

2020 Capital Markets Day

16 September 2020

Leading the Way to Carbon Neutrality

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Member of the Managing Board

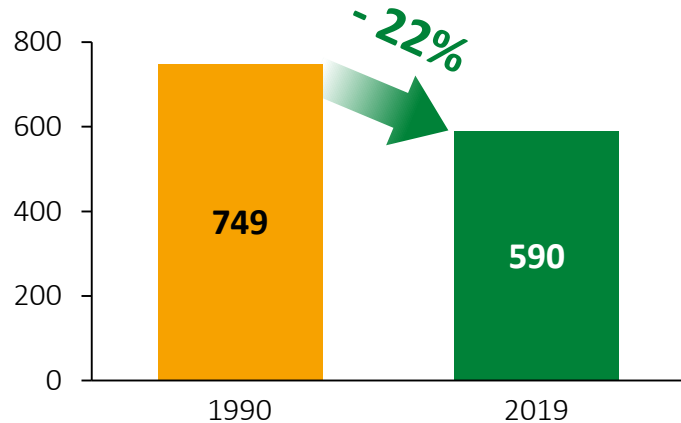


1. Strong track record of reducing CO₂ emissions
2. Setting new industry leading targets for 2025 and 2030
3. New targets underpinned by a clear roadmap
4. Leveraging our strong local sustainable and low-carbon product portfolio to further drive down emissions
5. Driving critical breakthrough CO₂ reduction initiatives to reach carbon neutrality by 2050 at the latest



