Commerce, international partners, Luke, Syke, Entrepreneurs of Northern Finland, Start-up ecosystem, Circular Economy Finland, Companies	Oulu City Strategy, Economic Policy Programme, Oulu Smart City Programme

Focus area: EDUCATION AND COMMUNICATION
Objective: Acting as a test platform for new circular economy services and products
Action: CREATE AN OPERATING MODEL THAT DEVELOPS THE CITY TO ACT AS A PLATFORM FOR EXPERIMENTS AND NEW CIRCULAR ECONOMY BUSINESS.

Cost estimation: 100 000 €. Initial project funding, continuation of ongoing development projects, and collaboration with, for example, university start-up activities.
Status: Planned
Action owner: Business Oulu, Education and Cultural Services
Schedule: 2027

DESCRIPTION	OUTPUT	INDICATORS
Planning: Based on the operations of Smart City Oulu, Oulu Circular Economy Cluster, and Northern Ostrobothnia Entrepreneurship Education Model, a common operational model will be further developed, taking into account the experiences of these and previous circular economy pilots and other development platforms. Define goals and schedule.	Operational model created.	Operational model created (Yes/No). **Reporting: Business Oulu**
Launch and pilot the operational model.	Model adopted. Testing of new circular economy services/products.	Number of piloting companies. **Reporting: Business Oulu**
Development of operations. The activity supports the utilization of circular economy business models as part of existing business.	Increase in circular economy rate and strengthening of business ecosystems.	Growth of circular economy business (Business Oulu's existing metric to be developed and monitored). **Reporting: Business Oulu**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Low. Companies may not find opportunities, the operational model may remain solely with Business Oulu. Incomplete due to staff turnover.	Various city departments and group companies, Kiertokaari, companies, OIA, research and educational organizations - towards entrepreneurship for students	Oulu City Strategy, Economic Policy Programme, FabCity Network

Focus area: EDUCATION AND COMMUNICATION
Objective: The city's staff is circular economy savvy. Sharing circular economy knowledge with residents.
Action: INCREASING THE CIRCULAR ECONOMY COMPETENCE OF OULU RESIDENTS.

Cost estimation: 10 000 €. To be done internally, with a more precise assessment of personnel time costs.
Action owner: Environmental Services, Education and Cultural Services, Central administration, Business Oulu
Status: Ongoing
Schedule: 2025 and ongoing

DESCRIPTION	OUTPUT	INDICATORS
Incorporating circular economy themes into eco-support training.	Increased awareness and promotion of the circular economy within units/work communities. Sharing and adoption of best practices, as well as internal networking and dialogue.	Number of eco-support training with circular economy themes. **Reporting: Oulu region environmental services**
Continuing education for teachers and early childhood educators, starting with sustainable future coordinators in schools and early childhood education.	Building children's and youth's understanding of the circular economy from recycling to circular economy. Enabling a pathway for circular economy expertise from early childhood education to working life.	Continuing education for teaching and educational staff (number of participants). Implementation of the sustainable future learning stream in school and early childhood education annual plans (number of schools) and annual follow-up survey for students. **Reporting: Education and Cultural Services**
Positive communication about the circular economy, communicating the city's circular economy activities.	Increased awareness and information sharing.	Media monitoring on circular economy themes (city communication). **Reporting: Central administration**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Low. Prioritization of resources to other activities, commitment of units to the activity (based on voluntariness), staff turnover if new personnel are not informed/trained for the role.	Education and Culture / City of Oulu (especially sustainable future coordinators), Trainers (various city experts on circular economy issues, e.g., Kiertokaari, KYP, Facility Services). Companies, organizations, higher education institutions as potential guest trainers.	Environmental Programme, Oulu City Strategy, Sustainable Future Learning Stream

Focus area:	**LAND USE PLANNING**
Objective:	**Land use planning promotes the adaptability, complementarity, and longevity of the urban structure and its parts, as well as the attractiveness of the areas.**
Action:	**IN GENERAL AND DETAILED PLANNING WORK, EXAMINE THE POSSIBILITIES OF IMPLEMENTING CIRCULAR ECONOMY GOALS AND, IF NECESSARY, INCLUDE CIRCULAR ECONOMY CONSIDERATIONS IN THE PLANNING WORK.**

Cost estimation: 10 000 – 100 000 €. To be done as part of existing internal processes. Circular economy review, for example, as consultancy work.

Status: Ongoing

Action owner: Urban Planning, Streets and Traffic

Schedule: Continuous

DESCRIPTION	OUTPUT	INDICATORS
Identify key potential circular economy components in the plan (already identified themes include utilizing existing community structures, preserved buildings and structures, mass balance, sustainable construction, adaptability and multi-use, sharing economy, shared spaces, waste management, use of recycled materials).	Significant circular economy themes are identified and considered in planning processes. Additionally, identify key strategic goals that can be promoted through land use planning at various levels of detail.	Number of plans (pcs) and qualitative description, where circular economy themes have been identified. **Reporting: Urban Planning**
Utilize circular economy review in applicable planning tasks.	Circular economy review provides information to support planning work and expands expertise.	

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Low/Medium. Plans must be long-lasting, so criteria cannot be too strict.	Authorities, planning offices, property owners, customers, residents	Environmental Programme, Land Use Implementation Programme, City Strategy

Focus area: LAND USE PLANNING

Objective: Land use planning promotes the adaptability, complementarity, and longevity of the urban structure and its parts, as well as the attractiveness of the areas.

Action: INTRODUCE PLANNING MARKINGS AND BUILDING GUIDELINES THAT PROMOTE AND ENABLE THE CIRCULAR ECONOMY AND MASS BALANCE ASSESSMENT.

Cost estimation: 10 000 – 100 000 €. Partially done as part of existing internal processes. Pilots increase costs (e.g., consultancy work).

