European Commission

Research and Innovation

Final Report on Construction and Circular Buildings: Insights from the Thematic Working Group of the Circular Cities and Regions Initiative

Brussels, December 2025

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List of acronyms

CCRI	Circular Cities and Regions Initiative
CCRI-M	CCRI Methodology
C&D	Construction and Demolition
EIB	European Investment Bank
ERDF	European Regional Development Fund
GPP	Green Public Procurement
PDA	Project Development Assistance
R&I	Research and Innovation
TWG C-BUILD	Thematic Working Group on Construction and Circular Buildings

About this Report - Informing, Inspiring, and Enabling Circular Actions

Circular construction is reshaping how cities and regions build, but turning ambitious ideas into practice requires overcoming complex technical, regulatory, and socio-economic challenges. This report presents the insights and outcomes of the Circular Cities and Regions Initiative (CCRI) Thematic Working Group on Construction and Circular Buildings (TWG C-BUILD) from January 2023 to October 2025.

The TWG C-BUILD supported cities and regions in addressing the challenges of circular construction through iterative peer exchange and joint reflection. Members co-developed practical solutions, shared priorities, and built knowledge grounded in real-world experience.

This report brings together circular solutions, good practices, and thematic insights generated during the three-year process, alongside key barriers and enablers. It also offers policy recommendations to foster enabling conditions for circular construction and forward-looking suggestions to strengthen future peer-learning formats.

Designed for local and regional authorities, policymakers, architects, developers, waste authorities, and research organisations, the report provides guidance, practical inspiration, and strategic perspectives to help cities and regions advance circular construction.

1 Chapter I: Looking back – Achievements of the TWG

1.1 Introduction / About the support provided by the TWG to its Members

1.1.1 Scope and mission of the TWG C-BUILD

Cities and regions are crucial players in the circular transition for construction and buildings. Local governments hold the power to shape the future of the built environment through planning, regulations, zoning and permits. Moreover, they can act as facilitators and provide incentives for actors in the construction ecosystem to take a more holistic systems approach to the design, construction, maintenance, operation and after-life use of buildings.

Multistakeholder collaboration can help map such flows of construction resources throughout a city, helping to anticipate future availability of resources and move towards more self-sufficient and circular cities. Such collaboration may involve city municipalities as well as the construction and waste industries, building owners, innovation agencies and universities.

1.1.2 Thematic focus areas

The TWG C-BUILD was established to help cities and regions address shared challenges by exchanging experiences on barriers and solutions, supporting members in developing circular approaches, and connecting them with relevant EU-level developments. Early discussions shaped three thematic focus areas that guided the exchanges:

- **Focus area 1**: Prevention, management and re-use of construction and demolition waste
- **Focus area 2**: Adjusting policies for local circular needs
- **Focus area 3**: Upgrading existing buildings and spaces

As members compared practical approaches, the work naturally converged around four key circular systemic solutions that structured the subsequent activities: (1) circular buildings and spaces, (2) marketplaces for construction material re-use, (3) urban resource cadastres, and (4) regional hubs for circular innovation.

1.1.3 Approach and methodology

An iterative, collaborative approach was adopted to support cities and regions in advancing circular construction. Its work combined structured peer exchanges, collaborative mapping of barriers and levers, and targeted matchmaking to connect members with relevant expertise and resources.

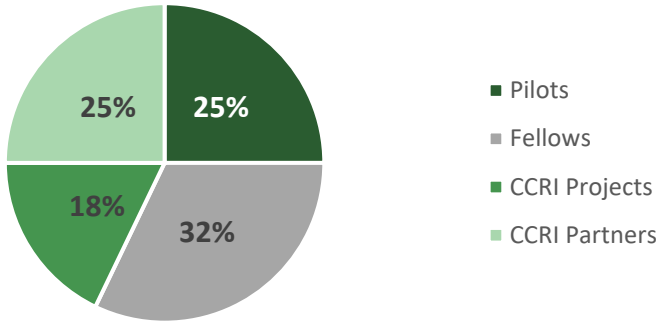
Early activities focused on identifying shared challenges through surveys and discussions, which informed the design of the TWG C-BUILD meetings and guided practical exchanges. These sessions enabled members to compare approaches, share experiences, and explore implementation pathways.

To strengthen learning and access to funding, updates on EU policy developments, reports, and opportunities, were shared regularly, complemented by contributions from external speakers when relevant to members' priorities.

Integrating peer learning, practical problem-solving, and policy alignment helped members move from identifying challenges to shaping actionable strategies for circular construction.

1.1.4 Composition of TWG members

The TWG C-BUILD brought together 25+ participants including cities and regions, CCRI Demonstration Projects, and Associated Partners (see figure below), each contributing perspectives from different stages of circular construction implementation. This mix of local authorities, project consortia, and supporting organisations ensured that the work remained both practical and relevant. As the group identified its circular systemic solutions, the involvement of CCRI Projects alongside other initiatives offering project development assistance, helped create a clear pathway for progressing the work.



