

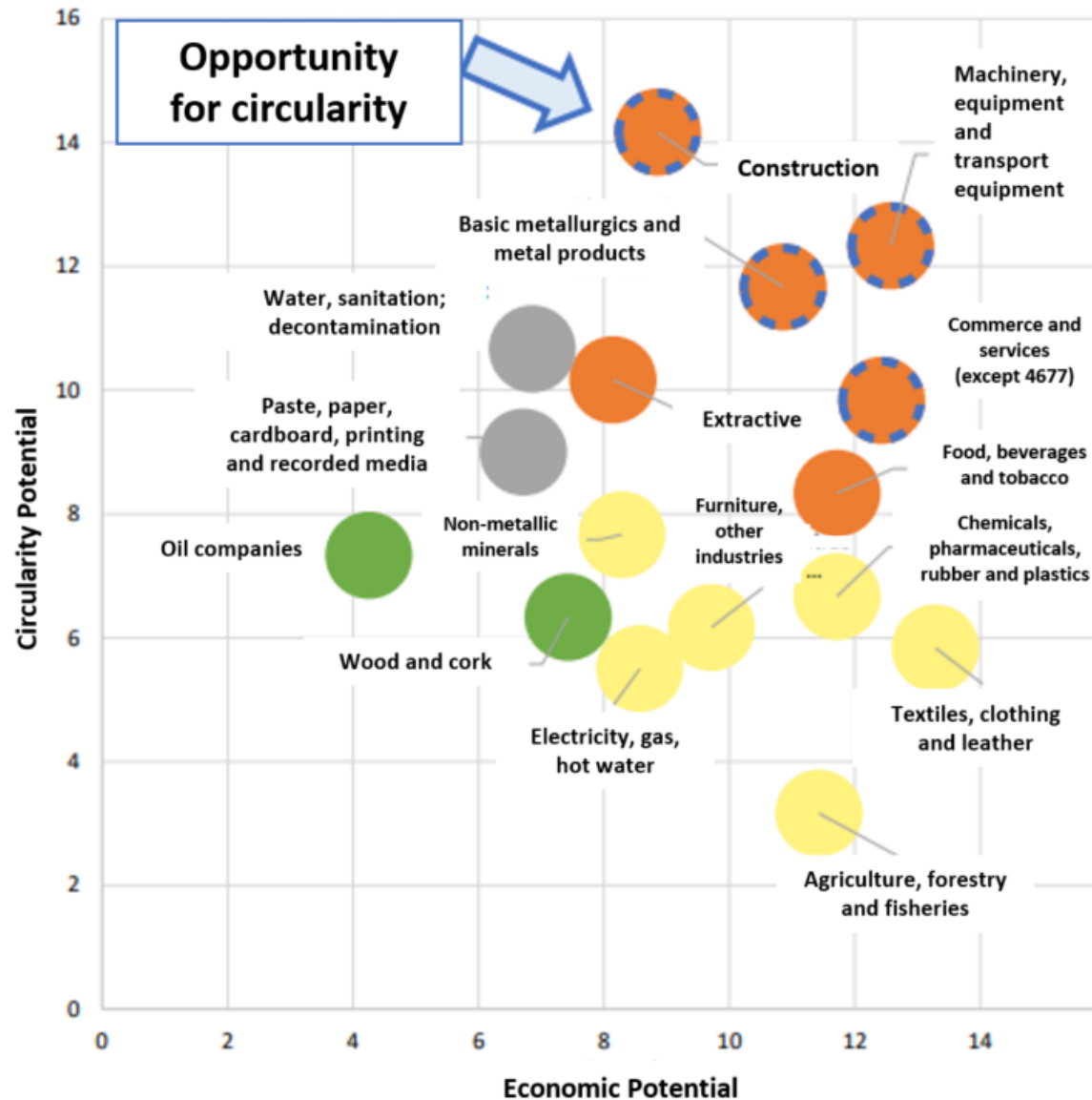
CircularBuild

Development and Validation of the Concept of Circularity

Applied to Modular Prefabricated Construction



Context



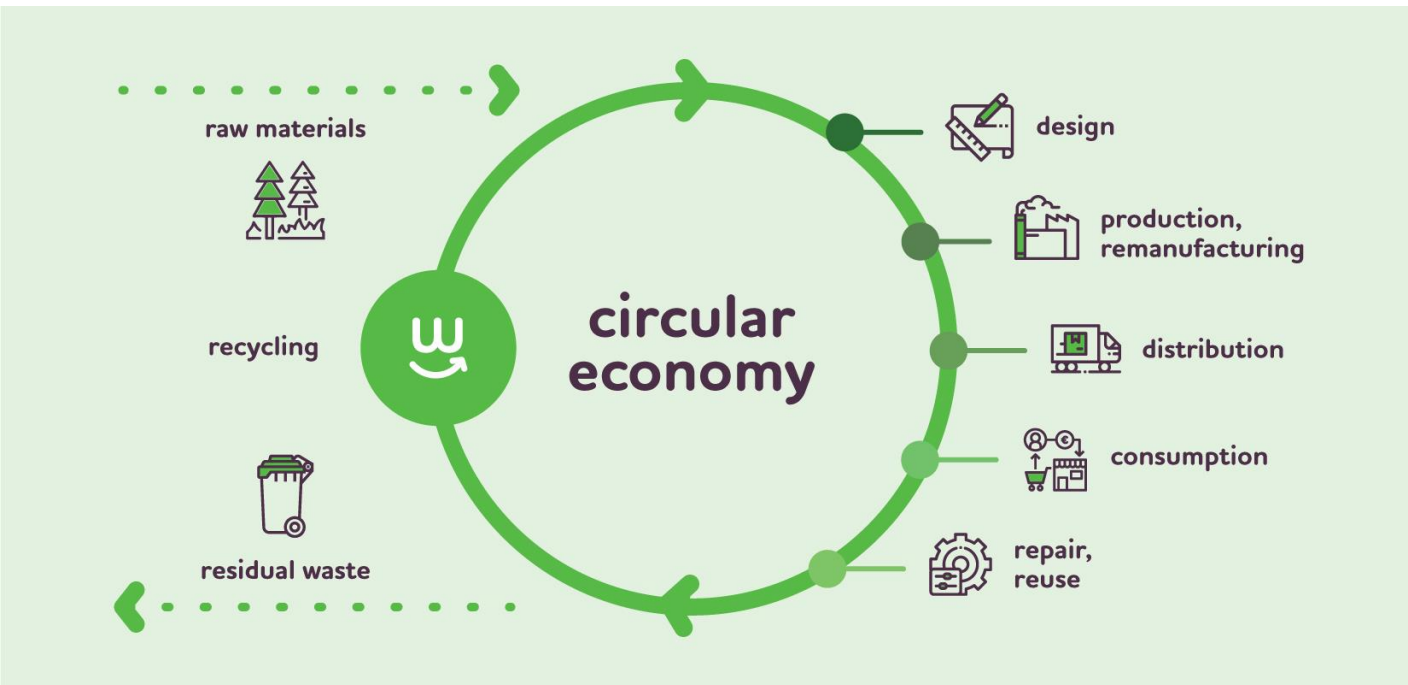
In Portugal, according to the data from the National Statistics Institute (in December 21, 2018) concerning 2017, there was:

- An internal consumption of materials increased by 6,2%;
- A material productivity decreased by 3,2%;
- An internal consumption of materials per capita of 15,9 ton



The construction sector is a key sector in the transition to a Circular Economy: it generates almost 10% of GDP and is responsible for 20 million jobs.

