CERACQ – GRIDD – ETS

REUSE AND THE CIRCULAR ECONOMY IN THE CONSTRUCTION SECTOR

FCRBE PROJECT

16th May 2025

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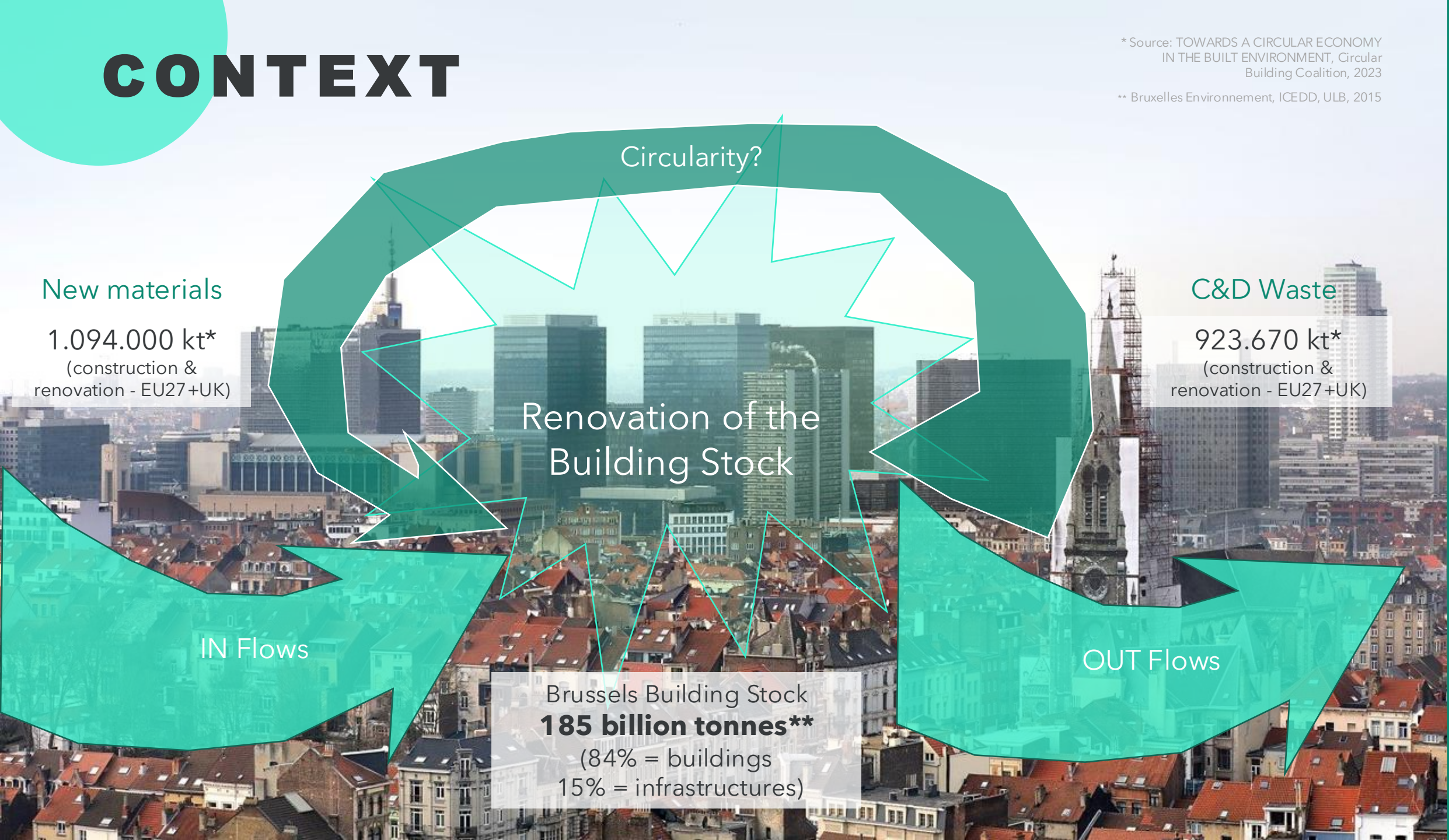
UCLouvain LOCI LAB

Takeda School
Crédit photo: S.Malaud (via Agwa)

CONTEXT

* Source: TOWARDS A CIRCULAR ECONOMY IN THE BUILT ENVIRONMENT, Circular Building Coalition, 2023

