



A roadmap to foster reuse practices in the construction sector

A collection of inspiring actions for public authorities



Authors:

Emilie Gobbo – Brussels Environment

Michaël Ghyoot – Rotor

Corinne Bernair – Brussels Environment

Anne Paduart – Brussels Environment

Proofreading:

Bruno Domange – LIST

Lucas Colombies – Seine-Saint-Denis

Katleen Vandriessche – Alteritas

Layout:

Visuality

Illustrations:

Visuality

Brussels, November 2021

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PARTNERS



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1. Why this roadmap?



This roadmap has been prepared as part of the Interreg NWE FCRBE project (corresponding to the deliverable WP LT D.1.1). The FCRBE project aims at enhancing the quantity of building elements being reclaimed and reused in North-West Europe. To do so, the project has developed between 2018 and 2021 a series of actions and tools addressed to professionals of the construction sector: building commissioners, contracting authorities, specifiers, architects and contractors.

Many of these tools focus on the project level: they supply the parties involved with methodologies, documentation and processes to adopt a more systematic reclamation and reuse in their projects. The project has delivered many outcomes, including an auditing method for inventorying the reuse potential of building materials, a range of specification strategies for installing reclaimed materials in construction and renovation works, and a collection of almost 40 reclaimed material documentary sheets¹.

These newly-developed tools have been tested by means of 36 pilot operations. During these operations, the FCRBE project partners assisted pilot associates to put reclamation and reuse actions into practice in their ongoing building projects. This scheme was extremely useful, not only for getting direct feedback on the FCRBE methods and for supporting different parties in the implementation of reuse practices, but also for meeting and tackling obstacles hindering the development of reuse on the site.

These operations, together with other feedback that was collected before and during the project, and through literature², have shown that, while some of these obstacles can be overcome by adopting new approaches at project level, others will depend on a more general context. They have to do with **technical, normative, juridical, economic and even cultural frameworks**. A more holistic approach is therefore necessary to make these obstacles evolve, and support the transition towards a reuse economy.

This is where public authorities come into play.

Policy makers can indeed have a strong influence on these aspects. As pointed out by Allwood and Cullen, they have at their disposal a wide range of possible actions, such as “determine and enforce standards and rules [...], encourage novel developments through taxes, subsidies and investments, enable change by providing infrastructure, information and skills, exemplify good practices through procurement and engage the public and industry through media campaigns and company initiatives.”³

The present document is 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.

¹ All available on <http://www.nweurope.eu/FCRBE>

² On the barriers to reuse and the influence of policy making for overcoming them, see for instance: Hradil P., 2014. *Barriers and opportunities of structural elements re-use*. Research report of the *Rakennuselementtien uudelleenkäyttö* (ReUSE) project (ref. project: 81120/ReUSE); RDC Environnement, éco BTP and I Care & Consult (Mélanie Coppens, Emmanuel Jayr, Marion Burre-Espagnou, Guillaume Neveux), 2016. *Identification des freins et des leviers au réemploi de produits et matériaux de construction*. Research report for ADEME (ref. project: 1506C0024); Dechantsreiter U., 2016. *Bauteile wiederverwenden - Werte entdecken. Ein Handbuch für die Praxis*. München: oekom (see notably chapter 4: “Identifizierung geeigneter Instrumente und Handlungsempfehlungen”); Rotor (Michaël Ghyoot), 2017. *Objectif réemploi. Pistes d'action pour développer le secteur du réemploi des éléments de construction en région de Bruxelles-Capitale*. Deliverable of the Brussels-ERDF project *Le bâti bruxellois, source de nouveaux matériaux*, <http://bbsm.brussels>.

³ Julian M. Allwood, Jonathan M. Cullen, 2015. “The influence of policy ... on future material sustainability” in *Sustainable Materials without the Hot Air. Making buildings, vehicles and products efficiently and with less new material*, Cambridge: UIT Cambridge Ltd, p. 337.

2. What is the context of this roadmap?

The present roadmap focuses on actions to foster the reclamation and reuse of building materials and elements. Reusing building materials is at the intersection of various considerations and presents many benefits:

- It is an effective way to prevent **waste production** and **raw materials consumption**, in the context of the construction industry, which is a major contributor to waste production and resources consumption in Europe.
- It fits within the framework of the transition towards a **more circular economy**. Reusing building materials indeed epitomises what 'circular' activities could be, i.e. creating prosperity by keeping existing goods in circulation, thus preserving their use-value⁴.
- By creating new activities of transformation, reconditioning of materials from building sites, it also presents a **strong potential for job creation, often local**.
- It is an excellent way of making a significant reduction in the environmental impacts of a building project since it bypasses the end-of-life phase of an existing material and the product phase of a new one - which are the phases that usually have the most impact. Therefore, reuse can be a major contributor to reach **decarbonisation objectives**.

In this sense, reusing building materials is also at the intersection of various recent European policies:

- **The Waste Framework Directive** (2008/2018).⁵ The 2018 text is an update of the 2008 Directive on waste. In this document, European authorities emphasise the need for preventing waste generation (i.e. see Art. 9). Reusing goods is one of the measures that Member States are required to

take to prevent waste production: "encourage the re-use of products and the setting up of systems promoting repair and re-use activities, including in particular for electrical and electronic equipment, textiles and furniture, as well as packaging and construction materials and products." (Art. 9, paragraph d). This can apply to building materials and elements.

- **The European Green Deal** (2019).⁶ This document sets out a general framework for transforming the EU's economy towards a sustainable future. It tackles climate and environmental challenges by putting forward a series of measures in various sectors (including the construction industry) and at different levels. The need for a more circular economy is clearly emphasised. The document encompasses a 'sustainable products' policy which draws, among other aspects, on "prioritising reducing and reusing materials before recycling them" (§ 2.1.3, p. 7).

- **The Circular Economy Action Plan** (2020).⁷ This document identifies constructions and buildings as a key sector for increasing material efficiency. A greater circularity of building materials is also identified as an important lever for reducing carbon emissions and achieving climate neutrality by 2050, "for instance through long term storage in wood construction, re-use and storage of carbon in products such as mineralisation in building material." (§ 6.1, p. 16).

- **The Renovation Wave** (2020).⁸ This document sets guidelines for undertaking ambitious building renovations throughout Europe. Although its main objective is to improve energy efficiency, it also fosters, for example,



whole life-cycle thinking and promotes a circular economy. In this regard, the Commission has committed, among other aspects, to put in place "measures to increase reuse and recycling platforms" by 2024 (§3.5, p. 16).

To a large extent, these texts are cross-referencing each other. They are also complemented by additional guidelines and instruments developed by (or for) European authorities. With regards to buildings and circular economy, the following instruments can be mentioned (the list is not exhaustive):

- *The Construction and Demolition Waste Protocol and Guidelines* (2018)⁹, which notably highlights the need for pre-demolition audits, including assessing the reuse potential of building components.
- *The Circular Economy - Principles for Building Design* (2020)¹⁰, which provides guidelines for adopting circular design principles, including reusing materials and fostering design for future reuse.
- *The reference framework LEVEL(s)* (2021)¹¹, which provides guidelines for assessing and reporting on the sustainable performances of buildings, including enhancing the future reuse of building components.
- Etc.

It is interesting to note that, in parallel, European technical committees, and notably the CEN/TC 350 'Sustainability of construction works', are also developing new frameworks to accompany these evolutions with harmonised standards. In the

same vein, European regulatory documents are being updated and developed for the same purpose. It is notably the case of the Construction Products Regulation (regulating the marketing of construction products,) which will soon be updated to integrate considerations relative to circular practices (although apparently not explicitly for reclaiming and reusing building materials).

In this context, we can say that reusing building materials is clearly on the European policy agenda. The exponential growth in the development of circular economy strategies across Europe is evidence of this. Nevertheless, although regularly cited in these strategies as a priority area for action, reuse is often lumped together with recycling and is rarely considered in more detail¹².

Moreover, these documents generally stay at the level of global ambitions and orientations. Due to their European scope, they rarely address specific contexts or present specific pathways to reach the objectives they set. In essence, most of them are expected to be translated by Member States into national, regional and even local policies and actions.

The collection of tangible actions developed in this roadmap are thus a proposal for actions. Although some of them address issues that will need to be tackled at European level, they mostly target national, regional and local levels, through the lens of reusing building materials.

⁴ "The key objective of a circular industrial economy is to keep the economic value and utility of stocks of manufactured objects and materials as high as possible for as long as possible.", "The circular economy, replacing the production of new goods, thus substitutes manpower for energy, and local workshops for centralised factories, enabling local job creation and the reindustrialisation of regions." Walter Stahel, 2019, *The Circular Economy. A User's Guide*. London, New York: Routledge, p. 12 and 14.

⁵ Consolidated text: Directive 2008/98/EC of the European Parliament and of the of 19 November 2008 on waste and repealing certain Directives. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705>

⁶ Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal. COM/2019/640 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2019:640:FIN>

⁷ Communication from the Commission to the European Parliament, the , the European Economic and Social Committee and the Committee of the Regions. *A 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/?uri=COM:2020:98:FIN>

⁸ Communication from the Commission to the European Parliament, the , the European Economic and Social Committee and the Committee of the Regions *A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives*. COM/2020/662 final. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0662>

⁹ https://ec.europa.eu/growth/content/eu-construction-and-demolition-waste-protocol-0_en

¹⁰ <https://ec.europa.eu/docsroom/documents/39984>

¹¹ https://ec.europa.eu/environment/levels_en

¹² Reference: GOBBO E., *How to build a roadmap: the do's and don't of reuse in the construction sector*, FutuReuse collection, 2021.



3. What is this roadmap about?

This document is aimed at **public authorities** (from local to regional or international), from different (European) regions. It provides them with **guidelines** on how to foster the reuse of building materials and elements in their area. They can already be very committed to promoting reuse or be just discovering the issue.

This roadmap is a **collection of tangible actions** that can be implemented to encourage a more systematic reuse of building materials. They are illustrated with existing examples which may **inspire** public authorities to push for reuse in their area, stimulate a change of mentality in the construction sector, and encourage the adoption of more circular practices.

How to implement these actions, however, raises much wider questions: in which order, to what effects, for which purposes, how do they relate to each other and to other policies... Indeed, each country, region or city has its own context and framework in which the reuse issue is integrated to varying degrees. To partly answer these questions, this roadmap classifies different **'categories of actions'**. They are built on complementary objectives: fostering the demand for reclaimed materials and the proper reclamation of reusable building materials, ensuring that the demand meets the offer, creating a supportive framework, and monitoring these efforts.

To achieve these general objectives, intermediate milestones can be targeted and successive actions implemented. The exact order will depend on each context, including existing policies and political views. However, the roadmap presents three possible approaches for implementing these actions and meeting the general objectives. These scenarios are proposed as a source of inspiration. They also demonstrate that the development of reuse practices can be undertaken from different angles.

4

4. How was this roadmap developed?

We have developed this roadmap by means of a collaborative bottom-up approach. We first elaborated a set of possible actions that public authorities could implement to foster the reuse of building materials in their area. These actions were collected from different sources: existing literature on the topic, discussions and workshops within the FCRBE project (outside this specific deliverable), close monitoring of new developments in the regulatory context (mostly but not exclusively in Belgium and France), and the personal experience of the FCRBE project partners.

This collection of ideas was presented during a first online workshop dedicated to this question, with participants from different backgrounds: environmental agencies, public and private building developers, consultants, research centres, universities, local and regional public authorities. The group also reflected a diversity of locations: Belgium, France, the Netherlands, Luxembourg and the United Kingdom.

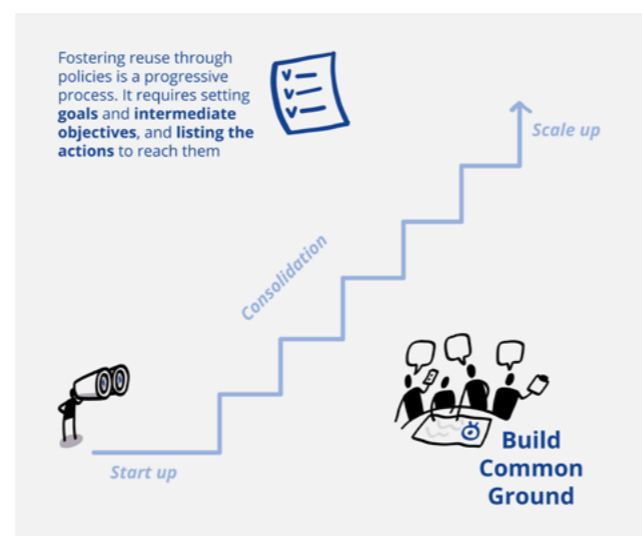
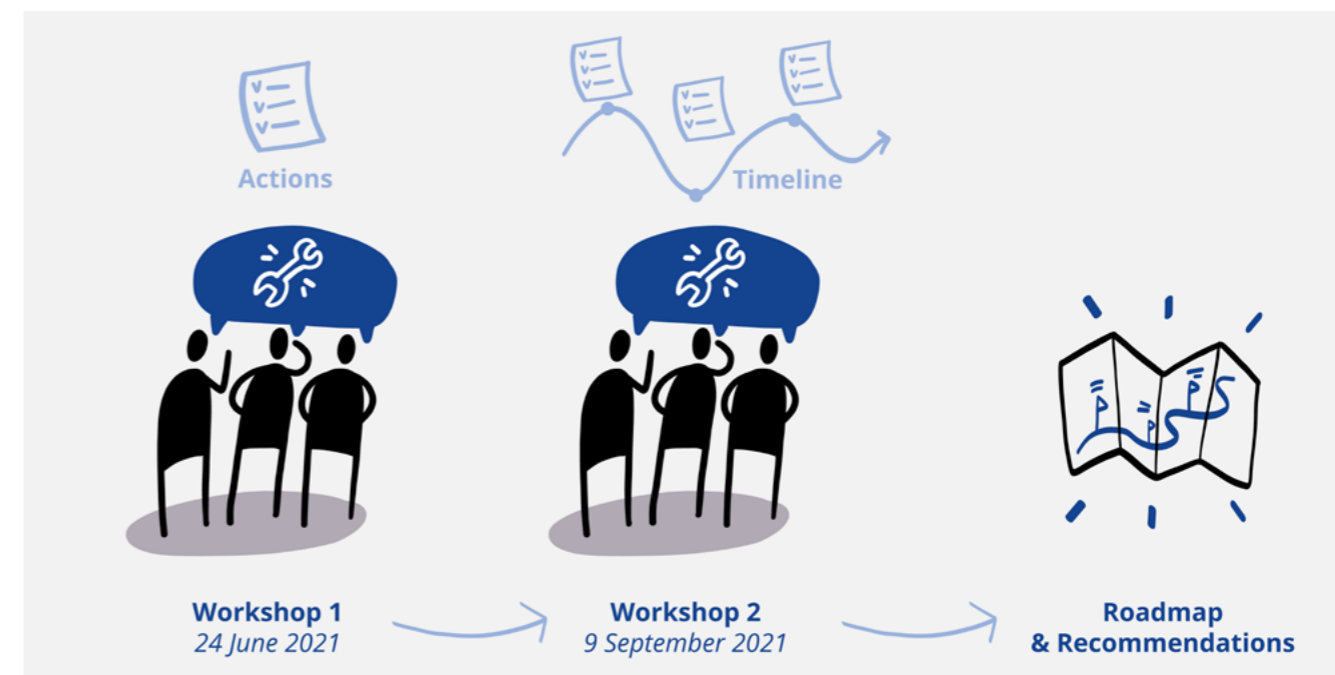
During the half-day session, the participants worked together to react to the suggested actions (which had been sent to them prior to the workshop). They could nuance or even dismiss some actions, and propose the addition of new ones if they felt some aspects were missing. The discussions during the workshop also helped to raise the potential pitfalls, conditions of success and possible prerequisite for putting these actions into practice. Finally, the workshops enabled us to group complementary sets of actions into coherent categories, sharing common objectives and/or approaches.

