



City hall Roeselare. © STUDIOPOINTU / Stad & OCMW Roeselare

circular economy

## Local circular construction: starting with circularity in your municipal construction and renovation projects



*Façade O.666, Oostende © OVAM*

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# Embodied CO2: the missing link for a future-proof, low-carbon built environment

In Flanders, the construction sector is every year responsible for approximately 15 million tons of waste.

Globally, buildings are responsible for 40% of CO2 emissions, of which 11% comes from the use of building materials, so-called 'embodied CO2 emissions'. These embodied emissions are created during the extraction of raw materials and during the production and transport of materials. In Flanders too, construction and demolition activities (including steel, concrete and cement) are responsible for 5-12% of national CO2 emissions.

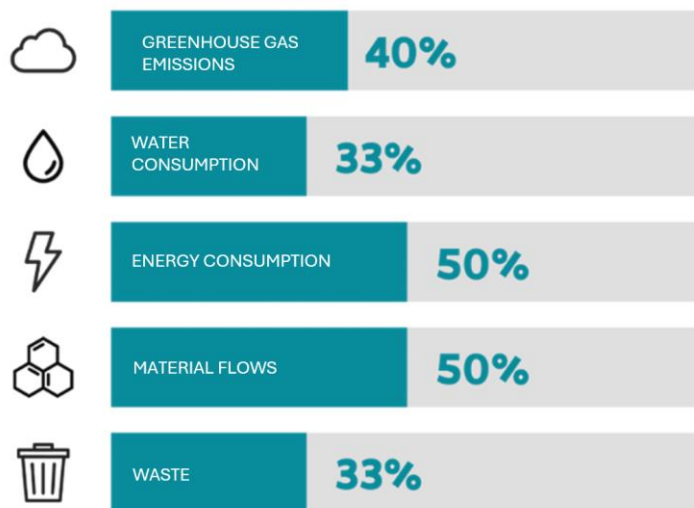


Figure 1 Construction sector's share of emissions and resources (translated)

Source: <https://bouwen.vlaanderen-circulair.be/en/what-is-it#:~:text=In%202019%2C%20the%20construction%20sector,percentage%20of%20global%20CO2%20emissions.>

it#:~:text=In%202019%2C%20the%20construction%20sector,percentage%20of%20global%20CO2%20emissions.

The Flemish municipalities already show a clear commitment to reducing emissions and mitigating the consequences of climate change. In recent years, the focus has been on reducing energy consumption, the so-called operational energy (responsible for operational emissions), but now the challenge lies in tackling the 'embodied CO2'. This can be done by responsible use of materials, extending the lifespan and preventing loss of value of materials and buildings. Circular economy offers various solutions for this.

## Why should your municipality start with circular construction and renovation?

Circular construction and renovation is not only important from a CO2 perspective, but also serves a local economic and social interest. By using materials efficiently and making maximum efforts to reuse, we can overcome the above challenges without putting additional pressure on the environment and natural resources.

## Circular construction and renovation for a future-proof built environment

We do not know the exact needs associated with our use of buildings in 50 years. It is therefore better to make them adaptable, taking into account the known societal challenges:

- Extreme weather phenomena, such as heat waves and floods
- By 2050, Flanders is estimated to have approximately one million more inhabitants, but we will have less space and fewer raw materials
- Due to family decline and aging, other forms of housing are required

Circular construction and renovation offers an enormous opportunity to make our buildings future proof: temporary, flexible, adaptable, movable, retrofit and expandable, etc. Moreover, such future proofing increases the chances of retaining the value of buildings.

## Circular economy strengthens the local and social economy in the long-term

The local production and reuse of building materials provides additional employment. This often creates jobs for people who would otherwise have fewer opportunities on the labour market. The circular economy therefore also creates jobs within the social economy.<sup>i</sup>

Circularity in construction is about reuse and recycling, but also about management, maintenance and repair. Because circularity considers the entire lifespan of a product, it also offers additional long-term certainty for service companies in your region.

## Towards a healthy living environment

A comfortable home and neighbourhood is something we all wish for. It is important to create sufficient space for greenery. This can be done, among other things, through efficient use of space. Additionally, products are often not designed with health and well-being in mind: consider, for example, the use of insulation material or glue. In circular construction it is possible to manufacture and use products that consist of non-harmful materials and that can be reused in a high-quality manner.

