Future perspectives for precast – BIBM vision

BIBM Decarbonisation Pledge

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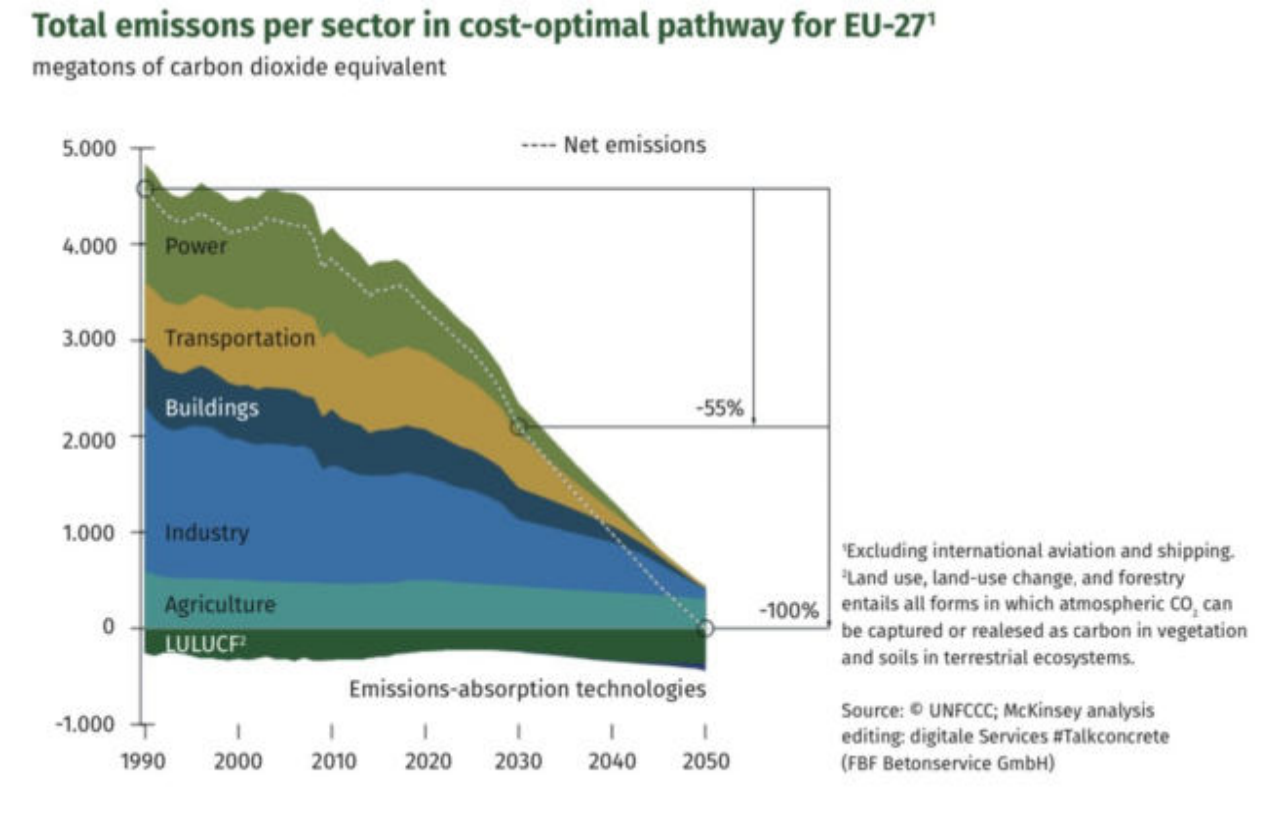
The Net-Zero Timeline

Go to

ZERO



Why this document?

- To **contribute** to **mitigate** climate change
- To **foster** stakeholder collaboration
- Precast concrete industry's **leadership**
- To **shape policy**
- To **inspire others** to act

General Structure

CORE

1. *Decarbonise the full structure during the entire life cycle*
2. *Embed circular economy principles*
3. *Involve the full value chain*