A second online workshop then addressed the possible scenarios for implementing these actions. It brought together participants similar to those at for the first workshop (in fact, many of them were indeed present at the first workshop). The participants were invited to reflect upon how and in which order the actions could be implemented. They explored different scenarios (such as a progressive implementation of actions with a strong involvement of many different parties, a major push in

R&D, a sterner transition based on more coercive measures, etc.). For each scenario, pros and cons were discussed. This helped to highlight the different interdependencies between the actions.

This collaborative approach allowed us to enrich and consolidate the development of this roadmap. By bringing together actors from different regions around the table, we also wanted to exchange good practices. The aim of including them from the outset was to develop a common background and reflect upon different pathways to foster the consolidation and upscaling of reuse practices..

The present document is the result of these discussions and preliminary work.



5. Roadmap's Strategic Objectives

The collaborative workshops, the feedback from the field and the literature review helped us to identify a collection of 36 actions. We have organised them in five families with different but complementary objectives. They reflect the bottom-up approach adopted here.

It all starts at the level of project development. In this context, fostering the reuse of building materials and products entails:

- Ensuring a careful reclamation of reusable materials (prior to and during demolitions)
- Ensuring the actual reuse of these reclaimed materials in new development (prior to and during construction and renovation works)

The first two strategic objectives therefore aim at **fostering the demand** for reusing building materials and **fostering the proper reclamation** of reusable building materials.

To achieve this, it is also necessary to **bridge the gap** between these two strategies in such a way that reclaimed materials can effectively be reused and, reciprocally, that the demand for reusing materials enhance the quantity of materials being reclaimed.

Starting from the construction projects, it is also necessary to consider the general context in which they take place, this includes cultural, technical, normative, economic and regulatory

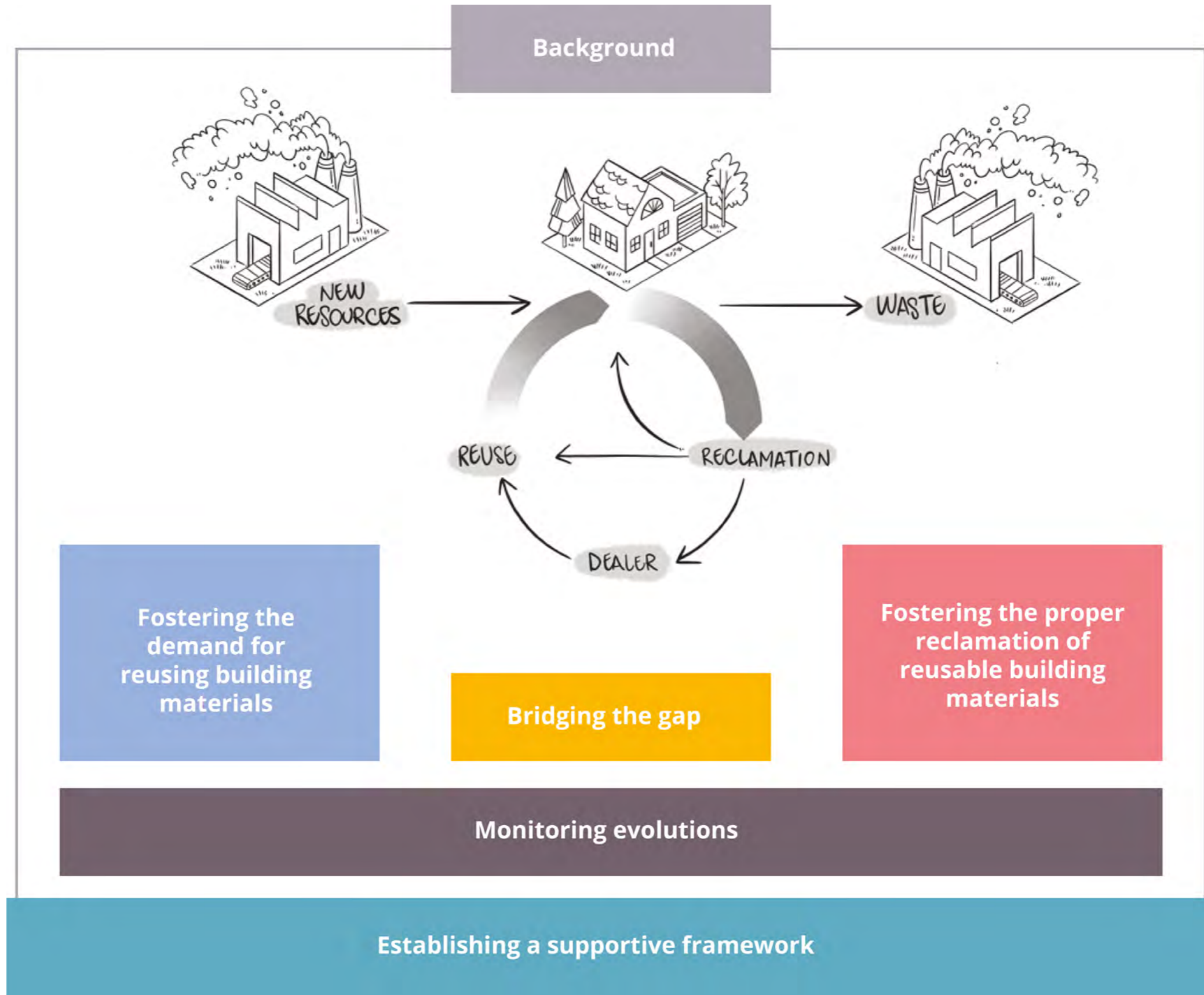
aspects. Fostering reuse also requires adapting this background and moving towards a **more supportive framework**. This is the fourth strategic objective.

When it comes to implementing actions and enforcing policies, it is essential to base them on actual data (qualitative or quantitative), to monitor them and to evaluate their effects over time in order to organise feedback loops and adapt the orientations if necessary. **Monitoring these progresses** is our final strategic objective.

These strategic objectives and related actions have to be linked to and consistent with circular economy strategies and energy performance targets because they are also part of the general and evaluation framework.

The five strategic axes proposed in this roadmap are shown in the figure below.

5



6

6. Collection of Actions

6.1 FOSTERING THE DEMAND FOR REUSING BUILDING MATERIALS	6.2 FOSTERING THE PROPER RECLAMATION OF REUSABLE BUILDING MATERIALS	6.3 BRIDGING THE GAP	6.4 ESTABLISHING A SUPPORTIVE FRAMEWORK	6.5 MONITORING EVOLUTIONS
6.1.1 Encouraging and supporting specifiers and contractors to adopt reuse practices	6.2.1 Raising private owners' awareness of reclamation procedures	6.3.1 Documenting the reclamation trade	6.4.1 Integrating reuse in Green Building Rating Systems	6.5.1 Surveying the reclamation trade
6.1.2 Assisting and supporting building commissioners to adopt reuse practices	6.2.2 Raising demolition contractors' awareness of possible reclamation pathways	6.3.2 Analysing existing reuse practices	6.4.2 Developing LCA and EPD for reclaimed materials	6.5.2 Monitoring reuse in building projects
6.1.3 Setting reuse objectives in public tenders	6.2.3 Raising DIYers' awareness of possible reclamation pathways	6.3.3 Fostering collaborative dynamics	6.4.3 Integrating reuse in environmental impact assessment tools	6.5.3 Surveying future material flows
6.1.4 Giving visibility to active enterprises and available reclaimed materials stocks	6.2.4 Conducting systematic reclamation audits	6.3.4 Supporting enterprises that adopt reuse practices	6.4.4 Developing labels for reclaimed products	
	6.2.5 Specifying dismantling for reuse	6.3.5 Developing synergies between the social economy and salvage activities	6.4.5 Ensuring a common approach regarding the fitness for reuse	
	6.2.6 Establishing a list of 'protected materials'	6.3.6 Federating the actors of the sector	6.4.6 Developing adapted insurance schemes	
	6.2.7 Developing material passports for reclaimed building elements	6.3.7 Fostering urban salvage yards	6.4.7 Facilitating the access to the technical documentation for past, present and future building materials	
		6.3.8 Facilitating the access to land and storage spaces	6.4.8 Clarifying CE-marking	
		6.3.9 Dealing with logistics issues	6.4.9 Clarifying the conditions of application for the end-of-waste status	
		6.3.10 Adapting education and training programmes	6.4.10 Internalising environmental costs of new products	
			6.4.11 Adapting fiscal policy for reclaimed products	

6.1

6.1 Fostering the demand for reusing building materials

This category groups together actions related to enhancing the demand for reusing materials at project level. These actions can be relatively easily implemented in any type of context.

They are important for the following reasons:

- To cut down the environmental impacts of construction and renovation works.
- To support the reclamation and salvage trade (locally but also more widely).
- To preserve valuable materials.
- To support and enhance the demand for reclaimed materials by inviting specifiers and clients to consider using reclaimed materials
- To enlarge the range of building materials being reclaimed.

6.1 FOSTERING THE DEMAND FOR REUSING BUILDING MATERIALS

6.1.1 Encouraging and supporting specifiers and contractors to adopt reuse practices

6.1.2 Assisting and supporting building commissioners to adopt reuse practices

6.1.3 Setting reuse objectives in public tenders

6.1.4 Giving visibility to active enterprises and available reclaimed materials stocks



6.1

6.1.1 ENCOURAGING AND SUPPORTING SPECIFIERS AND CONTRACTORS TO ADOPT REUSE PRACTICES

WHAT?	Architects, designers and contractors are the key players in the implementation of reuse strategies. They are the ones who choose, specify, procure, and install the materials. Raising their awareness of the benefits of reusing building materials can therefore greatly increase the amount of building materials being reused. They need to be informed about the possibilities at hand: which materials, which procedures, etc. They can also be supported in these actions (see Action 3.4 'Supporting enterprises who adopt reuse practices').
HOW?	Public authorities can activate different means to encourage construction professionals to adopt reuse practices: <ul style="list-style-type: none"> • Communicating and advertising, notably by promoting success stories. • Funding demonstrating projects to develop experience with reuse and share the main findings. • Organising training programmes to increase knowledge (also see Action 3.10 Adapting education and training programmes). • Fostering exchanges of good practices (through thematic events, newsletters, study trips, networking, etc). • Lead by example by implementing reuse ambitions in public procurements (see Action 1.3 Setting reuse objectives in public tenders). • ...
WHO?	Public authorities, professional federations, training centres, etc.
EXAMPLES?	<p>Training programme organised by Brussels Environment (administration of the environment of the Brussels-Capital Region) for professionals addressing specific topics on sustainable construction, including reclaiming and reusing building materials (link).</p> <p>Call for project Be Circular which provides financial support to projects focusing on circularity (link).</p>
Strong links to other actions?	Setting reuse objectives in public tenders (Action 1.3) Supporting enterprises who adopt reuse practices (Action 3.4) Adapting education and training programmes (Action 3.10)
FCRBE Resources	Feedback from the field: findings from 36 Pilot operations

6.1.2 ASSISTING AND SUPPORTING BUILDING COMMISSIONERS TO ADOPT REUSE PRACTICES

<p>Implementing reuse strategies in the current practices of the construction industry can face some challenges. Raising awareness amongst building owners and specifiers about the benefits and possible difficulties related to reuse practices is an important step ahead towards increasing the demand for reclaimed building products and supporting the local trade. Providing building owners and specifiers with specific assistance can help them overcome common issues such as understanding which materials are reusable, adapting tendering procedures, writing bespoke specifications, etc.</p>
<p>Public authorities can assist and support building owners and specifiers by fostering larger learning networks that bring together and support collaboration between different stakeholders in the field, like academic actors, industry, public authorities, architects, building developers, etc. They can also support the creation of toolkits of reference documents, evaluation and guidance tools, set public reference help desks, etc. Last but not least, when they are acting as contracting authorities, public authorities can lead by example and include reuse ambitions in their own tendering procedures (see Action 1.3).</p>
Public authorities, consultancies, academics, industry, architects, businesses, etc.
<p>AMOP Mission (2020–2021) The Brussels administration for the environment funded a consortium of experts who assisted other public contracting authorities in implementing circular actions in their ongoing projects. Reclaiming and reusing building materials was one aspect included in the mission (together with reversible design, exemplar waste management and digitalisation). This assistance was seen as a step towards the implementation of new regulations on circular performances in construction and renovation works. In total, 12 projects were supported during this 1-year project.</p> <p>Flanders Green Deal Circular Construction The Green Deal aims to bring together various actors of the construction industry and to develop a learning and knowledge network around circular construction. To participate in the Green Deal Circular Building, four conditions must be met:</p> <ul style="list-style-type: none"> • Carry out at least one pilot project (construction, research, circular products or services, etc.) • Participate in the learning network by exchanging knowledge and experiences • Provide relevant data, results and lessons to researchers of the living lab Circular Building (the research group is working on legal, economic and other barriers to the implementation of a circular construction) • Integrate principles of circular construction in their organisation and projects. <p>Vademecum circular construction for public building commissioners Guide to provide contracting authorities with keys to applying the principles of circular economy in both construction and renovation projects. The aim of the handbook is not only to increase understanding about circular building, but also to guide building owners step by step towards integrating more circularity in actual building projects. It includes inspiring examples and tangible ways of implementing circular themes in specifications.</p>
Setting reuse objectives in public tenders (Action 1.3) Giving visibility to active enterprises and available reclaimed materials stocks (Action 1.4)
Feedback from the field: findings from 36 Pilot operations

6.1

6.1.3 SETTING REUSE OBJECTIVES IN PUBLIC TENDERS

WHAT?	Public procurements are an important lever for public authorities to promote reuse practices. They can indeed lead by example through their purchasing choices and contracting procedures. Setting reuse objectives in public calls for tenders is a good way to stimulate the adoption of such practices: it will challenge tenderers to reach - or outreach - minimal requirements. By extension, it will contribute to developing expertise and know-how among construction professionals, enhancing the demand for reclaimed materials and progressively building a collection of inspiring and instructive precedents.
HOW?	<p>There are different ways to express a reuse objective in public calls for tenders. They will depend on the context, project, ambitions and available means. For detailed explanations, see the Specifications Strategies of the FCRBE Reuse Toolkit.</p> <p>Public authorities can also support the adoption of reuse objectives in calls for tenders of private developments. A good way to do so, is to share examples of clauses that can be integrated into calls for tenders and, more largely, disseminate good practices.</p> <p>More ambitiously, public authorities could also enforce minimal reuse rates for specific projects.</p>
WHO?	Public authorities (specifiers, requirements, public procurement, ...)
EXAMPLES?	<p>The aim of the Circubestek project is providing a platform that enables specifiers to easily find their way to specification texts of circular materials and techniques (including reuse targets)</p> <p>MVI criteriatool (from the NL) also proposes good examples of public specifications that can be adopted by private developers. There is one specification in particular that concerns reuse.</p>
Strong links to other actions?	Encouraging and supporting specifiers and contractors to adopt reuse practices (Action 1.1) Assisting and supporting building commissioners to adopt reuse practices (Action 1.2)
FCRBE Resources	<p>The guide ‘Reusing building materials in your projects: strategies for large-scale operations and public procurements’</p> <p>Feedback from the field: findings from 36 Pilot operations</p> <p>This aspect will also be addressed in the continuation of the FCRBE project through its call for capitalisation (2022–2023)</p>

6.1.4 GIVING VISIBILITY TO ACTIVE ENTERPRISES AND AVAILABLE RECLAIMED MATERIALS STOCKS

Reuse often depends on a network of enterprises that can provide a wide range of services such as supplying reclaimed materials, performing some operations on the materials (cleaning, restoring, etc.) or offering other related services (scouting materials, assessing their fitness for use, etc.). Shedding light on the companies active in a given context can greatly help clients, building owners and specifiers to take up reuse habits. Identifying stockholders is particularly important for gauging the materials that are already available on the market.