1.2 Achievements of the CCRI Thematic Working Groups

1.2.1 Key actions and support activities

Needs analysis: Previously mapped needs and offers were collected helping turn shared challenges into concrete cooperation opportunities and increasing the investment readiness and scaling marketplaces for construction material re-use.

In-person matchmaking workshops: Cities and regions were brought together with advisory providers to support matchmaking. An 'investment frame' (see Annex I) was developed and populated with members' barriers and proposed solutions affecting the investment readiness of circular buildings and marketplaces. It helped members prioritise actions that make business models both financially viable and socio-environmentally beneficial.

Cooperation with Pilot Companions, CCRI advisory services and external experts: Members were supported in accessing CCRI advisory services that facilitate the implementation of marketplaces for material re-use. This was done by co-developing an evidence base showing examples of what works, where obstacles persist, and how these insights can be turned into actionable policy measures. The results of this collaborative exercise have informed the recommendations for policymakers, and spotlighted marketplaces.

1.2.2 Results and impact

Identifying Research and Innovation (R&I) gaps: Members collectively identified that there are no standardised methods for testing and qualifying reclaimed Construction and Demolition (C&D) material and acknowledged the need to proceed on a case-by-case basis when reusing secondary materials. This recognition also underlined the importance of further developing harmonised testing and recertification approaches to support circular systemic solutions.

Sharing a replicable tool for verifying the usability of C&D materials: An Excel-based assessment tool for verifying the suitability of secondary construction materials was introduced. By facilitating the tool's translation and dissemination to all members, access to a replicable instrument for evaluating reclaimed materials' usability in practice was enabled, thus contributing to greater consistency and comparability in the absence of standardised methods.

Supporting decision-making on policy instruments to influence the private market: Exchanges helped define the criteria and considerations for choosing appropriate policy instruments (e.g., land allocation, procurement, and zoning) based on local conditions. These discussions informed the development of a simple decision tree which supports local and regional authorities in selecting the most suitable instruments for advancing circular systemic solutions through regional innovation hubs.

Advancing marketplaces for material re-use: Lessons learnt on material prioritisation and business model testing led to a member's successful ERDF application with the funding being used to expand testing and reuse operations and better coordinate with local construction professionals. More broadly, discussions helped members understand strategies for making a marketplace investment-ready and clarified a specific knowledge gap they needed to address: the degree of public sector involvement sought for their marketplace.

1.3 Enablers and obstacles

Circularity in construction is complex. Construction products are intermediary goods whose performance depends on the context of their installation in works with very long lifespans – the EU average for buildings is around 50 years. This long service life means there is often a significant delay between implementing a circular action and seeing its benefits, which can discourage stakeholders from acting now. In addition, products are regulated at the EU level, while the actual construction works remain a national competence.

While members are developing solutions for key issues such ensuring that materials are recovered, stored, and reused locally making secondary markets financially viable, they are still facing persistent barriers that require targeted solutions

Barrier 1: Lack of standardised processes for reclaiming C&D material and limited market readiness

Overview: Reusing materials often requires case-by-case testing, with no widely adopted methodologies in place. This R&I gap creates uncertainty and liability risks that local authorities cannot bear alone. Even when technical and liability issues are addressed, limited market readiness remains a major hurdle. Investments in circular construction typically involve large-value projects, and current economic conditions, including high prices for construction materials, have slowed uptake.

Marketplaces must also compete for space with other high demand uses, and circular construction projects often lack the financial track record that would reassure investors.

Enablers: Addressing the lack of standardised methods for reclaiming and ensuring C&D materials are fit for reuse requires a shared responsibility of risks across the value chain. By involving all actors – from demolition contractors to designers, certifiers, and end-users – in risk-sharing arrangements, no single party carries a disproportionate burden[1]. Joint protocols and mutual insurance schemes can build the trust needed for regular, large-scale material recovery[2].

In addition, a way forward is to develop business models that balance and highlight social and environmental benefits alongside financial returns. Showcasing how marketplaces, circular building and renovation projects, innovation hubs and the development of urban resource cadastres create local jobs, generate community value, and cut environmental impacts can make them more attractive for public funding, gaining political support, as well as for private investment. Embedding these co-benefits into public procurement and funding criteria can further accelerate adoption.

Barrier 2: Limited access to land for marketplaces

Overview: Even well-designed and well-funded initiatives cannot succeed without physical space. Limited access to land for marketplaces is a significant barrier in many cities, where suitable sites are scarce and compete with other commercial or residential uses. Without secure, long-term access to well-located premises, marketplaces struggle to operate efficiently, build customer bases, and plan for growth.

