



WORLD MATERIALS FORUM

6th of July 2023



Introduction

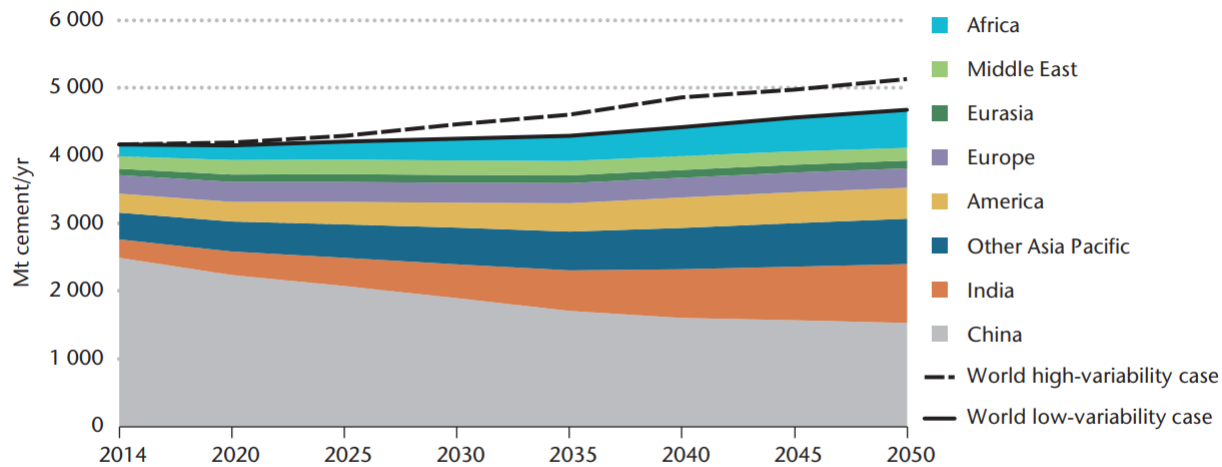
Concrete is the world's most widely used material.

It has revolutionized the global built environment for the past 200 years and it will remain the construction industry's preferred material, as it is the only one which can overcome the challenge of providing housing for an ever-increasing world population.

In 2020	
14.0 billion m³ 2020 volume of concrete globally	40% The percentage of total concrete production for residential market
4.2 billion tonnes 2020 cement production globally	\$440 billion The global cement and concrete products market value in 2020
By 2050	
9.8 billion Estimated world's population by 2050	68% Percentage of population living in cities