There are many ways to shed light on active enterprises and stockholders:

- Supporting the development of directories of entrepreneurs.
- Organising specific communication campaigns.
- Organising sectoral events to promote reclamation and reuse actors.
- Etc.

Public authorities, federations, reuse companies ...

The [Salvoweb directory](#) has existed since 1995 and lists the reclamation dealers in the UK

[Opalis.eu](#) is also an online reclamation dealer directory that covers Belgium, France and the Netherlands and proposes inspiring documents and project examples.

Documenting the reclamation trade (Action 3.1)
Federating the actors of the sector (Action 3.6)

Where to find reclamation dealers:
[1500 REUSE](#) which monitored and provided daily pictures of reclamation dealers across NW Europe. Salvoweb and opalis were also completed as part of the FCRBE project.

6.2

6.2 Fostering the proper reclamation of reusable building materials

This category groups together actions that address the question of reclaiming more systematically reusable materials from buildings undergoing demolitions. They are mostly at the level of individual projects and, therefore, can be relatively easily adopted and implemented. Fostering the proper reclamation of reusable building elements is important for the following reasons:

- It is an answer to the European regulation on waste. The Waste Framework Directive makes reuse and other waste prevention approaches a priority over recycling and other waste management strategies. Reclaiming materials with a view to reuse them is therefore in line with this regulatory principle.
- It prevents waste production, saves reusable resources and therefore increases material efficiency.
- It supplies reusable materials to the reclamation and salvage trade and, by extension, strengthens and expands the supply of reusable materials.
- It preserves valuable materials that can be reused for new developments (on the same site or via other channels).

6.2 FOSTERING THE PROPER RECLAMATION OF REUSABLE BUILDING MATERIALS

6.2.1 Raising private owners' awareness of reclamation procedures

6.2.2 Raising demolition contractors' awareness of possible reclamation pathways

6.2.3 Raising DIYers' awareness of possible reclamation pathways

6.2.4 Conducting systematic reclamation audits

6.2.5 Specifying dismantling for reuse

6.2.6 Establishing a list of 'protected materials'

6.2.7 Developing material passports for reclaimed building elements



6.2

6.2.1 RAISING PRIVATE OWNERS' AWARENESS OF RECLAMATION PROCEDURES

WHAT?	As they represent the largest section of building owners and decision makers, private owners (especially of medium to large buildings) can have a strong leverage to encourage the reclamation of reusable building materials. These owners usually contract their projects to professional enterprises. They also operate at a larger scale and on a more systematic basis. It is interesting to inform them about the various possibilities for reclaiming and reusing materials: identifying reusable materials (see Action 2.1) including specific clauses in their contracts (see Action 2.2), organising the projects accordingly (see Action 2.3), etc.
HOW?	As for the demolition contractors and the general public, there are many ways to raise private owners' awareness of reclamation procedures: <ul style="list-style-type: none"> • Targeted communication campaigns • Training sessions • Promoting ambassadors • Specialised help desks and assistance • Public grants encouraging virtuous reuse practices • Etc. In some contexts, there are owner representative organisations. In that case, it is worth activating them to convey the message to their members.
WHO?	Public authorities
EXAMPLES?	Homegrade is an advice and support centre for housing in the Brussels-Capital Region. Its mission is to provide free support to tenants and owners in improving their homes to reduce their environmental impact. As part of its mission, Homegrade organises numerous seminars and publishes awareness-raising aids and articles. In this context, a practical booklet entitled 'Inventory for the reuse of materials' has been published to help owners and tenants integrate this type of practice into the renovation of their homes.
Strong links to other actions?	Conducting systematic reclamation audits (Action 2.4) Specifying dismantling for reuse (Action 2.5) Documenting the reclamation trade (Action 3.1) Analysing existing reuse practices (Action 3.2)
FCRBE Resources	

6.2.2 RAISING DEMOLITION CONTRACTORS' AWARENESS OF POSSIBLE RECLAMATION PATHWAYS

Demolition contractors are regularly in contact with potentially reusable materials in the works they carry out. Even when it has not been explicitly specified in their contract, they may play an important role in reclaiming them. To activate this, they may need to be made aware of the different pathways for ensuring a proper reclamation: transactions with local reclamation and salvage dealers (some of them may have developed consignment schemes for this purpose), stockholding materials in their own facilities for future works, developing their own salvage business, etc.

There are many ways to raise contractors' awareness. They mostly rely on targeted communication and training programmes. Sectoral federations can play an important role here.

Mainly sectoral federations

Giving visibility to active enterprises and available reclaimed materials stocks (Actions 1.4)
Raising private owners' awareness of reclamation procedures (Action 2.1)
Conducting systematic reclamation audits (Action 2.4)
Specifying dismantling for reuse (Action 2.5)

In the framework of the FCRBE project, a specific training programme was developed for experts performing pre-demolition audits. This training program aims

- To present guidelines in conducting reclamation audits (based on the method developed in FCRBE),
- To help in identifying products suitable for reuse,
- To inform on the different reuse pathways and
- To give advice on how to encourage fruitful collaboration with the other stakeholders.

6.2

6.2.3 RAISING DIYERS' AWARENESS OF POSSIBLE RECLAMATION PATHWAYS

WHAT?	<p>In some contexts, private DIYers can represent a significant proportion of the construction and demolition activities. Although they usually operate at a small scale, they can contribute to fostering the reclamation of reusable materials (especially since they usually have more time to carry out their works). In the context of renovation works, reusable materials can be found that will not be kept on site. Therefore, it is interesting to raise DIYers' awareness of the benefits and possibilities of reuse: helping them to identify reusable materials, directing them towards local salvage dealers and online second hand marketplaces, providing them with documentation on how to dismantle these materials properly, etc.</p> <p>DIYers take the time to renovate or construct their building project. They want to develop their practices and have all materials available. Reuse practices might be seen as a real opportunity (quality of product, cost, availability).</p>
HOW?	<p>There are many different and complementary ways for public authorities to encourage DIYers to take up reclamation habits:</p> <ul style="list-style-type: none"> • Targeted communication • Accessible and user-friendly toolkits • Public grants encouraging virtuous reclamation practices • Public help desks for assisting them through the process • Etc. <p>In some contexts, there are already public help desks for the renovation of housing estates. These can be an excellent relay to guide building owners through the process of reclaiming reusable materials.</p>
WHO?	<p>Public authorities OSS (one stop shops) Training operators</p>
EXAMPLES?	<p>A website to help identify reuse potential and guide through the first steps: https://materiauteek.brussels/</p> <p>Paper and digital publication addressing reuse topics: Publication Homegrade</p> <p>Instructions for DIYers for the careful dismantling of reusable materials: http://reuse.brussels</p>
Strong links to other actions?	<p>Raising private owners' awareness of reclamation procedures (Action 2.1) Documenting the reclamation trade (Action 3.1)</p>
FCRBE Resources	



6.2

6.2.4 CONDUCTING SYSTEMATIC RECLAMATION AUDITS

WHAT?	<p>When a building owner is planning to undertake a partial or complete demolition, it is recommended that first a reclamation audit be conducted in order to identify reusable materials and components. This audit will help to ensure that the identified elements will be treated separately from the waste flows generated by demolition. It is also a useful resource for challenging architects to reuse materials in the new development (if any) and, more broadly, to organise the effective reclamation of the identified batches.</p>	EXAMPLES?	<p>Mandatory Salvage Assessments in the City of Seattle (Washington, US) As of July 2014, the City of Seattle mandates that a salvage assessment is conducted before any demolition or remodelling of buildings when the project is greater than 750 square feet (~70m²) or \$75.000 in value. Permit applicants are encouraged to reach out to professional salvage companies to conduct this assessment. Local public authorities provide applicants with a listing of local professionals capable of assisting in this task.</p>
HOW?	<p>There are various ways for public authorities to foster more systematic reclamation audits.</p> <p>First, when they act as contracting authorities for their own projects. They can then integrate systematic reclamation audits into their procedures of planning demolition and renovation (where justified) works. In this case, contracting authorities can conduct the audit internally or contract it to external experts (as part of a specific contract or within a larger consultancy mission).</p> <p>Second, when they act as policy-makers, they can make reclamation audits mandatory (at least in some cases, defined by the type or size of building). They can use urban regulation procedures for that purpose, by requiring a reclamation audit for any application of building permits involving for instance demolition works (partial or total) and/or renovation (where justified).</p> <p>Third, public authorities can also encourage reclamation audits in exemplary projects they would support. They can also raise stakeholders' awareness of good practices in terms of waste prevention protocols. They can also develop sustainable supporting frameworks and guidelines.</p> <p>Although reclamation audits are complementary to pre-demolition waste audits, it is important to stress their differences:</p> <ul style="list-style-type: none"> • Reclamation audits may involve a type of expertise that waste auditors do not necessarily have. • Reclamation audits are best conducted very upstream in the project process, since they may be useful to the designers of the new project (while waste audits can arrive a bit later on). • Most of the time, reusable materials will be considered as products rather than waste (their identification in the reclamation inventory is clear evidence that their owner intends to not discard them). Units and categories can therefore be different. <p>These nuances are important to take on board when making policies on that matter.</p> <p>Most of the time, reusable materials will be considered as products rather than waste (especially since their identification in the reclamation inventory is clear evidence that their owner intends not to discard them). Units and categories can therefore be different. Within the perspective of public policies development, the performance of reclamation audits can be reinforced by its integration within the above-mentioned current frameworks (in which they could be adopted on a regulatory basis).</p>	EXAMPLES?	<p>French code for conducting pre-demolition 'diagnostics' A French decree adopted on 30 June 2021 by the Prime Minister modifies the Construction and Housing Code to include new obligations regarding pre-demolition audits. It enforces that buildings greater than 1.000 m² (or having been used for specific industrial and agricultural purposes) have to be audited prior to applying for a demolition permit. This audit, called 'diagnostic' in the Code, has to include, among other aspects related to demolition waste, indications regarding same-site reuse opportunities (including the nature and quantity of reusable materials). Once the demolition works are over, this diagnostic must be completed through a form reporting on the effective results (formulaire de récolement). This form is to be submitted to an environmental agency. Source: <i>Code de la construction et de l'habitation</i>, Sous-section 1 : Diagnostic portant sur les déchets issus de rénovations et de démolitions (Articles R126-8 à R126-14).</p> <p>Loi AGECE 10 février 2020 makes reclamation audits mandatory. The next questions would be :how to make construction actors abide by this law?</p> <p>Call for project Renolab.B (Brussels-Capital Region, Belgium) The call supports the design and/or realisation of sustainable and circular renovation projects in Brussels.</p> <p>The establishment of an inventory of the building elements and materials present in situ constitutes a criterion for the admissibility of the application serves as a basis for the assessment of the preservation and the valorisation of the existing material resources of the building in the project (selection criteria).</p> <p>This inventory must make it possible to identify notably the existing elements preserved and, for the dismantled elements, those reused on the site and those evacuated to the reuse channels.</p>
WHO?	<p>This action concerns two main types of stakeholders:</p> <ul style="list-style-type: none"> • Building owners (private and public) who plan to undertake demolition works (either as part of a demolition/reconstruction operation or as part of a rehabilitation or major renovation operation). • Public authorities (local, regional or national) when it comes to implementing mandatory reclamation audits. 	Strong links to other actions?	<p>Raising private owners' awareness of reclamation procedures (Action 2.1) Raising demolition contractors' awareness of possible reclamation pathways (Action 2.2) Specifying dismantling for reuse (Action 2.5) Clarifying the conditions of application for the end-of-waste status (Action 4.9)</p>
		FCRBE Resources	<p>A guide to inventory the reuse potential of construction products</p> <p>Feedback from the field: findings from 36 Pilot operations</p> <p>Review of existing pre-demolition tools, policies and resources</p>

6.2

6.2.5 SPECIFYING DISMANTLING FOR REUSE

WHAT?	When contracting deconstruction and demolition works, it is recommended that specific attention be paid to the proper dismantling of reusable materials. The aim is to avoid altering the elements during the demolition so as to preserve their potential for reuse.
HOW?	<p>First, public authorities can lead by example and include dismantling specifications in their own contracting procedures. There are many ways to formulate such specifications, from requiring relatively light best-efforts obligations to setting specific reclamation targets.</p> <p>Then, public authorities can also encourage the adoption of dismantling procedures by other stakeholders, including private building developers. Sharing guidelines, good examples and documentation is a good way to do so.</p> <p>Another measure may consist of envisaging the introduction of a certification scheme guaranteeing dismantling specifications for reuse, to which demolition contractors of the demolition sector can comply, within private or public tenders.</p> <p>Calls for projects within the field of circular economy may support practical experimentation in dismantling operations.</p> <p>Finally, policy-makers could enforce minimal reclamation targets when specific building typologies and/or materials are to be demolished. The conditions should be well discussed, clearly defined and adapted to the context.</p>
WHO?	This action mostly concerns building owners (public and private).

