

Circular Procurement in  
Europe: Toolkit for  
local and regional  
governments



CityLoops - Rijkswaterstaat & Alba Concepts

# How to use this Toolkit

Welcome to the Circular Procurement Toolkit for local and regional governments. This toolkit has been specifically designed to assist cities in implementing circular procurement strategies for managing construction demolition and bio-waste more sustainably. By adopting circular procurement practices, cities can promote resource efficiency, reduce waste generation, and contribute to a more sustainable construction sector.

This comprehensive toolkit presents an array of tools utilised by cities during the CityLoops project for circular procurement practices, offering:

- **Clear explanations:** Each tool is accompanied by a concise explanation of its functionalities, making it easy to understand its application.
- **Optimal scenarios:** Learn when and how to best utilise each tool, tailored to different phases of procurement processes.
- **Intended objectives:** Gain insights into the specific purposes of each tool, such as waste reduction, innovative resource use, and sustainability promotion.
- **Examples:** Explore where these tools have been successfully implemented across various urban contexts, providing practical inspiration.

If the tool is applicable to Construction and Demolition Waste (CDW), you will find the following symbol on the slide:



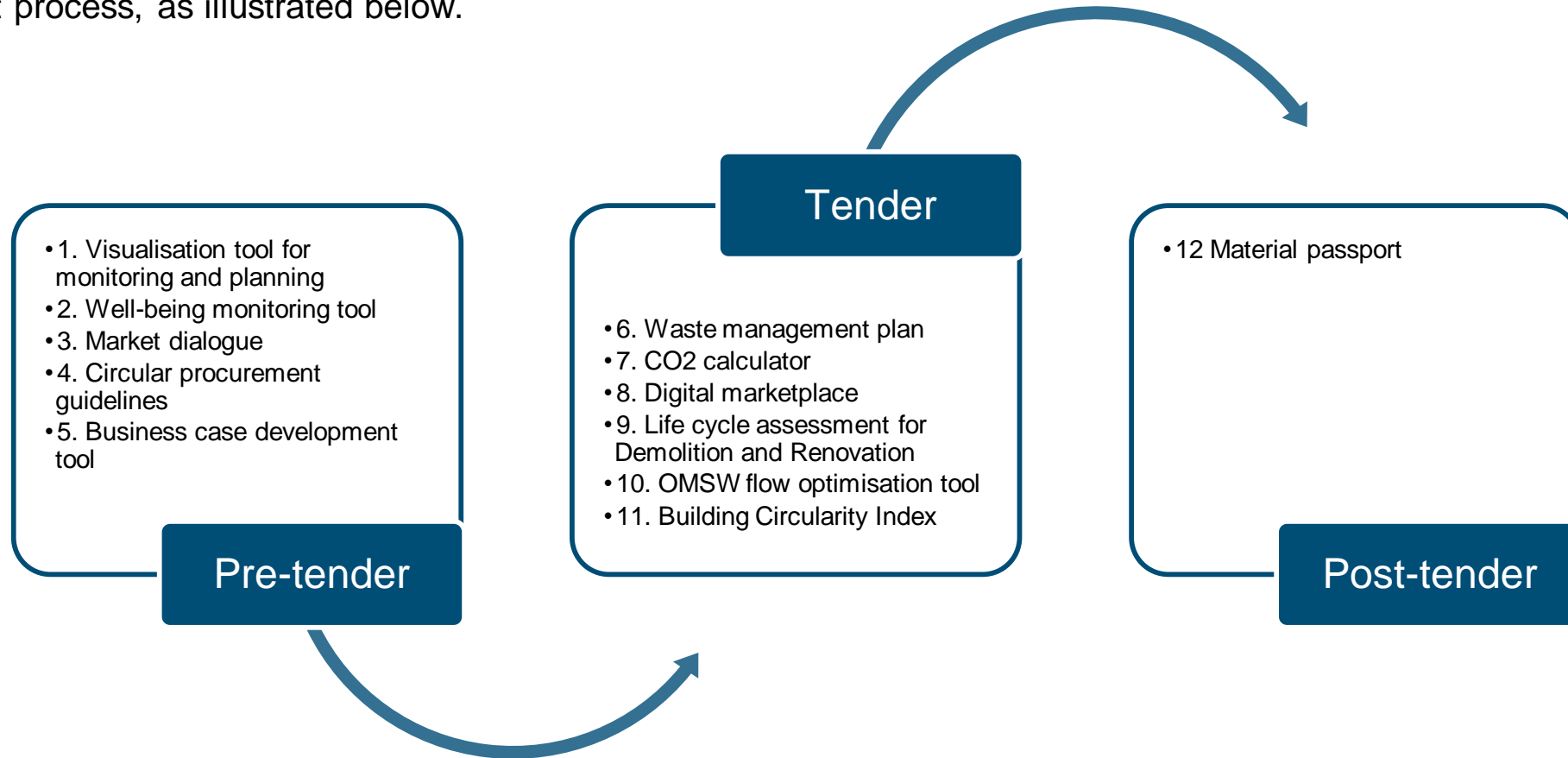
If the tool is applicable to bio-waste management, you will find the following symbol on the slide:



# Summary of all the tools



Each tool can be used at the different stages of the procurement process, as illustrated below.





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# Pre-tender phase

# 1. Visualisation Tool for monitoring and Planning



For construction projects in CityLoops, the tool was used to map masses and materials including their quality, degree of pollution, mass and type. This information allows the tool user to evaluate and plan for the reuse potential of the resources identified. As the tool is gathering data on traffic and emissions, it can visually represent with simulated or real-time data how circular CDW management correlates with these values. This feature will be used to demonstrate the environmental benefits of circular economy.

## When and how to use:

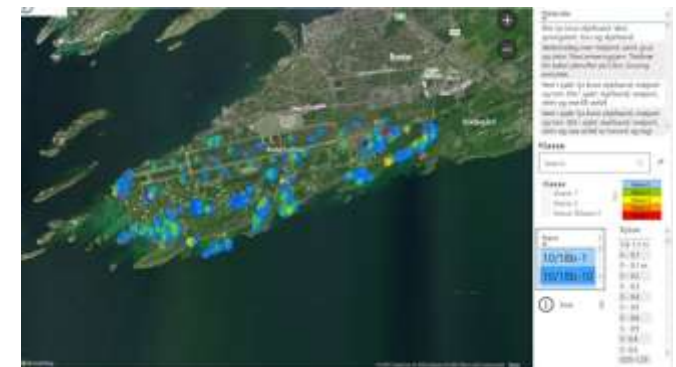
This tool holds significant relevance during the pre-tendering phase, particularly in visualising geospatial data through a 3D GIS visualisation tool. This visual insight empowers project teams to thoroughly analyse site nuances, explore diverse design scenarios, and make well-informed decisions that intricately cater to the project's procurement prerequisites. By harnessing the tool's capabilities, stakeholders can collaboratively pinpoint site-specific challenges, strategically align design proposals with real-world constraints, and lay the groundwork for a procurement strategy that harmonises with the project's spatial dynamics.

## Aim of the Tool:

The aim of this tool is first to allow for future scenario planning by considering the surrounding context and simulated impacts, and secondly it will present sophisticated data in a visual way for involvement of citizens and non-specialists in city-planning.

## Reference project:

**Bodø** employed a dashboard based on data from the Norwegian Geotechnical Institute, integrating observations from the demonstration area into a GIS tool and comparing them with a predefined pollution limit. This dashboard provided real-time updates on soil conditions, informing city planning. Within the CityLoops project, **Bodø** used this tool to decide mass readiness for reuse, cleansing necessity, and identifying polluted or hazardous soil requiring treatment.



## 2. Well-being Monitoring Tool



A tool that integrates available data on environmental, economic and social development to facilitate data-driven decision-making and a better understanding of the impacts of policies and initiatives on citizen wellbeing. Citizens can access information about their waste generation, and how city initiatives are impacting a series of sustainability and wellbeing indicators.

### When and how to use:

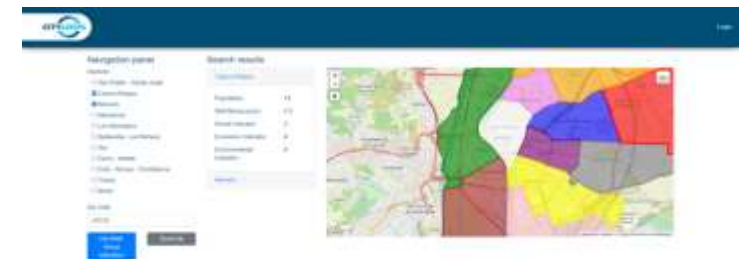
This tool can generally be applied during various stages of the tender process. Depending on the specific project and requirements of the contracting authority, these tools may be relevant in the planning, design, evaluation, or implementation phases of the project.