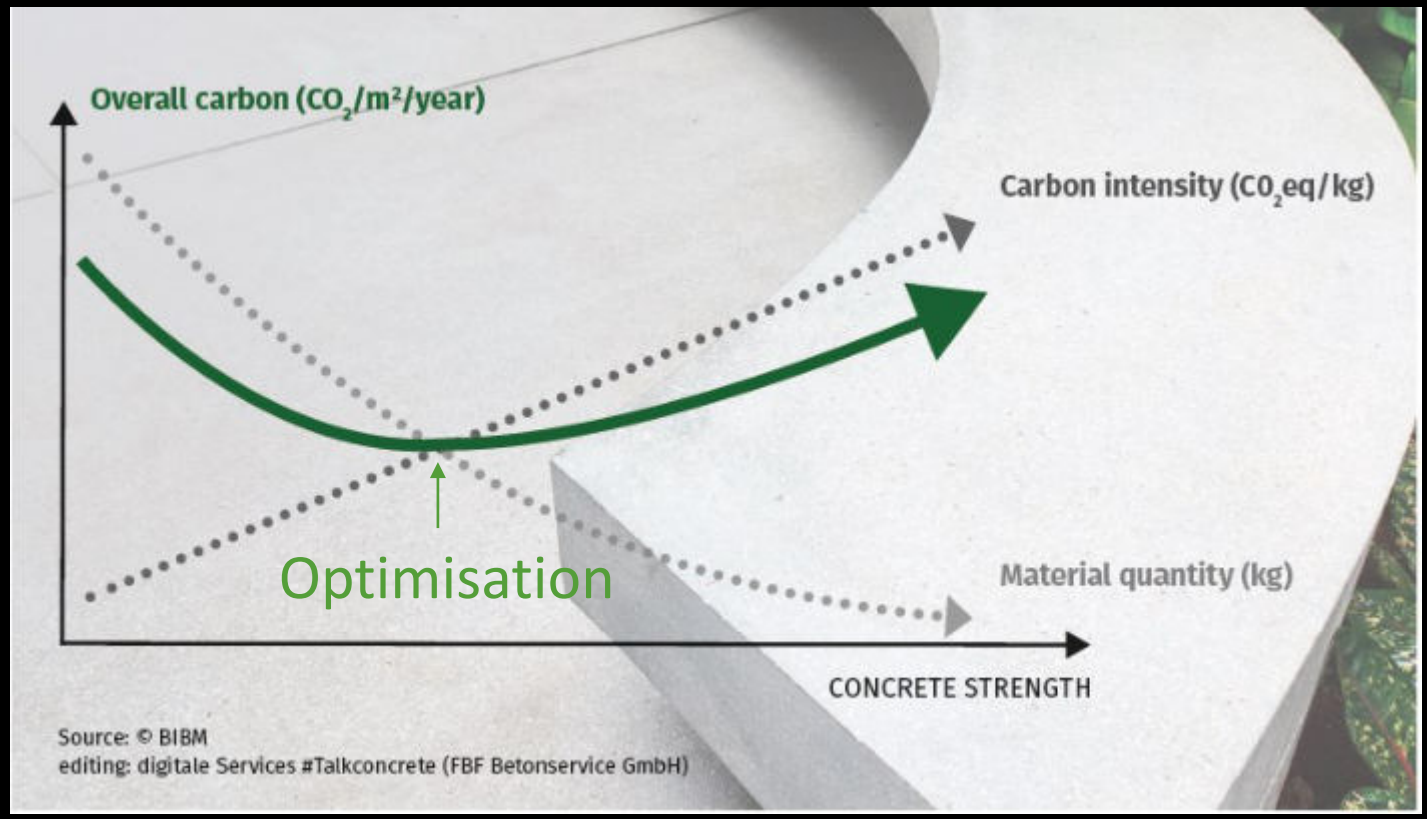
ACCESSORY

- The role of carbonation
- Enabling policy framework
- Roadmaps
- Standardisation

Cooperation is key!