Enablers: To overcome this, cities can integrate marketplace needs into municipal planning and leverage publicly owned spaces. This can involve earmarking space in land-use plans, prioritising publicly owned sites or infrastructure, and incorporating marketplace requirements into major development or regeneration projects. Temporary use of municipal depots, logistics centres, vacant warehouses, or sites scheduled for renovation can also provide cost-effective and strategically located options.

1.4 Inspiring success stories

Spotlighting the barriers and enablers for implementing the key circular systemic solutions of the TWG C-BUILD facilitated concrete achievements by individual members. These achievements were made possible through the collaborative activities which created opportunities to connect needs with solutions, share replicable tools and launch new projects to advance the implementation of marketplaces.

[1] Collaborative contracts are crucial to ensure the success of marketplaces. In this way, actors responsible for receiving, reconditioning, and certifying secondary construction materials can ensure the materials they are not the only liable party and meet the requirements for reuse

[2] TWG C-BUILD members are collaborating with insurers to generate trust in reclaimed C&D material.

1.4.1 Improving confidence in reused construction materials through an Excel-based verification

Challenge: Builders and authorities often struggle to agree on how to verify the essential characteristics and performance levels of reused construction products. This creates uncertainty around compliance, liability, and acceptance of secondary materials in new projects.

Figure 1: Screenshot of Finnish excel-based tool

Solution: An Excel-based tool was developed in Finland to support agreement on essential characteristics, methods of determination, and required performance levels for reused products[3]. The tool covers a range of materials, including clay bricks, calcium silicate bricks, glued-laminated timber, structural steel, windows, doors, and clay roof tiles. Thanks to a member which facilitated the contact, the developer presented the tool, addressing a need identified for more clarity on qualification, recertification, and liability in secondary materials. With the support of some members, the tool was translated into English by its developer and made accessible to all members.

Impact:

- **Provided members with a practical tool** to assess essential characteristics, methods of determination, and performance levels of reused materials such as bricks, structural steel, timber, windows and doors.
- **Responded directly to the need for clearer guidance** on recertification procedures, liability sharing, and verification of performance for secondary construction materials.
- **Enabled exchange between members** by connecting the technical expertise with the demand for standardised approaches to qualifying reused products.

What others can learn?

- **Many of the material streams included in the tool are common in public buildings** frequently commissioned by local and regional authorities. This makes them highly replicable in other regions facing renovation or demolition of public assets.
- **Cities and regions can replicate this success by adapting the tool to their own building stock**, for example, by piloting it on schools scheduled for renovation or housing estates undergoing deep retrofit.
- **Replication is most feasible at the regional scale for heavy materials** like bricks and roof tiles, where short transport distances keep reuse economically viable.
- By **working with local demolition contractors, clusters, and certifiers**, authorities can ensure the tool is used consistently, lowering verification costs and building confidence in reusing these material streams.

[3] Tool for determining the eligibility of reusable construction products | Testbed Helsinki | City of Helsinki

1.4.2 Increasing investment readiness and scaling marketplaces for construction material re-use

Challenge: Cities and regions working to establish marketplaces for material re-use face similar challenges, such as difficulty accessing land, limited knowledge on recertification and standardisation, and uncertainty around financing and public involvement. A further obstacle is the lack of investment readiness of marketplaces, as circular construction projects are often perceived as risky and lack the financial track record needed to reassure investors. These challenges often remain siloed, with each city attempting to find solutions in isolation.

Solution: Rather than advancing individually, several members chose to pool their expertise and work jointly on challenges linked to material re-use. They began comparing their approaches, identifying common bottlenecks and testing practical tools. This collaboration created a shared learning environment where they could benchmark solution maturity, explore viable business models for publicly led re-use marketplaces and clarify what was needed to improve investment readiness. The joint work has also generated outputs designed to support other cities and regions pursuing similar solutions through a replication toolbox.

Figure 2: 2nd CCRI Workshop

Impact:

- Shared understanding of common barriers - such as land access, recertification procedures and long-term financing of marketplaces – as well as key enablers – such as clear regulatory frameworks, innovative business models, and access to tools and peer learning networks.
- Accelerated maturity development through coordinated, cross regional learning rather than isolated experimentation.
- Opened the way to forming a consortium, which is now positioned to test innovative solutions for financing and investment readiness of reuse marketplaces.
- Demonstrated how a structured matchmaking approach can effectively turn shared challenges into concrete cooperation and joint development efforts.

What others can learn?