### The aim of the Tool:

The well-being tool aims to support decision-making processes and implementation of circular economy activities within the city. It serves as a means to consider simulations and gather insights that contribute to enhancing the well-being of citizens and promoting sustainable practices. By utilising the well-being monitoring tool, the city can effectively plan and implement circular economy initiatives, while also maximising citizens' knowledge and commitment to circularity and other sustainable activities.

### Reference project:

The tool allowed Seville to evaluate not only the immediate impact of the CityLoops' demonstration actions but also the broader implications for well-being across the city and its districts. By analysing economic, social, environmental, and waste data in conjunction with circular indicators, [Seville](#) made informed decisions during the procurement phase that aligned with both well-being goals and circular economy principles. The use of the well-being tool added a dimension of sustainability and holistic impact assessment to their procurement strategies, contributing to more responsible and impactful decision-making in the realm of circular procurement.



## 3. Market Dialogue



A competitive dialogue is a procurement procedure that allows for an exchange between the contracting authority and potential tenderers. It facilitates open exchange of ideas and innovative solutions between the contracting authority and the market.

### When and how to use:

This tool is primarily used before and during the procurement process. It helps explore possibilities, identify innovative solutions, and refine the procurement documents based on input from potential suppliers.

### The aim of the Tool:

Market dialogue aims to identify and define the means best suited to satisfying the contracting authority's needs. It provides a platform for creative collaboration and promotes the development of groundbreaking proposals that better align with the project's needs.

### Reference project:

The Municipality of [Mikkeli](#) conducted a Market Dialogue to enhance circularity. Prior to tendering, a Market Dialogue was organised, bringing together potential providers and stakeholders to exchange ideas and refine the procurement documents. Requirements included selective demolition, sorting of waste fractions, a waste management plan, and a summary report on construction and demolition waste management. The Market Dialogue resulted in increased awareness, improved alignment with circular principles, and successful implementation of sustainable practices in the construction project.



# 4. Circular Procurement Guidelines

The Circular Procurement Guidelines aims to facilitate the formulation of a series of recommendations or circular criteria to be incorporated into public procurement processes concerning school meal and catering services, the tourism sector, as well as green space maintenance. This tool presents a comprehensive perspective on the circular economy in relation to bio-waste management, thereby assisting public authorities in identifying potential shortcomings and, consequently, the requirement for new products and services. Additionally, the tool provides guidance on the definition and formulation of criteria throughout various stages of the procurement process.

### When and how to use:

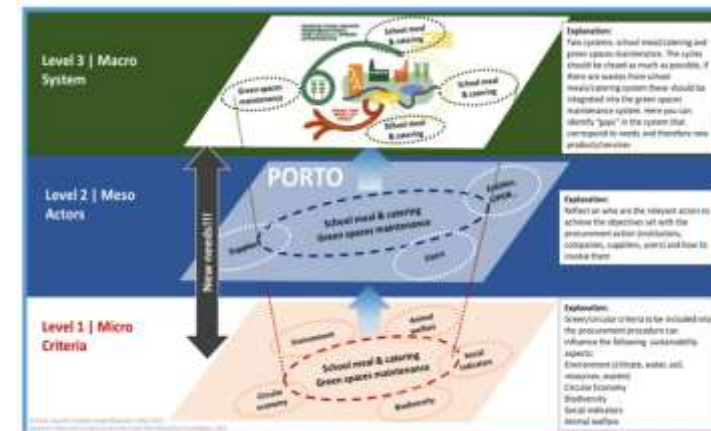
Porto's Circular Procurement Guidelines supports the acquisition processes, including tender books, by incorporating circular award criteria. These guidelines can be adapted to your city's context and needs.

### The aim of the Tool:

The aim is to improve sustainability practices and promote the adoption of circular economy principles in the procurement procedures of the above-mentioned sectors.

### Reference project:

[Porto](#) has developed these guidelines for circular procurement with canteen and catering services on one side, and the maintenance of urban green spaces, on the other side. This guidelines can be found [here](#).