** Bruxelles Environnement, ICEDD, ULB, 2015



CONTEXT

Belgium: 21.300.000 t
EU: 385.580.000 t

C&DW vs End-of-life treatment

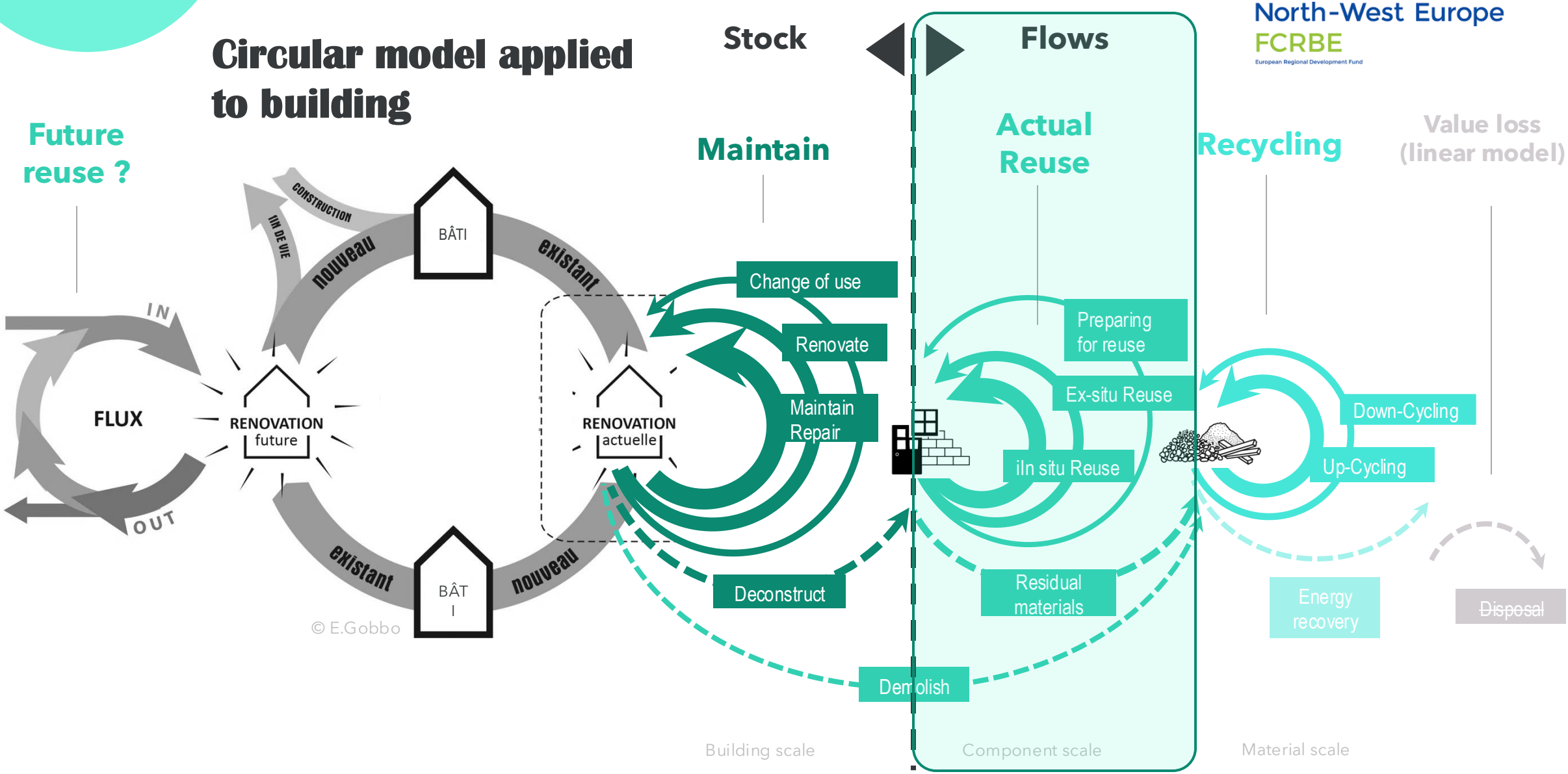
Source : FCRBE

* Source: estimation from FCRBE project

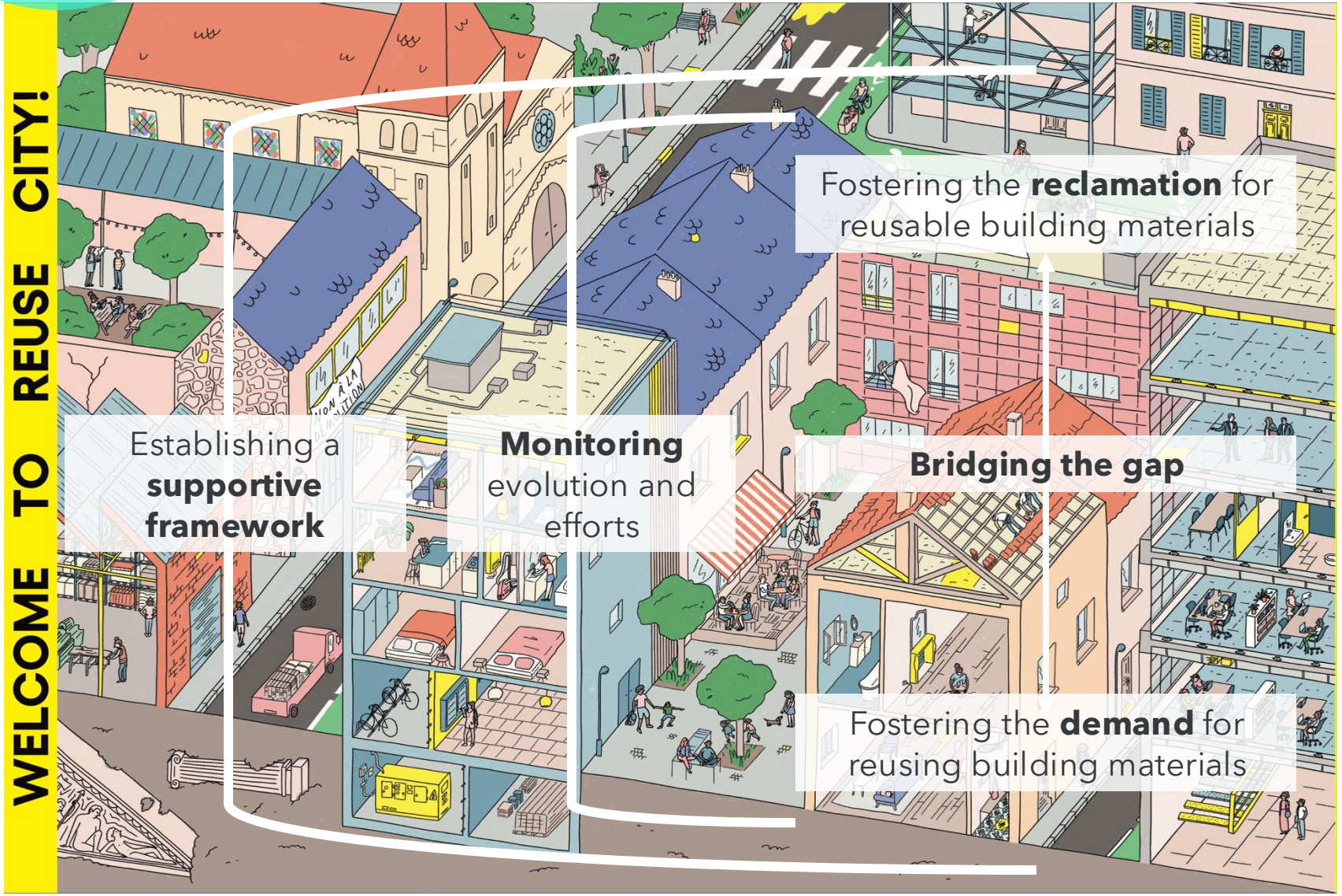
** Source: statistical data from Bruxelles Environnement