EXAMPLES?	<p>The Portland Salvage Ordinance focuses on salvaging all reusable building materials for specific building types. "On July 6, 2016, Portland City Council adopted an ordinance, including code language, which requires certain projects seeking a demolition permit to be fully deconstructed as opposed to mechanically demolished. With Council's unanimous approval of that ordinance, Portland became the first city in the country to ensure that valuable materials are salvaged for reuse instead of crushed and landfilled. Building on the success of the initial ordinance, Portland City Council adopted an amendment on November 13, 2019, which raises the year-built threshold from 1916 to 1940. The amendment went into effect on 20 January, 2020. "</p> <p>Providing useful tendering clauses: the MVI-criteria tool (the Netherlands) Dutch national public authorities have collected generic clauses that can be integrated into tendering documents to set specific objectives in terms of sustainability. Regarding the demolition of office buildings one of the contractual clauses provided relates to the conduct of a pre-demolition operation (by the tenderer) by scheduling sufficient time to dismantle and remove non-structural, non-stony materials from a building, and by indicating that the products and materials that can be reused are effectively dismantled.</p> <p>This clause is accessible via the Sustainable Public Procurement web-tool (MVI-tool)</p> <p>Enforcing salvage rates: the case of Vancouver In the city of Vancouver, local public authorities have set minimal recycling and reuse rates for specific building types when applying for buildings or development permits. In practice, reuse and recycling rates are measured by weight. The targets are as such: For houses built before 1950: 75% of materials by weight, excluding hazardous waste For houses built before 1950 and deemed character houses by the City: 90% of materials by weight, excluding hazardous materials.</p> <p>They have also set specific salvage requirements for wood: minimum 3 tonnes for houses listed on the Vancouver Heritage list and for houses built before 1910.</p> <p>It must be noted that these relatively high targets are based on the most common construction techniques in this context, i.e. balloon-frame wooden structures. These requirements are completed with useful resources such as toolkits, guidebooks and directories of local enterprises. It is important to note, however, that this approach does not distinguish between reuse and recycling (except for wood).</p> <p>Another interesting document in this context is the Vademecum for off-site reuse on 'How to extract reusable materials from public buildings?' (written and published by rotor in 2015 with the support of the Brussels-Capital Region)</p>
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Strong links to other actions?	<p>Especially for those listed as 'protected materials' (see Action 2.6 'Establishing a list of protected materials')</p> <p>This action is also accompanied by efforts in the following areas:</p> <ul style="list-style-type: none"> • Raising private owners' awareness of reclamation procedures (Action 2.1) • Raising demolition contractors' awareness of possible reclamation pathways (Action 2.2) • Conducting systematic reclamation audits (Action 2.4)
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FCRBE Resources	
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6.2

6.2.6 ESTABLISHING A LIST OF 'PROTECTED MATERIALS'

WHAT?	In the current regulatory context, reuse should be preferred to recycling and other waste management strategies. When it comes to assessing the 'reusability' of a building material, however, there are so many factors to consider that it is relatively easy for building owners to conclude that the elements present in their building are not reusable. These are therefore transformed into waste. A list of 'protected materials' would help overcome this obstacle. The list would contain materials which are deemed 'reusable' thanks to specific characteristics: relatively easy to dismantle, in demand on the existing salvage and reclamation market, easy to reuse. For these materials, reclamation would become the by-default option.
HOW?	Such a list would benefit from being established through a collective process, involving parties such as salvage and reclamation traders, contractors and public authorities. Once the list is ready, public authorities should enforce it in the regulation. It is likely that such a list would present local variations, reflecting the specificities of the reclamation trade and the local construction traditions.
WHO?	Public authorities (with the reclamation trade and possible heritage experts and researchers)
EXAMPLES?	Portland Deconstruction Code Vers une liste des matériaux protégés ?
Strong links to other actions?	These 'protected' materials should be carefully dismantled in a way that is clearly specified. It thus refers to 'Specifying dismantling for reuse' (Action 2.5)



6.2

6.2.7 DEVELOPING MATERIAL PASSPORTS FOR RECLAIMED BUILDING ELEMENTS

WHAT?	<p>Material passports make it easier to assess the feasibility for (future) reuse of building materials in new applications. The passports increase the available information on all materials present in a building and enable e.g. the sale of materials before deconstruction based on these detailed product data sheets. The development of reuse passports can be considered in two different ways.</p> <p>First, a (reuse) passport containing the information about materials or products that are reclaimed at a demolition site, including data about e.g. the history, location in the building or known characteristics.</p> <p>Second, these passports need to be developed in a larger scope including the context of a material passport developed for all new building products. Building materials that are documented using the concept of a material passport, include detailed information available from the manufacturers about the production process, the reuse potential, the type of assembly, the expected service life, environmental impact, etc.</p>
HOW?	<p>Material or element passports can include a multitude of valuable information streams. A common methodology for the collection of provided data should therefore be established by the different actors involved (e.g. architects, manufacturers, building owners, etc.) in order to create a useful database for the future.</p> <p>Besides technical information these passports can include information about circularity, which means that qualitative or quantitative criteria need to be added in the methodology.</p>
WHO?	Product manufacturers, deconstruction companies
EXAMPLES?	<p>Material Passports BAMB material passport (EU)</p> <p>CB'23 Passports for the Construction Sector (NL)</p> <p>Elementpaspoort (BE) The circular element passport contains data for full life cycle, maintenance, disassembly and reuse. It contains differentiation criteria in terms of compatibility, grid sizes, circularity, performance and materials.</p> <p>Examples in buildings Construction of social apartments (Cordium) QR codes will be applied in the apartments, giving information about the origin, composition, reuse potential of the selected building element.</p> <p>Circular dismantling of Cargo Building 18 (Schiphol)</p>
Strong links to other actions?	<p>Facilitating the access to the technical documentation for past, present and future building materials (Action 4.7)</p> <p>Developing LCA and EPD for reclaimed materials (Action 4.2)</p>
FCRBE Resources	Reuse Toolkit: Material Sheets



6.3

6.3 Bridging the gap

This category groups together actions that aim at consolidating the links between reclamation, reuse and all the steps inbetween. These actions are more crosscutting and, for many of them, rely on a holistic approach. They involve many parties and different degrees of implication, from encouraging and enabling to enforcing. These actions are important:

- To get a better understanding of the needs, challenges and opportunities in a given context.
- To take advantage of existing dynamics, consolidate them and foster new ones through synergies.
- To facilitate the match between the demand (materials to be reused) and the supply (reclaimed materials).

The actions are grouped here into three subcategories according to the framework to which they refer:

- Visibility:** support reclamation and reuse organisations
- Logistics and planning:** support favourable logistics and planning
- Training:** train the actors of the sector

6.6.3 BRIDGING THE GAP

6.3.1 Documenting the reclamation trade

6.3.2 Analysing existing reuse practices

6.3.3 Fostering collaborative dynamics

6.3.4 Supporting enterprises that adopt reuse practices

6.3.5 Developing synergies between the social economy and salvage activities

6.3.6 Federating the actors of the sector

6.3.7 Fostering urban salvage yards

6.3.8 Facilitating the access to land and storage spaces

6.3.9 Dealing with logistics issues

6.3.10 Adapting education and training programmes



6.3

a. Visibility: support reclamation and reuse organisations

6.3.1 DOCUMENTING THE RECLAMATION TRADE

WHAT?	It is possible to find reclamation companies in most regions of Europe. They can present different profiles, supply different sorts of materials and offer different kinds of services but they all make a business from reclaiming and reusing materials. Drawing on their know-how and expertise can be very effective in translating reuse ambitions into actual implementation. A good understanding of the trade is also paramount for building up adequate consolidation and development strategies.
HOW?	There are various ways to survey reclamation and reuse enterprises, and shedding light on their activities. In some regions, this information is already available via sources such as online directories, local listings, etc. If not, public authorities can encourage and support the development of such directories. They can start with a relatively local scope. It must be noted, however, that many professional dealers are active at an interregional level. This should be taken on board when defining the scope of the effort.
WHO?	The reclamation trade, with the help of public authorities.
EXAMPLES?	The Salvoweb directory has existed since 1995 and lists the reclamation dealers in the UK. Opalis.eu is an online reclamation dealer directory that covers Belgium, France and the Netherlands and proposes inspiring documents and project examples. The Construction Salvage and Recycling Toolkit provides a listing of recycling and reuse facilities in the Portland directory of construction salvage and recycling companies .
Strong links to other actions?	Giving visibility to active enterprises and available reclaimed materials stocks (Action 1.4)
FCRBE Resources	Where to find reclamation dealers: 1500 REUSE which monitored and provided daily pictures of reclamation dealers across NW Europe.

6.3.2 ANALYSING EXISTING REUSE PRACTICES

When developing public policies to foster reuse practices, it is useful to have a good overview of what already happens in a given context (local, regional, etc.). Besides reclamation dealers (see Action 3.1 'Documenting the reclamation trade'), there may be other actors with some experience with reuse in the construction industry. Architects, consultants, contractors and other types of organisations may already have committed to implementing reuse strategies at their level. There may also be local projects which pioneered in these aspects. Collecting feedback from these experiences is very useful for identifying the specific strengths, weaknesses, opportunities and challenges ahead.

Public authorities can support the undertaking of specific research with the aim of identifying precedents, collecting feedback and identifying opportunities and challenges. It is interesting to note that, in the past few years, this type of analysis has already been conducted in different contexts. This existing literature can help save time.
This sort of research is best built on strong interactions with different parties. This can be achieved through extensive interviews, round tables, networking events, etc.

This type of analysis can be conducted by public authorities or by external experts working for them. They should also involve local stakeholders (architects, consultants, contractors, local organisations, etc.)

[ADEME - étude des freins et leviers](#). For this report published in 2016, the French environmental agency ADEME brought together many different stakeholders from the construction industry. Together, they expressed the main challenges and opportunities for applying reuse on a larger scale in building projects. This state of the art helped to prioritise the subsequent actions.

[BBSM - Photographie de l'état des connaissances et pratiques chez les acteurs du secteur : architectes et entrepreneurs](#). In this report from 2016, researchers from the Catholic University of Louvain-la-Neuve interviewed construction professionals. The goal was to evaluate their level of knowledge about construction and demolition waste prevention and management strategies.

Documenting the reclamation trade (Action 3.1)

6.3

6.3.3 FOSTERING COLLABORATIVE DYNAMICS

WHAT?	To a large extent, the reuse of building materials thrives better when there are strong interactions between the different concerned parties (architects, clients, contractors, dealers, etc.). More largely, the development of reuse faces challenges that need to be tackled at a more general level than that of projects. There too, collaborative dynamics are paramount to mutualise resources and reflect upon these general questions, advocate reuse and share experience and expertise.
HOW?	There are different ways for public authorities to foster collaborative dynamics such as creating and supporting networks of parties involved, organising dedicated events, spreading relevant information through communication channels, etc. The development of calls for innovative and pilot projects can also encourage new forms of dynamic collaboration within projects. They can be the trigger for the installation of collaborative practices within/among several companies.
WHO?	Public authorities can play an important role in encouraging and supporting such dynamics. They can also involve sectoral organisations and, more largely, all stakeholders involved in reuse.
EXAMPLES?	In Brussels, the public authorities enabled an innovative governing dynamic to implement the Regional Programme for Circular Economy (PREC). It hinged on the following aspects: <ul style="list-style-type: none"> • Ensuring a close collaboration between 13 administrations and 3 ministers all the while fostering enough flexibility to deal with the crosscutting dimension of the programme. • Encouraging synergies, including by sharing pools of competences. • Involving the concerned parties from very upstream, notably through regular working groups. • All in all, the implementation of the programme was based on a hybrid format, between a bottom-up approach (co-creation with field actors) and a top-down approach (vision, arbitration and framing by political decision makers). • To go further, see: H. Belin, C. Hananel, 2019. L'économie circulaire en Région de Bruxelles-Capitale, Brussels: The Word Company, p. 50–51. <p>In 2017, the Brussels-Capital Region supported the launch of the platform of the actors for the reuse of building elements in Brussels. This platform was built on previous working groups of different stakeholders (public administrations, sectoral federations, contractors, architects, etc.) who met regularly to discuss different challenges about reuse. The launch of the platform allowed a better framework for these discussions. Since then, the platform has hosted many working groups, organised diverse events, developed a regular newsletter, etc.</p>
Strong links to other actions?	Encouraging and supporting specifiers and contractors to adopt reuse practices (Action 1.1) Assisting and supporting building commissioners to adopt reuse practices (Action 1.2)
FCRBE Resources	Fostering collaborative dynamics between the different project stakeholders was a key to the success of the pilot operations monitored by the FCRBE project. See Feedback from the field: findings from 36 Pilot operations .

6.3.4 SUPPORTING ENTERPRISES THAT ADOPT REUSE PRACTICES

In mainstream construction practices, reclamation and reuse may be slightly more expensive and more complicated than more conventional approaches. Dismantling properly can take more time than expeditive demolition, reclamation requires more manual labour than buying new mass-produced materials, reusing materials may require bespoke procedures, etc. More generally, the lack of experience about reuse in the construction industry may raise some challenges. All these aspects can hinder the adoption of reuse practices, despite their many other benefits (environmental, social, cultural, etc.). During a developmental phase, public authorities can incentivise enterprises to adopt reuse practices through innovation grants and other financial support.
Innovation grants can be awarded to building projects which aim at fostering reclamation and reuse practices. They are usually based on calls for projects, involving a close monitoring of the implementation and a reporting on the achieved results.
Public authorities
Be.Circular has been developed by Brussels' public authorities to support innovative circular projects. Both were based on a call for ideas, in which applicants had to describe their projects and circular intentions. Awarded projects benefited from financial support but also external technical assistance for tackling specific issues. In return, beneficiaries had to communicate on the achieved results. In total, between 2016 and 2020, this call for projects has supported 36 building projects for a total budget of almost €1 M. Most of them integrated reclamation and/or reuse aspects.
As the realisation of projects depends on a successful collaborative dynamic between different actors, supporting businesses also goes hand in hand with supporting other stakeholders.
So this action can be linked with: <ul style="list-style-type: none"> • Encouraging and supporting specifiers and contractors to adopt reuse practices (Action 1.1) • Assisting and supporting building commissioners to adopt reuse practices (Action 1.2) • Fostering collaborative dynamics (Action 3.3) <p>Showing examples of good practice can also inspire them:</p> <ul style="list-style-type: none"> • Analysing existing reuse practices (Action 3.2)

6.3

6.3.5 DEVELOPING SYNERGIES BETWEEN THE SOCIAL ECONOMY AND SALVAGE ACTIVITIES

WHAT?	Some steps of the reclamation process can be undertaken by social economy enterprises : cleaning materials, packaging them, etc. Public authorities can foster synergies between the social economy, the construction industry and the reclamation trade.
HOW?	This action mostly hinges on setting up synergies. This can be achieved in many different ways: pilot projects, networking events, etc.
WHO?	Social economy enterprises are usually federated under umbrella organisations, which are worth including in the discussions.
EXAMPLES?	For a large housing project in Brussels, the general contractor outsourced the process of reclaiming 2.000 m ² of bricks for reusing them on site. TheTravie company performed this task. They specialise in working with people placed in situations of handicap and can carry out a large range of missions.
Strong links to other actions?	Fostering collaborative dynamics (Action 3.3)
FCRBE Resources	

6.3.6 FEDERATING THE ACTORS OF THE SECTOR

Today in Europe, there is no organisation to federate the reclamation trade. Individually, some companies can be members of existing federations (of the construction or demolition industries, for instance), but there is no organisation that represents the specific interests of reclamation and salvage dealers, neither at European nor at national level. Yet it would be useful to ensure that the expertise and interests of the trade are taken into account when new technical and normative frameworks are set and, more generally, to sustain a good dialogue with public authorities.

This action should emanate from the trade itself. However, public authorities and existing federations (as well as other representative bodies) can accompany, encourage and support such a development.

Reclamations and salvage dealers should be central in this action. Existing federations and public authorities are also important.

[Build Reuse](#) (formerly known as The Building and Material Reuse Association (BMRA)) is a US-based non-profit federation of deconstructors and salvage dealers. It carries out various actions such as supporting deconstruction training programmes, organising regular conferences for its members and advocating reuse towards public authorities.