# 5. The business case development tool



The business case development tool describes the selection process of the different demonstration actions. The tool can be used to prepare the business case for each circular demonstration action, or pilot project, and to compare the initial assumptions with the results from the demonstration. The ultimate goal is a techno-economic, socially and environmentally sound business case.

## When and how to use:

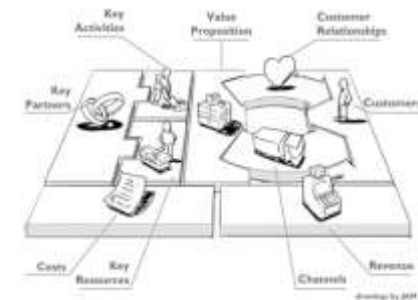
The business case development tool is typically used before the tendering phase of a project. It is employed to assess the feasibility and value of various demonstration actions and to validate or adjust the initial assumptions based on the results of the demonstrations.

## The aim of the Tool:

The tool provides a comprehensive analysis of the technical, economic, social, and environmental aspects of the project, allowing both potential bidders and the contracting organisation to make informed decisions.

## Reference project:

[Apeldoorn](#) used the business case development tool to create business cases for the five demonstrated actions and assess their suitability for their needs. The objective was to establish a comprehensive, economically, socially, and environmentally viable business case, ensuring alignment with sustainability and circular economy goals. This approach enabled Apeldoorn to make informed decisions, considering a wide range of impacts in their procurement strategies. These business cases can be found [here](#) on the CityLoops website.





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# Tender phase

## 6. Waste Management plan

A waste management plan is a document that outlines how waste will be managed during (selective) demolition, construction and renovation projects. It details all types of waste and their origins, the steps taken to lower the level of waste, and plans for removing and eliminating waste

### When and how to use:

A waste management plan is typically utilised during the tender process, specifically when the contracting authority requests potential contractors or suppliers to submit bids for a specific project. It forms an integral part of the tender submission, outlining how the bidder intends to handle waste management throughout the project's execution.

### Aim of the Tool:

A waste management plan aims to effectively and responsibly manage waste throughout its lifecycle, from generation to final disposal. A waste management plan will achieve efficient, environmentally responsible, and sustainable waste management practices, benefiting both the organisation and the surrounding community.

### Reference project:

The contractor that carried out the demolition activities was required to formulate and present an all-encompassing waste management plan, adhering to the directives outlined by the City of [Mikkeli](#) and the Waste Decree. The waste management plan was expected to focus particularly on the correct procedures for managing and disposing of eight distinct waste categories, as stipulated by the Waste Decree. The aim was to guarantee the separate collection of each waste type, in accordance with regulatory guidelines.



# 7. CO<sub>2</sub> Calculator



The CityLoops CO<sub>2</sub> calculator is a tool that calculates the lifecycle CO<sub>2</sub> impact of concrete, soil, or mixed CDW. This tool supports the reduction of CDW and soil waste, as well as the associated carbon emissions, by allowing comparison of possible actions for informed decision-making.

## When and how to use:

This tool is generally applied during the tender process. It can assist in evaluating and comparing the carbon emissions of various options, both before and during the tendering process. This enables the municipality to make sustainable choices and minimise the environmental impact of the project from the outset to the implementation and use of the selected solutions.

## Aim of the Tool:

It allows cities and urban planners to assess the environmental impact of their projects and interventions, particularly in the context of circular economy and sustainable urban development. The calculator considers various factors such as energy consumption, waste management, transportation, and building materials to provide insights into the carbon footprint of urban activities and identify opportunities for emissions reduction.

## Reference project:

The municipality of [Høje-Taastrup](#) effectively utilised the CO<sub>2</sub> calculator tool as a central component in their procurement process, leading to remarkable results. By leveraging this tool, they opted for more sustainable choices that resulted in an impressive reduction of nearly 30 tons of carbon emissions.



# 8. Databank and Digital Marketplace for Recovered materials



Digital marketplaces are vital for resource tracking and mapping, enabling supplier-procurer matches with material visibility, availability (location and timing), and details (quantity, quality, cost). It's advisable to integrate with existing platforms, often managed by private companies or ministries, to save time and resources. While initially used by CityLoops cities to display their own project materials, these platforms are evolving towards potential material exchange and sales.