Status: Ongoing

Action owner: Urban Planning, Streets and Traffic, Building Supervision

Schedule: Continuous

DESCRIPTION	OUTPUT	INDICATORS
Implementation of zoning designations that promote the circular economy and inclusion of circular economy in building guidelines. Considered zoning designations include "Protected Buildings" and "Temporary Use" designations. A linked principle is to facilitate changes in use.	Extending the lifespan of buildings and enabling multiple uses. The temporary use designation allows for the temporary storage of demolition materials at the end of a building's lifecycle and their planned use in the next project. Circular economy is included in building guidelines, considering environmental safety.	Number of plans with circular economy markings. **Reporting: Urban Planning**
Possible actions include active mass balance calculations and the adoption of guidelines for the use of reusable structural elements, considering environmental safety. A material bank could support the circulation of building materials.	Use of recycled soil masses in construction where applicable.	Number of plans using mass balance calculations. **Reporting: Streets and Traffic**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium/High. Suitability of recycled materials. Whether plots can be advanced if criteria are set too strictly. Communication problems and resulting resource waste.	Building designers, property owners, authorities, customers, residents	Environmental Programme, Land Use Implementation Programme, City Strategy, Oulu Architecture Programme, Restoration Regulation

Focus area: LAND USE PLANNING
Objective: Promote the circular economy through plot transfer conditions.
Action: INTRODUCE PLOT TRANSFER CONDITIONS AND CONTRACT TERMS THAT PROMOTE THE CIRCULAR ECONOMY.

Cost estimation: 0 – 10 000 €
Action owner: Urban Planning, Land and Surveying, Building Supervision

Status: New
Schedule: 2025 and ongoing

DESCRIPTION	OUTPUT	INDICATORS
Drafting and implementing circular economy conditions for the plot allocation in the Tahkokangas zoning area.	Desired circular economy goals are achieved through plot allocation criteria.	Implementation of circular economy criteria in land allocation and expansion from pilot operations to part of the operating model (Yes/No) **Reporting: Land and Surveying**
Testing the expansion of the operational model.	Circular economy goals are extended to a broader area.	
Using voluntary circular economy criteria as an incentive in plot allocation.	Plot applicants are aware of the city's circular economy goals in plot allocation.	

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium. Interest of plot applicants is uncertain.	Builders, designers	Environmental Programme, Land Use Implementation Programme, City Strategy

Focus area: MATERIAL CYCLES
Objective: Enhance statistics and monitoring, and map and utilize material flows more efficiently.
Action: DEVELOP REGIONAL MONITORING OF WASTE AND MATERIAL FLOWS AND THEIR RECYCLING RATES.

Cost estimation: 100 000 €.
Possible regional development projects (ERDF, EMR).

Status: Ongoing

Action owner: Streets and Traffic, Facility Services, Kiertokaari, Syklo

Schedule: 2027

DESCRIPTION	OUTPUT	INDICATORS
Regional monitoring of waste streams (municipal waste, construction waste), quantities of waste fractions, current handling, and investigation of potential utilization opportunities. Currently, information is only available on waste received by Kiertokaari and Syklo.	Timely and comprehensive information on waste generated in the area and ways to utilize it. Enhanced source separation and increased awareness, including biowaste and others. Improved utilization rate of collected fractions and increased recycling rate and monitoring. Compilation of utilization methods and types of fractions suitable for different recycling processes and monitoring the amount of material flows, i.e., potential. Preparedness to enhance the recycling of new fractions.	Total amount of municipal waste (t, kg/capita) and treatment methods (%) Amount of construction waste (t) and treatment methods (%) **Reporting: Kiertokaari and Syklo**
Investigation and monitoring of material flows of soil masses. Currently, information is available only on surplus soil going to landfill areas, not on other masses collectively.	Promotion and efficient coordination of the utilization of soil masses.	Quantity and utilization methods of soil masses (t, %). **Reporting: Streets and traffic**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium. Resources and division of responsibilities, lack of information and fragmentation. The measure reduces risks related to future legislative requirements concerning extensive knowledge of material flows.	Citizens, waste producers, companies, authorities, builders/clients, regional cooperation and logistics solutions, various city departments, higher education institutions, research and development organizations, Statistics Finland	Oulu City Strategy, Economic Policy Programme, Oulu Smart City Programme

Focus area: MATERIAL CYCLES
Objective: Enhance statistics and monitoring, and map and utilize material flows more efficiently.
Action: DEVELOP AND IMPLEMENT A MATERIAL BANK AND A MANAGEMENT AND UTILIZATION PLAN FOR MATERIAL FLOWS.

Cost estimation: 100 000 €
Action owner: Streets and Traffic, Land and Surveying, Facility Services, Kiertokaari
Status: New
Schedule: 2027

DESCRIPTION	OUTPUT	INDICATORS
Development of a material bank. Define what the material bank includes, besides soil masses. Determine the platform users, whether it is the city or others. Identify temporary storage locations.	Implementation of the material bank and improved availability of recycled materials.	Material bank in use (Yes/No). **Reporting: Streets and traffic**
Investigation of material flows, using results from the MASSA project. Creation of a plan and commitment of parties, as well as clarification of cooperation among all actors.	Better circulation of materials back into use. Clarification of information on the activities of other organizations.	Management plan created and implemented (Yes/No). **Reporting: Streets and traffic**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium. Quality of materials and reliability of information, cooperation, costs, matching material flows and needs, feasibility of the plan.	City organizations and enterprises, contractors, developers, waste operators	Oulu City Strategy, Economic Policy Programme, Oulu Smart City Programme, Environmental Programme

Focus area: MATERIAL CYCLES
Objective: Enhance nutrient cycling.
Action: CREATE AN OPERATING MODEL FOR THE USE OF BIOCHAR IN STORMWATER PURIFICATION AND GROWING MEDIA.

Cost estimation: 200 000 €. As a part of joint projects.
Action owner: Streets and Traffic, Kiertokaari

Status: New
Schedule: 2028

DESCRIPTION	OUTPUT	INDICATORS
Compilation of related information and investigation of material usage experiences.	Reduction in the need for filter sand and space requirements in stormwater management. The carbon sequestration properties of biochar promote climate change mitigation. Promotion of nutrient cycling.	Study completed (Yes/No). **Reporting: Streets and traffic**
First, create a pilot, for example, in the Kiertokaari area.		Pilot completed (Yes/No). **Reporting: Streets and traffic**
Define the entire process from biochar procurement onwards (e.g., own production process or purchased service). Identify potential fractions as raw materials for biochar.		Amount of biochar (tons) used in stormwater treatment and growing media in the city. **Reporting: Streets and traffic**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Low/Medium. Cost risk is the biggest risk. Availability and production costs of biochar and challenges posed by the iron content of stormwater to the filter material.	City and research and development organizations, maintenance, logistics, Biochar Time project OAMK, development activities in Finland (universities of applied sciences, universities, LUKE), beneficiaries of the utilization of bio-based fractions (agriculture and forestry operators, municipalities/cities), biochar companies	Regional Strategy, Northern Ostrobothnia Climate Roadmap 2.0, Environmental Programme

Focus area: BUILT ENVIRONMENT
Objective: Promote resource-wise commercial and residential construction
Action: CONSTRUCTION AND DEMOLITION ACCORDING TO THE PRINCIPLES OF THE CIRCULAR ECONOMY.