1. Decarbonise Precast Concrete Works

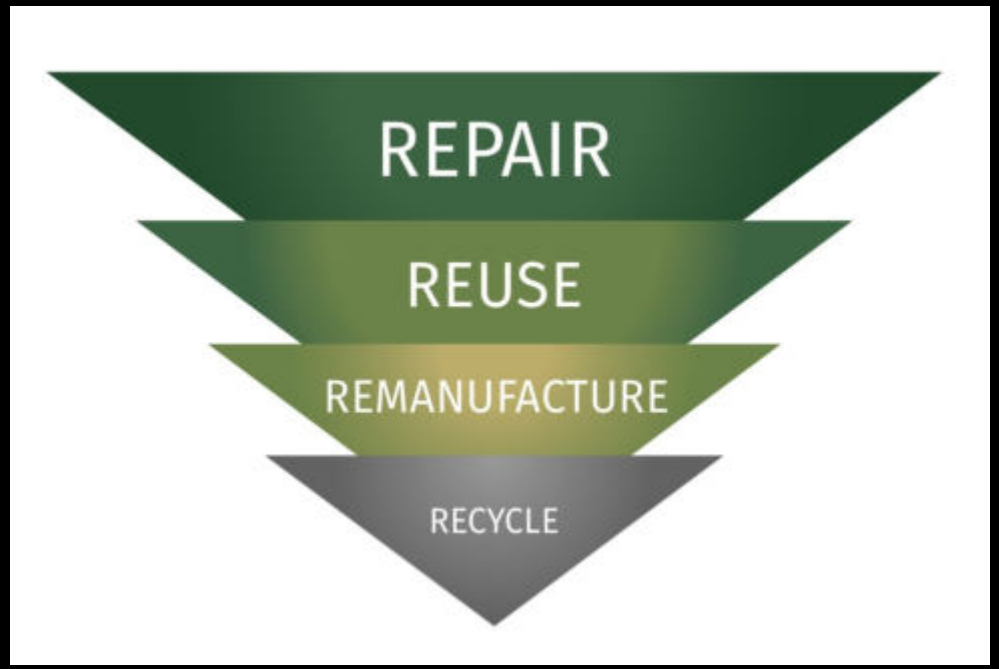
- ~~Low-carbon cement~~
- ~~Low-carbon concrete~~
- **Low-carbon (precast) concrete work**



A net balance of zero CO_{2eq} emissions

- For the whole structure
- Throughout the whole life cycle

2. Using circularity to reduce the whole-life carbon



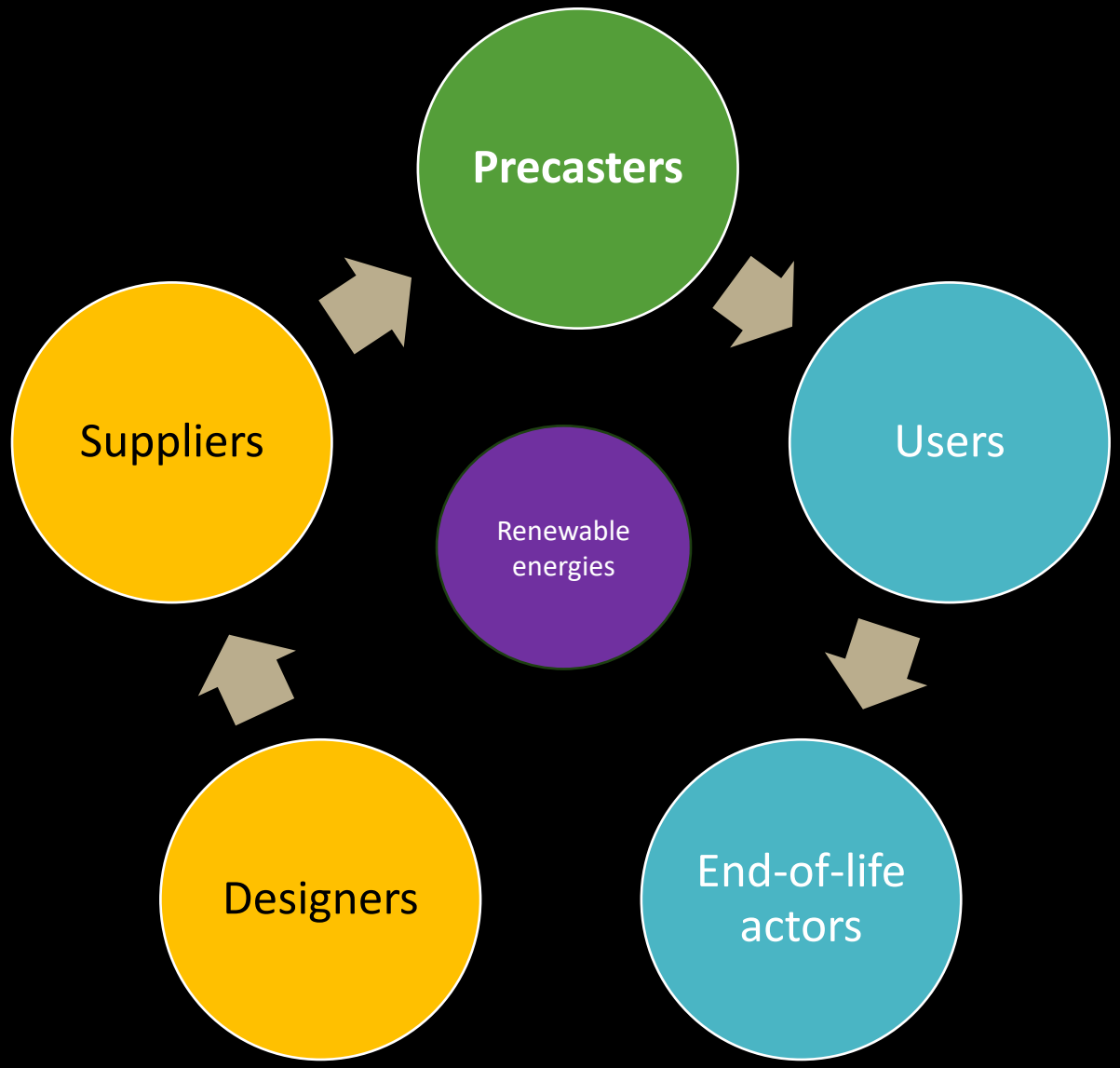
REPAIR - durability and the extension of product lifespans

REUSE - from a construction work that has reached the end of its service life into a new one

REMANUFACTURE – already used components are cleaned, repaired and combined to form new ones

RECYCLE – concrete to become secondary aggregates for new applications

3. Using the Value Chain Approach



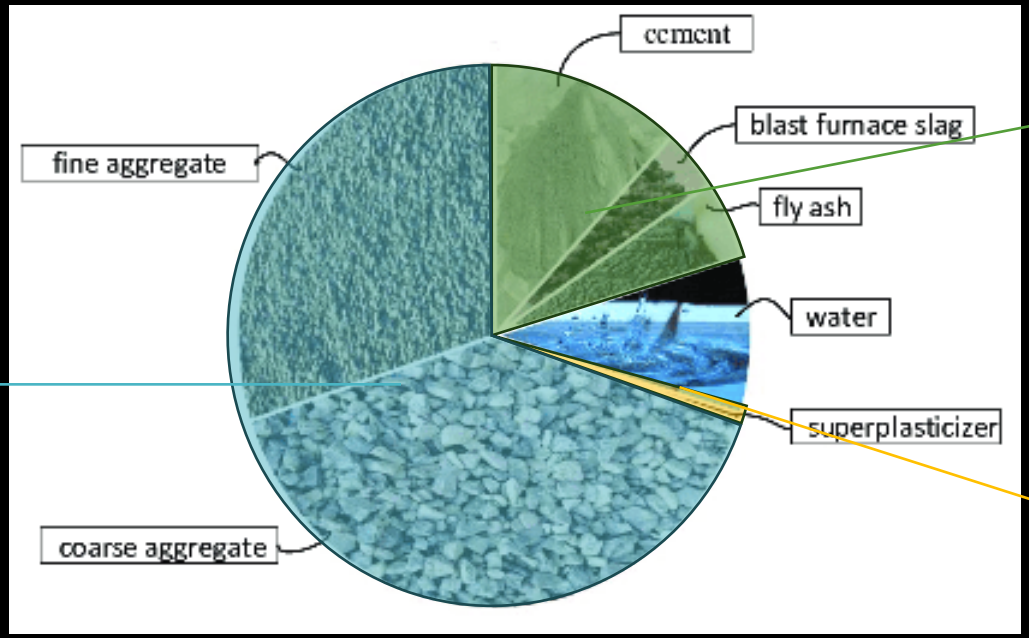
Decarbonising precast concrete works is possible by optimising the design, mix and transportation across the **supply chain**.

Design of precast concrete works

- Optimize concrete use
- Utilize lightweight concrete for efficiency
- Leverage digital tools for a smaller carbon footprint
- Design precast structures for easy reuse

Raw Material Manufacturing and Supply

- Promote low-carbon cement
  - Reduce clinker/cement ratio with alternative binders
  - Develop new binders
  - Invest in CCUS technologies



- Employ CO2-encapsulating aggregates

- Use cement-reducing admixtures
- Use admixtures that allows for using low-carbon cements

- Opt for low-CO2 reinforcement

Manufacturing

Design
- BIM/Digital fabrication – optimisation

Preparation
- Prestressing (thinner sections, longer spans)

Casting
- Concrete optimisation;
- Using higher strength concrete;
- Granulometry

Curing
- CO2 injection at curing

- Increase energy efficiency in manufacturing operations
- Electrification of precast plants

Further Reduction in the Emissions

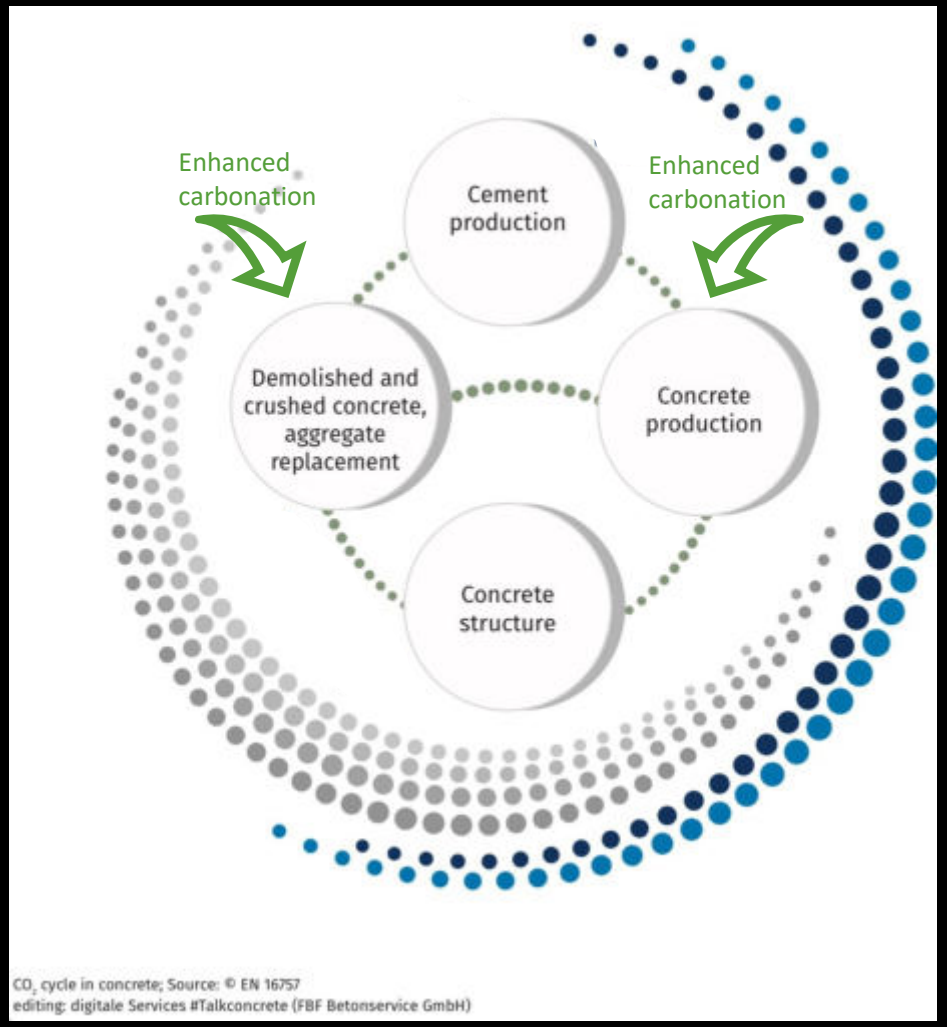
- Thermal mass
- Low maintenance
- Long service life
- Energy grids integration

Value Chain: End of Life

Further Reduction in the Emissions

- Disassemble and reuse
- Recycling into secondary aggregates for concrete
- Enhanced carbonation

The Role of Carbonation



- Natural Carbonation
- Enhanced Carbonation

Roadmaps & Standards

- Horizontal standards
- Concrete-specific standards
  - Available
  - Under development

An Enabling Policy Framework

- All construction materials to play a role (**material-neutral** policies)
- **Permanent carbon storage** (vs. temporary)
- Science-based policies - focus on **Life Cycle Assessment**
- Provide **a stable framework** with clear rules for industry to develop and invest
- Create a holistic framework that takes into account **whole life cycle**, **entire construction work** and **GWP** as one of the sustainability indicators

Conclusion

Concrete is the **second** most used material in the world (after water)

→ Small improvements in concrete sector in terms of carbon emissions will have a **huge impact**

3

pillars of the Pledge

→

1. Decarbonisation at the level of the **construction work** (during the whole life cycle)
2. The application of **circular economy principles**
3. The involvement of the **full value chain**

Science-based policies (applying life-cycle assessment methods)

→ Precast industry is committed to achieve a **sustainable** and **low-carbon** society through our solutions, based on minimizing **all environmental impact**.

THANK YOU!

DIGITAL VERSION

available on the
BIBM website