## When and how to use:

The tool can be implemented during the procurement process. Through a digital marketplace, suppliers can exhibit their range of circular products and services, creating a platform where sustainable offerings are prominently displayed. This platform acts as a central hub for procurers to engage with suppliers, explore innovative circular solutions, and make informed decisions that align with their sustainability objectives.

## Aim of the Tool:

The use of a database and digital marketplace for recovered materials increases the availability and use of high-quality reusable materials in tendering projects. It encourages circular procurement and reduces the demand for new materials.

## Reference project:

[Apeldoorn](#) sought [DuSpot](#)'s services to enhance collaboration with the municipality and promote material reuse in civil construction projects. DuSpot streamlined the process of offering and requesting materials, aligning with standardised specifications. It functioned as a platform for materials to be matched and reused, bolstering circular material loops in Apeldoorn's public space projects. The tool also allowed users to control visibility. While effectiveness varied among actions, the city found value in DuSpot's capabilities, although improvements are being pursued to address handling costs and material specification ease.



# 9. Life Cycle Assessment (LCA) for Demolition and Renovated sites



Life Cycle Assessment (LCA) allows to quantify the environmental impacts of buildings and materials. During demolition and renovation projects using this assessment allows to gain insight of the benefits of reusing and recycling building materials.

## When and how to use:

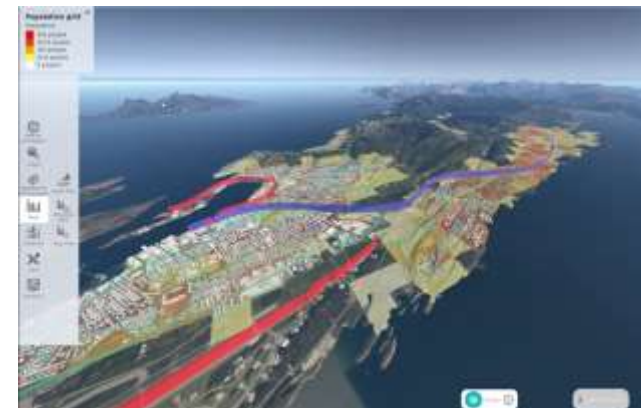
The tool can be used during and after the procurement process. In circular procurement, a Life Cycle Assessment for Demolition and Renovated sites is utilised to guide decision-making by evaluating the environmental impacts of materials and methods across a project's lifecycle. This assessment assists procurers in selecting options that minimise waste, energy consumption, and ecological footprints, thus fostering sustainability within construction and renovation projects.

## Aim of the Tool:

The aim of conducting a Life Cycle Assessment (LCA) for demolition and renovation sites is to assess and evaluate the environmental impacts associated with the entire lifecycle of these activities. By conducting an LCA, the goal is to identify and quantify the environmental burdens and potential hotspots throughout the lifecycle, enabling stakeholders to make informed decisions to minimise these impacts.

## Reference project:

**Bodø** use the Life Cycle Assessment (LCA) tool in combination with traffic data to quantify the amount of emissions on different sites in the city. The process involved gathering traffic data through an API connection to the National Road Authorities traffic sensors. This data provided information on the traffic load on different streets in Bodø. This information was visualised in a digital twin, where the height of the bars on the roads represented the amount of emissions generated by traffic.



# 10. OMSW flow optimisation tool



The OMSW (Organic Municipal Solid Waste) flow optimisation tool is being developed as a software to model various scenarios regarding routes, as well as the location and expansion of containers. The objective of this tool is to enhance the management of bio-waste and improve the efficiency of the implemented routes.

## When and how to use:

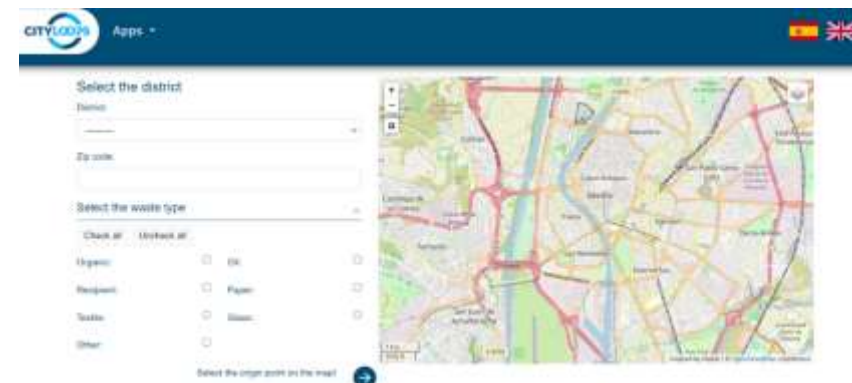
While tendering, integrating the OMSW flow optimisation tool can be highly advantageous for bio-waste management. This tool is instrumental in modeling waste collection scenarios, container placements, and expansion strategies, all aimed at optimising bio-waste management efficiency. By simulating diverse scenarios, it aids in evaluating strategies for advancing waste management in the city, with a specific focus on optimising organic waste collection routes.