Documenting the reclamation trade (Action 3.1)
Giving visibility to active enterprises and available reclaimed materials stocks (Action 1.4)

6.3

b. Logistics and planning: support favourable logistics and planning

6.3.7 FOSTERING URBAN SALVAGE YARDS

WHAT?	Cities are large producers of demolition waste and large consumers of building materials. Today, many batches of potentially reusable materials do not find their way to the professional reclamation dealers who are often located out of the city. Anchoring reclamation and salvage activities in urban areas could enhance the amount of materials being reclaimed and eventually reused. Such urban salvage yards could act as a proxy towards other reclamation companies, as a source of materials for urban customers and, possibly, as a showcase for materials sold by other, more rural traders. They also come with interesting perspectives in terms of job creation.
HOW?	Public authorities can support the development of urban salvage yards by various means, such as dedicating specific (public) areas for hosting these installations and/or financially supporting the launch of these activities. Zoning strategies in urban development plans can also be a lever to foster this type of activity.
WHO?	Public authorities, urban planners
EXAMPLES?	Materialenbank Leuven (Belgium) is a relatively young project launched by a Leuven non-profit organisation in collaboration with the City of Leuven and other local public stakeholders. They collect and sell salvaged materials. They are located very close to the city centre and are developing strong partnerships with large public stakeholders to facilitate the reuse of building materials. Not only did public authorities support the launch of the project; they also contributed to its development by supplying the yard with reclaimed materials and fostering the demand for reusing these materials in their new projects.
Strong links to other actions?	Facilitating the access to land and storage spaces (Action 3.8) Dealing with logistics issues (Action 3.9)
FCRBE Resources	

6.3.8 FACILITATING THE ACCESS TO LAND AND STORAGE SPACES

WHAT?	Currently, much of the reuse activity takes place outside the cities. Indeed, (re)establishing reuse economic activities in cities requires space for several stages of the value chain (refurbishment, cleaning, packaging, storage, etc.). However, urban areas are often faced with significant land pressure. Spaces and land are scarce and expensive. This is an obstacle to the development of reuse activities since storing and working on reclaimed building materials can necessitate vast areas.
HOW?	Public authorities and urban planners have an important role to play in this context. As a first step, public authorities could encourage urban studies to analyse land use plans, denote suitable and strategic sites for the development of reuse-related activities and identify spaces (land or potential buildings) that could be used for this type of productive activity. In this context, brownfields, urban wastelands and vacant buildings can represent a possible way of meeting this need for productive location while optimising the use of space and land. In certain configurations, precarious or temporary leases are implemented. However, this is not a viable solution in the medium or long term for companies engaged in reuse activities (difficult to “move”). It is therefore important to develop a stable and secure framework (both for the occupants and the owners) in order to encourage the installation of productive activities related to reuse. More broadly, it is important that the city can (re)integrate its “productive” character and reuse has a definite role to play in this. In order to do this, it is necessary to develop or readjust urban planning policy in order to anchor this type of activity in the urban fabric in a sustainable way. The studies could serve as a basis for an adapted urban planning policy in this sense.
WHO?	Public authorities, urban planners in collaboration with building owners, researchers
EXAMPLES?	Be Sustainable is aimed at those involved in urban development or revitalisation in the Brussels-Capital Region who wish to integrate sustainable development ambitions. Through a toolbox and a support service, Be Sustainable aims to support the development of sustainable neighbourhood projects, from diagnosis to concrete implementation. The aim is to create an optimal link with the context of the neighbourhood, its identity, its ecological, spatial, economic and social characteristics. In this context, the USquare project with its transitional occupation by See U and the establishment of a master plan is a good example. The purpose of this master plan is to define the development framework for strategic centres or districts in the region by defining a vision and the rules applicable to the development of the area it covers.
Strong links to other actions?	Fostering urban salvage yards (Action 3.7) Dealing with logistics issues (Action 3.9)
FCRBE Resources	

6.3

6.3.9 DEALING WITH LOGISTICS ISSUES

WHAT?	Transport related to (de)construction projects is often complex, inefficient and time-consuming, with little or no space available to store and recondition reclaimed building materials near the construction sites. Innovative logistical solutions are needed to support new transport, stocking and distribution models that support more resource efficient activities and boost the positive environmental and financial benefits of using secondary materials.
HOW?	In order to develop a response to the logistical challenges, it is possible to act on several axes, including: <ul style="list-style-type: none"> • Analyse the existing logistics framework • Provide professionals with storage space and logistics services • Define new logistics models and support experimentation • Optimise the use of spatial resources • Promote inter-sectoral exchanges in an identified territory (in this context, industrial ecology or industrial symbiosis studies can be useful) • Consolidation centres can help to support different reuse activities(i.e. temporary stock for cleaning for in situ reuse; stock for sale of ex-situ reuse; reverse logistics, etc.)
WHO?	Public authorities with the help of distribution, retailers, materials suppliers, etc.
EXAMPLES?	Brussels Construction Consolidation Centre (BCCC) Bouw hubs (NL) ‘Deconstruction Consolidation Centre’, a diploma project from the AASchool in London
Strong links to other actions?	Fostering urban salvage yards (Action 3.7) Facilitating the access to land and storage spaces (Action 3.8)
FCRBE Resources	



6.3

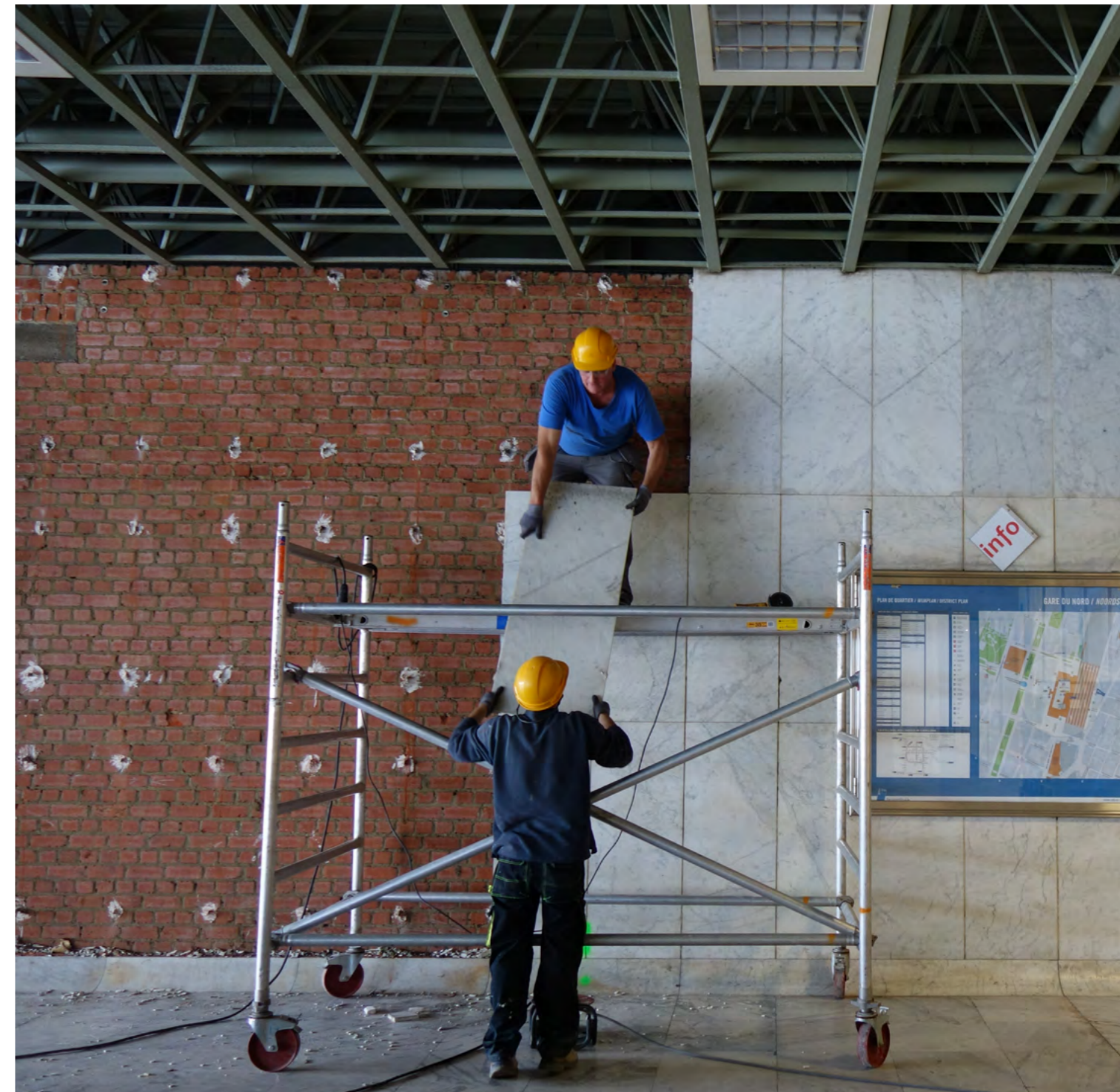
c. Training: train the actors of the sector

6.3.10 ADAPTING EDUCATION AND TRAINING PROGRAMMES

WHAT?	Thinking reuse can impact the way building projects are designed and built. It necessitates new reflexes, new methodologies and new types of knowledge. More largely, it calls for a paradigm shift in designing and building. In this sense, universities and training programmes can have a strong impact. Adapting them to integrate reuse considerations is a good way to train future practitioners.
HOW?	Drawing on a large collection of specific examples which experimented with new ways of teaching, it is now necessary to integrate these themes more systematically into the curriculum of all the actors of the construction industry.
WHO?	Universities, training centres
EXAMPLES?	<p>EFP: Projet Bric The BRIC project is a pilot project developed by the EFP (centre de formation de métiers en alternance) in the framework of the BAMB project. The BRIC module has a double objective: The design, construction and deconstruction of a sustainable, scalable and reversible module. Reclaimed materials are also integrated into the module's design. The training of apprentices and company managers in the concept of the circular economy in construction in order to develop these trades.</p> <p>CDR: Mobil Up</p> <p>VUB - Architectural Engineering - Design Atelier 'Man and adaptability' In the first bachelor year, architectural students are challenged to design projects with circularity in mind.</p> <p>Howest Hogeschool - Postgraduaat Circular Bouwen The postgraduate is aimed at building professionals, such as architects, urban planners, policy makers, and project developers and focuses on themes such as reuse and recycling, circular building design, circular urbanism, scenario planning, etc.</p> <p>UCLouvain has developed "Question of architecture: Materiality and eco-design", a workshop module for master students aimed at experiential learning by integrating circularity, reuse and environmental impacts issues into their architectural design.</p> <p>UHasselt has developed Building Beyond Borders which is a cross-border learning platform to enhance knowledge and push action towards regenerative and distributive design and building processes (including reuse). It offers a wide variety of learning moments to students, professionals and other interested alike through a postgraduate certificate, hands-on workshops, biennial fall symposium, master design studios, research and internships.</p> <p>TU Delft has organised an International Symposium on the Practices of Off-site Reuse in Architecture in 2017.</p> <p>However, for the most part these are currently optional and not compulsory programmes. There is still work to be done to integrate reuse and circularity more structurally into current university curricula.</p> <p>In the UK, the SCAN (Students Climate Action Network), a branch of the ACAN (Architects Climate Action Network), is challenging architectural schools to adapt the curriculum to act on the climate crisis. Among the main claims of this action: increase student agency, unite students' voices and embrace cultural change for "establishing future generations of climate literate built environment professionals." https://www.architectscan.org/stucan</p>

Strong links to other actions?

FCRBE Resources

The [Digital School of Re-construction](#) (Digi-SoR-c) summer school organised during August 2021.

6.4

6.4 Establishing a supportive framework

This category contains a series of actions which concern the adaptation of the general framework. The objective is to bring it more in line with actual reuse practices. In general, these actions are important for avoiding the gaps between a given context and the ambition of promoting reuse practices since these gaps can seriously hinder the adoption of reuse practice. As a result, reuse would be carried out only by pioneers and extremely motivated stakeholders. Tackling these different obstacles is therefore paramount to scale-up reuse practices.

The actions are grouped here into three sub-categories according to the framework to which they refer:

- a. Technical and normative
- b. Regulatory
- c. Economics

Concerning the technical and normative framework:

- To acknowledge the positive impact of reuse.
- To enhance the confidence of specifiers and contractors in reclaimed materials.
- To make it easier to find original technical documentation of reclaimed products.

Concerning the regulatory framework:

- To clarify grey areas in the current regulation.
- To have a framework adapted to circular practices and their specificities

Concerning the economic framework:

- To raise the competitiveness of reclaimed building materials (especially compared to imported and heavily impacting products)
- To encourage the development of a reuse economy

6.4 ESTABLISHING A SUPPORTIVE FRAMEWORK

6.4.1 Integrating reuse in Green Building Rating Systems

6.4.2 Developing LCA and EPD for reclaimed materials

6.4.3 Integrating reuse in environmental impact assessment tools

6.4.4 Developing labels for reclaimed products

6.4.5 Ensuring a common approach regarding the fitness for reuse

6.4.6 Developing adapted insurance schemes

6.4.7 Facilitating the access to the technical documentation for past, present and future building materials

6.4.8 Clarifying CE-marking

6.4.9 Clarifying the conditions of application for the end-of-waste status

6.4.10 Internalising environmental costs of new products

6.4.11 Adapting fiscality for reclaimed products



6.4

a. Technical and normative

6.4.1 INTEGRATING REUSE IN GREEN BUILDING RATING SYSTEMS

WHAT?	There are many different systems to assess and score the sustainability of buildings. They are used by building owners as a way to frame their ambitions, demonstrate their commitment or orientate the efforts of their tenderers. As such, they can be major levers to foster reclamation and reuse.
HOW?	These schemes are regularly updated. As a general trend, they increasingly focus on aspects regarding resource management, the choice of materials and circular aspects in general. However, there are still unclear definitions of reuse and the impact of such strategies on the global score could certainly be improved.
WHO?	Public authorities and green building rating systems developers.
EXAMPLES?	<p>Bâtiment Bas Carbone (BBCA) The French label Bâtiment Bas Carbon is slightly different from other schemes since it focuses exclusively on GHG emissions during the whole life cycle of buildings (including the impacts arising from materials production). It provides a bespoke framework for reused materials: their production impact can be accounted for zero in the global calculation of impacts.</p> <p>In the new building environmental regulation RE2020 in France, the impact of reclaimed products reused in a building is to be considered as zero in the calculation of the impact at the building level. Accordingly, an update of calculation methods is expected to take place in order to incorporate reuse in existing building environmental impact assessment tools in France.</p> <p>A Framework for Circular Buildings - indicators for possible inclusion in BREEAM This report provides a general framework for circular buildings and proposes concrete indicators for possible inclusion in BREEAM New Construction and Refurbishment and Fit-Out.</p> <p>BREEAM In-use International scheme This environmental assessment method considers evaluation parameters that support the Designing for disassembly, reuse and recycling strategies through scoring under the 'Resource' topic including aspects like 'Condition survey', 'Resources inventory', 'Optimising reuse and recycling' and 'Sustainable procurement'.</p> <p>Level(s) Indicator 2.2 in the European Level(s) rating system 'Construction and demolition waste' aims to prompt professionals to systematically plan for the reuse and recovery of materials, through segregated collection during construction, renovation and demolition activities</p>
Strong links to other actions?	Based on 'Developing LCA and EPD for reclaimed materials' (Action 4.2)
FCRBE Resources	FCRBE Report on 'Reuse in Green Building Frameworks'

6.4.2 DEVELOPING LCA AND EPD FOR RECLAIMED MATERIALS

An Environmental Product Declaration (EPD) is a document which transparently communicates the environmental impact of a material/product over its lifetime. EPDs can contribute to acknowledging the positive impact of material reuse compared to the use of new building materials. They make it easier for architects, contractors, and public authorities to compare the impacts of different materials and products in order to select (or incite the use of) the most sustainable option. Also, EPDs can help reclaimed materials to achieve additional (LCA) credits in well-established certification schemes, like BREEAM or LEED.

EPDs for building materials are generated according to the relevant standards (ISO 14040/14044, ISO 14025, EN 15804 or ISO 21930). As of today, very few EPDs have been established for reclaimed materials. They tend to be completely overlooked in existing EPD libraries. The cost of the procedure seems to prevent SMEs in the reclamation trade from accessing this scheme. In addition, they usually deal in a large and variable range of products, consequently multiplying the costs. Public authorities could support the reclamation trade to develop EPDs and populate databases with EPDs for reclaimed materials.