Source: GCCA

Cement production evolution by region



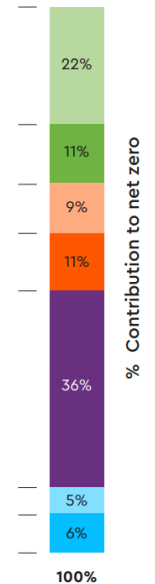
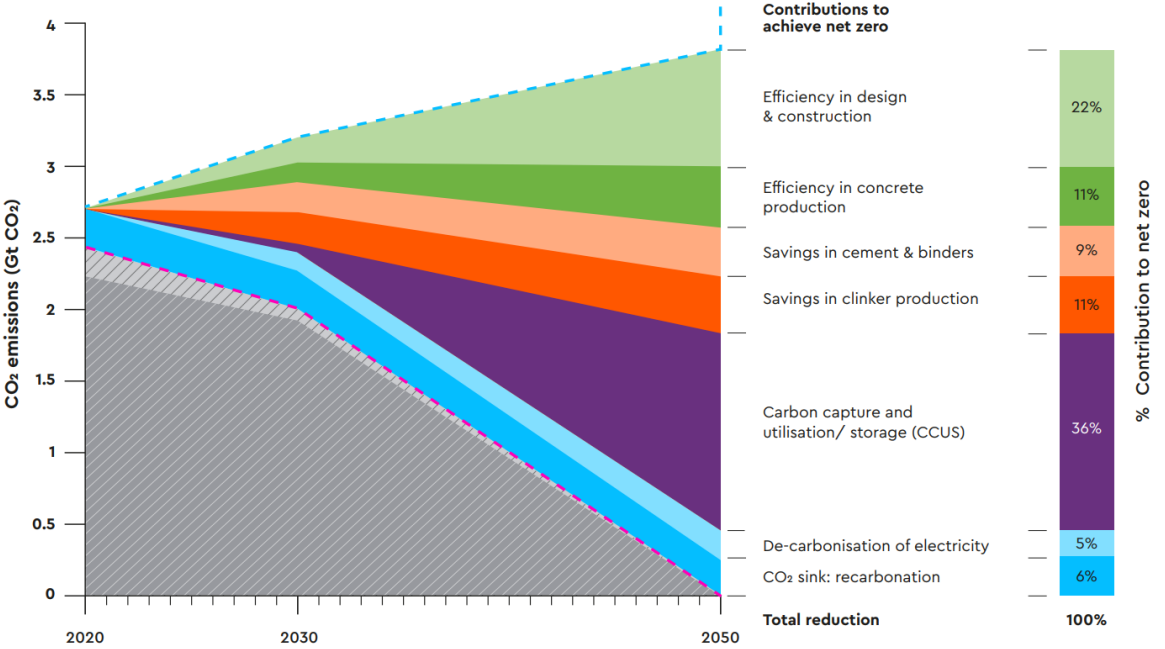
Source: IEA



Concrete Net Zero Pathway



Societies need for concrete (in the absence of any action) is forecast to result in 3.8Gt CO₂ in 2050.



Savings in clinker production

- thermal efficiency
- savings from waste fuels ("alternative fuels")
- use of decarbonated raw materials
- use of hydrogen as a fuel

Savings in cement and binders

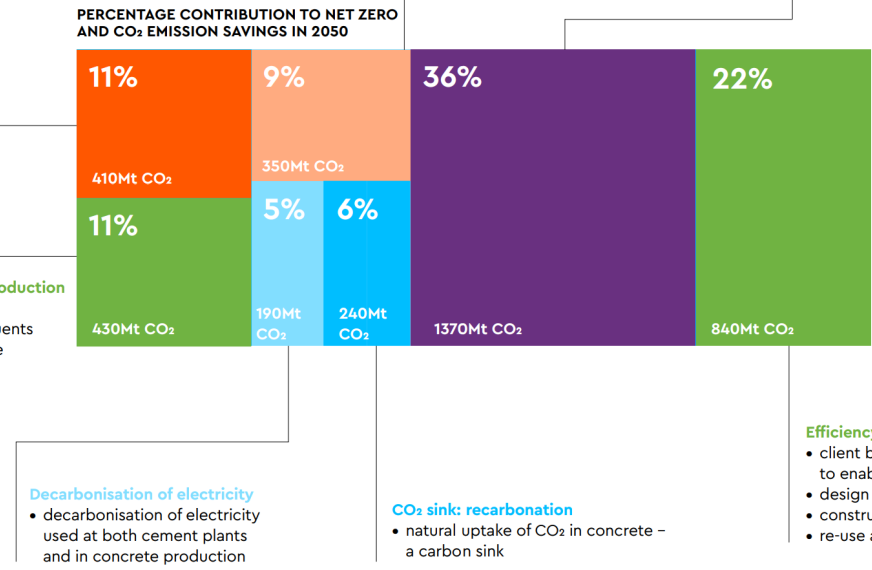
- Portland clinker cement substitution. Also expressed through clinker binder ratio
- alternatives to Portland clinker cements

Carbon capture and utilisation/storage

- carbon capture at cement plants

Efficiency in concrete production

- optimised mix design
- optimisation of constituents
- continue to industrialise manufacturing
- quality control



Decarbonisation of electricity

- decarbonisation of electricity used at both cement plants and in concrete production

CO₂ sink: re-carbonation

- natural uptake of CO₂ in concrete – a carbon sink

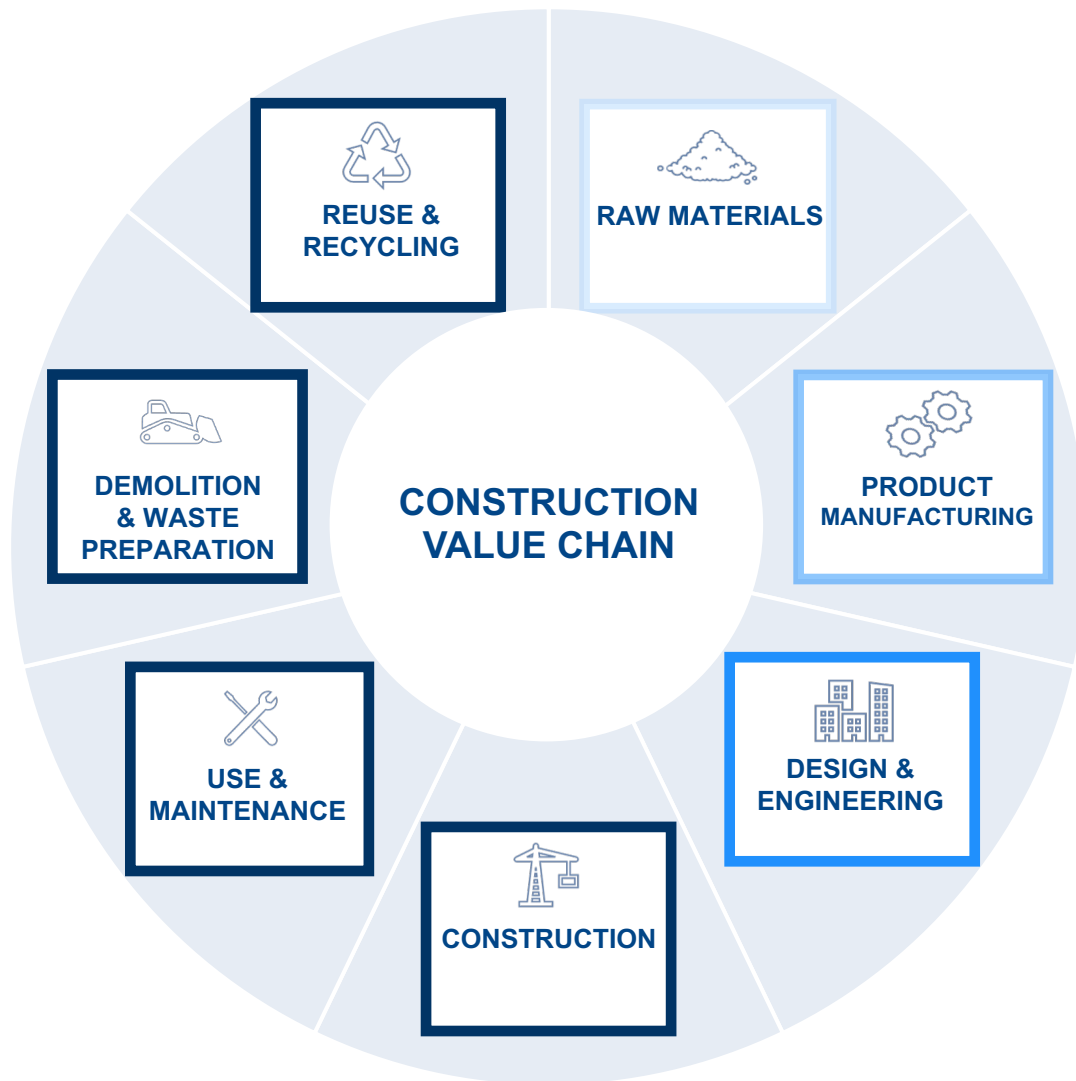
Efficiency in design and construction

- client brief to designers to enable optimisation
- design optimisation
- construction site efficiencies
- re-use and lifetime extension