## The aim of the Tool:

The tool's primary objective is to assess potential enhancements for bio-waste management within the city. Furthermore, it assists in analysing organic waste collection routes to optimise their effectiveness. The ultimate goal is to promote increased separate organic waste collection, spanning households and significant waste generators, across the entirety of the city.

## Reference project:

The city of [Seville](#) recognises the importance of establishing a baseline to plan and implement an effective strategy for achieving European objectives related to the recovery, recycling, and disposal of organic municipal solid waste (OMSW). To address this need, Seville has decided to develop a bio-waste flow optimisation App. The app can be found [here](#).



# 11. Building Circularity Index (BCI)



The Building Circularity Index (BCI) is a tool that measures the circularity performance of buildings. The BCI comprises two Critical Performance Indicators (KPIs): Material Use and Disassembly Potential. Material Use is divided into three categories: Material Origin, Material Future Scenario, and Material Lifespan. When assessing Material Origin, we examine the proportion of: virgin resources, recycled resources, biobased resources, and reused components. For Material Future Scenario, we consider the proportion of: landfilling, incineration, recycling, and reuse. The Disassembly Potential is measured based on four technical factors.

## When and how to use:

This tool can generally be applied during various stages of the tender process. It helps in setting circularity requirements for buildings and evaluating the circularity performance of different design options.

## The aim of the Tool:

Applying the Building Circularity Index promotes the selection of more circular building designs. It encourages the consideration of circular principles and the adoption of sustainable construction practices. Furthermore, it assists in offering clear and precise direction regarding the desired ambitions and specified goals for circularity.

The BCI serves as a versatile tool with multiple functions that can be used in the future. It enables the demonstration of product circularity, provides an overview of the circularity of the entire building, and can function as a material passport.







## Post-tender phase

# 12. Material Passport



A Material Passport is a documentation tool that provides detailed information about the composition, origin, and characteristics of building materials. It creates a digital record of materials used in construction, enabling their traceability and potential for reuse.

### When and how to use:

This tool is primarily used after the procurement process. It provides a comprehensive record of the materials used in a project, including their origins, composition, and potential for reuse or recycling. This passport informs decision-making by offering insights into the environmental impact of materials and facilitating sustainable choices, ensuring that the project aligns with circular economy principles.

### Aim of the Tool:

The use of a material passport in circular procurement provides the benefit of clearly documenting and keeping materials together, enabling better identification of what can and cannot be reused. It facilitates targeted search for reuse or recycling opportunities, reducing waste and preserving the value of materials. The material passport also helps identifying suitable partners for reuse and recycling, fostering the circular economy and creating new business opportunities.

### Reference projects

**Roskilde** used a Material Passport in their project, implementing a streamlined process. Environmental screening identified reusable/recyclable materials integrated into selective demolition tendering. Post-demolition, elements were categorised (green, yellow, red) for reuse/recycling potential. Excel sheets formed Material Passports with handling instructions, structural assessment, and reuse/recycling suggestions, supplemented by images. This data, along with BIM and LCA, aided decision-making.



GOLDEN									
Material	Quantity	Material	Material	Material	Material	Material	Material	Material	Material

# Other CityLoops resources

- [Circular Procurement in Europe: Handbook for local and regional governments](#)
- [The CityLoops circular procurement replication package](#)
- [The circular bio-waste management Handbook for local authorities](#)
- [The European handbook on promoting circular construction for local and regional governments](#)
- [The Construction/demolition procurement guidelines](#)
- [The Handbook for the Urban Circularity Assessment \(UCA\)](#)

*All the project resources are available [here](#) on the CityLoops website.*



# Acknowledgement



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