## Affordable buildings through less consumption and less waste

Our buildings must remain affordable. This means that it is necessary to find creative solutions to keep costs as low as possible in the short, medium and long term for users, society, the planet and the generations to come.

Circularity requires considering the avoidance of new buildings, or building differently (i.e. with alternative approaches). This means that you ask yourself whether a new building is necessary, and even choose to combine different functions of a building.

If a new building or renovation proves to be necessary, choose a circular construction method. The initial cost may be higher, but the future costs of a circular solution will indeed decrease in the long term. Circular construction reduces maintenance costs, reduces the amount of required materials (and ultimately waste) in all phases of a building's life, leading to a clear price gain.



Figure 2 Sub-themes of circular construction according to Kamp C (translated).  
Source: <https://www.kampc.be/tcentrum/circulair-bouwen-t-centrum>

# Five principles for a well-thought-out circular construction policy

The Flanders 'Ambition map' distinguishes five goals for circular construction. The most important principles for local authorities are highlighted here:<sup>ii</sup>



## Minimise the total **AMOUNT** of materials

- *View the demand for space from a 'needs perspective'. Is additional space necessary or can the demand be met within existing buildings and spaces? Can you join an existing operation through agreements about use?*
- *Ask the question whether new construction is better than renovating an existing building or infrastructure and take into account the environmental impact of new raw materials.*
- *Save space and materials by encouraging small-scale housing, shared functions (bicycle racks, laundry room, parking, garden, heating at district level) and forms of home sharing in the municipality.*



## Minimise the **ENVIRONMENTAL IMPACT** of materials

- *Choose materials and construction solutions with a lower environmental impact. The total environmental impact of materials can be optimised with a Life Cycle Analysis (LCA), for example via the TOTEM tool<sup>iii</sup>. One option is to choose bio-based materials if they have the desired performance characteristics.*
- *Choose and promote reused parts, materials and products when building or renovating.*



## Extend the **USEFUL LIFE** of buildings

- *Design for a long service life. Maximise the value of the building and its components, optimise value retention and the potential for value recovery.*
- *By designing for the future, buildings can be adapted to other needs without much expense. Examples include modularity, portability and integrating opportunities for conversion.*

- *Promote the preparation of maintenance contracts, post-intervention files and building services manuals.* And if this happens locally, it is good for employment in the region.



### Maximise the REUSABILITY of elements

- When determining the specifications for a construction or renovation project, you *emphasise opportunities for reuse of certain elements and materials during the building process.* You can include this by, for example, using performance-oriented criteria through public procurement, thus challenging the market to consider reuse.



### Maximise the REUSABILITY OR RECYLABILITY of materials

- *Promote the preparation of detailed demolition and reuse inventory* – prior to renovation or demolition. This is not always easy, but definitely worth it for larger projects.

## Overcome bottlenecks by working together

Cities and municipalities have important responsibilities for the built environment and are well placed to take the lead and promote local transition. The principles mentioned mainly focus on the role of local authorities as client and as a purchaser. But in addition to these roles, they also have responsibilities as representatives of citizens and policy makers.

Local authorities are therefore important players in influencing the use of materials and the retention of value of materials in buildings. They can integrate the circular economy into their policy plans, as some have already done for local climate plans, renovation strategies, demolition policies and waste policies. For the upcoming legislative term, we want to encourage local authorities to include the above aspects of circular construction in new multi-annual plans.

If circular and future-proof construction were so easy, why don't we do it yet or not always?<sup>iv</sup> As a matter of fact, Flemish cities and municipalities have already identified the most

important bottlenecks: lack of knowledge, stakeholder involvement, finances and cooperation. By working together, we can overcome these bottlenecks:

- *Sharing knowledge:* Circular Flanders<sup>v</sup> and the Association of Flemish Cities and Municipalities (VVSG)<sup>vi</sup> help - together with a series of European initiatives, such as Circular Cities and Regions Initiative (CCRI)<sup>vii</sup>.
- *Involve stakeholders:* involve citizens, companies and local authorities.
- *Facilitate financing:* To start with, there is a need for the right pricing and taxation. But there is indeed financial support available - from Flanders and from Europe in the form of subsidies, premiums or loans. Technical assistance is also available to help circular construction projects and their feasibility.
- *Promoting cooperation between government services:* necessary, for example, for preparing and executing innovative government contracts.

## Examples of successful circular building projects

### Oostende: Making a city together (O.666)

O.666 organised the transition from a former fishing cooperative to a shared space for artisans, citizen initiatives, social, ecological and artistic organisations. Every actor contributes and has a say.