Cost estimation: 50 000 € for development work. Costs for projects are higher. Updating the guidelines requires resources, and the actions possibly included in the guidelines will bring costs to the project. Personnel resources to coordinate the overall process.

Status: Planned

Action owner: Sivakka, Central administration, Facility Services, Land and Surveying, Streets and Traffic, Building Supervision

Schedule: 2026

DESCRIPTION	OUTPUT	INDICATORS
Operational model for circular economy-based demolition. Agree on the division of tasks and responsibilities at the city level. Adequately prepared demolition survey and selective demolition in all demolition projects. Coordination of schedules for demolition and construction projects.	Definition of goals at the project level (concretely in project planning). New local business related to demolition, reuse, and recycling. Utilization of demolition materials saves virgin materials.	Operating model for circular economy demolition created and in use (yes/no) **Reporting: Streets and traffic**
Updating the principles of the circular economy in planning guidelines (construction). Buildings should be long-lasting, easily adaptable, and multi-purpose. For example, broader adoption of digital reservation systems would facilitate shared use of spaces. Design for disassembly, cradle-to-cradle thinking.	Avoidance of demolition through multi-purpose use and extending the lifecycle. Definition of goals at the project level (concretely in project planning). More efficient use of spaces. Careful planning and preparation save money - sufficient time must be allocated to the initial phase.	Planning guidelines updated (yes/no) **Reporting: Facility Services**
Utilization of digital twins and collection/storage of qualitative and quantitative data on materials used in construction, lifecycle planning.	Higher utilization rate of construction and demolition waste (cascade principle).	Utilization rate of construction and demolition waste. **Reporting: Streets and traffic**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium. Cost impacts on construction projects. Schedule risk: coordination of projects may not succeed.	Northern Finland construction cluster, designers, demolition contractors, construction contractors, private construction projects and industry, Business Oulu, university	Construction Act and its reform, projects guiding the reuse of building components, taxonomy circular economy criteria

Focus area: BUILT ENVIRONMENT
Objective: Promote resource-wise commercial and residential construction
Action: PROMOTE REUSE IN RENOVATION AND NEW CONSTRUCTION AS WELL AS DEMOLITION.

Cost estimation: 500 000 €
Action owner: Facility Services, Sivakka, Kiertokaari, Land and Surveying, Streets and Traffic

Status: Ongoing
Schedule: 2027

DESCRIPTION	OUTPUT	INDICATORS
Conduct extensive and proactive demolition surveys. Ensure the availability and sufficiency of reusable demolition materials, including temporary storage of materials.	Reuse pilots have been implemented. An operational model for reuse in construction has been created and adopted. The model ensures that building products and components are efficiently directed to reuse.	Number of reuse pilots. Operational model created (Yes/No). **Reporting: Streets and traffic**
Implement pilot projects and experiments. Enhance material coordination and explore new innovations.		
Study pilots and lessons learned elsewhere. Include the use of recycled materials in planning guidelines and select ready-made recycled products.		
Develop an operational model for the reuse of materials from demolished sites within the group.		

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium. Cost impacts, assumptions about lower prices for used materials. Recycled materials lack precise product information.	Environmental Services, educational and research institutions, Northern Finland construction cluster, other municipalities in the Oulu region, private sector, Business Oulu	Waste legislation, Construction Act reform, projects guiding the reuse of building components, product standards, basic requirements of the Construction Products Regulation

Focus area: BUILT ENVIRONMENT
Objective: Promote resource-wise infrastructure construction
Action: IMPLEMENT CIRCULAR ECONOMY-BASED INFRASTRUCTURE CONSTRUCTION PILOTS AND ZERO-EMISSION CONSTRUCTION SITES.

Cost estimation: 1 000 000 €
Action owner: Streets and Traffic, Oulu Waterworks

Status: Ongoing
Schedule: 2027

DESCRIPTION	OUTPUT	INDICATORS
Planning and preparation of pilots. Market dialogues and benchmarking from elsewhere (e.g., Finnish Transport Infrastructure Agency, other cities). Procurement criteria for contracts to enable/promote the use of recycled materials. Use of recycled materials as a default in planning guidelines.	Market dialogues promote cooperation and help set appropriately high criteria for recycled materials and, for example, zero emissions.	Number of pilot projects. Use of recycled materials included in planning guidelines (Yes/No). **Reporting: Streets and traffic**
Implementation and monitoring of pilots. Implement a zero-emission construction site pilot. Increase the use of electric, biogas, HVO, and hydrogen-powered machinery and transport on construction sites. Develop site monitoring and documentation. Create uniform reporting requirements and monitor their use.	Monitoring the impact of pilots and incorporating practices into the operational model. Reduction of climate emissions and noise impacts from construction sites.	Number of pilots. Emission reduction achieved through pilots. Number of zero-emission sites. **Reporting: Streets and traffic**

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium. Availability of low-emission/fossil-free equipment from contractors.	Northern Finland construction cluster, contractors, design offices, educational and research institutions, Business Oulu	Circular Economy Green Deal, Construction Act and its reform, projects guiding the reuse of building components, taxonomy circular economy criteria

Focus area: BUILT ENVIRONMENT
Objective: The city's built environment is long-lasting and low-emission
Action: CONSIDER LONGEVITY AND ENERGY EFFICIENCY IN BUILDINGS.

Cost estimation: 1 000 000 €
Action owner: Central Administration, Facility Services, Sivakka

Status: Ongoing
Schedule: 2027

DESCRIPTION	OUTPUT	INDICATORS
Develop the lifecycle properties of buildings and set concrete goals in the project plan. Consider energy efficiency, sustainability, and safety in all major renovations and improvements, as well as in space modifications and maintenance.	Extended lifespan of spaces and better availability for users. Safer, healthier spaces for users. Reduced lifecycle emissions and energy consumption of city properties. Awareness and peer learning about circular economy opportunities in the built environment.	**Lifecycle emissions (kgCO2e/m2/year), carbon footprint calculation.** **Reporting: Facility Services, Sivakka**
During the needs assessment phase of major renovations, focus on energy efficiency. During the planning phase, conduct lifecycle calculations and energy optimizations, especially for larger and high-energy-consuming properties.		
Utilize existing best practices and expertise across the entire city group.		