Context



- ✓ CONCEXEC owns a modular prefabricated construction system, comprised by a set of prefabricated panels;
- ✓ CONCEXEC's modular prefabricated construction system allows constructions with almost no energy needs, as well as minimal impact on the soil;
- ✓ As a result of the company's commitment to minimizing the environmental impact of construction, CONCEXEC intends to evolve its concept of modular construction to a higher level of sustainability.

Objectives



To investigate alternative materials for the panels



To enable the complete circularity of the modular panel production system



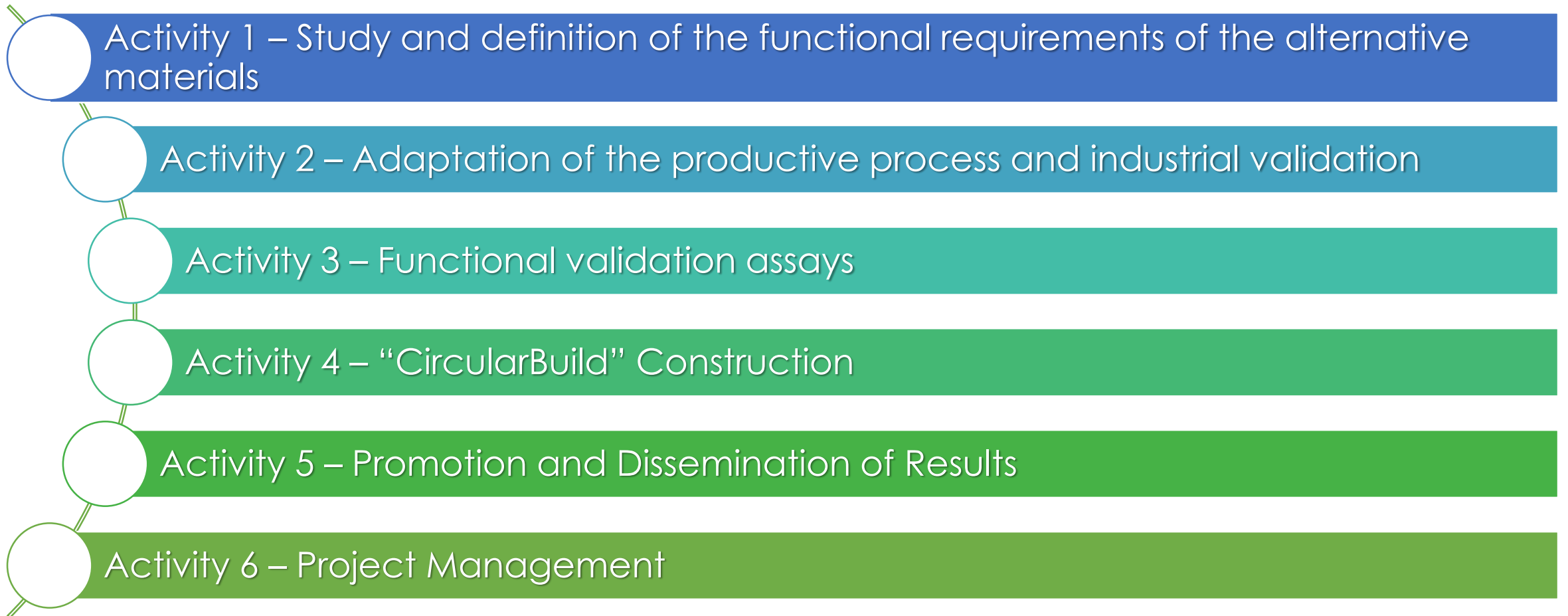
To totally reuse the waste generated by the "deconstruction" of buildings as raw material for new panels / new constructions

To maintain building performance in terms of energy efficiency



Methodology

This project is based on a 24-month Activity Plan, the results of which are expected to be long lasting, far exceeding the project's lifetime.



