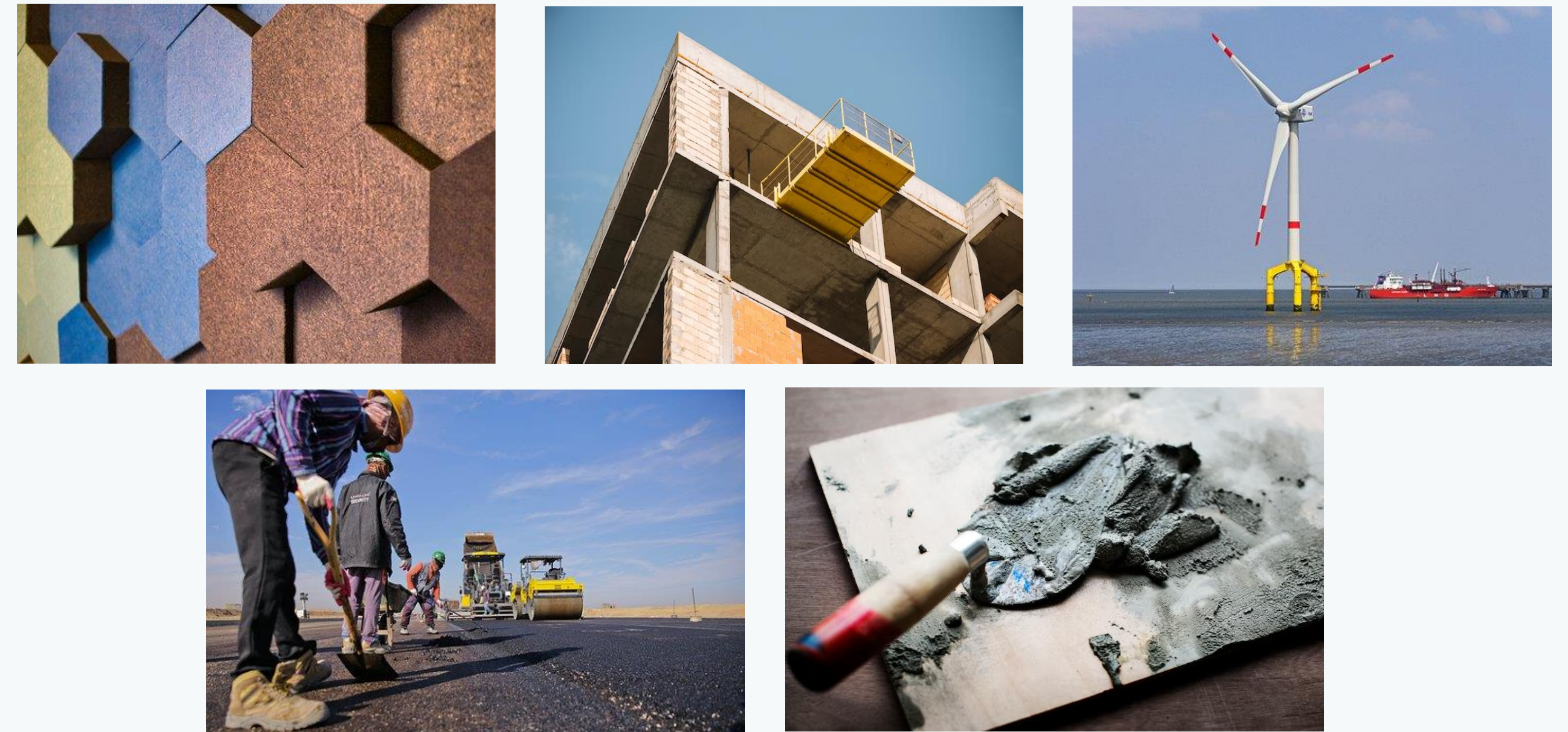


## Context

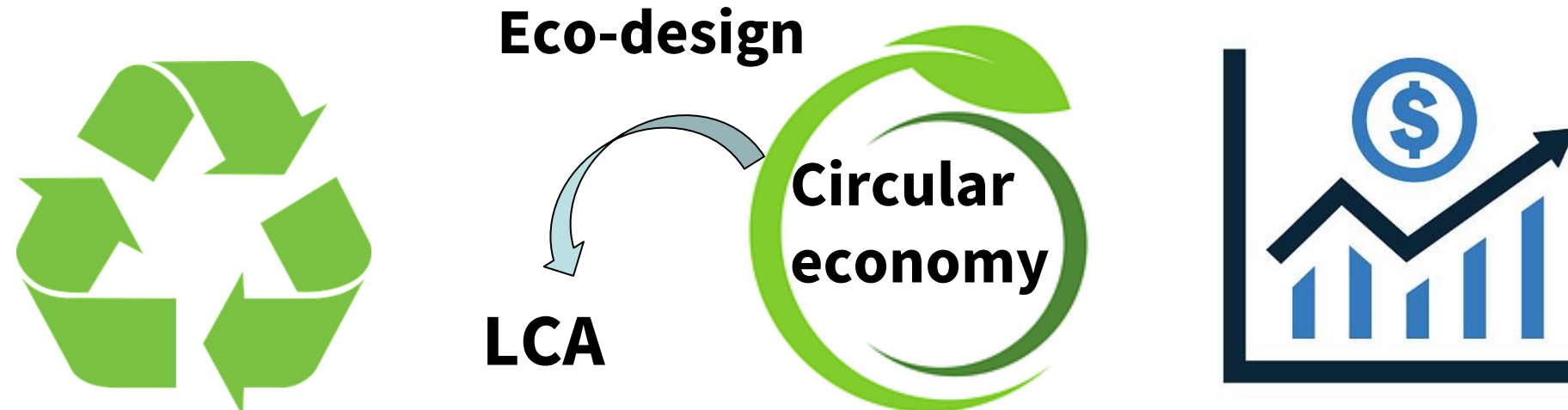
The **construction industry** is a significant contributor to environmental pollution, mainly due to the extraction of natural mineral resources [1]. In Wallonia, Belgium, the need for sustainable development has shifted the industrial interests towards reverse mineral industries. This study focuses on the **selection of local mineral wastes from deconstruction sites** to obtain materials with **equal or superior properties** and **minimal environmental impacts**. The study encompasses **5 projects** conducted under the ‘**REMIND**’ umbrella (Reverse Mineral Industry) aimed to use **Life Cycle Assessment** (LCA) as a decision-making tool to support **eco-design** and **strategic alternative choices** associated with targeted construction materials (insulating foam, concrete aggregates, high performance cement, self compacting concrete materials, and alternative binder materials for cements).



## Objectives

This study aims to promote a circular economy in Wallonia → waste recovery & efficient industries

- ✓ Identify local mineral wastes from deconstruction depending on the construction product
- ✓ Optimize materials with respect to specific application constraints and environmental impacts
- ✓ Identify new resource-saving and energy-saving technologies and alternative opportunities
- ✓ Market:
  - Upscale approach to identify potential markets
  - Offer a range of competitive product prices
  - Develop new sectors and value chains