- **Using collaborative grids to jointly map barriers and considerations for replication** can help cities and regions identify shared problems and pool resources instead of tackling them in silos.
- **The issues addressed in this case are common across the construction sector and therefore suitable for replication** when tackled collectively.
- **Other cities and regions can replicate this approach** by convening stakeholders to jointly explore these barriers and matching previously mapped needs and offers, so that technical, regulatory, and financial aspects are connected in practice**.**

1.5 Recommendations to policymakers

1.5.1 Recommendations relevant for all construction-related circular solutions

Recommendation 1. Share responsibility across the value chain for reclaiming C&D material.

Liability and risk-sharing are critical issues for reusing materials in practice. Circular construction often pushes actors into unfamiliar territory, as products need to be tested on a case-by-case basis, and no common or standardised methodologies have been rolled out yet. Therefore, local authorities cannot carry the risk alone.

- **For municipalities and national authorities:** Implement collaborative contracts, which regulate risk allocation between partners and allow for shared decision-making on material choices. Building on insights from the Norwegian national standard (NS 8407 with additions[4]),
- **For national and regional authorities:**
  - Inspired by North Holland's Circular Deal[5], establish **binding agreements on cooperation across the value chain** through collaborative processes in which municipalities, manufacturers, and contractors formally commit to standardised demolition criteria, transparent material reporting, and planning for where and how materials are reclaimed, ensuring one central legal responsibility.
  - Engage with research and academia to test and develop **digital tools** (including Excel-based or other user-friendly formats) for verifying the usability of construction products and collaborate with other public authorities to replicate them in cities across the EU.
- **For EU institutions:**
  - Collaborate with EU standardisation bodies (particularly CEN/TC350/SC1 on "Circular economy in the construction sector") to integrate standards developed by this body that reduce concerns about technical performance and warranty, and de-risk reuse practices.
  - Align standards for different product groups at national and European levels as part of the 'CPR acquis' process under the revised EU Construction Products Regulation[6].

Recommendation 2. Balance different policy instruments to influence the wider market, beyond public procurement.

Public procurement is one of many tools that public authorities have at hand to incentivise circular approaches. Procurement can be limited in scope, as it applies mostly to public buildings and infrastructure. Cities, regions, and the EU should use a broader mix of instruments to influence private actors and shape secondary markets for construction materials.

Recommendations for municipalities:

- For cities with significant public land ownership, **develop clear circular criteria for land allocation**[7].
- In cities with brownfields or underused spaces, **use public land leasing** to create on-site demonstration platforms that support circular business models and gain the buy-in of building professionals.

[4] See Norway's Standardisation Committee's website for more information: Totalentreprise NS 8407 og totalunderentreprise NS 8417

[5] Circular Deal - Province of Noord-Holland.pdf

[6] Regulation (EU) 2024/3110 of the European Parliament and of the Council of 27 November 2024 laying down harmonised rules for the marketing of construction products

[7] See the example of Tampere (CCRI Pilot): Circular economy criteria for land allocation - Kiertotalouspirkanmaa.fi

- Where long-term urban planning is a priority, **integrate circular criteria into zoning regulations** to guide future development.

Recommendations for regional authorities:

- **Establish innovation hubs** to support the uptake of circular criteria by municipalities and private developers. These hubs should offer technical guidance and allow for phased implementation to prevent added procurement costs.
- **Organise capacity-building activities** for the private sector, in collaboration with national Green Building Councils or similar platforms[8].

Recommendations for EU institutions:

- **Extend and adapt EU Green Public Procurement (GPP) and any new EU circular criteria** for certain products so they can be used in land allocation processes, helping influence the private real estate sector more directly.
- Through Horizon Europe calls, **fund joint initiatives between academia, cities, and regions** to develop adaptable circular criteria tailored to different policy instruments and local contexts.

1.5.2 Recommendations related to circular buildings and spaces

Recommendation 3: Improve the affordability of circular buildings and lower associated costs.

Recommendations for municipalities: Appoint a dedicated project manager within the public authority, specialised in circular construction and procurement. This person should lead efforts to make circular building tenders financially viable for the municipality:

- This role should include collaborating closely with municipal building project developers (e.g. architects and design teams) to identify cost-saving opportunities early in the design phase (e.g. optimising layout to reduce open space and integrate additional affordable housing units, such as senior residences).
- If the project manager and building professionals **identify knowledge gaps**, external expertise should be brought in to:
  - Assess upfront investment costs and identify ways to reduce long-term running costs through circular design.
  - Use this process as an entry point to **introduce digital building passports** across the municipal building stock. These tools help track materials and maintenance needs and provide structured data to plan renovations, anticipate repair costs, and extend building lifespans cost-effectively.

Recommendations for national and regional authorities: Incentivise the **wider uptake of off-site and industrialised construction techniques**, such as prefabricated modules, through national and regional strategies[9] and innovation hubs[10]. These approaches can significantly reduce construction costs and accelerate delivery, particularly in social or affordable housing developments.