RESEARCH APPROACH

Circular model applied to building



FCRBE: APPROACH



Main Obstacles to Reuse Practices

Reusable materials are **not systematically reclaimed** during demolition works

Existing reclamation dealers **lack of visibility** in the construction industry

Specifiers face challenges in fixing and implementing **reuse ambitions**, especially in procurement procedures and specifications

FCRBE: MAIN OUTPUTS

Interreg North-West Europe

OUTCOMES | EVENTS | BIG EVENTS & EXHIBIT | PILOTS | IN THE PRESS | ABOUT | SUMMER SCHOOL

Follow us on

Reuse toolkit

Contracting authorities, building developers, architects and other building professionals will find here a series of tools and methods to implement reuse actions in their projects:

Reclamation audit method

How to identify reusable materials in a building scheduled for demolition. Version: December 2022. Available in EN, FR and NL. Targets: building developers, contracting authorities, architects, contractors, etc.

GO TO THE DOWNLOAD PAGE

Guidebook on procurement strategies

How to integrate reuse ambitions in the tendering procedures of construction and renovation projects (including for public tenders). Version: February 2022. Available in FR, NL and EN. Targets: building developers, contracting authorities.

GO TO THE DOWNLOAD PAGE

Collection of material sheets

36 sheets covering a wide range of materials: how to reclaim and reuse them, what are their known characteristics, how available are they on the market, what are their environmental benefits... Version: December 2021. Available in FR, NL and EN. Targets: specifiers, architects, contractors...

GO TO THE DOWNLOAD PAGE

Practical guides for contractors

Six guides on reuse for specialised trades: general contractors, finishing companies, woodworkers, roofers, demolishers and infrastructure contractors. Version : September 2023. Available in FR, NL, EN.

GO TO THE DOWNLOAD PAGE

Reuse objectives method

Method to set, measure and report on reuse objectives in tenders, project implementation and public policies. Available in EN, FR. Targets: building developers, contracting authorities and policy makers.

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Insurance for reused building materials: good practices

A selection of 11 case studies which successfully dealt with insurance issues for reused building materials. A synthesis suggests guidelines for best practices. Version: September 2023. Available in EN (soon), FR. Targets: Building developers, contracting authorities, architects, contractors, insurers, etc.

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Findin

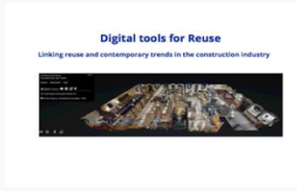
The FCRE and salv

Reclamation and salvage dealers in the United Kingdom and Ireland

SALVOWEB.COM

Digita

Contra develop



Digital Tools Report

How digital tools could facilitate the task of auditing buildings for assessing the reuse potential of their components (reality capture, scanning technologies, artificial intelligence, BIM...).

DOWNLOAD REPORT

Resources for reuse

Reusing building materials may raise a series of questions. To tackle them, the FCRBE project has developed a series of resources:

Futureuse booklets

7 shorts introduction to the world of reuse. These booklets cover the following topics: environmental impact, technical performances, material surface treatments, the product or waste issue, roadmap for public policies, urban stocks, fashion for reclamation. Version : November 2021. Available in FR, EN and NL.

GO TO THE DOWNLOAD PAGE

Yours Truly Reclaimed - The new label for authentic reclaimed products

The new Truly Reclaimed label verifies that a product or batch of material is genuinely reclaimed. The campaign helps customers distinguish Truly Reclaimed from new products that are made to resemble the old. Discover trulyreclaimed.org and the futuREuse community to support your journey in using the label.