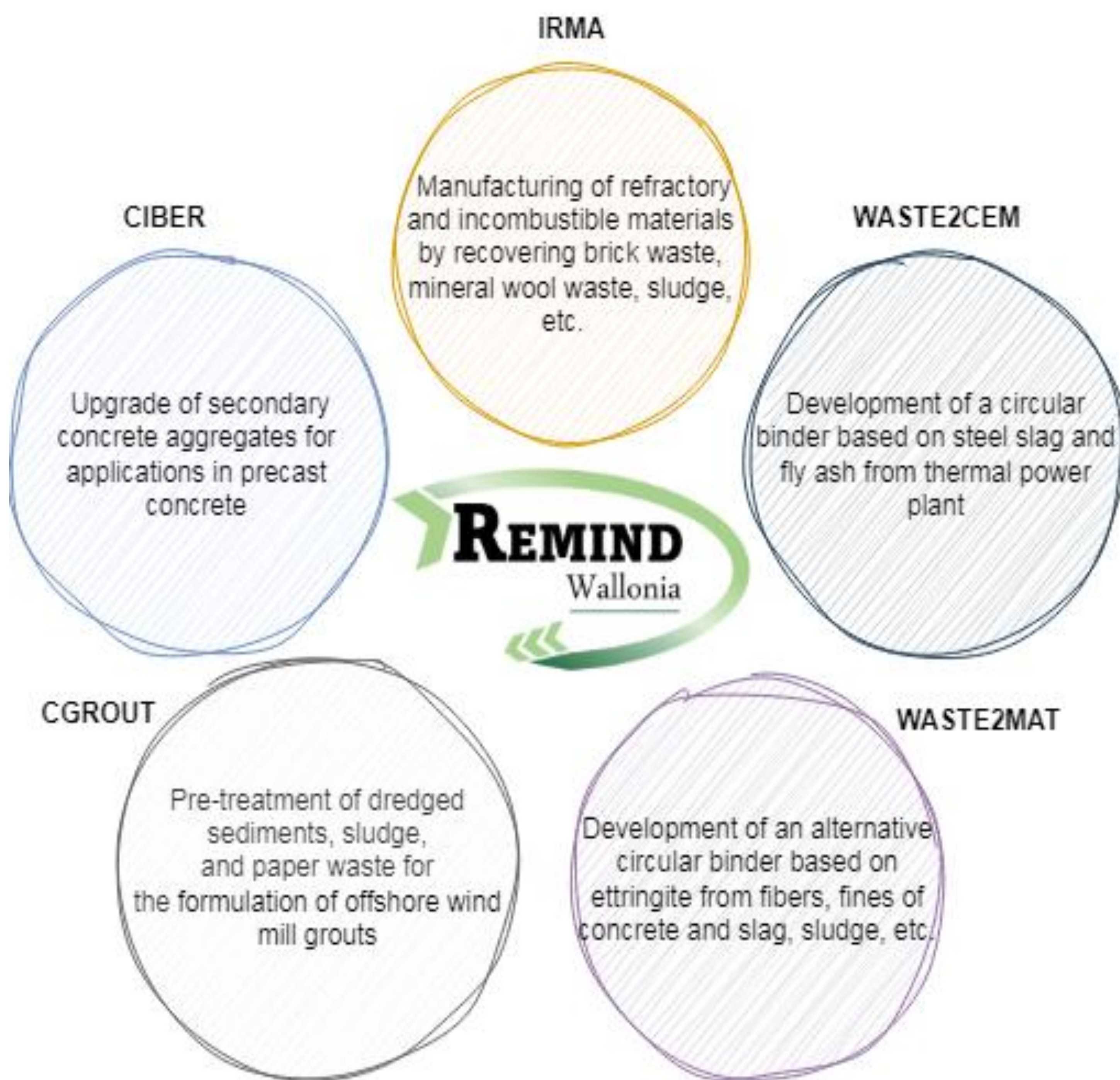
UCLouvain  
Eco-selection of materials

PEPs (ULiège)  
LCA of elements and systems

CTP  
Treatment and recovery of  
mineral wastes

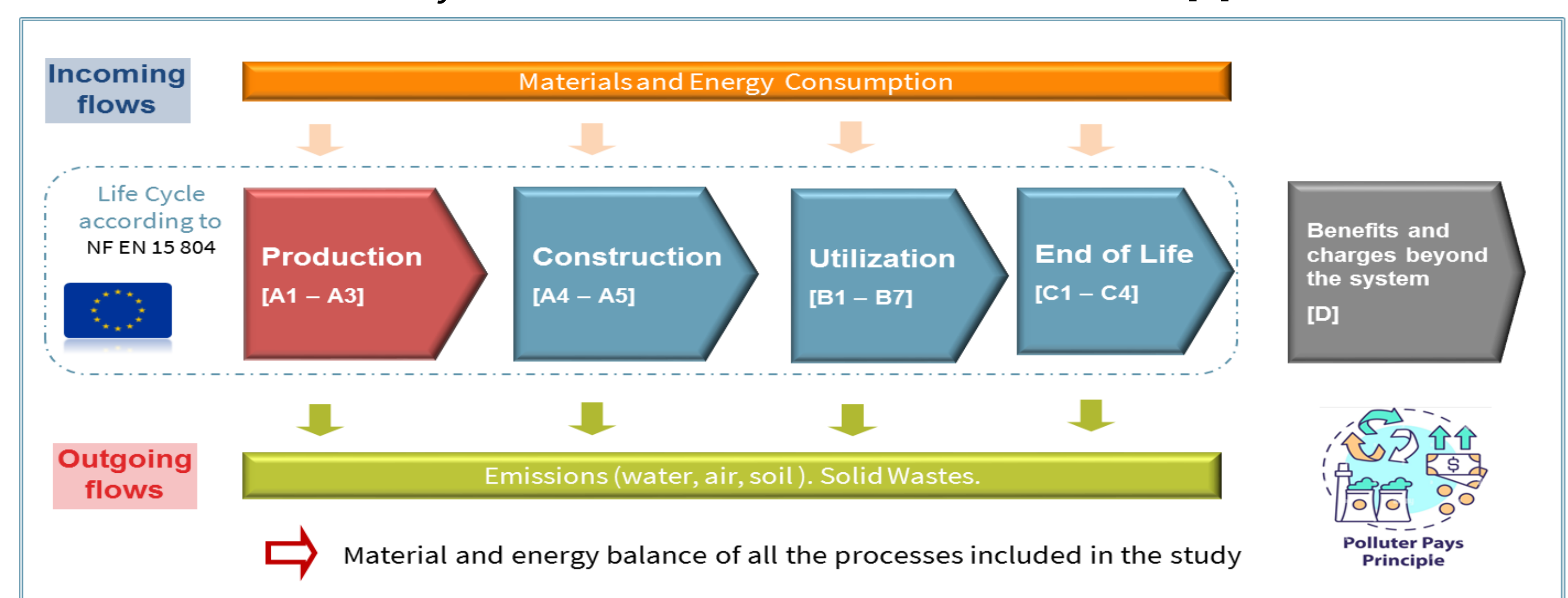
Industrials  
Access to raw materials  
(natural or waste) and  
industrial know how

## REMIND Projects



## State of the art (after 6 months) ⇒ in progress

- ✓ Primary data collection from industrials about raw materials + transport to production site + processing ⇒ *inventory and LCA*
- ✓ Secondary data from Ecoinvent 3.8
- ✓ Characterisation: - FU for each system  
- System boundaries based on EN 15804+A2 [2]



## Methodology

- ✓ Selection of local mineral wastes that are compatible with the industrial end products
- ✓ Case-by-case characterization of waste through laboratory analysis to determine physical, chemical and mechanical properties
- ✓ Evaluate the environmental impacts using LCA ISO 1440/44:2006 in a cradle-to-grave perspective for each scenario (traditional/new process + pre-treatment of wastes) -> ensuring compliance with environmental standards
- ✓ Material science optimization approach to study alternative materials (Ashby) [3]

## Projects and Partnerships

- ✓ **39 months for each project** - started in October 2022
- ✓ **2 phases**
  - Industrial Research → **GO/NO GO**
  - If Go -> Experimental Development and Upscaling
- ✓ **~ €18.7 million in budget (including €4 million in "pilots") ⇒ €11.5 million in subsidies (via the PNRR)**

- ✓ **Funded by The European Commission and Walloon Region and supported by GreenWin**



Scan me to know more about this project

### References

- [1] Stapleton, L. (2021). Mineral Resources. Encyclopedia of Ecology, 246-252
- [2] Ioannidou D., Foster. C., Symeonidis A., Muller J., Bourgault G., FitzGerald D., Moreno Ruiz E., (2021). Documentation for the 'Allocation, Cut-off, EN15804' system model, ecoinvent Association, Zurich, Switzerland.
- [3] Ashby, M.F.. Materials Selection in Mechanical Design. Netherlands, Elsevier Science, 2016. Ashby, Michael F. Materials and the environment: eco-informed material choice. Elsevier, 2012.