[8] See the model for street procurement and land allocation criteria applied by the Regional Council of Tampere (CCRI Pilot), where local authorities have worked collaboratively with the private sector, engaging with the Finnish Green Building Council, developing surveys to gather feedback and hosting a series of workshop with designers, architects, and building companies.
[9] See Spanish National Strategy: PERTE de la industrialización de la vivienda | Ministerio de Vivienda y Agenda Urbana
[10] See the Region of Tampere's and Helsinki-Uusimma's hubs (circular systemic solutions).

Recommendation for EU institutions:

- Revise the EU procurement framework to include **non-price criteria** under the planned Circular Economy Act, allowing public buyers to evaluate bids based on **total cost of ownership, energy use, and maintenance needs**, rather than just upfront price.
- Ensure that upcoming **mandatory circular public procurement criteria** (e.g. by introducing GPP criteria through delegated or implementing acts[11] [12]) focus on **cost-relevant aspects** such as durability, repairability, and recycled content; are usable for cities without major new tools or training; and are economically assessed to reflect what the market can already supply affordably.

Recommendation 4: Balance the social and environmental benefits of circular building projects with their financial returns

Recommendations for municipalities:

- **Ensure strong leadership and link circular objectives with social value to gain political support**. Circular building projects gain more public and political support when they clearly contribute to local priorities such as neighbourhood regeneration or affordable housing:
  - Appoint a project manager within the public authority to lead these efforts.
  - The project manager should also engage the full municipal council early to secure political support across election cycles.
- **Use life cycle costing to demonstrate long-term economic value.** Apply life cycle costing frameworks to compare the total cost of ownership between circular and linear approaches. Scenarios should highlight how durable materials and energy-efficient systems reduce operational costs and increase long-term value.

Recommendation for EU institutions:

- **Reflect circular and social value in the upcoming EU Strategy for Housing Construction[13].** The upcoming strategy should promote design solutions that lower running costs and support affordability – such as energy-efficient systems, modular layouts, and the reuse of materials – in alignment with the objectives of the Circular Economy Act. It should also encourage the combined use of circular and social criteria in public procurement, EU funding calls, and project evaluation.

1.5.3 Recommendations related to marketplaces for material re-use

Recommendation 5: Develop a sustainable business model for marketplaces for construction material re-use.

For municipalities and regional authorities: decide on a suitable ownership model and degree of public involvement, depending on the local or regional authority's access to space, materials, funding and procurement influence.

[11] The following pieces of legislation have been adopted empowering the Commission to potentially establish GPP requirements for certain construction product groups: (*1) Regulation (EU) 2024/1781 on the ecodesign requirements for sustainable products, (2) Regulation (EU) 2024/1735 on establishing a framework of measures for strengthening Europe's net-zero technology manufacturing ecosystem and (3) Regulation (EU) 2024/3110 laying down harmonised rules for the marketing of construction products*

[12] GPP criteria are aligned with the Level(s) EU public procurement. Any planned revisions of Level(s) indicators should be considered when introducing mandatory GPP.

[13] 1c203799-0137-482e-bd18-4f6813535986_en

- **Fully public ownership** is suitable when the authority has access to space, a steady flow of materials, secured funding, and can steer supply and demand through procurement. It allows full control and alignment with public works.
- **Public–private partnerships** work well when the authority can offer space, materials, or funding and use procurement to support activity, but prefers to share responsibilities with private partners to gain the buy-in of the local market.
- **Light public support for private initiatives** fits situations where the authority lacks access to space, materials, and funding and has limited influence through procurement. The focus should be on creating enabling conditions through (regulatory) incentives and/or capacity building across the value chain.

For EU institutions:

- Gather information on key projects under **different EU funding programmes supporting the development of marketplaces** (e.g. INTERREG[14], Horizon PDAs[15], ERDF) and consider establishing an EU-level knowledge platform to consolidate the lessons learnt and showcase successful formats and ownership models. Based on this, establish additional funding calls to address remaining knowledge gaps related to developing long-term, commercially viable markets with minimal public support.
- Replicate specific regional Swedish **ERDF calls**[16] which can be used for accessing funding for developing marketplace business models in other EU regions**.**

1.5.4 Urban resource cadastres

Recommendation 6: Support the implementation of urban resource cadastres by cities and their upscaling to the regional level.

For municipalities and regional authorities: Link urban resource cadastres to decarbonisation and other policy goals to gain political backing and incentivise upscaling to the regional level.

For EU institutions: In light of the upcoming EU-level mandatory digitalisation of demolition permits and pre-demolition audits under the Circular Economy Act – expected to be based on the French PEMD scheme[17] – ensure that the timing of pre-demolition audits allows cities to anticipate material flows in advance, identify supply and demand for secondary materials and develop tailored storage and logistical solutions.

