

Using reclaimed materials in construction projects

Is it more expensive?

Based on two research projects with pilots

Urban Mining of buildings
Creating value by closing material flows



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Interreg 
EUROPEAN UNION
North-West Europe

FCRBE
European Regional Development Fund

THEMATIC PRIORITY:
RESOURCE AND MATERIALS EFFICIENCY



Project objective: Increase by 50% the amount of reclaimed building elements being circulated in North Western Europe by 2032.

Total budget received from Interreg North-West Europe (2014-2020):
€2.6 million of ERDF

Total project budget: €4.33 million

www.nweurope.eu/fcrbe

Partners: 

Pilot Case – Tuighuisstraat

Location	Kortrijk Neighbourhood Tuighuisstraat
Year of construction	1924
Typology	18 small family houses in brickwork, semi-detached or terraced houses
Size of the project	+/- 2750 m2



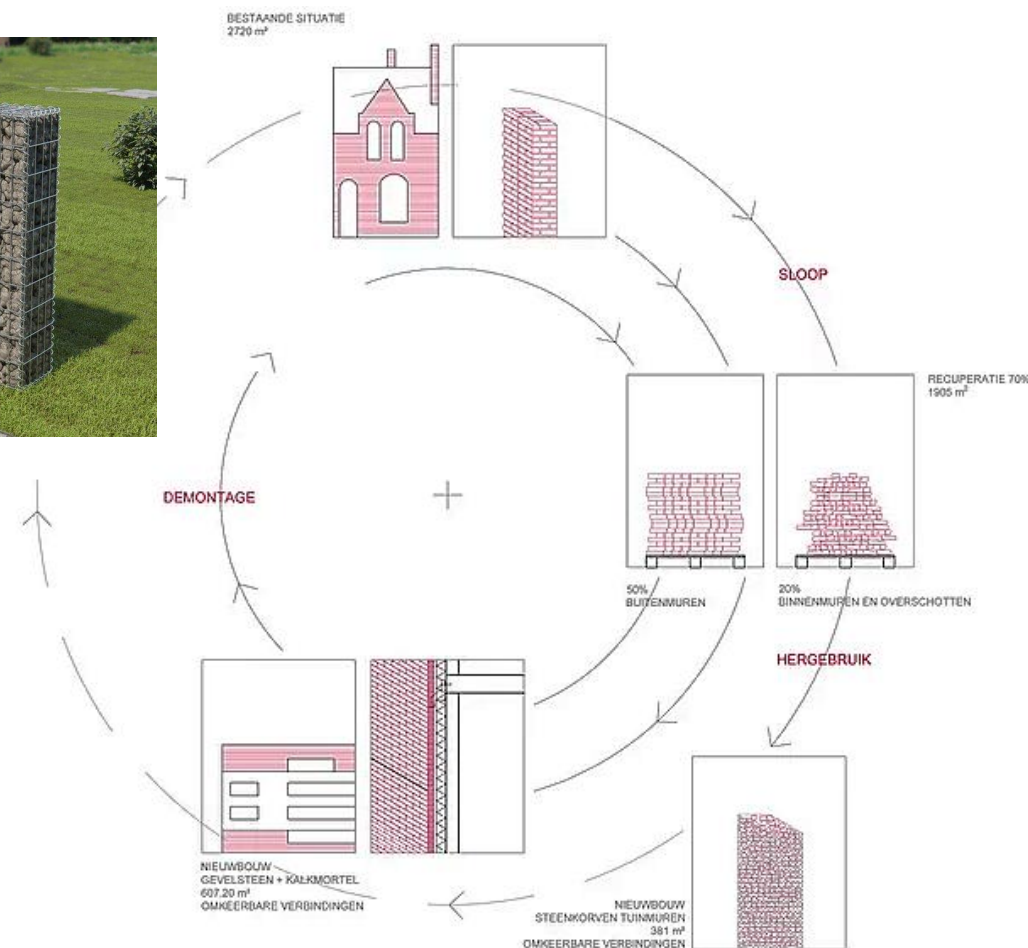
Reuse of bricks and roof tiles

**Wonen Regio Kortrijk
MAKER architecten**

Pilot Case – Tuighuisstraat

Objective

- Maximal reuse of bricks and roof tiles for reuse in the construction of the new houses and in gabions for the gardens.
- In the future houses they will use a different type of mortar: lime mortar in stead of cement mortar.
- In the tender, the reuse of the bricks and roof tiles was described in the project specifications. The tests that needed to be done are described as well.



Pilot Case – Tuighuisstraat

Operational process



Pilot Case – Tuighuisstraat

Results

Estimation of the architects

- 50% bricks
 - Of which 35% for reuse as bricks
 - Of which 15% for reuse in gabions
- 50% reuse of roof tiles



Actual recovery:

- Bricks for reuse in facade: **22 %**
- Bricks for reuse in gabions: **10 %**
- Roof tiles: **60 %**



Pilot Case – Tuighuisstraat - 2021

	Cost of dismanteling by specialised contractor	Cost of dismanteling by contractor with no experience		Unit price new bricks or roof tiles (similar type) 2021	Unit price new bricks or roof tiles in <u>2023</u>
Bricks	30 EUR/m ²	43 EUR/m ²		55 EUR/m ²	70 EUR/m ²
Roof tiles	10 EUR/m ²	25 EUR/m ²		15 EUR/m ²	20 EUR/m ²

SAVINGS DURING THE DEMOLITION PHASE?

On a total collected area of 1580 m² the savings on waste evacuation: 1,55 EUR/m²

Roof tiles => challenging to be break-even

Bricks => with specialised contractor: break-even or beneficial

EU Taxonomy



Construction of new buildings

Contributing to climate mitigation ▾

Contributing to climate adaptation ▾

Contributing to circular economy ▲

Description ▾

Substantial contribution criteria ▾

4. The use of primary raw material in the construction of the building is minimised through the use of secondary raw materials⁽⁸¹⁾. The operator of the activity ensures that the **three heaviest material categories used to construct the building, measured by mass in kilogrammes, comply with the following maximum total amounts of primary raw material used:**

a. for the combined total of brick, tile, ceramic, a maximum of 70% of the material come from primary raw material;

In order to respect the Waste Hierarchy and thereby favour re-use over recycling, **re-used construction products**, including those containing non-waste materials reprocessed on site, are to be **counted as comprising zero primary raw material.**

Mundo Lab – Louvain-La-Neuve - Belgium



<https://www.circubuild.be/fr/actualite/etude-de-cas-mundo-lin-louvain-la-neuve/>

- Project 2300 m²
- 1350 m² offices
- Used reclaimed beams for the entire structure
- Used lots of other reuse materials: acoustic panels, sanitary appliances, raised floors, lighting fixtures, ceramic tiles,...

Reuse of steel beams

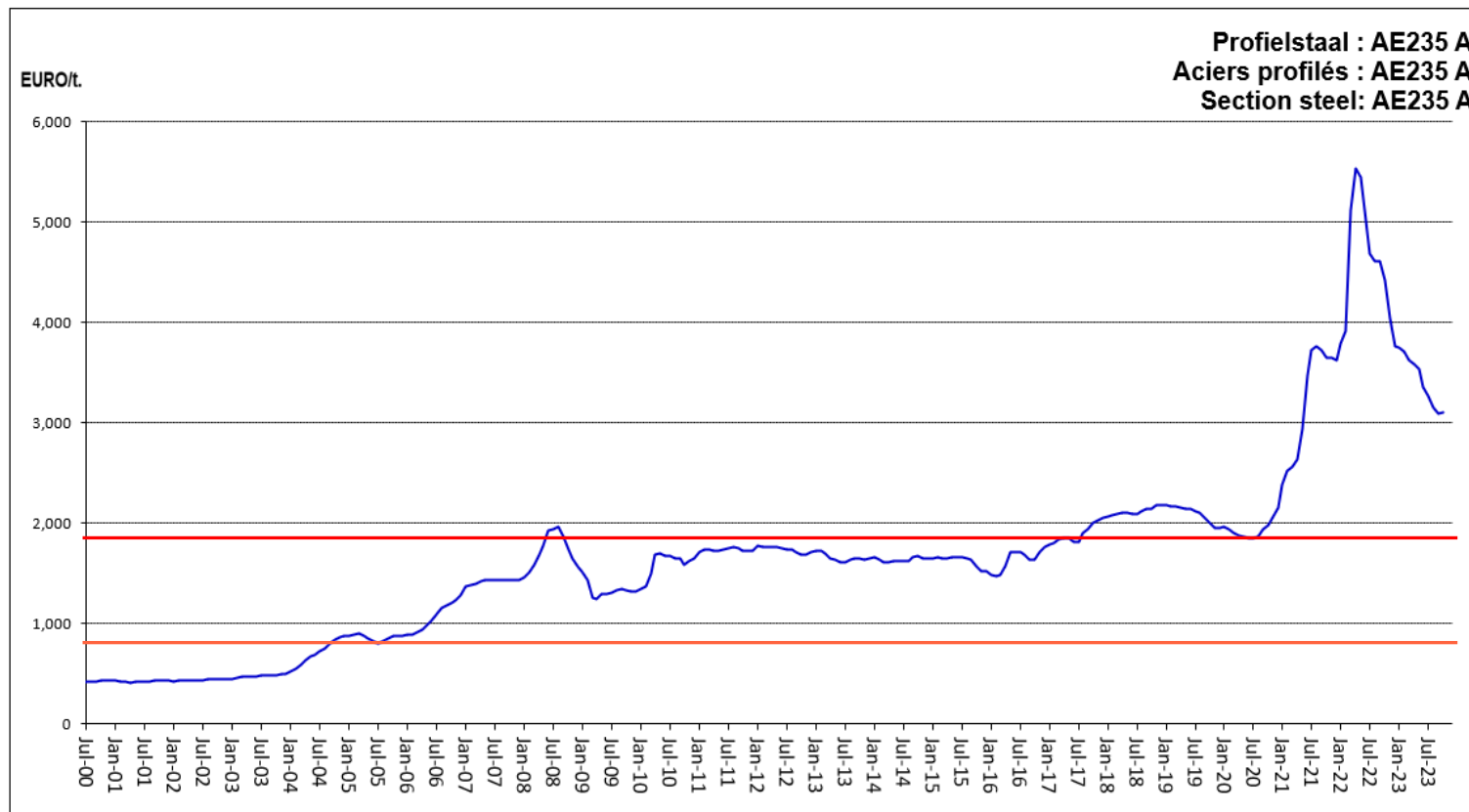


<https://www.lesoir.be/446855/article/2022-06-09/une-ossature-en-acier-issue-de-la-recuperation-louvain-la-neuve-une-premiere-en>



<https://www.circubuild.be/fr/actualite/etude-de-cas-mundo-lln-louvain-la-neuve/>

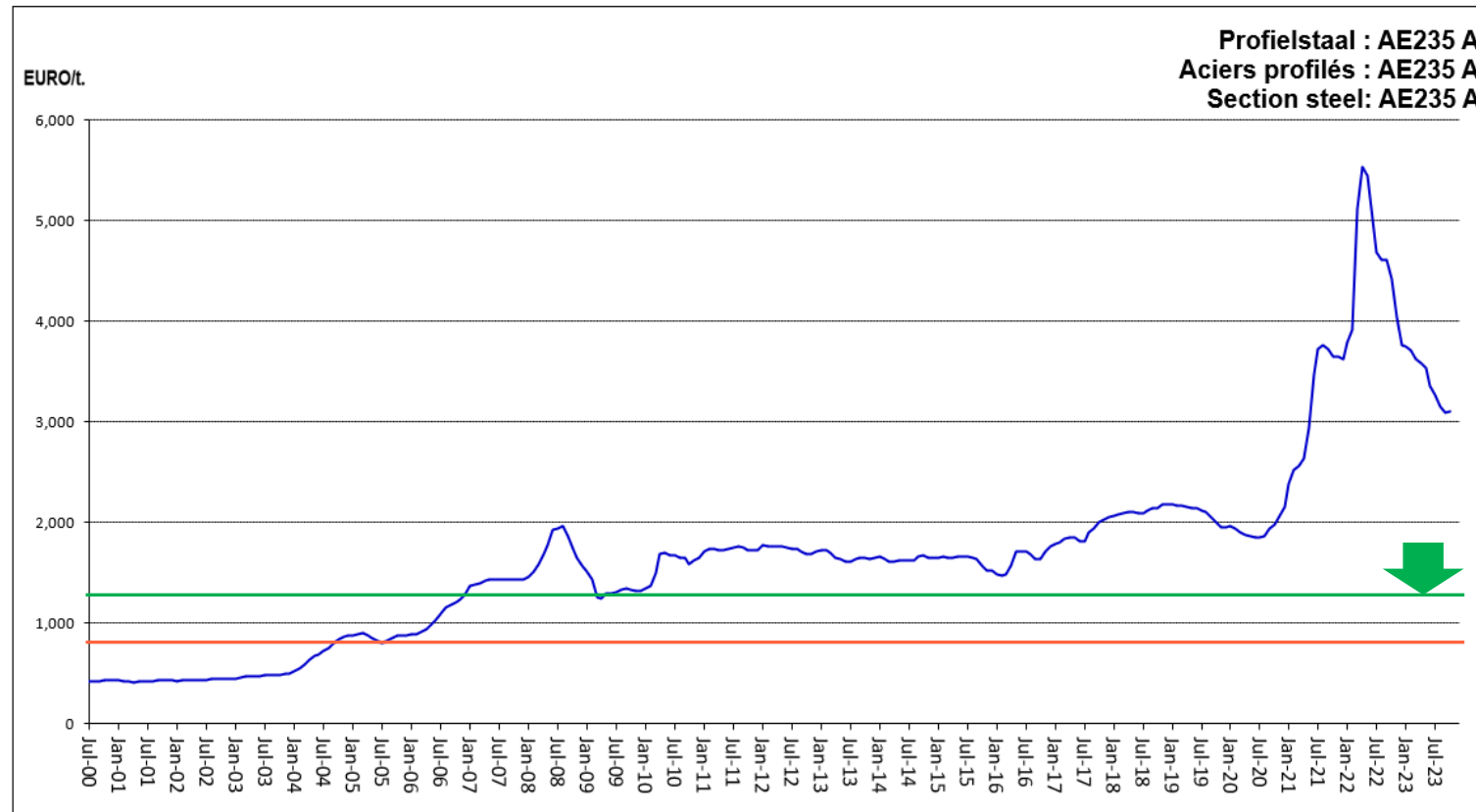
Reuse of steel beams



1800 EUR/ton (incl. testing, preparation,...)

Min. 800 EUR/ton second hand price

Reuse of steel beams



Halve the
additional cost
=> 1300 EUR/ton

Little variation
in price

Types of costs and benefits

COSTS	BENEFITS
(Specialised) labour	Company image valorization
Adaptation of processes and practices	Reduction of waste management costs
Additional logistics	Sale of reclaimed materials
Justification of the technical quality of materials	No or lower purchase costs
Traceability requirements	Reduction of transport costs
Sorting and preparation for reuse	
Adjustments and adaptations to integrate them	
Insurance and liability	

https://opalis.eu/sites/default/files/2023-10/en_id23_contractors_web.pdf

Conclusion

- We need specialised contractors to reduce and stabilise the “harvest price”
- We need standardised protocols for the implementation of the reclaimed materials in construction projects to keep the “additional costs” under control
- Shortage of raw materials and rising energy prices push up the unit price of new materials
- Indirect financial benefits: EU – Taxonomy will stimulate the use of reclaimed materials in projects

Questions?