RISK ASSESSMENT	STAKEHOLDERS	RELEVANT STRATEGIES, POLICIES, DEVELOPMENT PROGRAMMES
Medium. Increased costs, whether the benefits justify them.	Designers, contractors, users	Environmental Program, Construction Act: lifecycle properties

Appendix 2. Review of implementation of the circular economy roadmap 2023

Sustainable procurement

The strategic circular planning of procurement in Oulu aligns with the Procurement Policy Program. This involves identifying procurement needs and understanding the market. City staff are trained to make circular economy procurements, ensuring they have the necessary skills and knowledge. Additionally, there is a strong emphasis on communicating about procurements that promote the circular economy, highlighting successful examples and best practices.

The procurement plan was updated in 2024 to include three actions related to the circular economy. Collaboration with procurement experts has been established to plan implementation methods, and market dialogues and supplier engagement are conducted as needed. End users are involved in procurement planning, particularly in construction projects, and are given the opportunity to test procurements before the selection decision.

The procurement calendar ensures that procurement needs are met efficiently. Although no circular economy -themed procurement trainings have been organized yet, there is a plan to update procurement guidelines and identify project-specific training needs in collaboration with the procurement unit.

Examples of procurements implementing circular economy principles are being collected and communicated through the intranet, media, and websites, particularly for construction and energy procurements.

Lessons learned

To enhance and promote the circular economy in procurement, strategic updates to procurement plans are essential. These updates should prioritize circular criteria and mandate compliance from procuring departments. To evaluate the effectiveness of these criteria, continuous monitoring and follow-up are necessary.

The updated procurement plan includes three specific actions focused on the circular economy.

By maintaining a procurement calendar, Oulu ensures that procurement needs are identified and addressed efficiently. This tool helps streamline the implementation of procurements, making the process more organized and effective.

Organizing market dialogues as needed allows for better communication and collaboration with suppliers. This approach helps align market offerings with the city's circular economy goals and ensures that procurement decisions are well-informed.

Involving users in procurement planning for construction projects, according to project guidelines, ensures that the end-users' needs and preferences are considered. This participatory approach can lead to more sustainable and user-friendly outcomes.

Systematically communicating construction and energy procurements to the media and on websites through a communication specialist ensures transparency and keeps the public informed. This strategy helps build trust and encourages community engagement in circular economy initiatives.

While no circular economy-themed procurement trainings have been organized, this highlights an area for potential improvement. Providing targeted training could further enhance the understanding and implementation of circular economy principles among procurement professionals.

Sustainable procurement

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
Strategic Planning of Procurement According to the Procurement Policy Program	Procurement Plans: Identifying circular economy-related procurements in the procurement plan.	▲	The procurement plan was updated during 2024 including three actions for circular economy.
Market Knowledge and Identification of Procurement Needs	Collaboration with procurement experts in planning implementation methods. Market dialogues and supplier engagement in procurement preparation. Involving end users in procurement planning. Providing users the opportunity to test procurements before the selection decision.	✓	The procurement calendar ensures procurement needs and the efficient implementation of procurements. Market dialogues are organized as needed. In construction projects, users are involved in procurement planning according to the project guidelines.
City Staff Can Make Circular Economy Procurements	Updating procurement guidelines. Training plan in collaboration with the procurement unit. Identifying project-specific training needs. Kick-off for circular economy procurements.	✘	No circular economy -themed procurement trainings have been organized.
Communication About Procurements Promoting the Circular Economy	Collecting examples of procurements implementing the circular economy on the intranet. Gathering examples of the use of circular economy procurement criteria.	▲	Construction and energy procurements are systematically communicated to the media and on websites through the communication specialist.

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✘, Not relevant: ⊘.

Education and communication

The city leadership in Oulu is committed to promoting the circular economy, and city staff are knowledgeable about its principles. The circular economy is integrated into all educational and training programs, from early childhood to secondary education. This ensures that residents are well-informed and equipped with circular economy expertise. Oulu aims to profile itself as a leading circular economy city, increasing cooperation within the city organization and between cities to promote these practices.

Efforts have been made to increase awareness and integrate circular economy principles into decision-making processes. Circular economy-themed trainings have been organized for city decision-makers, and the goal of promoting the circular economy has been considered in the update of the city strategy.

Eco-support personnel activities have been strengthened and expanded to include circular economy themes. In their basic training, one area focused on waste management, waste sorting, and the circular economy in the City of Oulu. Circular economy issues have also been raised for staff in eco-support training.

Although a specific guide to the circular economy for residents has not been prepared, Kiertokaari (the Municipal Waste Company) provides recycling-related guidelines. Efforts to develop websites based on environmental and sustainability issues are ongoing, and active communication to residents and businesses is facilitated through a virtual circular economy showroom. Oulu's own circular economy days are organized annually, and the Circular Economy Arena (KiertotalousAreena) has been established as a recurring event.

Internally, a circular economy coordination group has been established to increase cooperation within the city organization, involving all departments, municipal enterprises, and companies. Oulu actively participates in the European Circular Cities Network and collaborates closely with other Finnish circular economy cities through initiatives like the CCD network, Let's Go Circular!, and the Net Zero Cities Twinning Program.

Goals and actions have been set to ensure biodiversity, considering circular economy solutions that promote these goals. An operational model has been created to develop the city as a platform for experiments (Smart City Oulu trial platform) and new circular economy businesses. Contact persons from different sectors have been gathered to form a network that enables these experiments. Additionally, a circular economy challenge competition was organized, and BusinessOulu's trial and pilot project services have been established.

Lessons learned

The challenge in Oulu was to inform companies about the circular economy cluster, including available research facilities and new CT companies. It was hypothesized that introducing these test labs and companies to potential future partners would foster valuable relationships. The research question explored the impact of having a large department at the Oulu Industry Summit where companies could showcase their stands. To test this, the KiertotalousAreena (Circular Economy Arena) was piloted at the Northern Industry event in May 2024. This event hosted up to 20 organizations or companies that provided research facilities and services or were small companies getting their first opportunity to participate.

Success was measured through planning phase discussions, attendee interest, informal interviews during the summit, and a satisfaction questionnaire after the event. The results showed strong interest, with all invited participants joining and slots filling quickly. Presenters were pleased with the new partnerships and fruitful conversations, as reflected in positive feedback and high satisfaction scores.

Key learnings included the irreplaceable value of live conversations, the significant role of circular economy in northern industry, the importance of sufficient coffee, the suitability of the themes, and the benefits of listening to the network. The investment was well worth it. Future iterations are planned for 2026 at the Northern Industry Summit, aiming for an even better location and new themes. Next steps include seeking funding and organizing an independent KiertotalousAreena event in 2025 with an international focus: Circular Arena Oulu (CIAO2025).

Education and communication

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
The city leadership is committed to promoting the circular economy.	Training and information are provided on a thematic basis. Increase circular economy awareness in decision-making. The goal of promoting the circular economy is considered in the update of the city strategy.	✓	Circular economy-themed trainings have been organized for city decision-makers. The implementation of the circular economy roadmap has been considered in the city strategy.
City staff are knowledgeable about the circular economy.	Strengthening/expanding the eco-support person activities, considering the circular economy theme. Circular economy as part of environmental responsibility training for staff.	✓	In the basic training of eco-support personnel, one area focused on waste management, waste sorting, and the circular economy in the City of Oulu. Circular economy issues have been raised for staff in eco-support training.
Circular economy expertise for residents.	Create a guide to the circular economy for residents.	▲	Started, partly done. A circular economy guide on the city website have been started. Kiertokaari (Municipal Waste Company) provides recycling-related guidelines.
Profiling as a circular economy city.	Develop websites based on environmental and sustainability issues. Active communication to residents and businesses, a so-called virtual circular economy showroom. Oulu's own circular economy days, an annual event.	▲	BusinessOulu's Circular Economy Cluster website and newletter. Circular economy -themed topics have been communicated through the environmental program's newsletter. Circular Economy Arena has been organized and will continue to be organized annually.
Increasing circular economy cooperation within the city organization.	Establish a broader internal coordination network for the city, the "circular economy group." Increase cooperation within the city organization, involving all departments, municipal enterprises, and companies.	✓	The circular economy coordination group has been established.

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
Increasing circular economy cooperation between cities.	Active participation in the European Circular Cities Network. Close cooperation with Finnish circular economy cities.	✓	CCD network, Let's go circular! and Net Zero Cities Twinning Program. Northern Finland construction cluster and circular economy cluster. Oulu Circular Economy Cluster is in the European Clusters Collaboration Platform ECCP Oulu is involved in the circular economy in Finland.
Ensuring biodiversity through circular economy solutions	Set goals and actions for the City of Oulu to ensure biodiversity, considering circular economy solutions that promote these goals in the biodiversity study.	✓	The possibilities for circular economy solutions were limited according to the study done in the biodiversity project LUMO in Oulu City.
City acting as a test platform for new circular economy services and products	Create an operational model that develops the city as a platform for experiments and new circular economy business. Gather contact persons from different sectors to form a network that enables experiments.	✓	Circular economy challenge competition was organized. BusinessOulu's trial and pilot project services established.

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✘, Not relevant: ⊘.

Land use planning

Land use planning in Oulu aims to enhance the adaptability, complementarity, and longevity of the urban structure, making areas more attractive and sustainable. Plot allocation conditions are designed to promote the circular economy, ensuring that new developments align with these principles.

As a part of the circular economy roadmap, the possibilities of implementing circular economy goals and including a circular economy review in the zoning work was explored. Also, circular criteria for plot transfer were piloted. The pilot project focuses on integrating the circular economy into land use planning and zoning. Key activities include the review of the Tahkokangas Housing Fair, which has been completed, and the mass balance review conducted as a zoning study in larger zoning plans, such as Ahonkangas and Heikkilänkangas fields.

The "From Tahkokangas to Circulation" project culminated in a final seminar held in March 2022. Zoning symbols in Tahkokangas, as referenced in the Circular Economy Handbook 2022, include special symbols in the Housing Fair area, along with some standard symbols that facilitate the implementation of circular economy principles.

In the 2023 plot transfer plan for professional builders, a circular economy condition was applied to four plots available in Tahkokangas. Applicants were required to submit a concept-level plan detailing how their project would utilize building components and materials in accordance with circular economy principles.

Lessons learned

The pilot area showcased how zoning symbols and special symbols can facilitate the implementation of circular economy principles. The review highlighted the importance of incorporating these symbols in urban planning to promote sustainability.

The Mass Balance Review conducted in larger zoning plans like Ahonkangas and Heikkilänkangas fields, this review emphasized the need for a comprehensive approach to resource management in zoning studies. It demonstrated how tracking material flows can inform better planning decisions.

From Tahkokangas to Circulation Project underscored the significance of continuous learning and adaptation in circular economy projects. It highlighted the value of sharing knowledge and experiences to improve future initiatives.

Circular Economy Handbook 2022 provided guidelines and best practices for integrating circular economy principles into urban planning. It served as a valuable resource for planners and developers.

In plot transfer plan pilot, a circular economy plot transfer condition was introduced for four plots in Tahkokangas. Applicants were required to submit concept-level plans detailing how they would utilize building components and materials according to circular economy principles. This approach encouraged innovative and sustainable building practices. Although a separate circular economy-themed plot transfer competition has not been organized, the existing initiatives have set a strong foundation for future competitions. These competitions can further promote the adoption of circular economy practices in urban development.

Land use planning

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
Land use planning promotes the adaptability, complementarity, and longevity of the urban structure and its parts, as well as the attractiveness of areas.	Create a list of circular economy-related themes and goals for land use and zoning.	✘	Not yet prepared.
	In general and detailed zoning work, explore the possibilities of implementing circular economy goals and, if necessary, include a circular economy review in the zoning work.	✓	Tahkokangas, Housing Fair (review done). Mass balance review in larger zoning plans as a zoning study, e.g., Ahonkangas, Heikkilänkangas fields
	Introduce zoning symbols and building guidelines that promote and enable the circular economy, with initial pilot areas being Tahkokangas and Hartaanselänranta.	✓	From Tahkokangas to circulation - project 3.2022 final seminar. Zoning symbols in Tahkokangas. Circular Economy Handbook 2022. Special symbols in the Housing Fair area, some standard symbols also enable the implementation of the circular economy
Plot allocation conditions promote the circular economy.	Implement plot transfer conditions and cooperation agreements that promote the circular economy.	✓	In the 2023 plot transfer plan for professional builders, a circular economy plot transfer condition was used for four plots available in Tahkokangas: applicants had to make a concept-level plan on how the project will utilize building components and materials according to the principles of the circular economy
	Organize a circular economy-themed plot transfer competition.	▲	A separate circular economy-themed plot transfer competition has not been organized

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✘, Not relevant: ⊘.

Material cycles and mapping of flows

Efficient use and management of materials are key objectives in Oulu. This includes determining the service level of municipal waste, enhancing statistics and monitoring, and improving recycling services. Efforts are also made to enhance nutrient cycling and assign responsibility for soil mass management. Developing mass coordination between projects and actors, as well as mapping material flows for more efficient utilization, are crucial steps in this process.

Regional monitoring of the material recycling rate of municipal waste is being developed in cooperation with Statistics Finland and environmental authorities. KIVO has initiated a project to standardize the calculation of the recycling rate for each waste facility, with Kiertokaari involved.

Studies have been conducted on the treatment, recycling, and utilization of biowaste, garden waste, green waste, and sewage sludge. A pilot project on the use of biochar in stormwater purification and growing media has been implemented, along with a pilot project for the local treatment of green waste. Starting from spring 2024, sewage sludge will be treated at a biogas plant.

A mass coordinator is recruited, and regional cooperation has been initiated. A market survey and pilots for a digital mass management tool have been conducted, and the conditions and need for soil bank operations in Oulu have been investigated. A pilot project for soil bank operations has been implemented.

A management and utilization plan for material flows has been developed, including interim storage and processing locations, opportunities for the city's own construction sites, and the utilization and piloting of recycled materials. The plan also covers products made from recycled materials.

Efforts to enhance the utilization and sale of surplus movable property and building components/materials have been made. A process model for the sale of movable property from buildings under management has been developed, with decommissioned movable property sold at auction and reusable items stored at the Oulunsalo depot.

Lessons learned

The challenge was to explore cooperation, opportunities, and best practices around biochar. The hypothesis suggested that bringing different stakeholders together would uncover more uses for biochar. The research question examined whether using biochar in various applications could reduce the carbon footprint and create carbon sinks. To test this, a Biochar Day was held in March 2024, inviting companies, research institutes, and other cities to share their ideas and experiences with biochar and brainstorm collectively. Success was measured by evaluating new ideas from each group and gathering participant feedback.

The results included numerous innovative ideas, such as using biochar to collect fertilizers from stormwater for later use in growing soil. Participant feedback was highly positive. Key learnings highlighted that everyone gained new insights into biochar's possibilities and that bringing diverse stakeholders together generates fruitful ideas. The concept proved successful and could be repeated annually. Next steps involve piloting the idea of using biochar to collect fertilizers from stormwater and applying it to growing soil, along with seeking funding and incorporating the pilot into the action plan.

In the MASSA project, a material and mass flow analysis of the Oulu city organization was produced, along with a management and utilization plan based on this analysis for the most significant identified material and mass flows. Additionally, the project investigated the possible acquisition of a digital mass management tool to meet the needs of the City of Oulu.

Material cycles and mapping of flows

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
Enhancing statistics and monitoring	Develop regional monitoring of the material recycling rate of municipal waste in cooperation with Statistics Finland and environmental authorities.	▲	KIVO is initiating a project to standardize the calculation of the recycling rate of municipal waste for each waste facility. Kiertokaari is involved.
Enhancing nutrient cycling	Conduct a study on the implementation model for the treatment, recycling, and utilization of biowaste, garden waste, green waste, and sewage sludge. Implement a pilot project on the use of biochar in stormwater purification and growing media. Implement a pilot project for the local treatment of green waste.	▲	Studies have been conducted. Sewage sludge will be treated at a biogas plant starting from spring 2024. NEW ACTION: Use of biochar tested in pilot project. Experimental production of soil and growing media products.
Assigning responsibility for soil mass management and developing mass coordination between projects and actors	Define the role, responsibilities, goals, and recruitment of a mass coordinator. Initiate regional cooperation. Conduct a market survey and pilots for a digital mass management tool. Investigate the conditions and need for soil bank operations in Oulu. Implement a pilot project for soil bank operations.	✓	Recruitment completed, MASSA project and Kiertola project.
Mapping material flows and more efficient utilization	Develop a management and utilization plan for material flows; interim storage and processing locations, opportunities for the city's own construction sites, utilization and piloting of recycled materials, products made from recycled materials. Enhance the utilization and sale of surplus movable property and building components/materials.	✓	Plan prepared in 2023 as part of the MASSA project funded by the Ministry of the Environment. A process model has been developed for the sale of movable property from buildings under its management. Decommissioned movable property is sold at auction. Reusable items are stored at the Oulunsalo depot.

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✗, Not relevant: ⊘.

Sustainable and resource efficient built environment

Oulu is committed to minimizing construction by utilizing existing spaces and renovating old buildings. This approach promotes resource-wise office and residential construction, as well as infrastructure projects. The goal is to ensure that the built environment is long-lasting and low-emission. Efforts are made to minimize waste generation and its harmfulness, with a focus on planned demolitions and the recycling and reuse of demolition materials.

The roadmap actions have focused on several key areas to promote the circular economy in land use planning and construction. Efforts have been made to anticipate and prepare for the repurposing of vacant spaces and the reuse of decommissioned buildings. Space rental services engage in dialogue to minimize idle spaces, and decisions are made on whether to sell or demolish properties when they are no longer needed.

Design principles now emphasize the longevity, adaptability, modularity, maintainability, and reparability of buildings, with considerations for dismantling and recyclability. A model for new and renovation projects adhering to circular economy principles has been developed, including goals and criteria. Lifecycle CO2 targets for buildings have been defined, and a bonus for a small carbon footprint in construction projects has been piloted.

Several pilot projects have been implemented, focusing on the reuse of building components, material passports, low-carbon materials, and timber construction. These themes will be included in the design guidelines during the 2026 update. Facility Services and Sivakka comply with building permit conditions and monitor contractors' compliance. Although a comprehensive circular economy model has not been developed, principles are followed as much as possible.

The carbon footprint calculation was piloted in the Kaijonharju daycare replacement project and extended to other new construction projects. A bonus based on a small carbon footprint was also piloted. Various projects, such as the Lipporanta depot demolition and the Kaijonharju daycare, have been implemented, with material reports made for projects with a climate study.

Training has been provided to promote the use of recycled materials in infrastructure construction, and a model for circular economy infrastructure construction is being developed. However, some pilot projects and models are still in the planning stages or have not yet been implemented.

Efforts to improve the planning and timeliness of maintenance and repair activities for city-owned buildings are ongoing. A digital maintenance log is in use, and the building automation system is updated as needed. Energy efficiency improvements are considered in all major renovations, although a study on maintenance for extending lifespans has not been realized.

Waste minimization during the building design phase is a priority, with performance targets and incentives for contractors. Demolition surveys are required for all sites, and guidelines for the circular economy in demolition are being developed. Selective demolition is implemented in all projects, and an operational model for the reuse of surplus materials is in the planning stage.