Public authorities, suppliers of reclaimed materials, LCA consultants, research centres.

Parisian salvage dealer [Mobius](#) conducted a LCA for reclaimed raised floors systems. They used it to produce an EPD which is available from [INIES](#), the French official library of EPDs.

Brussels salvage dealer Rotor DC conducted a LCA for reclaimed ceramic tiles as part of the Careno R&D project. However, they did not invest in establishing an EPD.

Linked to 'Integrating reuse in environmental impact assessment tools' (Action 4.3) and 'Integrating reuse in Green Building Rating Systems' (Action 4.1)

In the [FutuREuse Booklet Collection](#): 7 short introductions to the world of reuse, there is one booklet on 'The environmental impact of reuse in the construction sector'

6.4

6.4.3 INTEGRATING REUSE IN ENVIRONMENTAL IMPACT ASSESSMENT TOOLS

WHAT?	Designers are increasingly required to assess the global impact of their projects, not only after the project completion but also as part of the design process. To do so, they rely on modelling tools which provide them with iterative feedback on their choices of building materials and elements.
HOW?	These environmental impact assessment tools should provide an option to model reuse scenarios and provide designers with a quick feedback on the environmental benefits of this solution.
WHO?	Public authorities, LCA consultants, EIA tool developers, etc.
EXAMPLES?	<p>TOTEM At present, building materials and elements that are reclaimed and reused during renovation works, or sourced from a reuse network can be modelled in TOTEM. In addition, the tool will accredit the benefits of future reuse of building products by including the reuse potential of building solutions in future versions.</p> <p>MPG The Dutch environmental performance calculation (MPG 'Milieuprestatie Gebouwen') aims to include the benefits of reuse of existing structures, products, and building installations today and in the long term, as it recognises reuse as an important driver for circular construction. However, in today's practice, reuse is not yet frequently being taken into consideration in calculations. However, it is expected that future elaboration on the used EPD databank and calculation method will enable the benefits of material reuse to be taken into consideration.</p>
Strong links to other actions?	Based on 'Developing LCA and EPD for reclaimed materials' (Action 4.2)
FCRBE Resources	The FCRBE report on 'Reuse in Environmental Impact Assessment Tools. A prospective report'

6.4.4 DEVELOPING LABELS FOR RECLAIMED PRODUCTS

Eco labels are frequently used in the construction industry to assess certain aspects of building materials and products. They can cover a wide range of both environmental and social aspects. They also come in different formats, from self-declared labels to third-party certified schemes. Developing specific labels for reclaimed materials would enhance customers' confidence.

Labels for reclaimed materials could potentially cover a wide range of aspects: sound origin of the materials, quality of the dismantling, technical performances, environmental benefits, etc. They can be developed for products but also for specialised companies.

The reclamation trade, managers of existing labelling schemes, research centres, etc.

[The Salvo Code.](#)

For over 20 years, FCRBE project partner Salvo has developed the Salvo Code, a code for good practices in buying and selling reclaimed building materials. The code is intended to highlight to customers that the company respects some standards when buying items. It notably indicates that items have not been stolen or dismantled from historic buildings without permission. Dealers who have committed to adopt the Salvo Code are designated with the logo of a crane.

[Salvo's 'Truly Reclaimed' label.](#)

The Truly Reclaimed scheme will allow consumers to tell the difference between authentic reclaimed building materials and newly produced alternatives. The label will increase the visibility and representation of reclaimed products and promote ethical dimensions of the reclamation industry, whilst exposing fraudulent behaviour. In the long run, future developments of the label may include an assessment of the environmental benefits of the reclaimed products.

The FCRBE [Truly Reclaimed](#) labelling scheme

6.4

6.4.5 ENSURING A COMMON APPROACH REGARDING THE FITNESS FOR REUSE

WHAT?	When it comes to reusing building materials, specifiers and contractors are sometimes faced with questions regarding the performances of reclaimed building elements. Not that these are necessarily lower than new products (in many cases, the opposite is true!) but the way to demonstrate these performances can differ from those used for new mass-produced materials. There is a need for an approach that is both in line with reuse specificities and accepted by the construction industry to assess the fitness-for-use of reclaimed elements. This also includes ensuring a common approach regarding toxicity.
HOW?	This approach will need a concerted effort involving research centres, technical committees and reclamation specialists. To effectively foster reuse, it is important that these aspects do not become an obstacle to reuse. In general, close attention should be paid to existing practices, know-how and accumulated knowledge. Regarding toxicity, it is important to provide the trade with informed and realistic guidelines regarding the treatment of reclaimed materials that are contaminated with potential toxic substances.
WHO?	Research centres, technical committees, consultants, reclamation dealers, experienced reusers, etc.
EXAMPLES?	In recent years, both the Belgian Building Research centre (BBRI) and the Centre Scientifique et Technique du Bâtiment (in France) have developed protocols to assess the fitness for use of reclaimed building materials. They hinge on a hybrid approach, combining information that can be identified when the material is still installed, thorough visual inspection and additional tests, with the different means depending on the requirements of the intended new use. These methods have been applied to specific materials: <ul style="list-style-type: none"> • BBRI general protocol • BBRI protocol applied to a series of reclaimed materials: bricks, mineral wool insulation panels, structural steel, parquets, and technical installations. • CSTB's protocol and its application to specific materials. Concerning possible toxic treatments of wood: Salvo's position (for wood elements)
Strong links to other actions?	Facilitating the access to the technical documentation for past, present and future building materials (Action 4.7)
FCRBE Resources	In the FutuREuse Booklet Collection: 7 short introduction to the world of reuse , there is one booklet on 'Evaluating the technical performance of reclaimed building materials' and one on the 'Material Surface Treatments for commonly reclaimed building elements' Reuse Toolkit: Material sheets

6.4.6 DEVELOPING ADAPTED INSURANCE SCHEMES

Because it is sometimes considered to be an innovative practice, insurers are not always comfortable with reused materials. Dealing with this issue can increase the complexity of a project and/or lead to increased premiums for specifiers and commissioners.

A clearer framework would increase the confidence of building professionals. This framework should be built on existing best-practices, know-hows and accumulated knowledge.

Insurers, research centres, reclamation and reuse specialists, etc.

REPAR is part of the Research and Expertise programme on reuse in the construction sector, led by Bellastock in partnership with ADEME and CSTB (France). REPAR proposes project tools for ordering, prescribing, implementing, evaluating and ensuring the reuse of building components. The REPAR 2 report 'Reuse as a bridge between architecture and industry' is available [here](#).

Ensuring a common approach regarding the fitness for reuse (Action 4.5).

The [Reuse Toolkit: Material sheets](#) could help to build confidence in some reclaimed products. This aspect will be further developed through workshops with insurance companies in the WP Capitalisation (2022-2023).

6.4

6.4.7 FACILITATING THE ACCESS TO THE TECHNICAL DOCUMENTATION FOR PAST, PRESENT AND FUTURE BUILDING MATERIALS

WHAT?	Documentation of existing building products can be hard, if not impossible, to find. Old catalogues, technical documentation, original specifications and other related formats are not always well conserved. Yet, finding such documents can be crucial for assessing the fitness for use of reclaimed building materials and, more largely, for getting a better understanding of materials from the past that could be reused today.
HOW?	<p>This type of action can be carried out following a twofold approach.</p> <p>1. At the level of construction elements and materials:</p> <p>Public authorities could support the creation of a major public archive which brings together any piece of documentation of building materials present in the built environment. It would be filled in by architecture and construction historians, building research centres, manufacturers, reclamation auditors, etc. The time span would correspond to the age of the buildings undergoing major transformations, probably from the early 19th century (if not earlier) until today. This 'living archive' would be easily browsable so that relevant information can be found quickly. Together with 'as built' documents, it would become a major source of information about the materials in the built environment.</p> <p>The creation of such an archive ideally requires the development of an open-source and reuse-friendly database to collect technical sheets of construction products that have been put on the market. It is also essential to ensure that the material sheets are maintained and enriched over time. This type of approach could also be coupled with the principle of material passports, if these are indeed made available.</p> <p>2. At the project level:</p> <p>The principle of providing access to updated technical information and plans is also a major issue in facilitating future interventions and to provide information on the constituent materials. Gathering data on the nature and location of the components (thanks to the plans and technical data sheets) can provide information on the frequency, type of maintenance and replacement (avoiding a premature end of life) of the elements which can also be used to characterise a material for future reuse.</p>
WHO?	<p>At the level of construction elements: Public authorities with the help of material manufacturers and research centres.</p> <p>At the project level: The architects and project team for the initial file, the building owner for updating the building data over time</p>

EXAMPLES?

The ['Post-war building materials'](#) website and the accompanying book aims to assist a broad group of stakeholders, ranging from architectural and construction historians, restoration and renovation architects, to building administrators and owners, in recognizing and valorising typical post-war materials. This research will help them to link brand and product names with their fabrication, and understand their applications...

In Belgium, every building owner has been obliged since 2001 to compile a file called **'Dossier d'Intervention Ultérieure'** (for 'subsequent intervention file') on works carried out on his building. The file must be updated each time work is undertaken (maintenance, repairs, replacement and dismantling of certain installations). This file can be compared to the maintenance booklet of a car. The purpose of this obligation on the part of the seller is to ensure safety and health in the event of future renovations. How can this be done? By having a better knowledge of the materials used during previous renovations, the location of pipes hidden in the walls, etc.

Strong links to other actions?

Obviously, this action can be related to Action 2.7 'Developing material passports for reclaimed building elements'. However, while material passports are currently being developed for (a fraction of the) new products put on the market now, making them a useful contribution to tomorrow's reuse, this database would seek to include as much documentation as possible about materials that are part of the current urban stock and that are likely to be reclaimed and reused today.

FCRBE Resources

[Reuse Toolkit: Material Sheets](#)



6.4

b. Regulatory

6.4.8 CLARIFYING CE-MARKING

WHAT?	Today, the European regulation on construction products and CE-marking is still unclear as to whether reclaimed building materials should be CE-marked and, by extension, whether existing European harmonised standards are applicable to reclaimed materials. Some organisations have taken a position and proposed different (and contradictory) interpretations. It is, however, up to the European Commission to make the final decision. In the meantime, this grey area in the regulation deters some clients and specifiers from implementing reuse practices.
HOW?	Revising the Construction Product Regulation and taking into consideration the specificities of reclaimed building materials.
WHO?	European public authorities
EXAMPLES?	Within the framework of the Feder-BBSM project (Bâti Bruxellois Source de nouveaux Matériaux), a study was carried out on the issue of CE marking for reused elements . The first part of the study highlights the ambiguity of the notion of re-use in the European framework legislation on waste. It explores why, in the current context of legal uncertainty, CE marking is not compulsory for the operator who reintroduces reused construction elements on the market. The second part of the study distinguishes between legal and technical standards in the construction sector. It points out the challenges of the increasing interaction between these two types of standards.
Strong links to other actions?	Clarifying the conditions of application for the end-of-waste status (Action 4.9)
FCRBE Resources	

6.4.9 CLARIFYING THE CONDITIONS OF APPLICATION FOR THE END-OF-WASTE STATUS

The general European Waste Directive framework is quite clear: in the end, reclaimed materials will be considered as products, either because they have remained so or, in the event of them becoming waste, because they have undergone a specific 'preparation for reuse'. There is, however, still some room for interpretation as to whether some reclaimed materials acquire the status of waste at some point during the reclamation process, and if so under which conditions. This can have consequences for salvage operators who ensure their reclamation and marketing notably in terms of environmental permits and certifications they may be required to have. It can also impact cross-border exchanges of salvaged material and therefore hinder the development of reuse in regions close to national borders (notion of minimal critical mass of exchanges to create a market)

General conditions for bypassing the waste status are relatively clear (the material is dismantled with the intention of being reused; no additional steps are necessary to ensure reuse other than sorting, cleaning and cutting the material to size; there is a market for the material and/or its reuse is certain; the material is safe to be used; etc.). What is needed now is a clearer interpretation on how this applies to specific practices and cases. It is possible that a jurisprudence will progressively be constituted. The legislator could also proactively provide these clarifications.

EU regulators (for harmonisation of national rules reasons),, public authorities, reclamation actors, etc.

This action is likely to have a direct impact on Action 4.2 'Developing LCA and EPD for reclaimed materials' in particular concerning the system boundaries in the impact allocation calculations.

In the [FutuREuse Booklet Collection: 7 short introductions to the world of reuse](#), there is one booklet on 'Product or waste? Criteria for reuse'.

6.4

c) Economics

6.4.10 INTERNALISING ENVIRONMENTAL COSTS OF NEW PRODUCTS

WHAT?	On the current European market, some materials that are theoretically perfectly reusable can hardly compete with equivalent new products that are imported from outside Europe. The main reason is that reclaimed materials usually include a lot of manual labour (for the careful dismantling, cleaning, etc.) which, by comparison, costs more than importing new products made from raw materials from abroad. As of today, retail prices do not reflect the costs of the environmental and social impacts associated with these two different scenarios. A mechanism translating these aspects into a cost assessment would probably completely change the game, not only for the materials that are currently profitable to reuse but also to extend the range of reusable materials.
HOW?	There are many ongoing discussions on how to develop such mechanisms and many different possible scenarios: carbon tax, new accounting methods, attributing a cost to externalities, pricing policies, etc. They all depend on rethinking market mechanisms at different levels. This approach goes hand in hand with an adapted tax system integrating reclaimed building elements: they must be thought out in a concerted and coherent manner.
WHO?	Public authorities, EU regulators (for harmonisation of national rules reasons)
EXAMPLES?	
Strong links to other actions?	Adapting fiscalty for reclaimed products (Action 4.11) Developing LCA and EPD for reclaimed materials (Action 4.2) And to a lesser extent 'Integrating reuse in environmental impact assessment tools' (Action 4.3).
FCRBE Resources	

6.4.11 ADAPTING FISCALITY FOR RECLAIMED PRODUCTS

Fiscalty can be a powerful lever to encourage the marketing of specific goods. Applying a specific and adapted tax system to reclaimed building material would help increase the competitiveness of these materials.

Public authorities could adapt and develop an incentive tax system and set up specific subsidies for reclaimed products. Nowadays, reclaimed building materials are sold with the same VAT regime as that of new products. However, in some countries, some second-hand goods benefit from a reduced VAT (compared to new equivalent products). To encourage and facilitate the circular economy and the reuse of materials, applying a reduced VAT or specific subsidies would make reclaimed materials more attractive from a financial point of view. To do so, tax regulations need to be adapted by the competent public authorities.

Public authorities (federal public services, tax administration).

[Reduced VAT for reused goods in Belgium](#)

[Sweden tax breaks for repairs](#)

Internalising environmental costs of new products (Action 4.10)

6.5

6.5 Monitoring evolutions

As a roadmap starts from a certain point and fixes goals to achieve, it is essential to monitor the progress made over time so that the implementation effectiveness can be evaluated. Indicators used will depend on different concerns (environmental, as well as social and economic) and can be both quantitative and qualitative (even if quantitative indicators are usually preferred). Depending on the type of action taken, reuse indicators may concern: the number of tonnes of waste avoided (or by volume), the environmental impacts avoided, the number of jobs or new activities created, the number of projects integrating reuse, the amount of financial aid allocated to reuse, etc. Estimating the ease or difficulty to access information needed for monitoring is also a parameter to be taken into account.

