



Pioneering carbon capture in the cement industry: The Brevik CCS project

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Vetle Houg **Managing Director Heidelberg Materials** **Cement Norway**

Since April, Vetle has been Heidelberg Materials' sales lead for its cement business in Norway. Prior, he was Head of Sustainability at Heidelberg Materials in Norway.

20+ years experience in the cement and concrete industry, accompanying the Brevik CCS project from the beginning.



Concrete is the foundation of our society



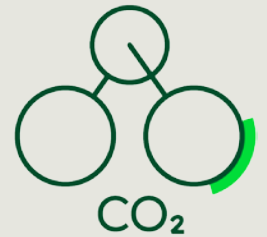
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**We are aware of
our carbon
footprint – and
we will lower it**



~7%

**of global CO₂ emissions
from cement and concrete**
(in Norway, ca 3 % of CO₂
emissions)



Pioneering the decarbonisation of our industry

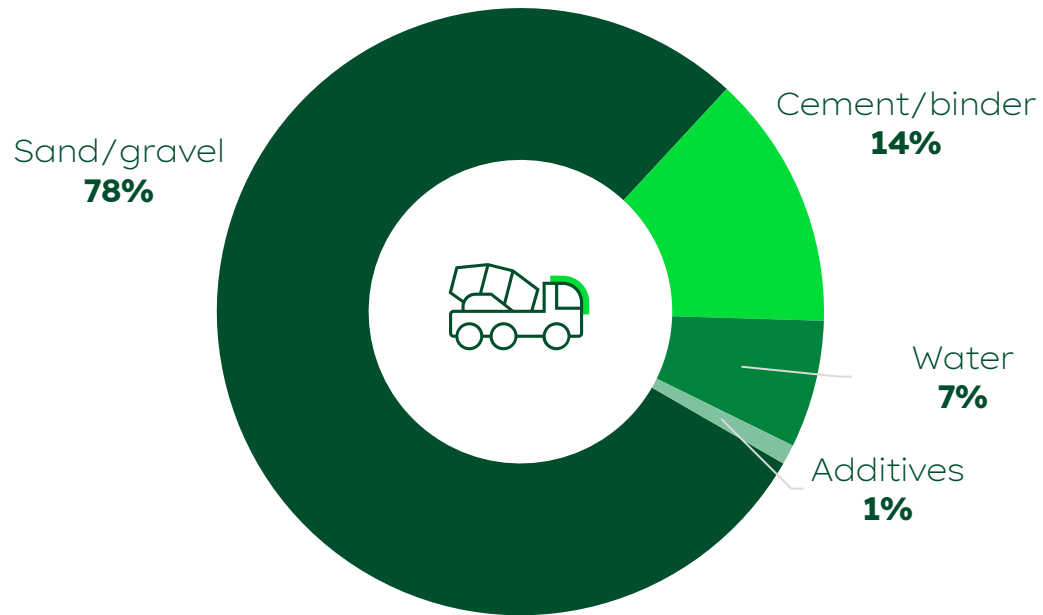


**Can we make
concrete a net-zero
building material?**

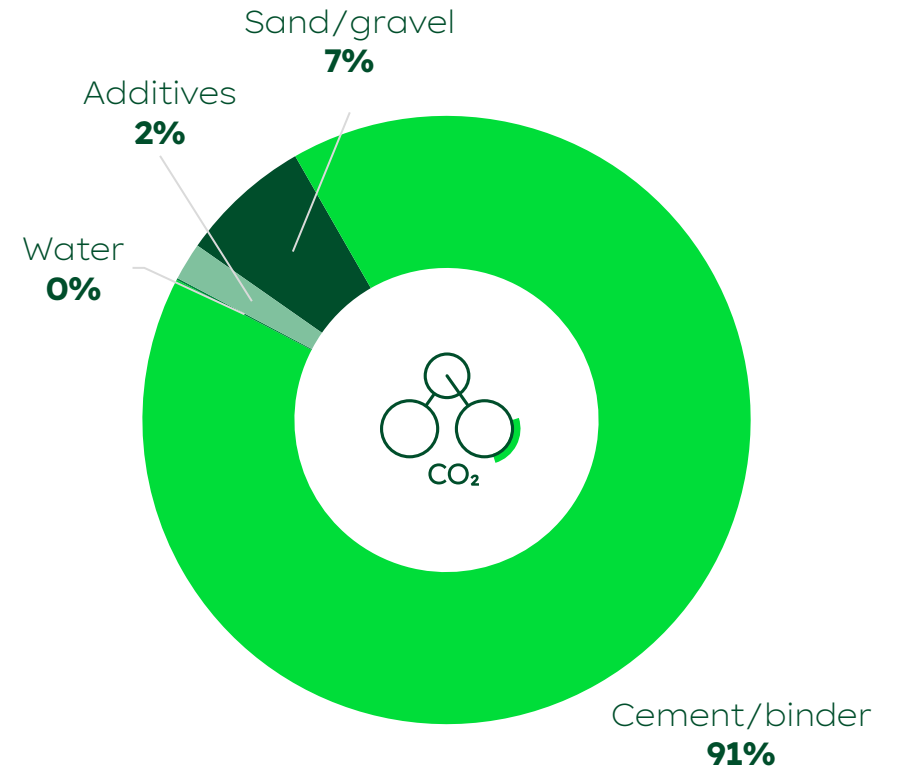


What is concrete made of, and what causes its CO₂ footprint?