Presentation of the Consortium

In order to accomplish the goals set out in this project, a consortium was gathered to ensure the representativeness of the main players in the value chain and which stands out for its multidisciplinary and skills, means and resources complementarity



CONCEXEC

CONCEXEC
(project leader that owes all the R&D that underlies the CircularBuild system)



LNEC
(non-corporate entity that ensures the know-how and the physical and technical means for the functional validation of the new materials)



Cluster Habitat
(will ensure a full transfer of the know-how generated to the sector and the national coverage of the project impacts)



RISE
(Norwegian laboratory with skills and means to carry out specific fire resistance assays)

Results

Innovative pilot solutions to increase resource efficiency

01

Panels with satisfactory performance as well as not inferior to the traditional base solution under study

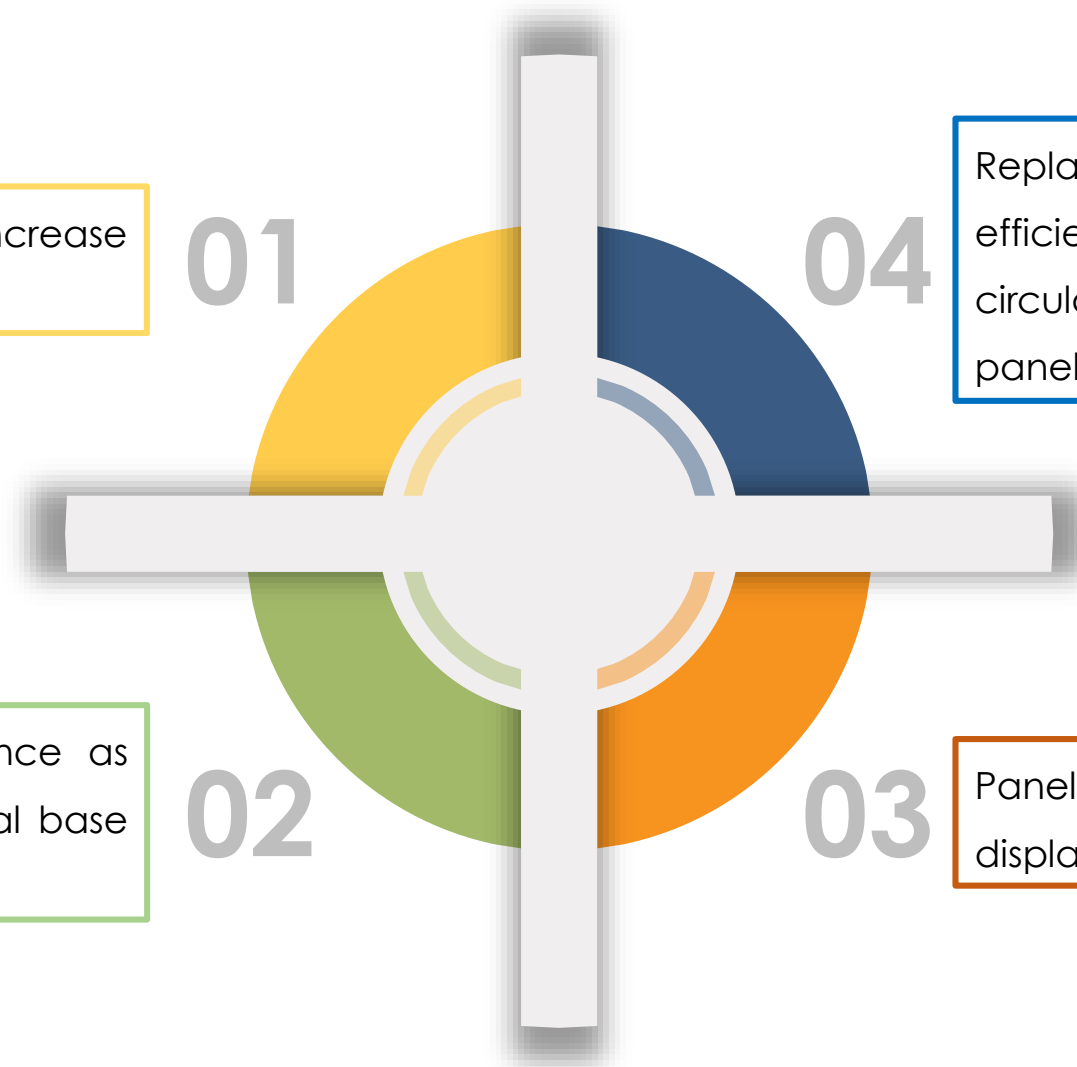
02

Replacement of materials by more energy efficient ones as well as with greater circular potential in the construction of the panels