Monitoring evolutions is therefore important to:

- Respect the European Waste regulation.
- Monitor the evolution of the trade and the results of specific actions and public policies.
- Get feedback on implemented actions and adapt them accordingly.
- Get a better understanding of reuse practices, faced obstacles and successful stories and assess how practices are evolving.
- Benchmark realistic targets for different types of building projects. To monitor the results of public policies and actions.

6.5 MONITORING EVOLUTIONS

6.5.1 Surveying the reclamation trade

6.5.2 Monitoring reuse in building projects

6.5.3 Surveying future material flows



6.5

6.5.1 SURVEYING THE RECLAMATION TRADE

WHAT?	Organising a regular statistical survey of the reclamation trade, at regional or national level. Surveying the quantities of materials that are re-circulated by the trade and through specific projects, corresponding jobs and carbon benefits.
HOW?	Measuring the evolution of the reclamation trade requires gathering data on the flow of each material being circulated. Most of this information is in the financial records of the dealers but not publicly available. In such a situation, data can be obtained either by cooperation with the dealers or by obligation. The data analysis methodology proposed in the project (deliverable 2.1) and developed to measure the volumes of building elements being circulated by the reclaimed sector can be followed to collect the data. To evaluate the carbon benefits, the methodology developed to estimate by extrapolation the environmental benefit of reclaimed building material in stockholdings of a number of businesses can be used. Public authorities can finance such research.
WHO?	Independent bodies, federation of reclamation and reuse enterprises with the financial help of public authorities
EXAMPLES?	The first complete survey taken of the UK reclaimed building materials sector, the BigREc Survey 1998 provides a snapshot of the architectural salvage trade in the late nineties. The survey was undertaken by Salvo under the supervision of the Building Research Establishment (BRE) with the aim of identifying possible interventions that might increase the levels of reuse.
Strong links to other actions?	Documenting the reclamation trade (Action 3.1) Analysing existing reuse practices (Action 3.2)
FCRBE Resources	As part of the FCRBE project, several reports were produced to investigate and survey the reclamation trade: <ul style="list-style-type: none"> • ‘Statistical analysis of the building elements reclamation trade in Benelux, the UK, France and Ireland’ whose report will be available by the end of 2021 and which was presented at the FCRBE - final event in the ‘Shedding the light on the reclamation trade’ session, • ‘Data analysis methodology to measure the volumes of building elements being circulated by the reclaimed sector in the BENELUX, France, Ireland and the UK’ develop prior to statistical analysis, • ‘Extrapolating carbon emission reductions from reclamation stockholdings’.

6.5.2 MONITORING REUSE IN BUILDING PROJECTS

Surveying the circular efforts of building projects could provide essential information in terms of:

- 1) Preserving the existing building,
- 2) Outflows (proportion of reclaimed, recycled and discarded materials),
- 3) Inflows (proportion of reused, bio-based, recycled and new materials).

If carried out on a systematic basis in all ongoing projects in a given area, this type of monitoring would also provide useful data for regional or even national statistics (see Action 5.1). More generally, this type of information is useful for obtaining feedback on reuse practices.

Monitoring circular efforts and accounting for flows can be approached in two ways:

- As a voluntary approach that can be integrated either in a call for projects or in the initial request made by the client.
- As a compulsory process integrated into the administrative procedures (permit application forms, for instance).

In order to enable an evaluation of efforts over time and to measure the achievement of objectives, it is important to be able to develop and establish a harmonised and common method of accounting for flows and evaluating reuse in projects (indicators, units, calculation method, monitoring, etc.).

Public authorities can set the framework and ensure the monitoring of pilot projects and calls for exemplary projects. The assistance of building project teams, project owners, consultants and experts, and possibly researchers, is also necessary.

As part of the [Be.Circular](#) call for projects, financial and technical support is offered to contractors who integrate a circular approach. A follow-up of the projects is also integrated in order to evaluate the barriers and the opportunities for developing circular practices. The candidates are also required to account for their incoming and outgoing flows, including the proportion of reclaimed and reused materials.

Setting reuse target in public tenders (Action 1.3)
Conducting systematic reclamation audits (Action 2.4)

[Feedback from the field: findings from 36 Pilot operations.](#)

In the further course of the FCRBE project and the call for capitalisation (2022–2023), it is planned to account for reuse efforts in various existing projects.

6.5

6.5.3 SURVEYING FUTURE MATERIAL FLOWS

WHAT?	Urban metabolism is a scientific discipline that studies cities from the angle of the different flows they consume and discard (energy, water, food, materials, etc.). These analyses can help obtain a better understanding of the material flows that are being produced and those that are expected in the future. This can be a valuable source of information to support and implement reuse practices.
HOW?	Public authorities can contract the undertaking of such research. There are different approaches to analysing urban flows. They all depend on the objectives and expected outcomes. In this case, it is interesting to focus specifically on prevention and reuse opportunities: what sort of materials are currently discarded as waste, what is their reuse potential and how are these trends going to evolve in the near future?
WHO?	Universities research labs, specialised consultants, etc.
EXAMPLES?	<p>The Urban Metabolism project led by Plaine Commune is a circular economy approach applied to the building and public works sector. The project combines study and experimentation and includes:</p> <ul style="list-style-type: none"> • The characterisation of the urban mine and identification of the materials eligible for reuse and recycling in the area through the resource diagnosis of the 30 pilot sites; • The operational implementation of reuse via several means of action planning, through the introduction of 'Urban metabolism' clauses in the framework documents and land use planning references, support for project owners to create opportunities for synergy; • The drafting of documents and generic methodologies enabling the various actors to deploy the approach on completion of the three-year project.
Strong links to other actions?	Fostering urban salvage yards (Action 3.7)
FCRBE Resources	In the FutuREuse Booklet Collection: 7 short introduction to the world of reuse , there is one booklet on 'Understanding urban stocks'.



7. How to orchestrate actions: implementation strategies



How to orchestrate all these actions, in which order and timeframe to implement them, is a broad question and depends on the specific context and ambitions of each area. The aim of this roadmap is not to give a single recipe but rather to inspire and provide guidelines for action. In this respect, although the Brussels-Capital Region is often mentioned as an example, it is an example among others. It is up to each of us to define our own strategy... to be shared without moderation in order to inspire others.

7.1 The case of the Brussels-Capital Region

Environmental issues and the circular economy are a key source of employment and economic growth. To this end, the Brussels Capital Region has developed various strategies in recent years that support, among other things, reuse practices in the construction sector.

Between 2011 and 2015, the region launched the Environment-Employment Alliance, which aims at stimulating an environmentally friendly, low-carbon economy that consumes few non-renewable natural resources. The Environment-Employment Alliance has been developed for 4 key sectors (sustainable construction, water, sustainable food and resources and waste) which resulted in nearly 200 concrete actions carried out by 275 organisations. Among the actions supported by the sustainable construction and resources and waste axes and related to the issue of reuse, we can mention:

- A practical guide for the reuse of construction materials
- A directory of Belgian resellers of reclaimed building materials (Opalis) and whose geographical scope has been actually extended to France and the Netherlands
- The creation of a Stakeholder Platform for the Reuse of Construction Elements in Brussels
- The encouragement of reuse and recycling materials in public works contracts
- The encouragement of reuse and recycling materials in sustainable neighbourhood contracts

The Environment-Employment Alliance aims to mobilise and coordinate public, private and associative actors around concerted actions. The project is truly innovative for two reasons: on the one hand this alliance aimed to bring several worlds together by transforming environmental issues into economic opportunities; on the other hand this alliance wanted to go beyond classic consultation by closely associating all stakeholders to achieve a real collective and individual commitment to work together.

One year later, in 2016, the Government of the Brussels-Capital Region adopted the Regional Circular Economy Programme 2016-2020 (PREC) which pursues three general objectives (in line with the previous programme):

- Transforming environmental challenges into economic opportunities.

- To relocate the economy in Brussels in order to produce locally when possible, reduce travel, optimise the use of the territory and create added value for the people of Brussels.

- Contribute to the creation of employment.

To reach these objectives, 111 measures divided into four strategic parts were developed:

- Cross-cutting measures (favourable normative framework, direct and indirect aid, innovation, public procurement, employment, training, education)
- Sectoral measures (construction, resources & waste, trade, logistics, food)
- Territorial measures
- Governance measures (enhanced cooperation between administrations)

As part of this programme, a specific roadmap for the construction sector was developed in 2018. [The Construction stakeholders' roadmap in Brussels: towards a circular economy](#) was developed by and with construction stakeholders around various thematic workshops including design, reuse and logistics. Priority actions and a vision with three key milestones are presented to ensure the transition of the construction sector to the circular economy:

1. Voluntary measures are expected by 2025 through:

- Integrating circularity into urban planning programmes
- Stimulating the demand and the supply
- Developing reuse/reclamation channels
- Preparing a favourable logistical and regulatory framework

2. The introduction of regulations for public buildings are foreseen by 2030

3. And finally, a move to regulations for all buildings is planned by 2040.

Also within the framework of this programme, a call for projects ([Be Circular](#)) has been set up to encourage companies (SMEs, VSEs, self-employed, non-profit organisations, etc.) active in Brussels to develop innovative projects in line with the priority themes defined in the PREC. A specific category - '**circular building sites**' - has been developed for the construction sector to support renovation/construction/expansion projects in the management of resources (material and human). The support provided to these companies by the public authorities is both financial (subsidy) and technical (coaching). Within this framework, six calls for projects were conducted between 2016 and 2021, involving no less than 36 innovative circular projects. Project monitoring has also been set up in order to make the most of the feedback from these projects (obstacles and levers to reuse practices) and thus be able to provide guidelines for future regulations.

After the development of a circular economy vision for the construction sector, the co-construction of a roadmap and the experimentation through building projects, it appeared obvious to integrate the circular economy in the building

renovation strategy which then became the [Strategy to Reduce the Environmental Impact of Existing Buildings by 2030-2050](#). This strategy for the Brussels-Capital Region aims therefore to combine energy and circularity issues. This strategy aims mainly to accelerate the rate of sustainable renovation of existing buildings through a major support system for owners, which should lead to the achievement of certain performance obligations. This strategy integrates the circular approach by taking into account the global environmental impacts of the building. Renovation must therefore be thought out in order to maintain as much of the existing building as possible, to enhance the value of the materials present by reusing them in the renovation itself or in other projects. The modalities for the implementation of these obligations will be discussed within the RENOLUTION Alliance. This Alliance aims to develop a public-private collaboration to design, evaluate and develop tools to support the RENOLUTION of the built environment and make it an environmental, economic and social opportunity for Brussels. Thus, this strategy reaffirms the region's intention to integrate reuse as an action strategy for renovation and circular economy.

In order to support the renovation of the Brussels building stock, the government has set up a support and financial aid scheme, moving towards a one-stop shop for all renovation procedures. In this context, the Government has launched in 2021:

- **RénoClick**, a support and financing programme for regional and communal public authorities (in collaboration with Brussels Environment and Sibelga), in order to help them implement renovation work that encourages the energy transition.
- Project management support for public authorities
- Tailor-made support for condominiums (which account for 55% of housing in Brussels) given their specific characteristics
- The **RENOLAB**, which aims to contribute to the large-scale deployment of innovative solutions for the sustainable and circular renovation of Brussels' buildings. RENOLAB proposes two distinct components:
 - RENOLAB.ID which supports ideas, projects (ongoing or to be created), tools and mechanisms (financial, social, economic, technical, etc.) that allow the removal of obstacles to renovation of buildings.
 - RENOLAB.B which offers support (financial and guidance) for circular and sustainable renovation projects of existing buildings, whether they are at the design or execution stage. This part of the call for projects also aims to take up the previously mentioned call for 'circular work sites'.

The following timeline shows in chronological order the different actions implemented by the region to encourage reuse practices in the construction sector through various themes such as sustainable construction, circular economy, waste and resources. This list of actions is obviously not exhaustive but aims to illustrate the evolution of the place of reuse in the sector's practices and regional strategies.

The Brussels strategy, even if it is broader than just focusing on reuse, can be seen as a progressive implementation approach. Indeed, over a period of about 10 years, the region has worked to raise awareness in the sector of the challenges of reuse and circularity by encouraging voluntary and innovative practices. In its roadmap for the construction sector towards a circular economy, the region has set an ambitious vision with the implementation of regulations on circularity by 2030 for public buildings and 2040 for all buildings. The way in which these ambitions will be implemented is not yet clear, but the various aid and support systems mentioned above (renoclick, renolab, etc.) will make it possible to test the feasibility of imposing regulations on the subject or not. It is therefore possible that in the next 10 years, these aspects will be the subject of specific regulations imposed on all buildings, starting with the exemplarity of public buildings.



7

Timeline of the Brussels Capital Region strategy



Publications



Plan/programme/strategy/initiatives developed by the Region



Reuse in building projects



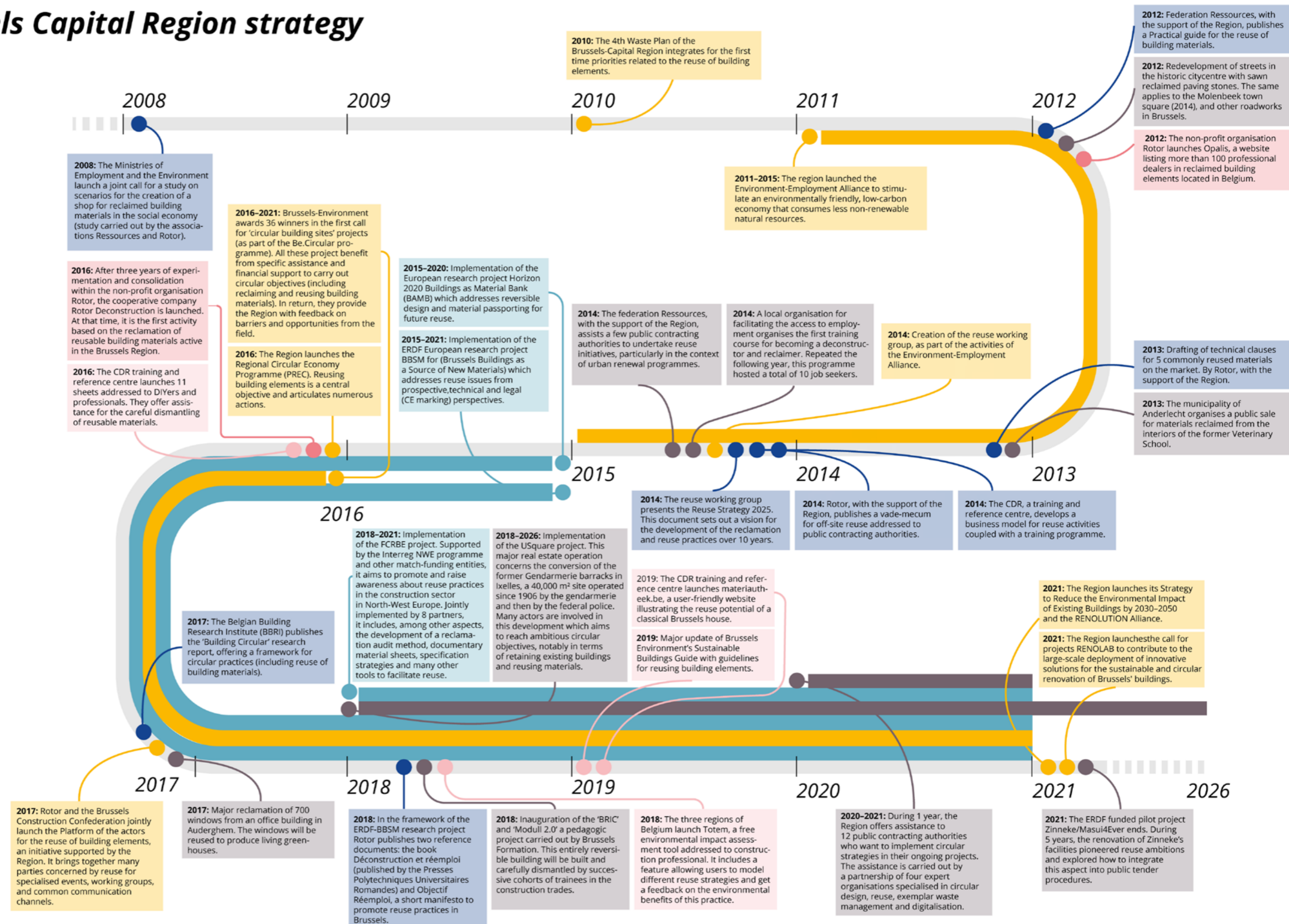
Research project



Reclamation and salvage dealers



Other

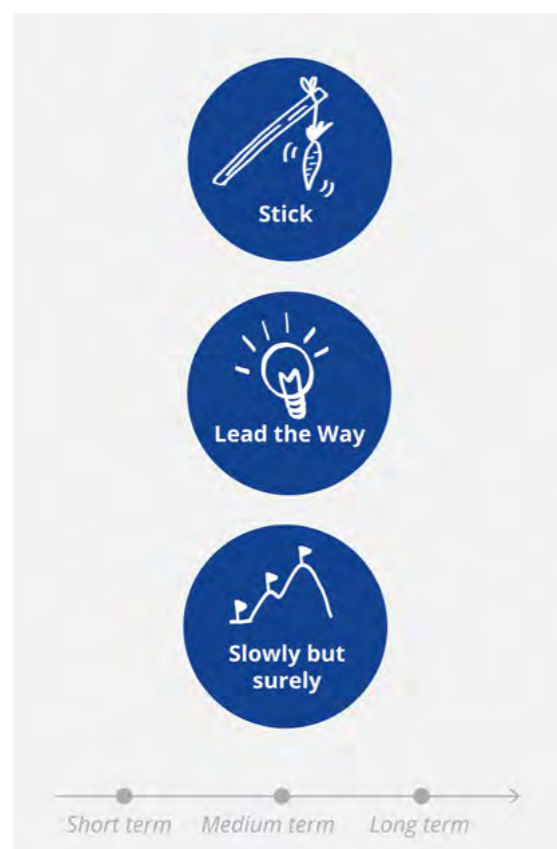


7.2 Various implementation strategies

The implementation approach proposed by the Brussels-Capital Region may seem long in the light of the climate emergency we are facing. However, this approach guarantees a gradual integration of circularity and reuse issues by the construction sector. The feedback from innovative operations developed thanks to the support provided during the voluntary measures phase provides a useful and inspiring basis for the introduction of specific regulations in the longer term.

This is not, however, the only possible approach. The prioritisation of the actions to be taken and the different milestones to be reached will have to be defined in consideration of the context, the existing degree of integration of reuse in the sector's practices and the specific ambitions of each territory.

During the roadmap workshops, we wanted to 'open up' the reflection to different types of implementation approaches. We therefore worked on prioritising the actions to be implemented according to three different timeframes and three given approaches:



The 'Stick' approach proposes a more coercive path. The 'Lead the way' approach aims to encourage innovation and experimentation first. And the 'Slowly but surely' approach takes the time to set things up more gradually.

These three types of approaches are not necessarily antinomic, they can coexist and complement each other. For example, the

Brussels-Capital Region strategy can be defined as a 'Slowly but surely' approach even if it integrates, via its calls for innovative projects, a 'Lead the way' approach. For each of them, an indicative timeframe was proposed and discussed within the working groups.

Prioritising and ranking the actions

During the first workshop, we worked on prioritising actions that apply at project level, namely those related to the categories 'Fostering the reclamation', 'Fostering the demand' and 'Bridging the gap'. These actions were also ranked according to their effectiveness (respective potential impact) and feasibility (relative ease of implementation over time).

Effectiveness was assessed according to the following impact scale:

- Huge impact: 20% effort for 80% result,
- Important impact: important lever to scale up reuse in the sector,
- Impact on awareness building,
- First level impact: quick win,
- Poor impact: nice to have but with poor result.

Feasibility was assessed according to the following time scale:

- Short term,
- Medium term,
- Long term.

They were then crossed into two axes giving a new insight into the landscape of actions.

The work carried out during the workshops identified the following actions as priorities:

1. 'Fostering collaborative dynamics' (Action 3.3 in the 'bridging the gap' category) is the action that received the highest number of preferences because its impact can be relatively large and it can be achieved in the short term.
2. 'Setting reuse targets in (public) tenders' (Action 1.3 in the 'fostering the demand' category) is also an important action to implement considering its important impact on the sector, even if its implementation may take more time than the previous action.
3. 'Conducting systematic reclamation audits' (Action 2.4), 'Encouraging and supporting specifiers and contractors to adopt reuse practices' (Action 1.1) and 'Giving visibility to active enterprises and available reclaimed material stocks' (Action 1.4) won an equivalent number of preference votes.
4. The next most important action is to 'Establish a list of protected materials' (or commonly available and reused) (Action 2.6).
5. In an equivalent way, the following actions have been identified: Dealing with fitness for reuse; Awareness/analyse economic viability; Clarify that reclaimed materials

remain products; Documenting the trade; Raising awareness of demolition contractors and assisting building commissioners.

6. Finally, the following actions were mentioned but received fewer votes: Supporting enterprises who adopt reuse practices (Action 3.4), Developing material passports for reclaimed building elements (Action 2.7), Analysing existing reuse practices (Action 3.2), Fostering urban salvage yards (Action 3.7). Supporting stakeholders to adopt reuse practice was also mentioned. This aspect is addressed through the actions 1.1 (Encouraging and supporting specifiers and contractors), 1.2 (Assisting and supporting building commissioners) and 3.4 (Supporting enterprises). Finally, participants stressed the importance of demonstrating the positive impact that reuse can have. This feature is mainly related to actions 4.1 (Integrating reuse in Green Building Rating System), 4.2 (Developing LCA and EPD for reclaimed materials) and 4.3 (Integrating reuse in environmental impact assessment tools).

This prioritisation exercise enabled us to sound out the actors present on what they felt should be done quickly to ensure wider dissemination of reuse practices in the construction sector.



The 'Stick' Approach

In view of the climate emergency, a coercive approach may be seen as more rapid and radical or more appropriate to the sector's urgent need for change and transition: "we can't wait any longer, we have to act" and for everyone to act towards this change, it is necessary to be able to 'pull out the stick'. This type of more coercive approach can be observed in other types of sectors such as waste management regulations or energy performance requirements.

This approach was initially proposed in three milestones divided as follows:

Phase 1: Regulation

Putting in place a more binding regulatory framework that 'pushes' the sector to integrate reuse and circularity in their practice and implementation. Development of a programme that sets out the main intentions and strategy for phased regulation that will set a progressive and staggered level of requirement.

Phase 2: Supporting

Identify the potential of the existing (buildings, materials,

sites, channels) and integrate this approach into certain administrative procedures, e.g. permit applications (obligation to carry out a pre-demolition audit/reuse audit, selective sorting and identification of recovery channels, and their assessment). Establish a socio-economic framework that encourages retain, repair and reuse.

Phase 3: Implementing

Define requirements adapted to the building types. Integrate reclaimed and/or reusable materials in project designs to valorise existing and future resource potential. Set and assess targets to meet larger objectives (sustainability, circularity, decarbonisation, etc.). Could an obligation of a percentage of reused elements be proposed? Or simply a justified carbon or environmental balance?

In the workshop discussions, the importance of having a 'carrot' at the end of the stick (i.e. providing a bonus) was raised as essential to ensure some commitment to this change. The shortening of the initially proposed timeframe was also discussed, in order to be more ambitious.

In the light of this approach, we again worked on the prioritisation of actions concerning the supportive framework and monitoring actions categories:

Before:

- Ensuring a common approach regarding the fitness for use (Action 4.5)
- Ensuring a common approach regarding toxicity (Action 4.10)

In the short term:

- Adapting education and training programmes (including the training of craftsmen) (Action 3.10)
- Clarifying end-of-waste status (Action 4.9)
- Developing LCA and EPD for reclaimed materials (Action 4.2)
- Adapting VAT for reclaimed products (Action 4.12)
- Developing adapted insurance schemes (Action 4.6)
- Imposing a Reuse rate - Encourage the integration of reuse in public and private procurement: Setting reuse target in (public) tenders (1.3)
- Imposing deconstruction (obligations of means through recovery channels assessment and sorting): Conducting systematic reclamation audits (2.4)
- Documenting the reclamation trade (3.1)
- Facilitating the access to the technical documentation for past, present and future building material (Action 4.7)

In the medium term:

- Developing labels (Action 4.4)
- Integrating reuse in Green Building Rating Systems (Action 4.1)
- Integrating reuse in environmental impact assessment tools (Action 4.3)

- Monitoring reuse in building projects (Action 5.2)

In the long term

- Tax on products: Internalising environmental costs of new products (Action 4.11)
- Facilitate the access to sourcing offer // Fostering urban salvage yards (3.7 and 3.8)
- Clarifying CE-marking (Action 4.8) (may be not necessary)



The 'Lead the way' Approach

The 'Lead the way' approach is based more on research and development. It aims to encourage innovation and experimentation in order to build a knowledge base and feedback as a foundation for the development of appropriate regulation. This approach is directly inspired by initiatives, support systems and frameworks such as the Permit to Innovate and Permit to Experiment developed in France, the Living Labs or the Calls for projects like Be Circular developed in Brussels, but other models are possible.

This approach was initially proposed in two distinct milestones:

Phase 1: Experimentation

Reuse is integrated as an objective in its own right in a series of diverse innovative projects (renovation, deconstruction, construction, platform, logistics, etc.). A favourable framework is set up to facilitate the emergence of these projects (fablab, multidisciplinary team, experimentation permit, calls for projects, financial incentives, etc.) and a follow-up of the projects and initiatives is ensured.

Phase 2: Standardisation

Implementation of a progressive (regulatory, technical and normative) framework supporting reuse as a circular economy strategy that builds on the feedback from the experimentation phase. There is a prioritisation of actions in circularity in which reuse practices are largely supported and implemented.

A five year experimentation phase seems to be adapted to the temporality of construction projects. The workshop discussions tend to reduce the duration of the standardisation phase (e.g. from 5 to 2 years) depending on each action and its appropriation by the market. It was also suggested that a common framework for monitoring evolution and progress should be developed upstream and then deployed on a larger scale (from local to regional).

The prioritisation of actions according to this approach was proposed as follows during the workshops:

In the short term:

- Developing adapted insurance schemes (Action 4.6)
- Clarifying CE-marking (Action 4.8)
- Clarifying end-of-waste status (Action 4.9)
- Adapting VAT for reclaimed products (Action 4.12)
- Integrating reuse in environmental impact assessment tools (Action 4.3)
- Ensuring a common approach regarding the fitness for use (Action 4.5)
- Ensuring a common approach regarding toxicity (Action 4.10)
- Facilitating the access to the technical documentation for past, present and future building material (Action 4.7)
- The development of the experimentation phase implies measuring and evaluating the efforts made in innovative reuse projects and initiatives. Therefore, actions related to monitoring should take effect as early as possible in the process, at least in terms of accounting and monitoring methods: Surveying the reclamation trade (Action 5.1) and
- Monitoring reuse in building projects (Action 5.2)

In the medium term:

- Integrating reuse in Green Building Rating Systems (Action 4.1)
- Internalising environmental costs of new products (Action 4.11)
- Developing LCA and EPD for reclaimed materials (Action 4.2)
- Developing labels (Action 4.4)



The 'Slowly but surely' Approach

The 'Slowly but surely' approach is probably the most progressive and long-term strategy. It has the advantage of being more realistic in terms of the integration of a paradigm shift by the construction sector which is often characterised by a certain inertia to change. Nevertheless, it can also be 'criticised' for the implementation time it requires with regard to the current environmental objectives and challenges.

An acceleration of the phasing of the different milestones can, however, be envisaged depending on the context. In addition,

it is also possible to link to the different phases along the way depending on the degree of integration of reuse practices by the sector.

This approach was developed in three distinct milestones:

Phase 1: Start-up

Reuse practices are incorporated as part of circular economy strategies and broadly supported through information, documentation, and giving visibility.

Phase 2: Consolidation

Reuse practices are largely implemented in pilot projects. The public sector leads by example. A broader framework emerges, notably through setting technical and normative aspects.

Phase 3: Scale-up

The global framework has become reuse-friendly. Reuse practices are commonplace. They contribute to achieving more global objectives of sustainability, circularity, decarbonisation, etc.

The prioritisation of actions according to this approach was proposed as follows during the workshops:

In the short term:

- Clarifying end-of-waste status (Action 4.9)
- Developing adapted insurance schemes (Action 4.6)
- Ensuring a common approach regarding the fitness-for-use (Action 4.5)

- Ensuring a common approach regarding toxicity (Action 4.10)
- Surveying the reclamation trade (Action 5.1)
- Facilitating the access to the technical documentation for past, present and future building material (Action 4.7)

In the medium term:

- Integrating reuse in environmental impact assessment tools (Action 4.3)
- Integrating reuse in Green Building Rating Systems (Action 4.1)
- Developing labels (Action 4.4)
- Developing LCA and EPD for reclaimed materials (Action 4.2)
- Monitoring reuse in building projects (Action 5.2)

In the long term:

- Internalising environmental costs of new products (Action 4.11)
- Clarifying CE-marking (Action 4.8)



8. Conclusions

This roadmap aims above all to inspire public authorities by proposing a collection of tangible actions structured by strategic objectives and by considering various implementation scenarios. It does not pretend to be exhaustive or to give a single recipe. It aims to introduce a field of possibilities in order to encourage and install reuse in a more structural way in construction practices.

Through the growing development of circular economy strategies, many regions/countries are now re-envisioning reuse as a fully-fledged lever of action to address environmental issues, enhancing local resources and reducing waste by increasing the value of materials.

The elaboration of a specific roadmap for reuse will depend on various parameters: distinct territorial contexts, varying state of practices and profession, different competences and implications of actors/stakeholders, type of governance envisaged and policy ambitions pursued, etc. Reuse roadmaps will probably require a more local approach by proposing targeted concrete measures. However, it should be developed with a transversal vision (inter-sectoral and inter-scale) with an outward vision extending beyond territorial and institutional boundaries. Indeed, material flows and stakeholder dynamics very often exceed the local scale and authority-related competences. In addition, it is also necessary to ensure consistency with other ambitions in terms of circularity, renovation wave, energy performance, etc.

Nevertheless, despite the different scenarios envisaged in this document, certain actions seem to be a priority, such as the importance of clarifying the end-of-waste status, developing appropriate insurance systems, ensuring a common approach to toxicity and reusability, documenting the reclamation trade, fostering collaborative dynamics and setting reuse targets in public tenders. The renewed interest in reuse practices and the benefits it brings in many ways suggest that reuse will be increasingly integrated into building practices in the future.



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Brussels, November 2021