TRULYRECLAIMED.ORG

A roadmap to foster reuse practices in the construction sector

A collection of inspiring actions for public authorities and policy makers who wish to encourage the reuse of building materials in their area. Languages: EN, FR, NL.

DOWNLOAD THE ROADMAP

A statistical survey of the reclamation trade in Ireland, the UK, France, Belgium and the Netherlands

Profiles, socio-economic impact and quantity of materials stocholded by professional reclamation and salvage dealers in the project area. Forthcoming...

DOWNLOAD REPORT

Reuse in Environmental Impact Assessment tools

Designers are increasingly required to use modelling tools to assess the environmenta impact of their projects. How do these tools integrate reuse? What are the best practices in this context? Version: November 2021. Available in EN.

DOWNLOAD REPORT

Reuse in Green Building Frameworks

To demonstrate their commitment towards sustainable building, developers can use different labels, certifications and guidelines. How do these frameworks reward reuse strategies? What are the best practices in this context? Version: November 2021. Available in EN.

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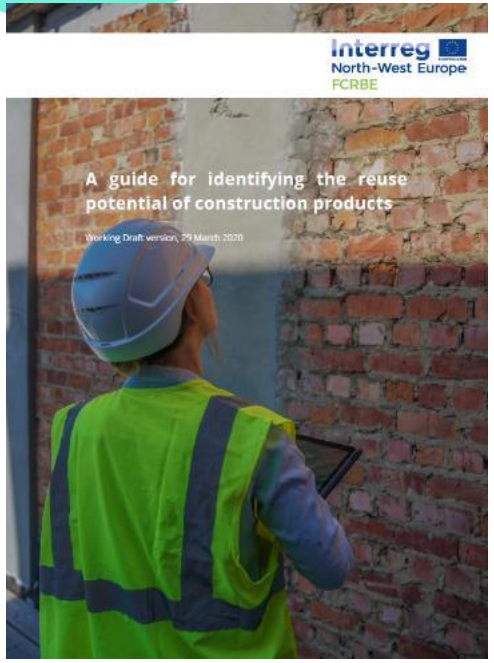
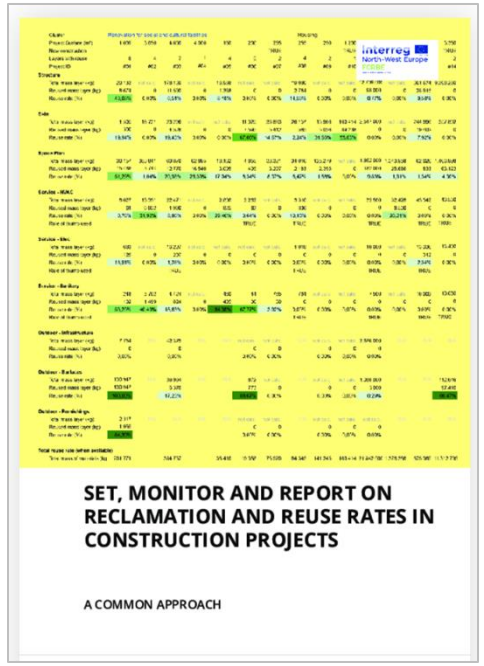
FCRBE: MAIN OUTPUTS



Fostering the **reclamation** for reusable building materials

Fostering the **demand** for reusing building materials

Bridging the gap

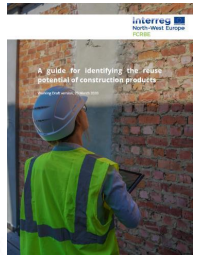


Monitoring evolution and efforts

Aims and objectives

Establishing a **supportive framework**

FCRBE: RECLAMATION AUDIT METHOD



How to identify reusable materials and their potential for reuse in a building to be demolished?

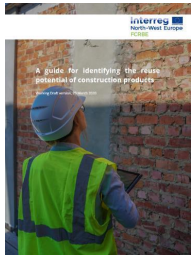
This guide has been developed to help create a pre-demolition inventory of potentially reusable construction products.

- What are the **objectives** of the reuse inventory ?
- **How** to carry out a reuse inventory?
- **Who** can carry out an inventory?
- **When** should an inventory be carried out?
- How to **identify** reusable items and their potential?
- What **information** should be gathered and how should it be **structured**?
- What are the **destinations** for reclaimed items?

By analogy with common materials on the re-use market

By criteria based on positive and negative aspects

FCRBE: RECLAMATION AUDIT METHOD



How to identify reusable materials and their potential for reuse in a building to be demolished?

What **information** should be gathered and how should it be **structured**?

Level of detail

General infomation

Elements identification

Data sheet by elements

RECLAMATION INVENTORY

PRIMARY INFORMATION

Identification			Picture	Quantity		Dimensions				Mass		Total			Location in situ	Condition	Remark(s)	Reclamation phase
ID number	Element group	Element name		amt.	unity	width	length	hight	unity	amt.	unity	total surface	total volume	total mass				phase for collection on site
A	Interior doors			103	pce													pre-deconstruction
A1		door THEUMA (left opening)		51	pce	92	3.4	211	cm	~50	kg	/	/	2550	Building A, 22nd floor	A few doors have scratches on their surface	Fire-resistant 30 min.	pre-deconstruction
A2		door THEUMA (right opening)		52	pce	92	3.4	211	cm	~50	kg	/	/	2600	Building A, 22nd floor	A few doors have scratches on their surface	Fire-resistant 30 min.	pre-deconstruction

FCRBE: GUIDEBOOK ON PROCUREMENT STRATEGIES

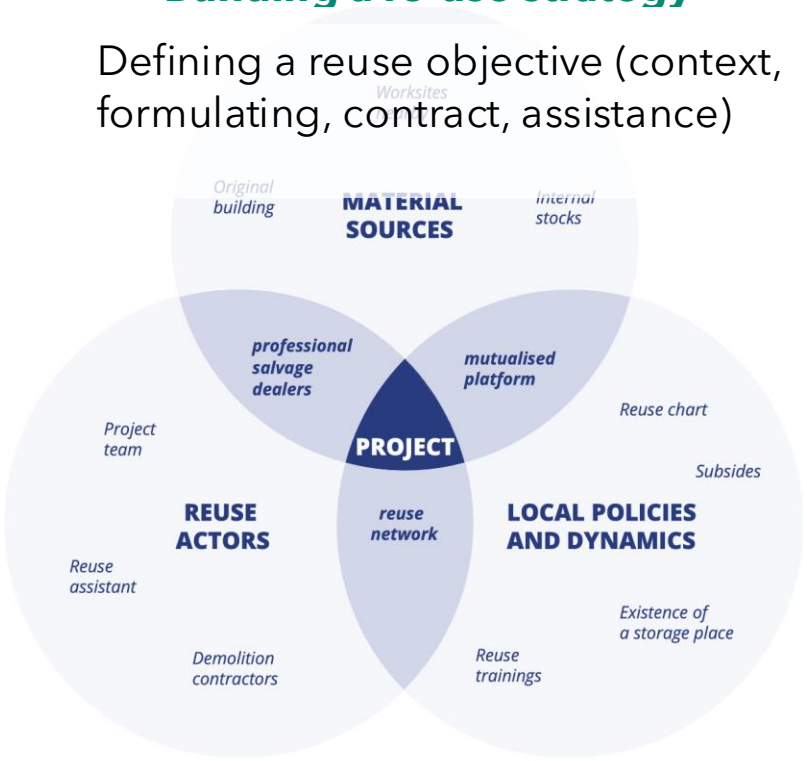
How to integrate reuse ambitions in the tendering procedures of construction and renovation projects (including for public tenders

Conclusion:

- Adapting reuse to your own practice
- Analyse the context
- Start small and develop your ambitions with your feedback (gradation of objectives)
- Allow a degree of flexibility

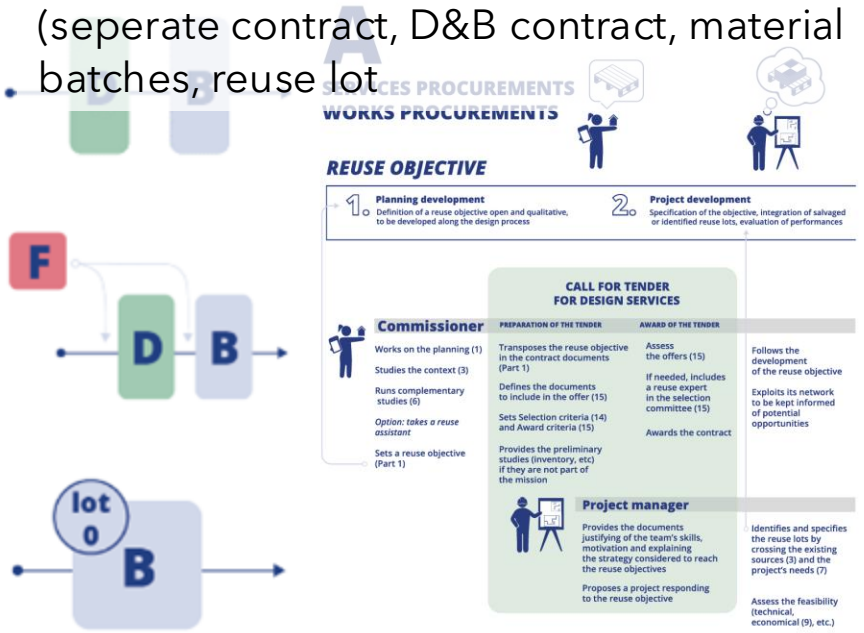
Building a re-use strategy

Defining a reuse objective (context, formulating, contract, assistance)



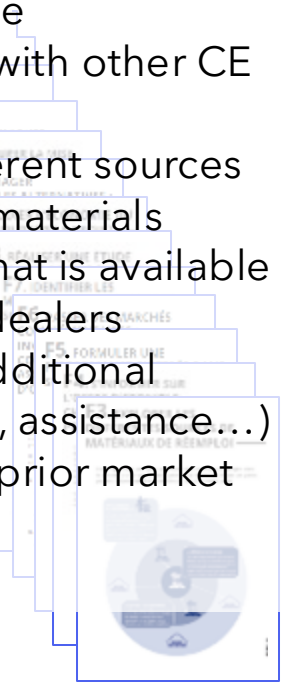
Procurement

Implementing the objective step by step (seperate contract, D&B contract, material batches, reuse lot



Thematic sheets

- Benefit of reuse
- Linking reuse with other CE aspects
- Exploring different sources of reclaiment materials
- Finding out what is available from salvage dealers
- Contracting additional services (audit, assistance…)
- Conducting a prior market consultation
- …



FCRBE: MATERIAL SHEETS

Fiches introductives

Finitions intérieures

Structure et gros-oeuvre

Paysage et pavage

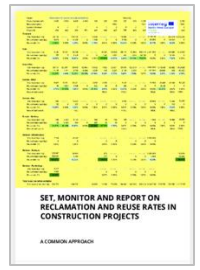
Portes et fenêtres

Équipement

How to specify reclaimed materials in a project when no information is available?