Strong track record of reducing CO₂ emissions

Specific net emissions kg CO₂/t cementitious:
Our achievements so far

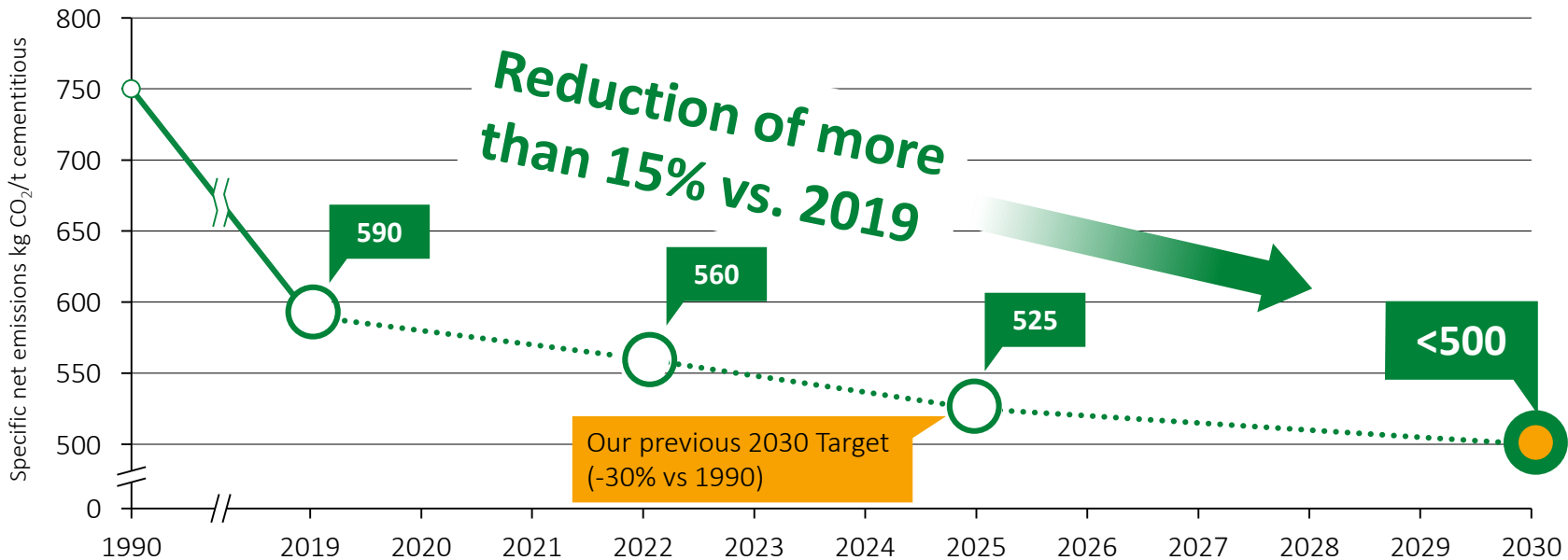


CO₂ reduction targets are an integral part of our strategy

- By 2019, we had reduced our specific net CO₂ target by 22% from our 1990 baseline
- The Carbon Disclosure Project (CDP) rated HeidelbergCement with an **A score in 2020**, upgraded from “A-” in 2019
- We are the 1st cement company to receive confirmation from Science Based Targets initiative (SBTi) that our CO₂ reduction target is in line with the goal of Paris Agreement – to limit global warming to below 2°C
- Clear commitment to Task Force on Climate-related Financial Disclosures (TCFD) compliant reporting

Industry-leading emission target of <500kg/t by 2030

Our previous 2030 target will already be met in 2025
New 2030 CO₂ target



Our new CO₂ targets are underpinned by a clear roadmap

- Each country has a detailed **bottom-up carbon roadmap**
- All measures agreed with local management at plant level
- Carbon roadmaps are embedded in management incentive schemes
- Carbon roadmaps rolled out globally – not just in the EU

CO₂ specific CapEx of approx. €50 m p.a.
on average over the next 10 years



LEILAC project: Lixhe, Belgium

Less clinker incorporation and more biomass are key levers for CO₂ reduction

5 levers to meet our 2030 target

Product mix



Clinker incorporation:
2019 until 2030:
75% to 70%

-5% pts

Alternative fuels



AF rate:
2019 until 2030:
24% to 43%

Biomass rate:
2019 until 2030:
9% to 19%

+100%

Low emission fuels

Increased usage of gas as fuel (-40% CO₂ emissions/GJ compared to coal)



Footprint changes / plant efficiency

All major overhaul investments targeting CO₂ reduction (e.g. EU, US)



Commercial levers

Increased share of sustainable low carbon concrete products



Leveraging our strong local sustainable and low-carbon product portfolio

A short list of some of our sustainable / low carbon products and solutions

Products / Solutions

Brands

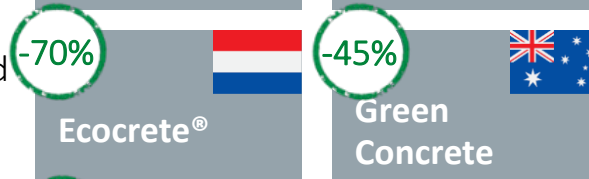
Details

Low carbon concrete products



- EcoPlus uses ground slag as secondary cementitious materials (SCM) to reduce CO₂ intensity in concrete
- Nor Lavkarbon uses fly ash as SCM to produce low carbon concrete

Concrete with recycled aggregates



- Ecocrete is a sustainable / eco-friendly concrete with up to 100 % recycled aggregates and low CO₂ cement
- Green Concrete uses recycled materials and slag to reduce CO₂ content

Innovative low carbon construction solutions



- i.power RIGENERA: concrete jacketing solution for structural retrofitting
- i.Tech 3D: high-tech concrete specially formulated for 3D printing technologies

Solutions for energy transition and clean air

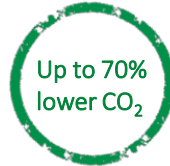


- TioCem: photocatalytic cement that decomposes NO_x in the surrounding air
- Powercrete: high-performance heat-conducting concrete for long distance underground cable power transmission

Approx. CO₂ reduction potential vs. ordinary concrete, except in the case of i.Tech 3D & i.power RIGENERA (reduced concrete application)

Deep dive: Ecocrete

Ecocrete®



Product description:

Sustainable/ eco-friendly concrete with up to 100% recycled aggregates and low CO₂ cement

Range of application:

Residential, non-residential, floors, foundations

Advantages:

- Up to 70%¹⁾ lower CO₂ per m³ concrete
- Reduces need for primary aggregates
- Promotes circular economy
- Wide range of applications



Reference project: Heelmeesters, Netherlands

The Dutch government's plan of using all demolished concrete in concrete production by 2030 creates a great market opportunity!

