Evaluating to improve bio-circularity performance

Tools and resources for cities and regions

Circular Cities & Regions Initiative
CCRI Project

An initiative of the European Commission

The HOOP project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°101000836.

Underground waste containers in Münster, Germany - ©AWM

Separately collected food waste in Bergen, Norway - BIR

1. Introduction

In order to vitalise Europe's urban bioeconomy, it is crucial to assess the state of the circular bioeconomy transition and identify successes, bottlenecks and ways to improve bioeconomy policies and their implementation at local, regional and national levels.

At the centre of this transition, cities and regions need appropriate monitoring and evaluation frameworks to measure progress towards their policy targets, such as waste reduction and recycling. Only by gathering the data and benchmarking their performance, can cities and regions identify the most effective actions to improve.

The HOOP project has developed a range of tools and methodologies to help cities understand their situation regarding circular bioeconomy. This manual introduces the reader to those tools, as well as to relevant resources coming from outside of the project.

2. Challenges

Considering that biowaste collection was only made mandatory in the EU from the start of 2024, urban bioeconomy can be considered rather a 'new' policy field. This is a cause of some of the common challenges which hinder the evaluation of circular bioeconomy activities in cities and regions.

For example, there is a lack of standardised terminology and frameworks within the (urban) bioeconomy field. This absence of common definitions poses challenges in terms of data collection, analysis and comparison.

Urban bioeconomy activities also affect, and are affected by, many public policy areas, from food to waste to entrepreneurship to energy to health. In a city context this may mean that many different administrative departments, or even organisations, need to be engaged to access data and improve performance. This creates a challenge for cities and regions which may be more used to working in silos.

Aerial view of the LIPOR administrative building, Porto, Portugal - LIPOR

3. HOOP resources

Urban Metabolism

To evaluate resource use in cities and regions, the HOOP project is using Urban Metabolism, an interdisciplinary concept that studies how cities interact with the environment and more specifically how they use resources and emit pollution flows, as well as the associated societal, economic and environmental challenges around these flows.

This approach helps to better understand the functioning of cities by characterising and understanding processes by which flows of materials, energy and water are consumed, transformed and rejected in different forms by cities.

For urban circular bioeconomy, the following waste streams are of most interest: mixed municipal waste, food waste, garden and park waste, post-consumer wood and wastewater. It was found that in the eight HOOP cities and regions about 60% of the biowaste is treated by anaerobic digestion and or composting. A high proportion of biowaste still ends up in the mixed municipal waste. This data analysis helped cities to evaluate their collection rates and identify promising valorisation routes for biowaste.

Learn more

Table 1. Data types and sources used in Urban Metabolism

Layer	Description	Source
Layer 1: Context	Examine context of the city: spatial boundaries, constituent cities, population, economy	Maps, national and urban statistics
Layer 2: Biophysical characteristics	Land area, urbanised area, climate, and gross floor area built	Maps, literature, statistics
Layer 3: Resource metabolism	Consumption of water, food, energy and materials, waste generation during processing and consumption	National and urban statistics
Layer 4: Ownership	Distributors and suppliers of resources (water, energy), stakeholders in collection, consumption and treatments of resources and waste streams	National and urban statistics
Layer 5: Policies	Overview of policies that shape the direction of resource flows	Literature

Circularity Label

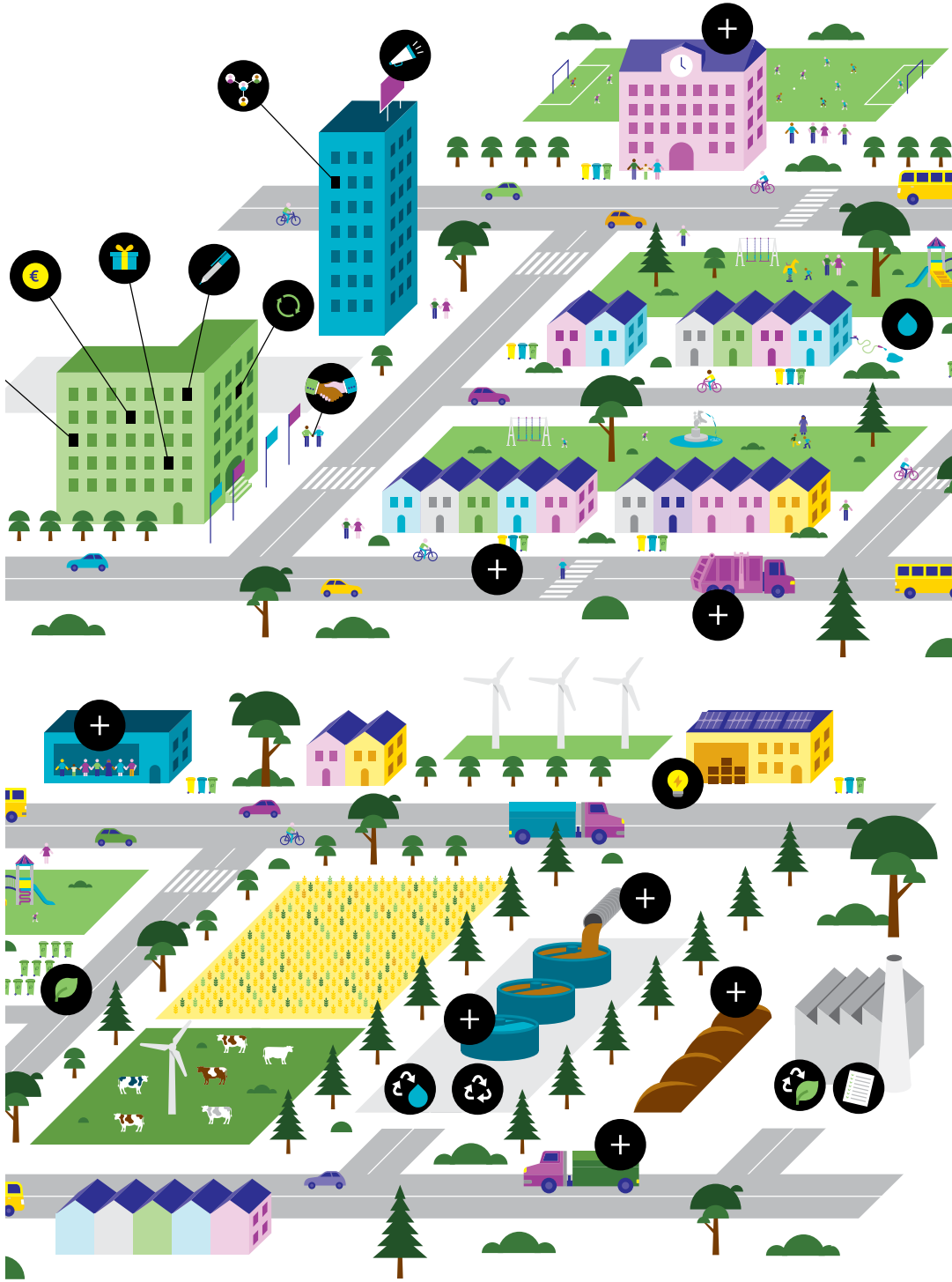
The HOOP Circularity Label tool is an instrument to understand the current performance of a city/region regarding the implementation of bio-circular measures.

The Label consists of a list of indicators related to urban biobased waste streams including the Organic Fraction Municipal Solid Waste (OFMSW) and Urban Waste Water Sludge (UWWS). The assessment covers the political ambitions, strategies and implemented policies, participation, awareness and initiatives of the society, consumption, and waste patterns as well as waste treatment. Besides the status on the circular urban bioeconomy, the Label also detects areas cities can improve on in their local bioeconomy.

The tool takes the form of an online questionnaire comprising of 27 questions related to qualitative and quantitative indicators. A scoring system then dictates the circularity level of a city/region based on their responses. The HOOP Bio-Circularity Label Certificate will be awarded to cities and regions that demonstrate maturity in circular policies, programs and projects.

Dimensions of the Circularity Label

Try out the label



Circularity indicators illustration - HOOP

4. Meet the experts

Bax & Company is an innovation consultancy that supports changemakers to build pilots, tools and collaborations that turn ideas into societal impact and a partner in the HOOP project.

How do you advise cities and regions to measure their progress in becoming circular?

The HOOP Bio-Circularity Label (the Label) is a practical tool to assess your performance on the way to 100% bio-circularity. With a limited number of indicators, the actual situation of a city or region is presented. The HOOP Urban Circular Bioeconomy Hub provides a user-friendly, interactive tool, resulting in both an instant indication of the level of progress and suggestions for further improvements.

Across four dimensions (Policy, Society, Consumption and waste patterns, and Resource management), the Label employs an easy-to-use set of indicators that reflect the critical aspects of circular economy practices. Each indicator is designed to capture specific data points, which are then used to calculate a Circularity Level (CL). Scores range from 1 to 9, with CL5 denoting the European average. This scoring system allows cities and regions to precisely gauge their performance against a standardised metric, identifying strengths and areas for improvement.

The main aim of the tool is to accelerate the production and application of bio-waste-based materials and products, reaching higher levels of recycling, towards a circular society. The Label offers a framework to demonstrate the effectiveness of green policies and investments. It supports boosting investments in circular technologies, projects, and companies, by cities, regions, companies and financial institutions.

How does the HOOP Bio-Circularity Label help cities and regions improve their performance?

Upon evaluating the scores, the Label provides cities and regions with feedback on each dimension, offering insights into how to improve specific areas of circular economy practices. This targeted guidance helps policymakers and stakeholders focus their efforts on making impactful changes, that drive significant improvements in sustainability and resource efficiency.

The Label's evaluations provide detailed information that help policymakers identify areas that require change as well as successful activities. This encourages the improvement of current regulations and the development of new strategies that are more in line with the ideas of resource efficiency and sustainability.

By establishing a clear framework and providing feedback for improvement and progress, the Label encourages cities and regions to continuously strive for higher standards in their circular economy efforts. This ongoing process of evaluation and improvement fosters a dynamic environment, where cities and regions remain committed to advancing their sustainability goals.

Learn more about Bax

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5. Dive deeper in the HOOP Virtual Academy

CityLoops Urban Circularity Assessment

The Urban Circularity Assessment (UCA) is an urban, economy-wide material flow and stock accounting method, which paired with indicators, will enable the assessment of material circularity of a municipality or city. The goal is to monitor progress toward a Circular Economy from an economy-wide perspective at the city-level, focusing on system-wide effects like displacement and rebound, and reductions in resource use and waste flows.

Find out more

BioCircularCities tool

The BioCircularCities tool supports the identification of the most suitable technological options for improving organic waste management. The most convenient pathway towards waste biomass valorisation strongly depends on drivers and barriers related to the local political and socio-economic context. The objective of the tool is to provide some first clues about what could be suitable in term of technological pathways, given a specific context.

Discover the tool

Green City tool

This tool is both a simple self-assessment and benchmarking tool for cities, and a source of information and advice for anyone wanting to learn more about how we can make cities greener and more sustainable. This tool is all about city governance and the approach taken to sustainable urban planning – it is not about quantitative indicators of sustainability, although it will guide you to the best places to find such information.

Learn more

CCRI Self-Assessment Tool

The Self-Assessment Tool (SAT) aims to support the implementation of circular economy actions referred to as Circular Systemic Solutions (CSS) across cities, regions, and territorial clusters in Europe. It is part of the guidance and support instruments provided by the Circular Cities and Regions Initiative (CCRI) – and connects to other instruments such as the CCRI-Methodology and the Knowledge Repository.

The purpose of the Self-Assessment-Tool is to support cities in tracking their progress towards respective Circular Economy (CE) goals. The tool acknowledges the diversity of CE projects and local circumstances. Therefore, the SAT emphasises a tailored monitoring approach that addresses specific needs and context. The public version of the tool will be available by the end of 2024 via the CCRI website.

Find out more

6. Key takeaways

1. Cities and regions need appropriate monitoring and evaluation frameworks to measure progress towards their policy targets, such as waste reduction and recycling. Only by gathering the data and benchmarking their performance, can cities and regions identify the most effective actions to advance circular bioeconomy principles.

2. Urban bioeconomy is a relatively new field, spanning many areas of public policy, and the absence of common definitions poses challenges in terms of data collection, analysis and comparison.

3. To evaluate resource use in cities and regions, the HOOP project is using Urban Metabolism, an interdisciplinary concept that studies how cities interact with the environment and more specifically how they use resources and emit pollution flows. The results of the Urban Metabolism of the eight HOOP lighthouse cities and regions can be viewed here.

4. HOOP partners have developed a Circularity Label tool to understand the current performance of a city/region regarding the implementation of bio-circular measures. The assessment covers the political ambitions, strategies and implemented policies, participation, awareness and initiatives of the society, consumption, and waste patterns as well as waste treatment. Besides the status on the circular urban bioeconomy, the Label also detects areas cities can improve on in their local bioeconomy.

5. Both the Urban Metabolism and the Circularity Label methodologies were explained in greater detail in a dedicated webinar in May 2024.

6. Additional tools exist to support cities to evaluate and improve their performance with regards circular economy. These include the CityLoops Urban Circularity Assessment, the BioCircularCities Tool, the Green City Tool, and the forthcoming CCRI Self Assessment Tool.

7. Further resources are available within a designated section of the HOOP 'Virtual Academy' knowledge repository.

Children learn about composting in Münster, Germany - ©AWM

HOOP is a Horizon 2020 project that supports 8 lighthouse cities and regions in developing large-scale urban circular bioeconomy initiatives that will focus on making bio-based products from urban biowaste and wastewater.

Visit our website

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