

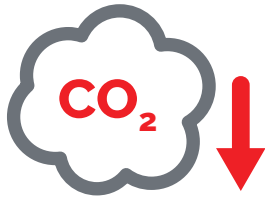
## BUILDING CARBON NEUTRALITY IN EUROPE

Engaging for concrete solutions

### OBJECTIVES

CO<sub>2</sub> reduction by 2050

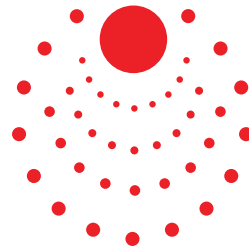
**-32%**  
with  
conventional  
technologies



**-80%**  
with  
breakthrough  
technologies

To achieve our objectives

**NEW INTEGRATED APPROACH: THE 5 Cs**



CLINKER  
CEMENT  
CONCRETE  
CONSTRUCTION  
CARBONATION

## CLINKER

**SIGNIFICANT PROGRESS IN CLINKER PRODUCTION:**

Over the last decades, the cement industry has **invested heavily** in four main pathways to **reduce direct CO<sub>2</sub>** emissions.

We are now a third of the way to our target of a 32% reduction by conventional technologies.

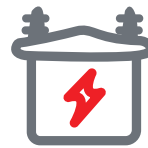
FUEL  
SUBSTITUTION



CCS/CCU



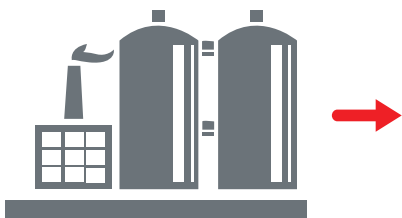
THERMAL  
EFFICIENCY



CLINKER  
SUBSTITUTION  
AND NOVEL  
CLINKERS



## CEMENT

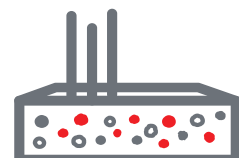


Given the scale of the cement industry, **small changes matter**. There are new ways of making the product 'smarter'.

PRODUCING  
LOW-CLINKER  
CEMENTS



DEVELOPING  
INNOVATIVE  
BINDERS



IMPROVING  
ENERGY  
EFFICIENCY



# CONCRETE



## USING LOW-CLINKER CEMENT

Concrete has **low embodied CO<sub>2</sub>** compared to other construction materials. **The carbon footprint of cement can be lowered** while delivering the same performance thanks to:



## FINE TUNING ADDITIVES

CO<sub>2</sub> can be used to make concrete with recycled aggregates

## OPTIMISING MIX



**10% - 20%**

Reduction in global warming potential of the concrete.

# CONSTRUCTION

## THE LIFE CYCLE OF A BUILDING



Buildings can bring further **CO<sub>2</sub> savings**. To do this, we need to look not only the use phase of a building, but its entire life cycle – from **design to construction to demolition**.

Thanks to thermal mass, buildings can be designed to use less energy.

Supply chain optimisation and 3D printing have potential to drive down the construction sector's emissions.

Concrete structures can last several renovation cycles without being rebuilt.

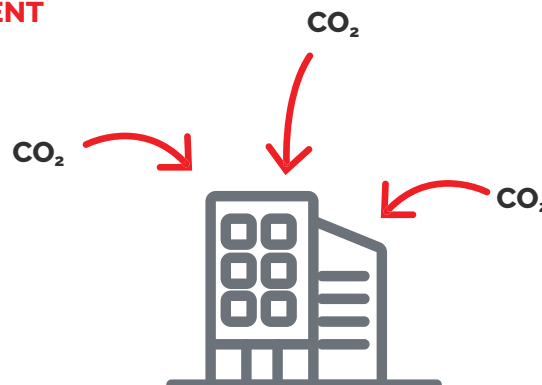
**Concrete is 100% recyclable.**

# (RE)CARBONATION

## A LITTLE-KNOWN FACT ABOUT CEMENT IS THAT IT IS A CARBON SINK!

Hydrated cement used in concrete or mortars **naturally absorbs CO<sub>2</sub>** during its lifetime, a process known as **carbonation**, thus removing carbon from the atmosphere.

IPCC recognises the phenomenon of **(re)carbonation** as a **carbon removal**.



Up to **25%** of the **process emissions** related to the production of the cement can be absorbed.