[14] Home | PREUSE
[15] Home | CirCoFin
[16] See, e.g. Promote the transition to a circular economy in North Central Sweden - Tillväxtverket
[17] Le diagnostic « produits, équipements, matériaux et déchets » (PEMD) | Ministères Aménagement du territoire Transition écologique

Annex

Annex I: Investment frame

Actions	Barriers		Practical solutions
	Circular buildings	Marketplaces	
(1) Demonstrate social and environmental benefits of the CSS	*How to highlight qualities of circular buildings?* *How to make societal and environmental selection & procurement criteria at least equally important than the financial investment costs?*	*How to demonstrate the socio-environmental benefits of a marketplace?* *How to balance the socio-environmental benefits with investment costs?*	*To be completed during discussion*
(2) Working toward a business model that generates financial returns	*How can I make investment feasible, knowing that the circular building project probably has a higher investment cost?*	*How to work toward business models for material re-use marketplaces that generate financial returns? Where should the ambition be set?*	

Annex II: Selection of key resources

To complement the focus topics, a sample of resources was collected, aligned with the recommendations. For more resources relevant to the design and implementation of CSSs and local and regional scales, please visit the **support materials page** on the CCRI website.

Table 1: Tools, reports and other knowledge items collected during the discussions of this group, relevant for recommendation 1

Resources	Description
Recommendation 1: Share responsibility across the value chain for reclaiming C&D material	
EU CDW Management Protocol (European Commission, 2024)	The overall aim of this Protocol is to increase confidence in the C&D waste management process and the trust in the quality of C&D recycled materials. This will be achieved by: a) Improved waste identification, source separation and collection; b) Improved waste logistics; c) Improved waste processing; d) Quality management; e) Appropriate policy and framework conditions.
Evaluating the technical performance of reclaimed building materials (FCRBE Project, 2023)	Booklet including detailed methodologies on evaluating the technical performance of reclaimed building materials and ensuring their fitness for reuse
Insights from the URGE network: thematic report	This thematic report explores how European cities, particularly Munich, are addressing the regulatory and standardisation gaps that hinder the circular use of construction and demolition waste (CDW), highlighting the role of technical specifications, pilot projects, and green procurement in enabling the safe reuse of secondary raw materials and advancing EU circular economy goals.
A guide for facilitating the integration of reclaimed building materials in large-scale projects and public tenders (FCRBE,2022)	This guide is a tool aimed primarily at building owners. It presents several routes to integrate the principles of reusing building materials in construction and renovation projects. The proposed strategies are adapted to the development of public building projects. *The Interreg project FCRBE (Facilitating the circulation of reclaimed building elements in Northwestern Europe) has other reports and publications.*

Table 2: Tools, reports and other knowledge items collected during the discussions of this group, relevant for recommendation 2

Resources	Description
Recommendation 2: Balance different policy instruments to influence the wider market, beyond public procurement	
Procura+ Manual (ICLEI, 2016)	The Procura+ Manual includes key guidance on sustainable procurement approaches for six high-priority product groups, including construction.
How to engage the market - a step by step guide for dialogue events (ICLEI, 2021)	This guide is for public buyers that want to understand the HOW of market engagement events.
Circular economy criteria for land allocation - Kiertotalouspirkanmaa.fi (ReCreate Project & Regional Council of Tampere, 2024)	Circular economy criteria for land allocation has been developed to offer a catalogue of ready-made circular economy criteria and recommendations for their assessment, scoring and verification.

Table 3: Tools, reports and other knowledge items collected during the discussions of this group, relevant for recommendations 3 and 4

Resources	Description
Material passports – best practice, Innovative solutions for a Transition to a Circular Eoncomy in the Built Environment (BAMB, 2019)	This publication provides a guidelines for actors along the construction value chain and shows the benenfits of material passports and how these can be implemented into general building practice. Furthermore, it provides an overview of the types of material and product-related information. *The Horizon2020 Project BAMB (Buldings as Mateiral Banks) has a range of other reports and publications.*
Sector-wide Circularity Assessment - Construction Sector (CityLoops, 2021)	The report offers contextual insights into three CityLoops cities and their construction sectors under investigation. It then evaluates the circularity of these sectors using circularity indicators and a Sankey diagram. Lastly, it analyses and interprets the findings, discusses the limitations of the data used, and provides recommendations to enhance circularity in the sector.*The Horizon CityLoops project has a range of other relevant tools and reports.*

Table 4: Tools, reports and other knowledge items collected during the discussions of this group, relevant for recommendation 5

Resources	Description
Recommendation 5: sustainable business model for marketplaces for construction material re-use	
A roadmap to foster reuse practices in the construction sector (FCBRE, 2021)	The document presents a body of recommendations and ideas for actions that could be initiated and implemented by public authorities to foster the reclamation and reuse of building materials on their territory. It includes specific recommendations for 'surveying future material flows' (see page 71 for more details)
Summary: Urban mining of buildings (Circular Flanders, n.d.)	A summary of the research and real-life experiments conducted at demolition sites in Flanders, including an overview of barriers and recommendations.