Deep dive: i.Tech 3D

i.Tech 3D

Product description:

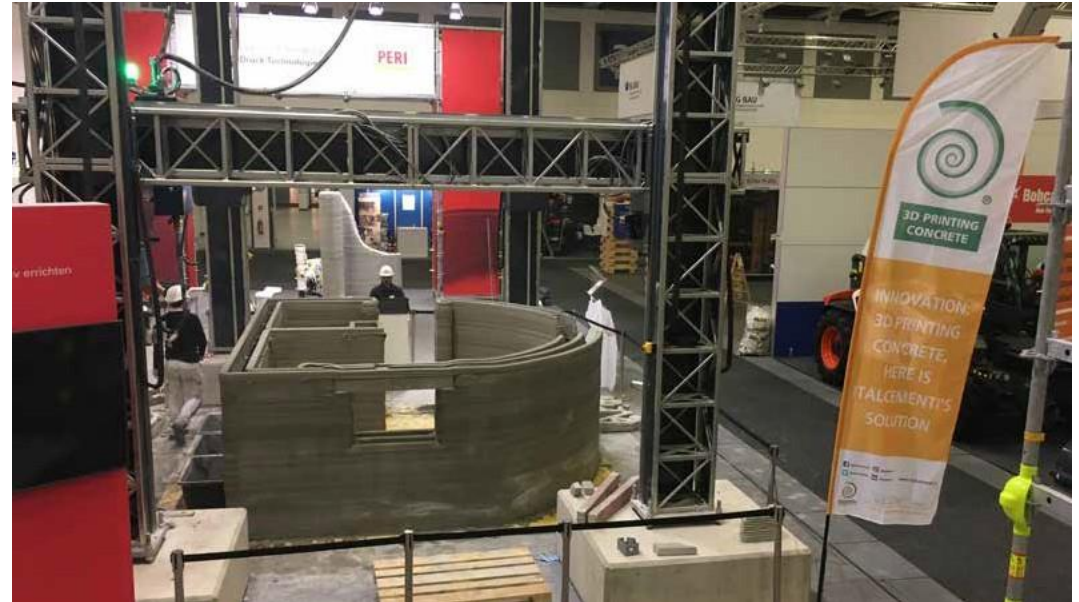
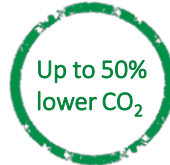
High-tech concrete that can be used for construction solutions by means of 3D printers

Range of applications:

Buildings, precast elements and urban furniture, columns, facades, stairs

Advantages:

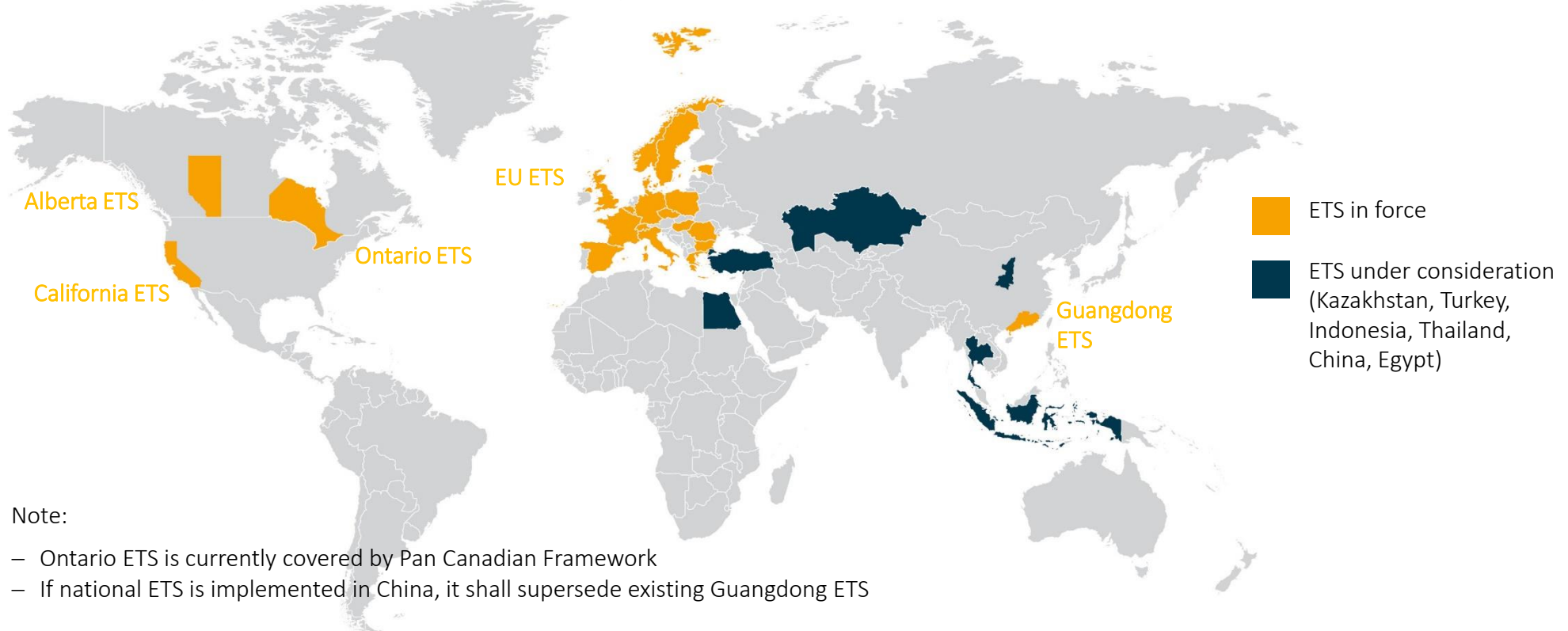
- Up to 50%¹⁾ less concrete leading to ~50% less CO₂ emissions per element
- Higher rapidity, productivity and lower labor costs¹⁾
- Flexibility: usable for complex shapes & different 3D printing technologies