04

Panels built with recycled materials that display industrial viability

03



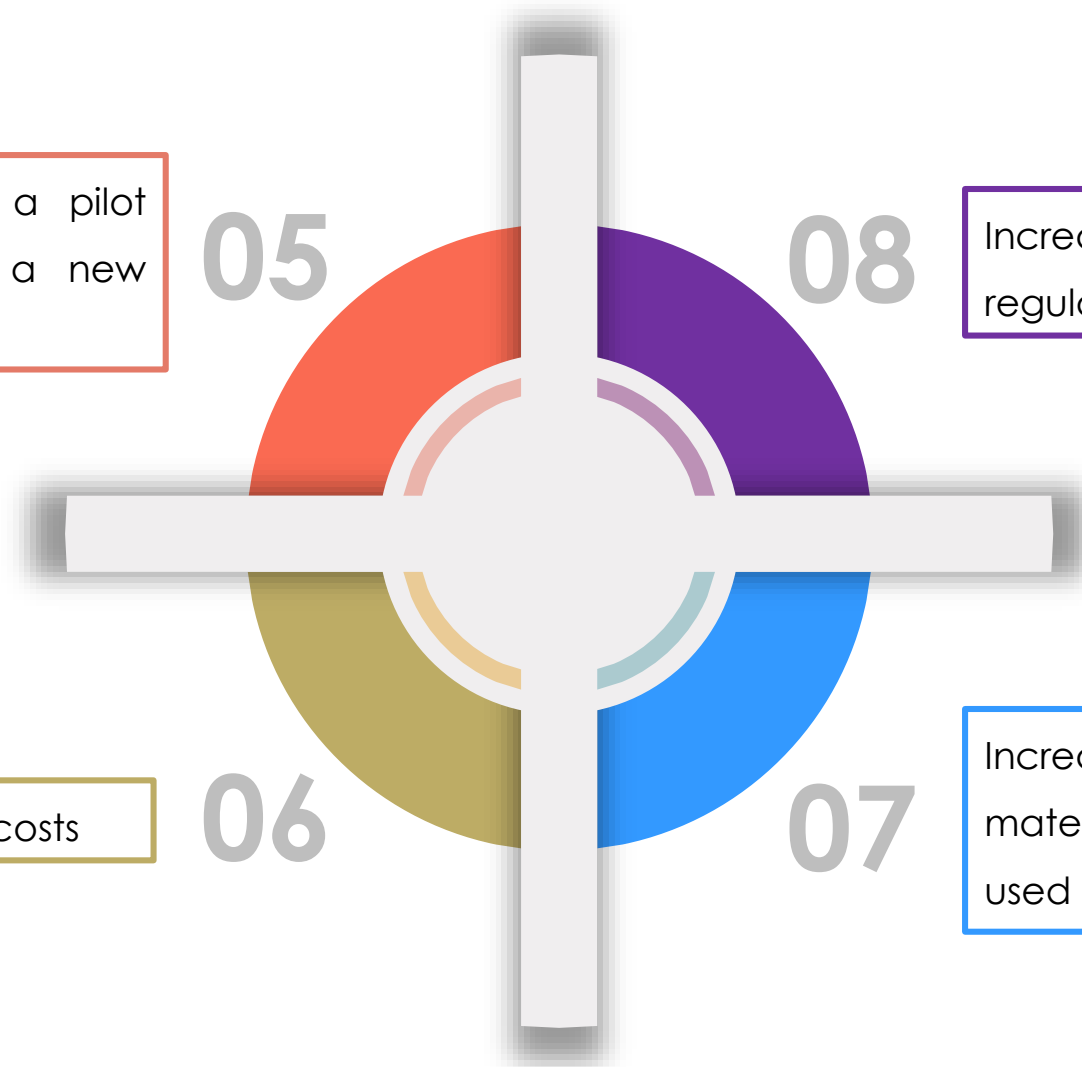
Results

Reused panels, after dismantling a pilot module, for the construction of a new module