Collection of **36 material sheets** intended for designers, specifiers and other members of construction project teams wishing to reuse these building materials or product. This collection of sheets is aimed at bringing together the available information to date that is likely to facilitate the reuse of building materials and products.

FCRBE: REUSE OBJECTIVE METHOD

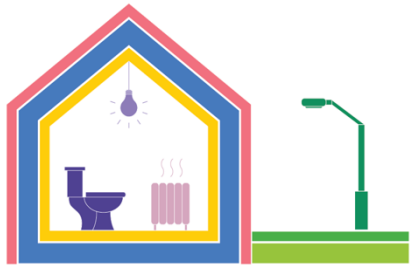


What reuse rates are actually achieved in projects? How can we help project owners to identify quantitative targets for reuse in their projects? Retrospective analyses

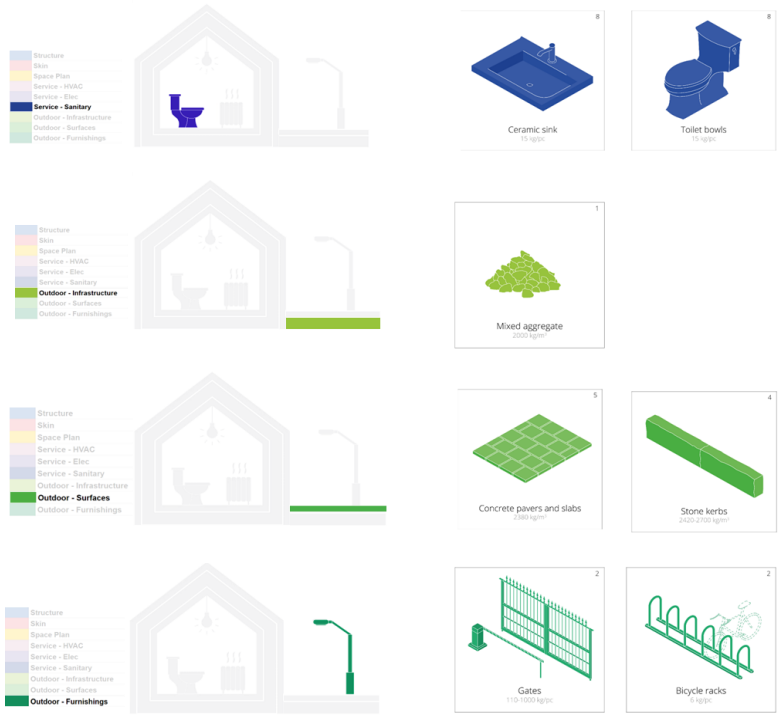
$$\textit{Taux de réemploi par layer}\ [\%] = \frac{Q\ matériaux\ réemployés\ dans\ le\ layer\ [Kg]}{Q\ tot.matériaux\ utilisés\ dans\ le\ layer\ [Kg]}$$

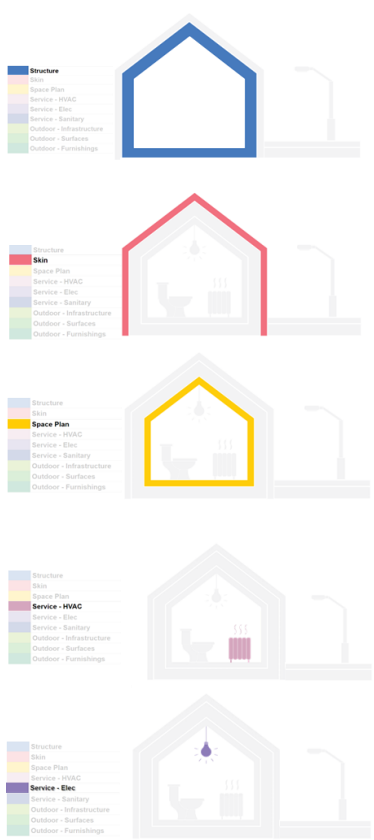
Flux IN

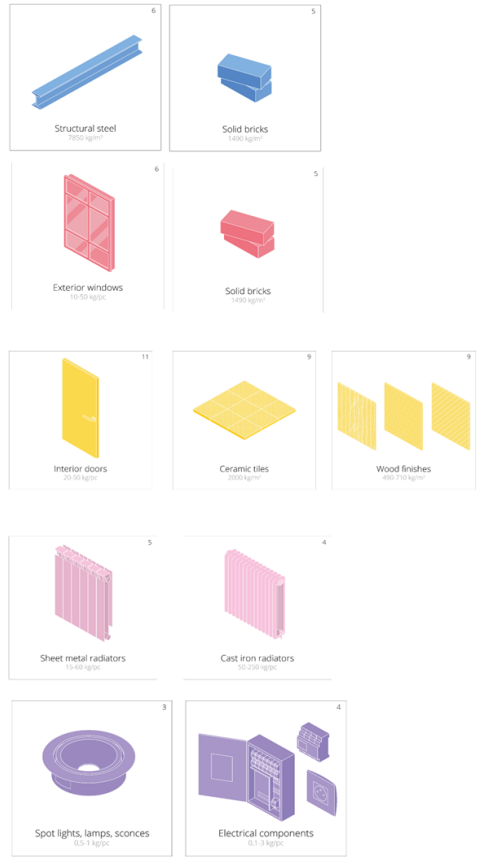
Proposed Layers



- Structure
- Enveloppe
- Aménagements intérieurs
- **Services**
  - HVAC
  - Sanitaires
  - Électricité
- **Aménagements extérieurs**
  - Revêtements
  - Infrastructures
  - Mobiliers

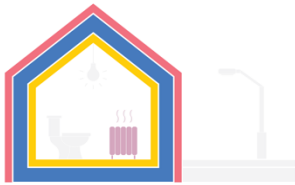




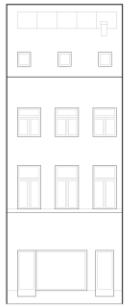


FCRBE: REUSE OBJECTIVE METHOD

Retrospective analyses on 32 construction and renovation projects to identify the effective reuse target achieved and test the reuse objective method

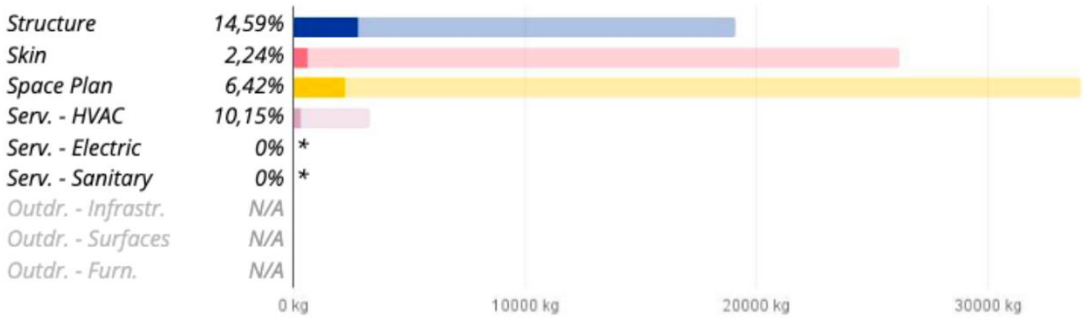


Projet Dethy



Program: *Individual housing*
Project type: *Transformation of an existing building*
Surface area: *255 m²*
Contracting authority: *Private owner*
Architect: *BXLMRS - Lionel Bousquet*
Contractor: *Bois&Structure*
Reuse assistance: *Enesta*
Engineering assistance: *Enesta*
Contract: *Private*
Public support: *N/A*
Year of completion: *2017*

Reuse rate per layer (in mass)



Building elements reused in the project (per layer)