3D printer at Bautec fair in Berlin built a 14m² room each day

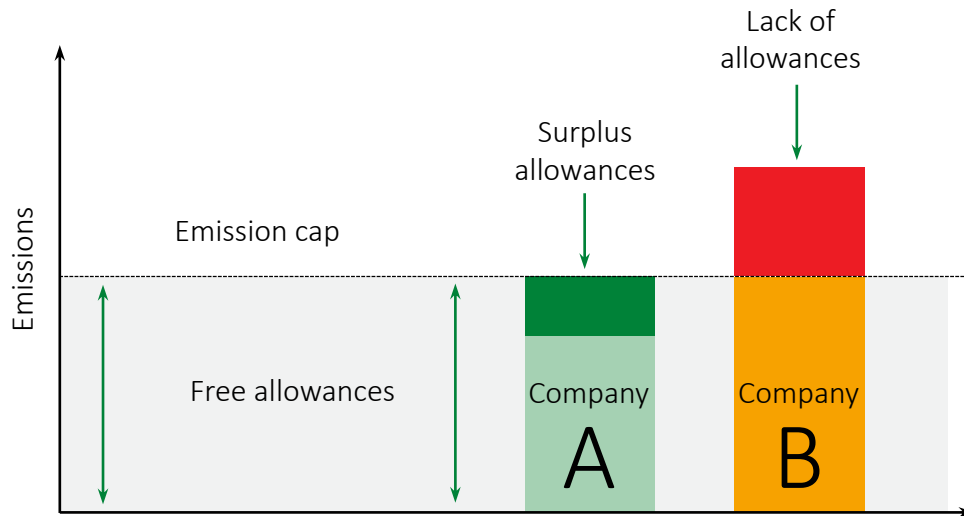
Carbon emissions regulations are being tightened worldwide