Lessons learned

Key lessons include the importance of engaging in dialogue to minimize idle spaces and making informed decisions on property use. Major renovations and space changes increasingly consider circular economy themes, with plans to update design guidelines by 2026. Compliance with building permit conditions and monitoring contractors ensure adherence to circular economy principles. Piloting carbon footprint calculations in projects has been seen to incentivizing low carbon footprints and has therefor been extended to other constructions. Various pilot projects have successfully incorporated circular economy materials and practices, proving it is possible. Digital maintenance logs and updated building automation systems support energy efficiency and longevity, and efficient material use in the future. Efforts to minimize construction waste and implement selective demolition ensure sustainable practices and can lower costs.

Built environment

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
Planned minimization of construction by utilizing existing spaces and renovating old buildings	Anticipating and preparing for the repurposing of vacant spaces. Promoting the reuse of decommissioned buildings.	✓	There is much room for improvement in preparing for changes in use. Space rental engages in dialogue about space needs/service network, aiming to minimize the idle use of spaces. When the need for a property ends, a decision is made whether to sell or demolish the property. The property/space can be rented out until a decision about its future is made.

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
Promoting resource-wise office and residential construction	Designing with a focus on the longevity, adaptability, modularity, maintainability, and reparability of buildings. Plans also consider dismantling and recyclability. Developing a model for new and renovation projects that adhere to circular economy principles - goals and criteria. Defining the lifecycle CO2 targets for buildings and piloting a bonus based on a small carbon footprint in construction projects. Implementing pilot projects for circular economy construction: reuse of building components, material passports, low-carbon circular economy materials, timber construction.	✓	In major renovations, improvements, and space changes, these are considered as much as possible in the action area. The themes will be included in the design guidelines during the 2026 update. Facility Services and Sivakka comply with building permit conditions (waste law and regulations) in new and major renovation projects and monitor their contractors' compliance. A circular economy model has not been developed, but principles are followed as much as possible. The carbon footprint calculation was piloted in the Kaijonharju daycare replacement investment project. This piloting has been extended to other new construction projects. A bonus based on a small carbon footprint was piloted on the construction site. Target-level carbon footprint for buildings in the Housing Fair area. Pilots implemented (e.g., Lipporanta depot demolition contract, Pöllönkangas daycare replacement investment demolition, Kaijonharju daycare, Tuiran multipurpose building, Asema school, Alakylä school). For projects with a climate study, a material report is also made. Circular economy materials are used as much as possible.
Promoting resource-wise infrastructure construction	Promoting the utilization of recycled materials in infrastructure construction through training. Developing a model for infrastructure construction that adheres to circular economy principles and providing related training. Implementing pilot projects for circular economy infrastructure. construction and zero-emission construction sites.	✘	Not yet implemented. Not yet implemented. Pilot projects not relevant.

OBJECTIVE	ACTION		PILOT ACTIONS AND IMPLEMENTATION STATUS
The city's built environment is long-lasting and low-emission	Improve the planning and timeliness of maintenance and repair activities for city-owned buildings. During maintenance, upkeep, and major renovations, implement improvements that extend the building's lifespan. Conduct a study on maintenance work that extends the lifespan of infrastructure and implement the measures.	✓ ✘	A digital maintenance log is in use for all properties. The building automation system is updated as needed. The prepared renovation program is implemented based on needs in the construction side. Within the available resources, energy efficiency is improved. In construction, these themes are considered in all major renovations. The basis for repairs is energy efficiency and longevity. Study on maintenance for extending lifespans not realized.
Minimize waste generation and its harmfulness	Minimize waste during the building design phase and aim to influence waste generation through corrective construction. Minimize waste generation in the city's own construction projects by setting performance targets and incentives for contractors during the bidding phase.	✓	In building design, material choices are considered, and waste on the construction site is minimized. Requiring an environmental plan from the contractor and obligating the recycling of plastic waste is in progress. In a demolition project, the scoring of mixed waste quantity was tested, with more quality points given to the contractor if they commit to a small amount.
Demolish in a planned manner	Require a demolition survey for all city repair and demolition sites. Develop demolition guidelines that consider the circular economy. When demolishing old infrastructure, assess in advance the usability, quality, and quantity of the structures and materials to be demolished.	▲	Demolition surveys are required for all sites, attached to the demolition/building permit application. In preparation, a guide for the relocation/reuse of log buildings has been published. Assessment of usability and quantity not realized.
Promote the recycling and reuse of demolition materials	Promote and require selective demolition. Create an operational model for the reuse of surplus materials from infrastructure construction (e.g., street and curb stones). Develop an internal operational model for the reuse of demolition materials, demonstrating their usability.	▲	Selective demolition is implemented in all demolition projects. The demolition survey specifies the material streams to be sorted. Model for surplus material not yet in use. Internal operational model in the planning stage.

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✘, Not relevant: ⊘.

Energy and energy efficiency

Municipalities and cities can support low-carbon energy production and energy efficiency in line with the circular economy by procuring renewable energy for their own needs and promoting the utilization of various by-products in energy production. The municipality can also encourage and support businesses, residents, and other stakeholders in sustainable energy solutions through its own actions. Smart energy systems enable the optimization of production and consumption, as well as the role of residents as active energy consumers and small-scale producers.

The City of Oulu has set goals for 2030 that emphasize energy wisdom and sustainable development. In energy-wise Oulu, energy efficiency is an essential part of operations, and energy production is based on low-emission energy sources. The city is committed to actively promoting energy efficiency and zero emissions through cooperation, experimentation, and learning.

With its measures, Oulu aims to increase the city's vitality, considering the carbon footprint and handprint, as well as economic, social, and environmental impacts. Additionally, the replicability and scalability of the measures are key criteria. The city utilizes and facilitates development platforms for energy efficiency and zero emissions in collaboration with stakeholders.

The goal is to increase carbon sequestration, reduce the use of fossil fuels by 60–80%, and improve energy efficiency by 30% from the 2020 level by 2030. Oulu focuses on low-carbon energy production, carbon sequestration and storage, the utilization of renewable energy, and increasing biogas production.

In the utilization of district heating and cooling, as well as waste heat, the focus is on smart energy solutions, low-temperature technologies, demand response studies, modelling and forecasting, and heat energy storage. The energy efficiency of the city's operations and buildings will be improved, and energy self-sufficiency will be increased.

Energy and energy efficiency

OBJECTIVE	ACTION	IMPLEMENTATION STATUS 2023
Carbon sequestration and storage	CO2 capture at Laanila eco and bio power plants	▲
	Utilizing decommissioned peat production areas for carbon sequestration	✓
Utilization of renewable energy	Utilization of solar energy	✓
	Attracting onshore wind power investments to the Oulu city area	⊘
	Carbon-neutral energy sources	✓
Increasing biogas production	Planning biogas production from the organic fraction of municipal waste at the eco power plant	✖
Utilization of waste heat	Conducting a study on the utilization of industrial waste heat	✓
	Utilizing waste heat from Taskila wastewater	▲
	Exploring the potential of data centers	✓
	Commercial refrigeration systems	✓
Smart energy solutions	OE KL's digitalization program. HOPE, BF project (€12M) Highlighting the benefits of sector integrations (electrification)	✓
	Control room of the city project	✓

OBJECTIVE	ACTION	IMPLEMENTATION STATUS 2023
Utilization of low-temperature technologies	Hukka 7 project: Overall optimization of district heating network temperature levels, utilization of return heat	✓
	Making city project	✓
	Implementing smart energy solutions in the Raksila sports area	✓
	Implementing smart energy solutions in the 2025 housing fair area	▲
Demand response studies, modelling, and forecasting	Developing a follow-up plan based on already implemented examples	▲
Heat energy storage	Exploring additional heat storage possibilities in Oulu beyond current storage facilities	▲
Improving the energy efficiency of city operations	Measures in accordance with the City of Oulu's energy efficiency agreement 2017–2025, such as energy audits, ESCO measures, fuel changes, design guidance, and procurement of energy-efficient equipment and practices	✓
	Information and training on energy efficiency matters	✓
	Smart consumption monitoring and control systems to improve energy efficiency	✓
Increasing energy self-sufficiency	Actively seeking new utilization targets for local biogas	✓
	Investing in renewable energy systems in connection with new construction and renovations	✓

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✘, Not relevant: ⊘.

Sustainable food system

A sustainable food system is cost-effective and strengthens the regional economy. The environmental impacts of a responsible food system on carbon dioxide emissions, biodiversity loss, and water eutrophication are minimal, and nutrients are efficiently recycled. In a sustainable food system, by-products from production and consumption are effectively utilized, for example, in biogas production. A socially sustainable food system ensures healthy food, enables good nutrition, and considers food security.

The City of Oulu has set a goal for 2030 to be a pioneer in sustainable school and workplace catering. The aim is to provide high-quality and suitable food services and to develop them to be even more sustainable in collaboration with businesses, research and educational institutions, and other communities. The city plans to adopt advanced technology that helps manage and utilize information throughout the food chain.

Oulu promotes regenerative farming methods, calculates the carbon footprint of the city's food services, and sets a goal to reduce this footprint. Additionally, the city aims to promote a plant-based diet and urban small-scale farming. The goal is to achieve 0% edible food waste throughout the value chain by 2030. This will be achieved through systematic cooperation to minimize food waste.

Sustainable food system

OBJECTIVE	ACTION	IMPLEMENTATION STATUS 2023
Promoting regenerative farming methods	Explore the possibilities of rural development funding	▲
Carbon footprint calculation for the city's food services and goal to reduce the footprint	Implement carbon footprint calculation per kilogram and portion	✓
	Visible communication of the carbon footprint of food services	✗
Promoting a plant-based diet	Narrow the gap between plant-based and mixed diets. Increase the attractiveness of plant-based food.	✓

OBJECTIVE	ACTION	IMPLEMENTATION STATUS 2023
Promoting urban small-scale farming	Favor useful plants alongside ornamental plants in new and renovation construction (yards and parks)	✓
	Implement cultivation pilots in schools, possibly also in daycare centres	✓
	Hietasaari's new allotment area as a test platform for sustainable small-scale farming: organize courses and pilots for residents in cooperation with organizations	✓
	Enable urban small-scale farming pilots in the urban environment	▲
Edible food waste throughout the value chain at 0% by 2030	Calculate food waste, set targets, and visibly monitor food waste per food service unit both in terms of waste amount (kg) and costs (€)	✓
	Utilize digital applications to monitor food waste	✓
	Implement measures to reduce food waste based on waste generation analysis	✓
	Visible communication of food waste amounts and costs	✘
Systematic cooperation to minimize food waste	Organize experiential events for schools and educational institutions during the autumn food waste week in cooperation with daycare centres and schools	✓
	Integrate concrete measures to reduce food waste into education	✓
	Communication on reducing food waste to residents: guidance and information targeted at residents	✓

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✘, Not relevant: ⊘.

Sharing economy

The sharing economy refers to collaborative forms where sharing platforms are utilized for the temporary use of goods or services. The key aspect of the sharing economy is the shift from producing, selling, and owning goods to an economy that emphasizes borrowing, exchanging, renting, recycling, and sharing goods, as well as intangible services. Borrowing and sharing enhance the use of products and spaces. For example, car-sharing and city bikes are good examples of the sharing economy. Municipal libraries can also expand their lending collections from books to include sports equipment, tools, and health devices, such as blood pressure monitors.

The City of Oulu has set a goal for 2030 to comprehensively utilize circular economy methods through the sharing economy. The aim is to improve the utilization rate of city spaces and resources, have libraries function as platforms for the sharing economy, and promote sharing and the sharing economy.

Sharing economy

OBJECTIVE	ACTION	IMPLEMENTATION STATUS 2023
Improving the utilization rate of city spaces and resources	Explore which city spaces and other resources can be shared for public use	✓
	Implement a digital, user-friendly reservation system	✗
	Define usage target levels for spaces and other resources and monitor them	▲
	Provide clear information and communication about rentable spaces and other resources	▲

OBJECTIVE	ACTION	IMPLEMENTATION STATUS 2023
Libraries as platforms for the sharing economy	Plan and communicate the expansion of library services systematically. Examples: • On-site use of sewing/work machines • Borrowable sports equipment and yard games • Equipment lending for event organisers • Offering spaces for use by other organisations Plan the operation of self-service libraries to promote community (enhancing space usage, activities of associations, etc.)	✓
Promoting shared use and the sharing economy	Create an operating model through which residential areas can express interest in piloting and companies & micro-enterprises can offer their services/platforms	▲
	Promote shared use and the sharing economy by encouraging community involvement, in cooperation with projects like the Helping Community project	✓
	Tender and implement the city bike system	▲

Status: Implemented: ✓, Partially implemented: ▲, Not implemented: ✗, Not relevant: ⊘.


OULU