--- Net zero pathway
 CO₂ emissions from electricity
 Direct net CO₂ emissions (Direct CO₂ emissions minus re-carbonation)



Circularity: A key enabler to reach net-zero in concrete



Sustainable and net-zero concrete requires

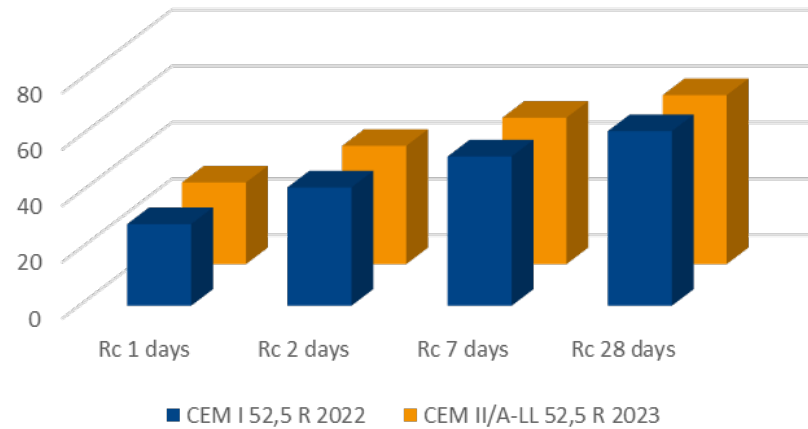
- Circularity
- Local production
- Cooperation along the value chain



How to bring innovation in a very conservative sector?

By using innovative materials with no compromise on performances and processability

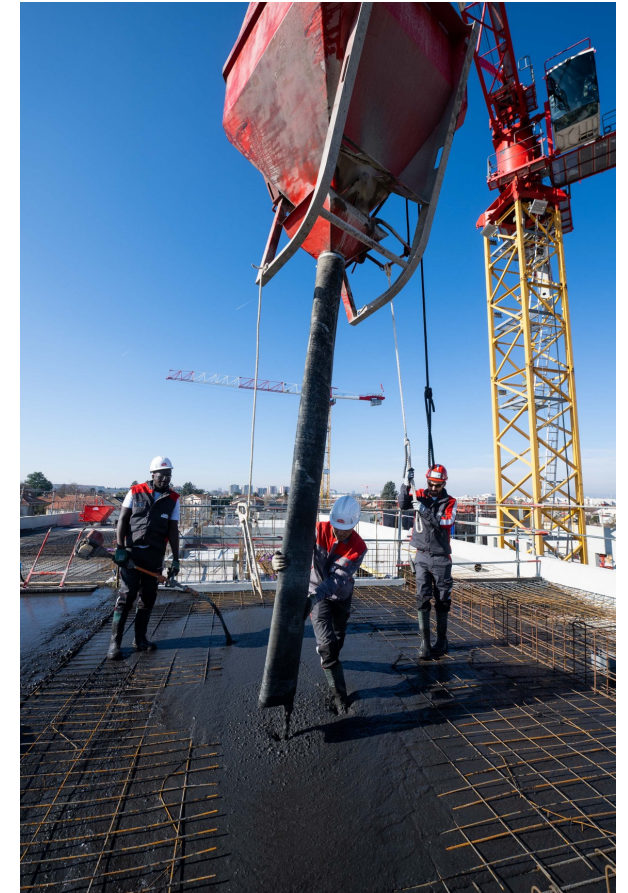
LIMESTONE FILLER



ZND CEMENT



MATERRUP



CARAT

How to bring innovation in a very conservative sector?

*By creating additional value with the combinaison of **Environmental and Digital transitions***



-50%
CO₂ footprint

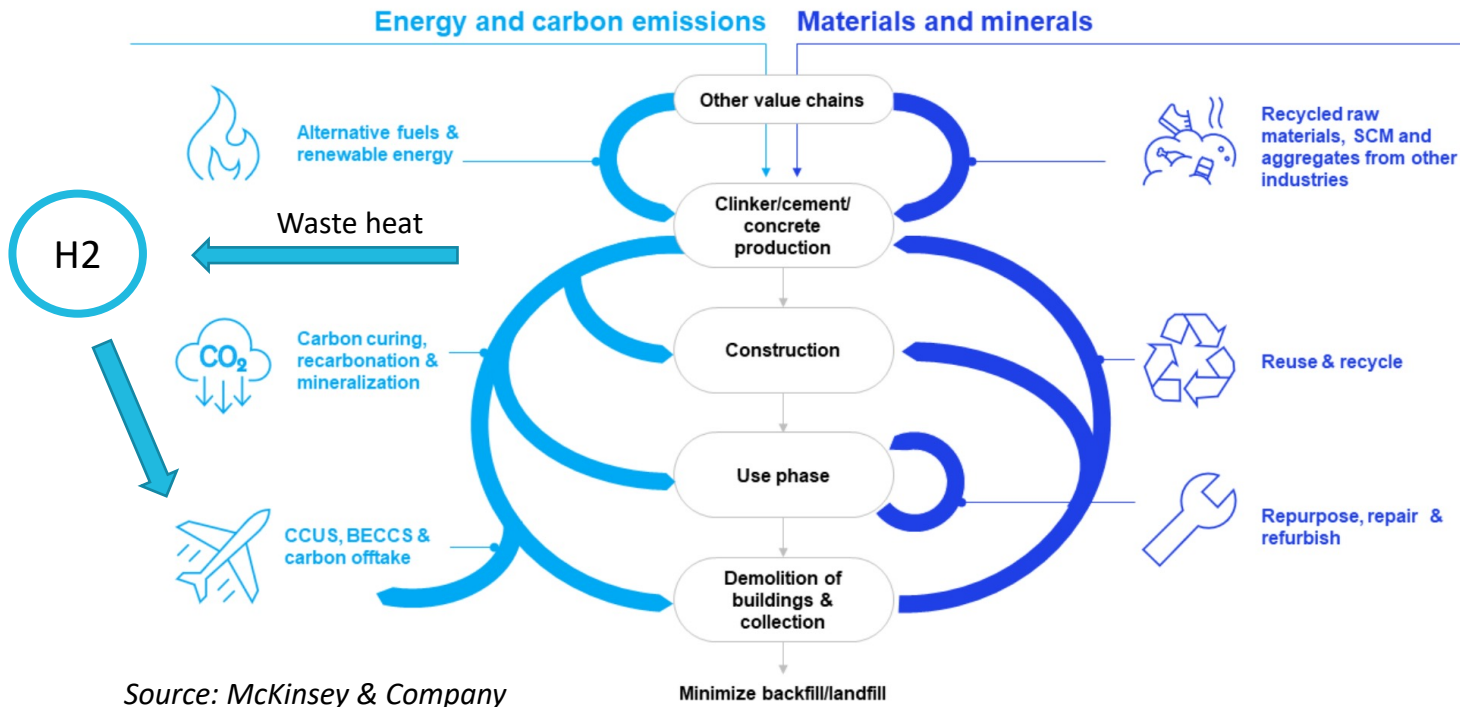
Li thosys 3D printing technology, can reduce by up to 50% the carbon footprint of a wall, reduce building site waste and improve biodiversity.


SmartConnect
Créateur du béton connecté™



Bâtir
le vivre
ensemble 

Transversal approach to decarbonisation



Circularity in concrete and cement has two angles:

- Recirculation of materials or minerals from waste (of the own value chain or from other value chains)
- Recirculation of energy (through alternative fuels or renewable energy), or of captured emissions.



Bâtir
le vivre
ensemble