Increased energy efficiency compared to regulatory values

Reduced manufacturing times and costs

Increased usage of secondary raw materials (resulting from the separation of used materials)



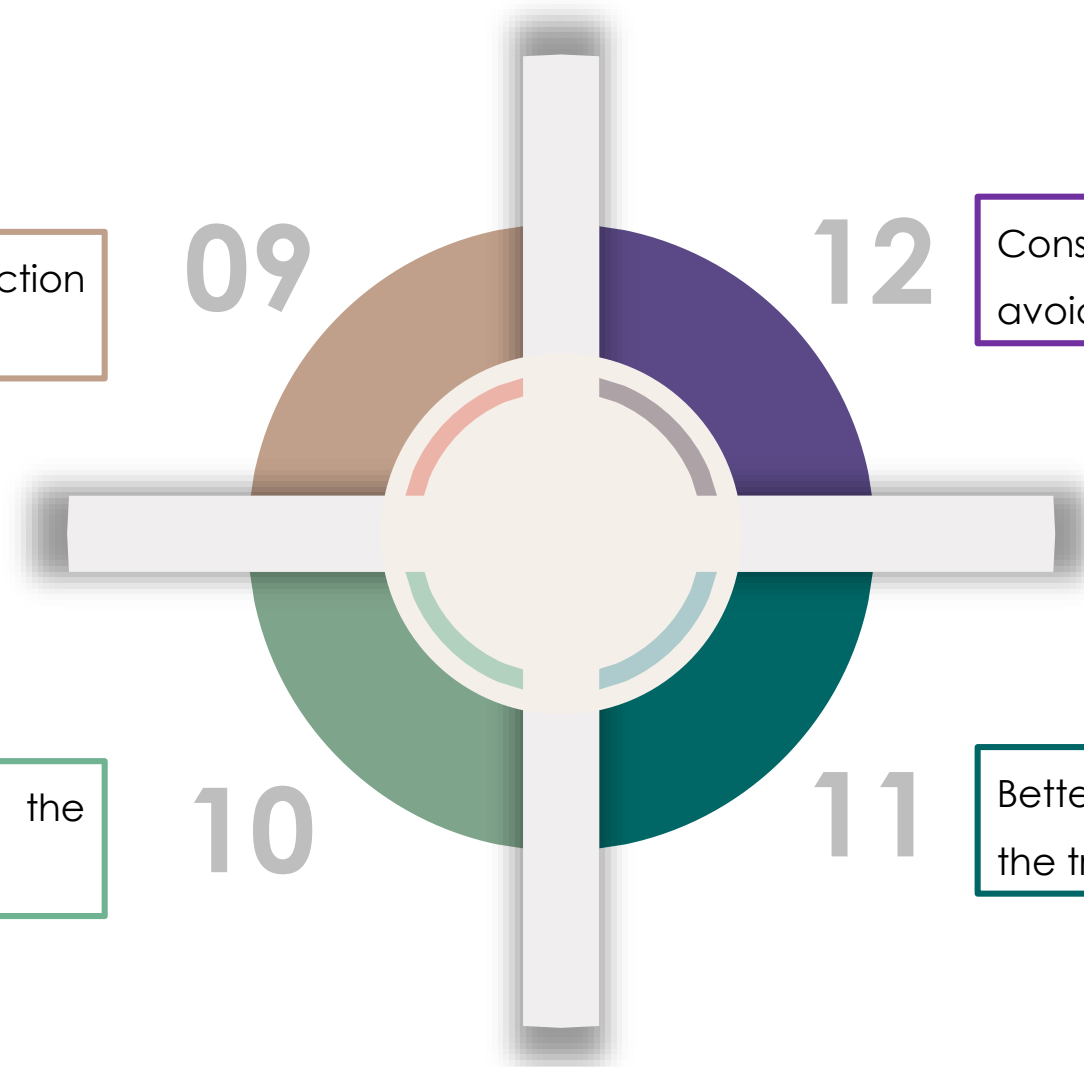
Results

Circular Economy in the Construction Sector

Better economic performance than the traditional base solution under study

Construction and demolition waste avoided in pilot construction

Better environmental performance than the traditional base solution under study



Expected Impact

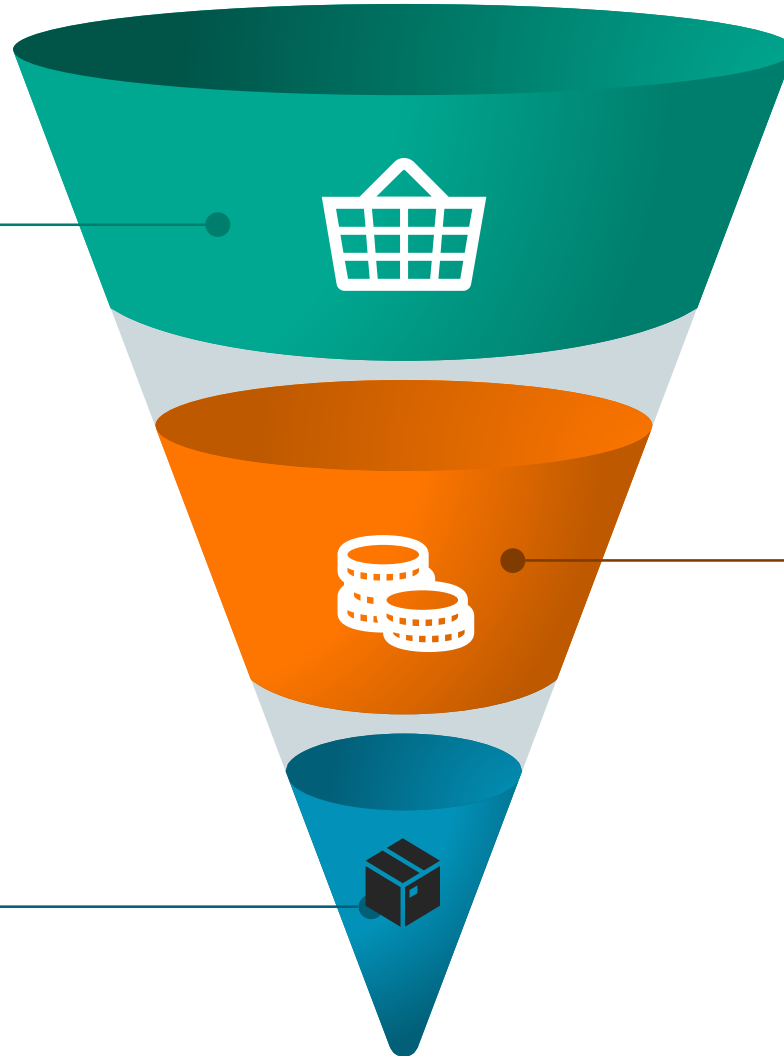
To increase the application of Circular Economy principles in the construction sector



To expedite the transition of the construction sector to a circular and efficient economy - Zero waste; Energy Efficiency and Material Productivity



To increase the efficiency in the use of resources in the construction sector



Conclusion

This project's impact broadly transcends the boundaries of its Consortium as well as the economic and competitiveness impact generated by each of the partners, moreover covering the entire value chain of the national and international construction sector. As such, it contributes to:

