

Valorisation of Residual Flows in the Construction Sector

How can reuse of building materials be encouraged?

AP University of Applied Sciences | Circular Innovation Lab

De Kooning Annemie & Breugelmans Joris

May 2025

'By building circularly, we create a cycle, where materials can be reused or recycled at the end of their life cycle. In this way, we consume fewer raw materials, reduce waste and our CO2 emissions, and make building materials affordable.'

In this context, we want to make the valorisation of residual streams in the construction sector a reality.

The study started in September 2024 and will be completed in June 2027. During the first year, the current situation in Flanders will be investigated. During the second year, possible solutions will be developed for subsequent implementation and evaluation.

Current barriers to reuse provide inspiration for possible solutions. Business models, collaborations and other ideas from non-construction sectors in Flanders also offer opportunities. Finally, existing initiatives around reuse of building materials in foreign construction sectors are also valuable sources.

Current barriers

Through discussions with almost all sector associations of the major construction actors, the following thresholds have been detected. This enumeration is non-exhaustive and invites the reader to add to it.

Abundance of primary raw materials

Currently, it is still too easy to choose primary raw materials. Manufacturers' production processes are geared to this, and the customer receives a "clean" product with guaranteed quality. Since there is no scarcity for the time being, prices and extractions of primary raw materials are accepted.

Drive for new stuff

In times of mass production, consumers have become accustomed to quick product changes. Regardless of the shorter lifespan of many mass-produced products, consumers often quickly decide they want something new.

Complexity of and storage and transport

Current transport and storage methods are seamlessly geared to new products coming straight from the manufacturer and transported to building trade and/or construction site. When recycled materials are introduced, the current situation is disrupted. Moreover, there is little certainty about the demand for these secondary materials and the period for which they should be stored. Storage sites need to be designed and managed differently.

Reuse is not cheaper

The demolition of a building must be done selectively and carefully so that the material has the best possible chance of being reused with the least amount of damage. This requires know-how and labour hours. The material must then be transported to a storage facility where it is kept for an (often indefinite) period of time.

Because primary raw materials are not expensive, manufacturers still work in a linear business model and transport and storage are relatively easy (as companies have been used to doing for years), a shift to 'reusing building materials' is not cheaper.

Aesthetic and hygiene requirements

In a 30-year-old home, the washbasin still appears white. As soon as it is reused in a newly built house, however, the colour turns out to be less white than

previously thought. Despite years of good maintenance, brushing your teeth at a sink previously used by strangers turns out to be not so pleasant.

Technical requirements not guaranteed

Contractors know their trade inside out. They know that certain materials, such as load-bearing beams, can still be perfectly reused and carry the roof of a subsequent home for years to come. However, without a certificate or other valuable warranty, the contractor will not reuse the beam because of his 10-year liability.

Ignorance residents

Builders choose their building materials from local traders. In doing so, they are not given the full picture of the raw materials for their chosen product. If builders knew that mines are required on the other side of the world under a regime of child labour, their preference might be different.

A resident does not worry about whether his home is reusable. After all, that is often the problem for the next owner. His home is no more or less comfortable, no more or less valuable, if the parts are reusable.

Image

There are preconceptions about reusing materials (or more generally: about second-hand products or clothing). It often does not resonate with comfortable or luxurious living. 'Consumers of the second-hand market are stingy or cannot effectively afford new products.' Second-hand products are dirty and/or worn out. And so on.

Anything else?

Are there any more thresholds than the ones listed here? Feel free to get in touch!

Possible solutions

Lowering thresholds

'What if... there are no new raw materials left?'

No raw materials

To take big steps towards maximum reuse of building materials, it is necessary to adopt the following starting point: *'What if... there are no more new raw materials?'* If we can only build with existing materials and products, the construction industry will have to organise itself in a completely different way. Let's not wait for that day to come, but anticipate it through innovation and prevent it from ever happening.

Education and knowledge

Learning from an early age that you don't have to default to new things as a consumer will change the mindset. The image of 'second-hand' will automatically improve. Teaching materials in primary and secondary schools can also provide insight into where our building materials come from.

Materials platform

Offering available secondary building materials online links the supply and demand sides. Indicating from when the materials are available will allow an architect to take this into account in his design or the contractor in his calculation of transport and storage.

~~Waste~~ raw materials

A product is called 'waste' as soon as it ends up in the dumpster. As long as that does not happen, a product retains its value. Therefore, at the end of its use phase by the consumer, a product will be a 'raw material' rather than a 'waste'. And then the consumer throws it in the 'raw material container'. An undergraduate thesis is being launched at the Applied Psychology programme at AP University of Applied Sciences (academic year '25-'26) to map the impact of this changing use of language.

Refurbishment

By refurbishing, repairing, polishing, etc., building materials and products can be made to look 'like new' again. Hygienic and aesthetic requirements are restored. This role can be played by manufacturers who - in addition to their current production process

with primary raw materials - can start up a new production line for upgraded secondary products. Some products also carry a history, which can add value.

Label for circular buildings

Analogous to an EPC label, a materials label could add value to a building, encouraging its owner to work with circular materials. Currently, the M-level is being considered by OVAM for implementation from 2030.

Entanglement path demolition inventory?

Extending the current procedures for preparing a demolition inventory to all demolition sites will bring more raw materials back into circulation.

Mandatory share of reuse in specifications?

Architects can tender and build circularly. So is a requirement necessary? 'If the right companies find a match with each other, innovation arises naturally. Intrinsic initiatives are much more valuable than having to comply with obligations from the government.' ~ Paul De Bruycker, chairman Flanders Circular in panel discussion Thinking Day Circular Links at IVM Environmental Management.

Solutions in other sectors in Belgium

Recytyre

This environmental contribution is paid by the consumer when purchasing new car tyres. At the end of usage period, the collector is paid with this contribution. The 'old' tyres are recycled or offered on the second-hand market.

Recupel

This environmental contribution is paid by the consumer when purchasing new electro-appliances. When the period of use ends, Recupel collects the electro-appliances, paid for by this contribution. After repair, the 'old' electro-appliances are offered on the second-hand market via second-hand shops. Appliances that can no longer be repaired are recycled.

Bebat

Companies offering batteries on the market pay an environmental contribution. Consumers can return them to a Bebat collection point free of charge at the end of the usage period. After careful sorting, the raw materials from the batteries are recycled.

Solutions abroad

Extended producer responsibility for construction products in France

Producers and importers of construction products pass on an environmental contribution to consumers. The French government has recognised four eco-organisations for managing construction waste, to which producers must be affiliated.

Collaboration

'Alone you go faster, together you get further!'. It is imperative that all building parties are involved in the story. The basis of sustainability is system thinking: look at what the impact of a given solution is on all levels and from everyone's perspective.

Drawing up a covenant would already put the noses in the same direction. With every solution, it is necessary to test it with every actor in the building sector, even if they are not directly involved in the new idea.

Focusing research VaReBo

Not every solution will cover the full load. Depending on a particular materials group (such as finishing materials, structural materials, piping and techniques, external joinery,...), one or another solution will be more suitable.

Based on input from all construction-related sector associations and their members, the focus of further research will be determined. The chance of success of a solution is so much greater if it is supported by those who have to work with it in the field. Support gives success!

We are only researchers, we know nothing, but we can bring people together. 😊

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Annemie & Joris