Emission trading schemes (ETS) currently in force/ planned across HC markets



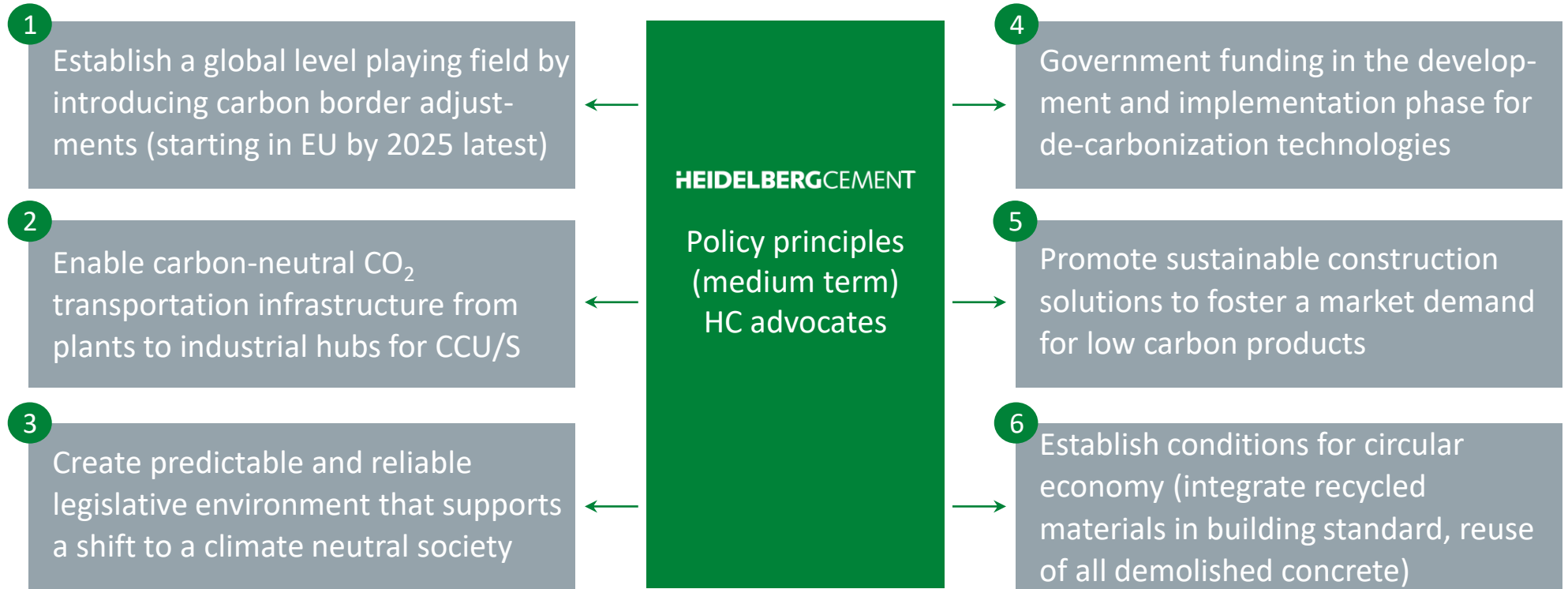
EU-ETS system acts as a global blueprint

ETS regulatory framework



- The EU-ETS is the blueprint for other cap and trade emissions trading schemes globally
- Free allowance certificates are issued to cement companies below an emission cap
- Current CO₂ price at approx. €30 (as of 14 September 2020)
- The emission cap reduces progressively. The next reduction (Phase 4) takes place in 2021
- HC are “long” on EU-ETS certificates until 2023

Actively engaging policy makers to drive change



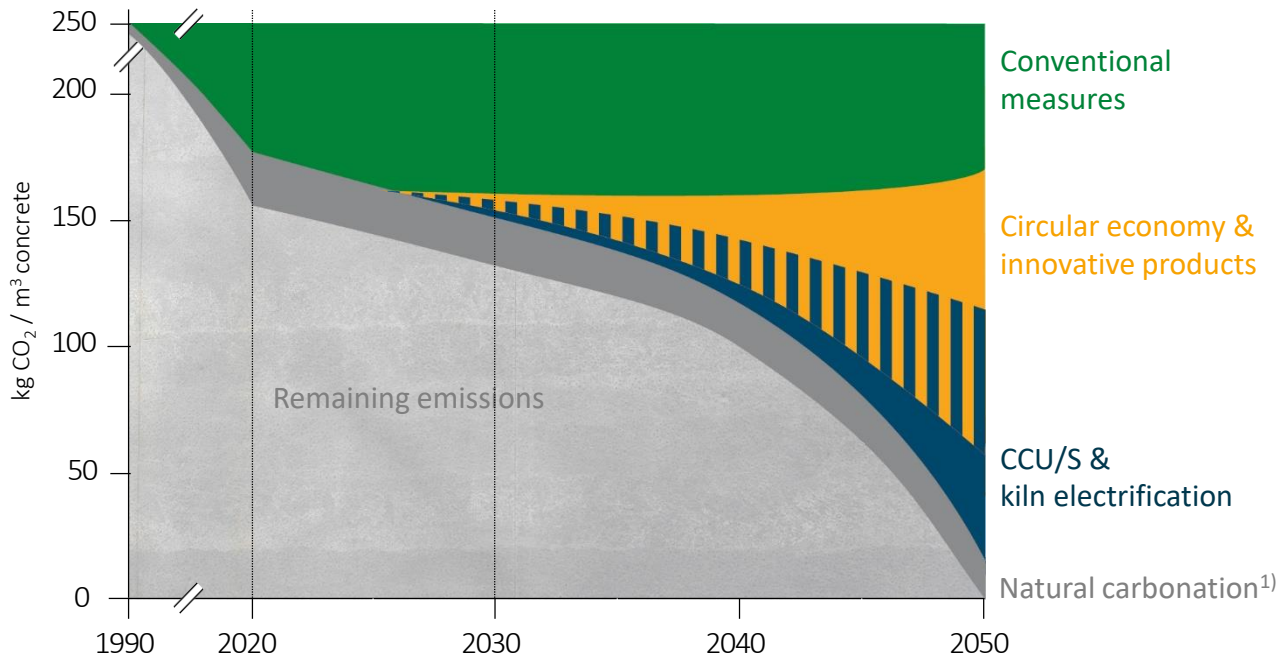
Our goal is to realize
carbon neutral concrete
by 2050 at the latest.