Table 5: Tools, reports and other knowledge items collected during the discussions of this group, relevant for recommendation 6

Resources	Description
Recommendation 6: Support the implementation of urban resource cadastres	
Mapping building material stocks in cities: regional material cadastres. Guideline (CirCon4Climate, 2023)	This guideline introduces the topic of mapping construction material stocks in the built environment. Based on this, appropriate cadastre concepts can be developed in cities and regions and the necessary steps specified.
Booklet: Understanding Urban Stocks (FCRBE, 2021)	The report explores the concept of urban metabolism, comparing cities to living organisms that consume, transform, and emit resources in a largely linear and inefficient manner. It emphasises the critical role of built environment stocks in understanding resource flows, their accumulation, and potential reuse within cities, focusing on challenges such as accessibility, heterogeneity, and long lifespans of materials.

Table 6: Selection of resources for the cross-cutting topics for the TWG Construction and Circular Buildings
(*) = not specific to construction and circular buildings

Resources	Description
Circular skills and technology in construction	
European Research Area roadmap for circular technologies (European Commussion, 2023)	This second industrial technology roadmap sets out circular technologies in the construction industry (as well as the textile and energy intensive industries), which address all stages of a material and product lifecycle. It indicates the means to adopt these technologies. *It includes a dedicated section on circular business models (pp. 53-55).*
Stimulating demand for circular construction skills - a guide for public authorities (BusGoCirular, 2023)	This document highlights the various levers at the disposal of local and regional governments and public administrations to support upskilling. *The Horizon2020 Project Bus-go-Circular has other training material. Including a slide deck on 'Training material for public procurers: How to procue cicular construction skills?'.*
Jobs and skills to drive a circular built environment (Circle Economy , 2023)	This report analyses which jobs/skills are needed to enable four circular strategies within built environment. The proposed strategies are smart material management, product-as-a-service, bio-based materials and offsite, modular construction.
Stakeholder engagement	
Replication package on stakehodler enagment (2023)	Stakeholder involvement activities are deemed relatively easy to implement and replicate. Planning these activities requires methodologies, both for identifying stakeholders and understanding their relationships, and for effectively integrating them in a development process. CityLoops demonstration cities have concluded the following from the development of stakeholder engagement activitie.
Barriers and Recommendations to Scale The Circular Built Environment (Circle Economy, 2018)	This report elaborates on which are the key stakeholders in the built environment, what their roles are in a linear business model and how that changes when the business model becomes circular. The report also highlights five cross-cutting barriers that apply to changing the roles of stakeholders, five business models and the characteristics of the circular built environment, which must be adressed to move forward.
Funding and finance	
Building value: A pathway to circular construction finance (Circle Economy, 2019)	This report demonstrates the radical potential to accelerate the circular economy in the built environment. The industry is re-thinking how to calculate value in buildings and how to finance them. A Community of Practice was established to formulate key reforms to current methods of valuation and financing to stimulate circular construction.
Circular City Funding Guide (EIB, n.d.) (*)	The main focus of the guide is to provide information on financing/funding sources and provide guidelines for setting up funding programmes for circular initiatives/projects.
Monitoring and indicators	
Study on Measuring the Application of Circular Approaches in the Construction Industry Ecosystem (European Commission, 2023)	The study recommends 19 indicators that companies could use to report on circular approaches in construction projects. These indicators apply at four different levels: construction product, building or infrastructure works, urban level, and organisational level. Given that construction is dominated by SMEs, the indicators are ones that SMEs should be capable and willing to report against.
Indicators in the monitoring framework for the circular economy 2023 (European Commission, 2023) (*)	The new monitoring framework aims to provide a comprehensive overview by measuring direct and indirect benefits of increasing circularity. It comprises 11 indicators grouped into 5 dimensions: (1) production and consumption; (2) waste management; (3) secondary raw materials; (4) competitiveness and innovation; and (5) global sustainability and resilience.
Level(s): European framework for sustainable buildings (European Commission)	Level(s) provides a common language for assessing and reporting on the sustainability performance of individual buildings. It is a simple entry point for applying circular economy principles. *See factsheet, eLearning and Calculation and Assessment Tool.*
Circular economy indicators for buildings and housing (CE Center, OVAM, 2021)	This report presents a Circular Economy monitor for the societal need fulfilment system of buildings and housing. It is part of the CE monitor of the policy research centre. The indicators of this monitor were compiled and reported to reflect the circular economy, including its economic, environmental, and societal aspects.

Annex III – Circular Systemic Solutions of TWG C-BUILD

Circular buildings and spaces

This circular systemic solution focuses on rethinking how buildings and their surrounding urban areas are designed, transformed, and used across their whole life cycle. This involves working with durable, recyclable, and non-toxic materials, designing for flexibility and adaptability, and ensuring that structures are easy to maintain, retrofit, or disassemble for reuse. Tools such as **life-cycle assessment, life-cycle costing, and building (material) passports** help track resources over time and plan renovations in a cost-efficient way.

This solution also extends beyond individual buildings to urban planning and regeneration. It covers approaches such as modular and industrialised construction that can reduce costs and speed up delivery, the **integration of cultural and social values in redevelopment projects**, and the creation of spaces that are affordable, resilient, and relevant to community needs. By aligning building-level initiatives with district, city, and regional strategies, circular buildings and spaces connect environmental objectives with social value and financial feasibility.

Marketplaces for construction material re-use

As part of the activities of this working group, the term ‘marketplace’ refers to both **physical and digital platforms that facilitate the exchange of salvaged construction materials from one owner or project to another**. Physical marketplaces can take many forms, from depots and storage facilities to dedicated spaces where materials are sorted, cleaned, documented, and prepared for reuse. They may also serve as buffer spaces for materials in transit, or as platforms bringing together different circular construction actors. Digital marketplaces provide the online interface for advertising and trading reusable materials, sometimes focusing on products still to be salvaged, and other times on stock already reclaimed and ready for use.

What unites these different forms is their role in organising the flow of reusable building materials and making them accessible for new construction, renovation, or maintenance projects. In the context of this working group, marketplaces are understood as initiatives where public authorities are involved in some capacity – whether through **providing space, facilitating logistics, or creating the conditions for demand**. Sections 1.3 and 1.4 of this report explore how such marketplaces can overcome barriers such as access to land and investment readiness, and an example of how they can be replicated across different local and regional contexts.

Urban resource cadastres

In our work, we have also looked at the practical approaches and tools members are using to **identify and track construction materials in existing buildings for later recycling or reuse**. These tools help stakeholders optimise material use, reduce waste, improve waste management strategies, and strengthen overall circularity. When scaled up, they support the implementation of a broader circular solution: urban resource cadastres.

Urban resource cadastres collect and **systematise data on the material stock contained in buildings** and infrastructure, as well as on flows expected from future construction and demolition. By mapping how much material will become available and where it will be needed, they enable cities and regions to plan ahead for reuse, recycling, and recovery[18]. These cadastres act as coordination mechanisms, bringing together knowledge from the private sector, municipal authorities, and specialised actors in construction and demolition waste logistics. While often applied at the city level, they are most effective when scaled to the regional level, where exchanges between multiple municipalities can reduce storage costs and widen the market for secondary materials.

In practice, urban resource cadastres can anticipate waste and material flows, support sector-wide circularity assessments and carbon reduction targets, inform renovation and regeneration plans, and even strengthen disaster preparedness. Above all, they give local authorities and their partners the data needed to match supply with demand for secondary materials and make circular construction strategies and solutions, such as marketplaces and circular buildings, more effective.

Regional hubs for circular innovation among municipalities and the private sector

Regional hubs for circular innovation are collaborative platforms that bring together municipalities, public actors, and private stakeholders to accelerate the transition to a circular economy. These hubs aim to foster systemic change across the construction value chain and link with others by **creating the conditions for new business cases, testing policy instruments, and supporting market development.**

They work by providing **criteria, tools, and models that can be used by both municipalities and companies**, while also encouraging dialogue between the public and private sectors. In practice, regional hubs help municipalities integrate circularity into **procurement, land allocation processes, and building permits, as well as through the use of public ownership and leasing of land**. These instruments incentivise circular building projects, make reuse and recycled content more attractive, and embed circular principles into local governance frameworks.

By connecting municipalities within a region, hubs amplify local efforts, provide clearer signals to private actors, and give businesses greater confidence to invest. In this way, they act as catalysts that turn policy ambitions into practice and help scale up circular solutions across territories

[18] European Commission: Directorate-General for Research and Innovation, AIT, ECORYS, EGEN, Tecnalia, Menger, P., Etminan, G., Rueda, F., Bianchi, M., Fernández Fernández, I., Fuster Figuerola, E.Maleki, P., *Circular cities & regions initiative – Methodology for the implementation of a circular economy at the local and regional scale*, Menger, P.(editor), Etminan, G.(editor), Rueda, F.(editor), Bianchi, M.(editor), Fernández Fernández, I.(editor), Fuster Figuerola, E.(editor) and Maleki, P.(editor), Publications Office of the European Union, 2022,https://data.europa.eu/doi/10.2777/068045

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