Solid bricks
2.784 kg
- 101,9 kgCO_2eq

Rigid insulation
585 kg
- 276,8 kgCO_2eq

Wood finishes
2.183 kg

Sheet metal radiators
336 kg
- 619,4 kgCO_2eq

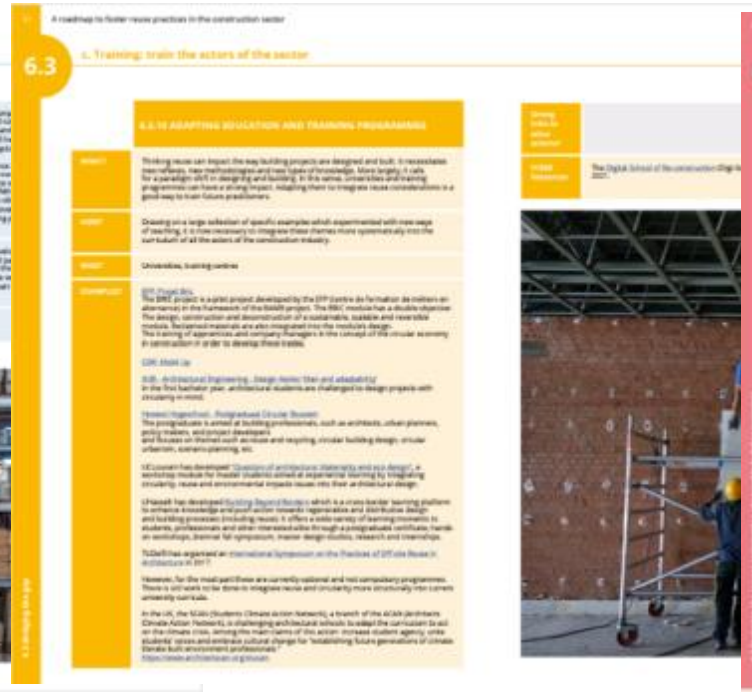
FCRBE: REUSE OBJECTIVE METHOD

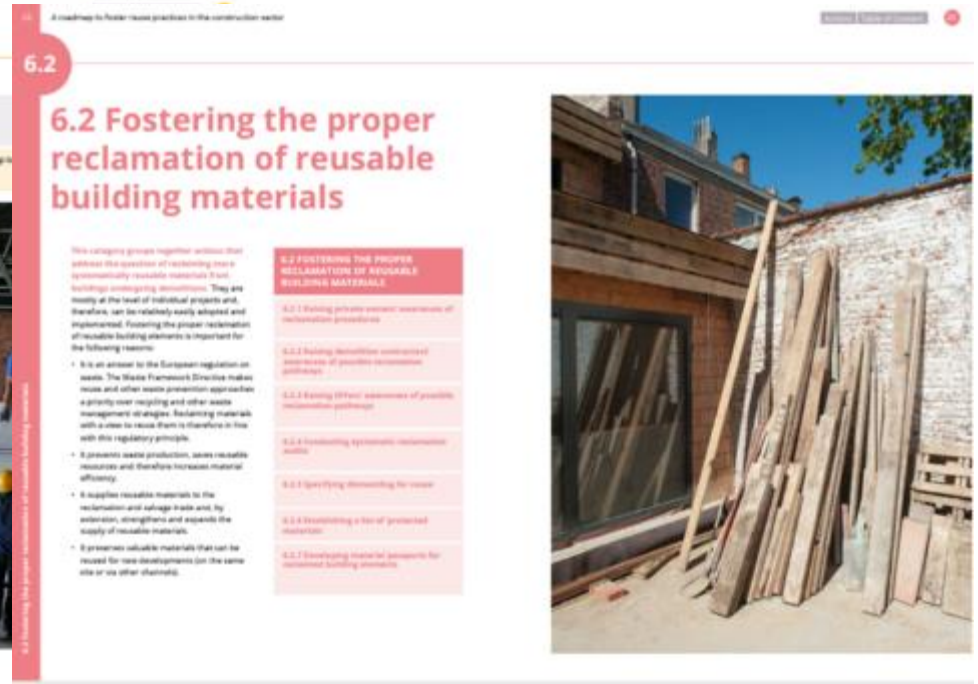
A document that proposes a collection of **35 inspiring actions** developed along 5 strategic lines and provides **guidelines** for public authorities **to encourage the reuse of** building materials and components

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 EV
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 fiscality for reclaimed products	

What? **How?** **Who?** **Examples?**

Links with other actions and FCRBE deliverables





CONCLUSIONS

Many obstacles
- Regulatory
- Economic

Need for a political position, not only focused on economic issue nor the short term but considering a long term vision and ambitions !

- Costs
- Supply
- Accessibility
- Availability
- Profit ??
- …

Pavé de grès, neuf, origine: Belgique

~90 €/m²

Pavé de grès, de réemploi, origine: Belgique

~50 €/m²

Pavé de grès dit "Kandla", neuf, origine: Inde

~25 €/m²

Source: Rotor

CONCLUSIONS

Many obstacles…
- Technical and cultural

Brussels, 1928, démolition du Palais Granvelle, un ouvrage de 1550.
© KIK-IRPA, cliché A105361

- Insurability
- Performance over time
- Certification
- Professional training/awareness
- …

- Questioning the practices
- Changing the practices
- Developing a new shared/common narrative
- Change our relation to resources and waste …

Source: démolition de la barre de Monmousseau. Photo Progrès /Richard MOUILLAUD (03 avr. 2021)

CONCLUSIONS

The framework is evolving…
- Incentives, standards, regulation

Expected or implementing regulatory developments

- **EPB Directive** [12/03/2024] ARTICLE 7 > NEW BUILDINGS Member States shall ensure that the GWP (global warming potential – climate change) throughout the life cycle is calculated in accordance with Annex III and appears in the energy performance certificate of the building: (a) from 1 January 2028 for all new buildings with a usable floor area greater than 1,000 m^2; (b) from 1 January 2030 for all new buildings.
- ISO 59020 Circular Economy
- **LEVEL(s)**
- **EU Taxonomy**
- CO_2 performance ladder
- Social clauses
- Environmental clauses
- …

CONCLUSIONS

But also Many opportunities…
- Innovations: collaborations, economic and social (investments, business models, …)

Source: Urban – Be.Exemplary

Source: Facade Leasing Pilot Project (TUDelft)

CONCLUSIONS

« … the reuse of products and recycling of materials **do not create a sufficient flow of building products and materials to close the circularity loop** with renovation materials alone. […] a broader scope must be adopted such as **preventing the need for material** altogether and using **less impactful and more regenerative materials.** »

Source : Circular Buildings Coalition, 2023

"A circular economy is about **managing stocks**: assets of cultural, natural and human nature, and manufactured objects. We have to learn how to **maintain** these stocks, because in industrialised countries we have a society of abundance. We have everything we need, but **we have to learn how to look after it, and to care for it**."

Walter Stahel in conversation with Ellen MacArthur, 26 June 2019. Via Medium.com

Source: Rotor

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https://uclouvain.be/en/research-institutes/lab

UCLouvain LOCI LAB

https://vb.nweurope.eu/projects/project-search/fcrbe-facilitating-the-circulation-of-reclaimed-building-elements-in-northwestern-europe/

https://doi.org/10.1016/j.jobe.2024.111344

https://doi.org/10.3390/su17020541

https://opalis.eu/fr

Source: Rotor