CARBON
NEUTRAL

Carbon neutrality by 2050 requires a variety of localized approaches

Our approach to carbon neutrality



Circular economy & innovative products

- Recycled materials (recycled aggregates, recycled concrete paste as raw material)
- Alternative cementitious materials (e.g. calcined clay, carbonated recycled concrete paste)
- Low carbon clinker types (example: Ternocem, CSA)
- Low carbon cement types (example: MultiComponentCement – CEMII/C-M)

CCU/S & kiln electrification

- Carbon Capture & Usage (high protein animal feed, manufacture of fuels, carbonates and chemicals)
- Carbon Capture & Storage (amine scrubbing, Oxyfuel technology, LEILAC)
- Hydrogen & kiln electrification projects

1) Natural carbonation is the absorption of CO₂ from the atmosphere during the lifetime of a concrete construction

Circular Economy – many recycled aggregates activities already well established



Australia



USA (CAL)



Germany



Netherlands

Business description

Mature, stand-alone business (Alex Fraser Group)

Ancillary activity at HC sites

Ancillary activity at HC sites

50/50 JV (Rewinn B.V.)

Locations

5 sites

8 sites

7 sites

1 site

Main final products

Mostly road base (80%), aggregates, sand, dust

Road base

Road base

Aggregates for HC RMC, road base

- Recycled aggregates have become increasingly important for HC considering their CO₂ reduction potential
- Recycled aggregates to be further developed to secure future volumes for tomorrow's re-carbonation processes

CCU/S – driving innovative projects and technologies with significant potential

TRL 8

Post combustion (Amine)

Early Stage: 4 research projects in Europe
 Pre-industrial: Edmonton, Canada
 Industrial/commercial scale:
 Brevik, Norway



TRL 5

Oxyfuel

Early Stage: Preparatory research work done together with ECRA/UMONS
 Pre-industrial: CI4C, Germany



TRL 6

Direct separation (LEILAC)

Pilot: LEILAC-1, Belgium
 Pre-industrial: LEILAC-2, Germany



TRL 8

Micro-algae

Early Stage: 3 research projects executed in Sweden, Turkey & France
 Pre-industrial: Safi, Morocco



TRL 7 to 8

Hydrogen

Pre-industrial: Carbon neutral H₂ based fuel, pilot at Ribblesdale, UK
 Industrial/commercial scale:
 H₂/O₂ HydrOxy combustion, France

TRL 3

Kiln electrification

Early Stage: Feasibility studies
 CEMZERO, Sweden, ELSE, Norway &
 LEILAC-2, Germany

TRL - Technology Readiness Level (scale from 1-10, 1 being very early stage and 10 being industrial scale)

Northern Lights at Norcem Brevik – the first global CCS project in Cement

CO₂ capture



- Aker Solutions technology (more than 7,500 hours of testing at Brevik completed)

CO₂ transport



- By ship
- Responsibility - Equinor

CO₂ storage



- Offshore storage in the North Sea
- Planning by Equinor and partners

Facts

Technology:

Amine - Post combustion capture

Scope:

Capture, liquefaction, pipe transfer, storage on quay

Strategic Partners:

Aker Solutions (capture technology), Equinor, Shell and Total (transport & storage)

Annual CO₂ captured:

approx. 400,000 t per year (approx. 50 % of plant emission)

External funding requirement:

>80%



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