[More info](#)

### A temporary knowledge centre: De Potterij - Mechelen

The Public Waste Agency of Flanders (OVAM)<sup>viii</sup> and the city of Mechelen wanted to maintain artisanal production in the city at the “De Potterij” (a centuries-old workplace in the city) and a circular approach was chosen from the start.

Labo Leegstand<sup>ix</sup>, an initiative supported by Circular Flanders, was given an experimental space in the Potterij to develop expertise in modular and circular construction. Typically, when using a space temporarily, people often fall back on fast and cheap 'disposable' construction systems. However, the market for circular building materials is already sufficiently mature to also be used for temporary use. Places for temporary use are an ideal training ground for the further development of circular and modular building systems. Labo Leegstand investigated what interventions are required for temporary and flexible use of the vacant buildings and looked for suitable modular construction systems.

[More info](#)

### The Circular School of the Future - Oudergem

A change-oriented design with a flexible structure is an important first step. Commitment at material level only follows afterwards. After all, the social benefits of circular building design are greater than that of the use of circular materials for only a specific part of that building.



[More info](#)

## Innovation with local stone – Design Museum Ghent

The project conducts technical research on the development of a circular brick façade from local raw materials including waste, as well as legal research into the way in which governments handle public procurement. The project combines legal guidance, design research, technical expertise and knowledge throughout the entire development process of the public construction project. In this way, the project partners hope to contribute to the principles of circular construction and become a source of inspiration in Flanders and beyond.

[More info](#)

## New Town Hall Roeselare

The design of Roeselare City Hall has been awarded the [Belgian Construction Award 2021](#). Not only was the demolition waste of the old building given a new life, but many types of other building components were reused by other actors (from furniture to lighting and even radiators). For example, more than 50 schools and associations brought back second-hand kitchens, cupboards and office materials.

[More info](#)

## More info and resources

There are already several ongoing regional initiatives to promote circularity and decarbonisation in the built environment:

- OVAM policy program 'On the Way to Circular Construction' ("Op Weg Naar Circulair Bouwen") that gives shape to these circular ambitions for the construction sector for the period 2022-2030
- OVAMs Green Deal Circular Construction ("Green Deal Circulair Bouwen") and Circular Construction Work Agenda: quintuple helix collaboration firmly anchored in Flanders.
- Interreg project KARMA (2023-2026) explores the possibilities to expand the Flemish Local Energy and Climate Pact ("lokaal energie- en klimaatpact, LEKP") with circular economy objectives for the built environment (with support from the Flemish Agency for Home Affairs as associated policy authority).
- Various publications and tools for action: Lokaal Circulair - Vlaanderen Circulair ([vlaanderen-circulair.be](http://vlaanderen-circulair.be))
- Different Flemish cities have signed the Circular Cities Declaration: Ghent, Leuven, Mechelen, Roeselare and recently Hasselt.
- Circular Cities and Regions Initiative (CCRI)<sup>vi</sup> is a European initiative (DG Research and Innovation) to share knowledge and provide technical and financial support to local and regional authorities to promote the circular transition.

<sup>i</sup> [Policy Brief Circular Jobs 2021 - Final.pdf](#) ([vlaanderen-circulair.be](http://vlaanderen-circulair.be))

<sup>ii</sup> <https://aankopen.vlaanderen-circulair.be/nl/leerhub/bouw>

<sup>iii</sup> <https://www.totem-building.be/>

<sup>iv</sup> See various publications and tools for action: <https://vlaanderen-circulair.be/nl/aan-de-slag/lokaal-circulair>

<sup>v</sup> <https://vlaanderen-circulair.be/en>

<sup>vi</sup>

[https://www.vvsg.be/Leden/Algemeen/VVSG%20stelt%20zich%20voor/2022\\_VVSG%20introduces%20itself\\_ENGELS.pdf](https://www.vvsg.be/Leden/Algemeen/VVSG%20stelt%20zich%20voor/2022_VVSG%20introduces%20itself_ENGELS.pdf)

<sup>vii</sup> <https://circular-cities-and-regions.ec.europa.eu/>

<sup>viii</sup> <https://ovam-english.vlaanderen.be/?showUserLocaleOptionsMessage=false>

<sup>ix</sup> <https://buur.be/en/project/pilootproject-potterij-mechelen/>