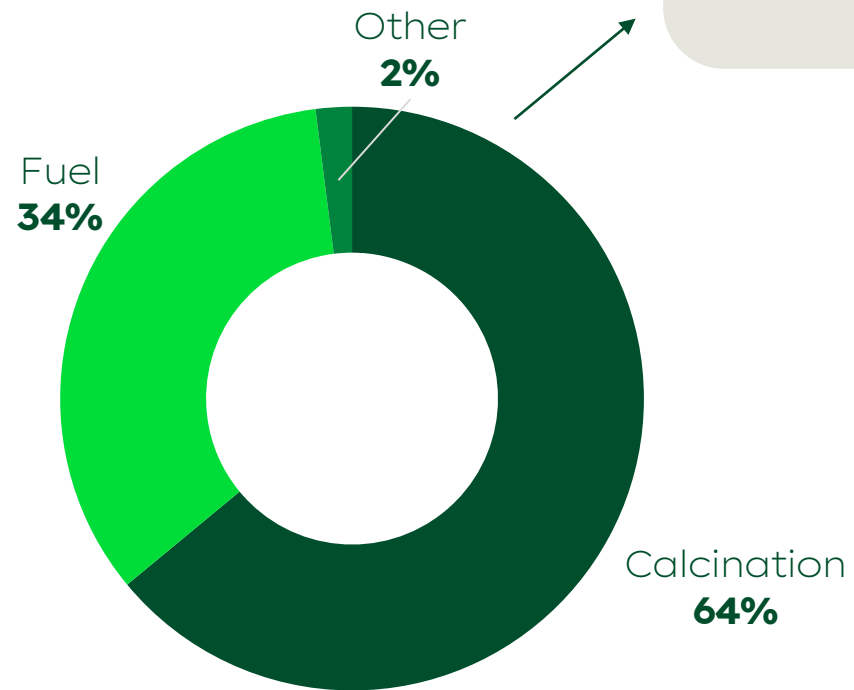
Weight %



CO₂ emissions

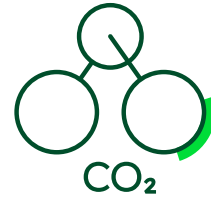


Why cement production is CO₂ intense



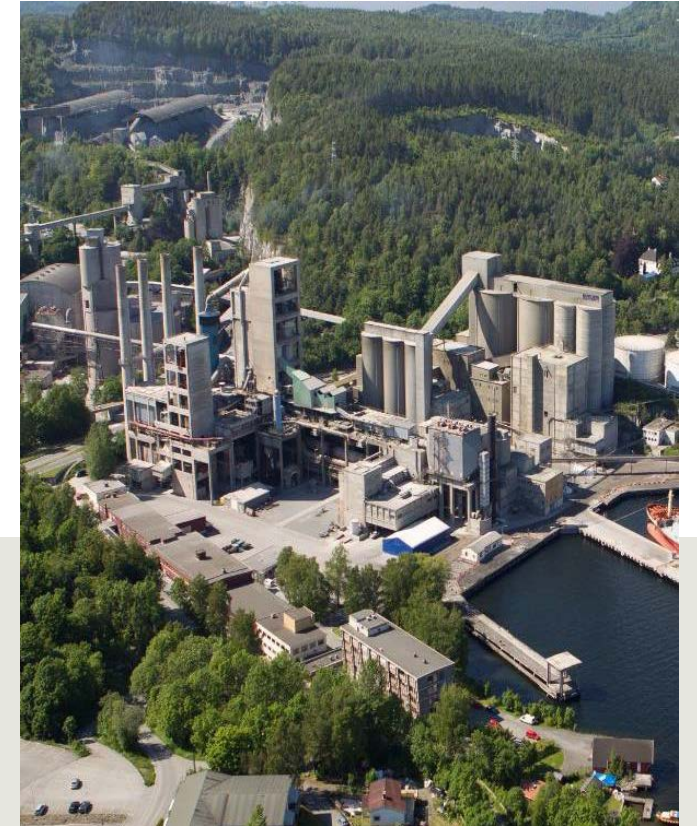
Pioneering carbon capture in our sector: Brevik CCS

The world's first
in the cement
industry



400 kt

CO₂ capture per year



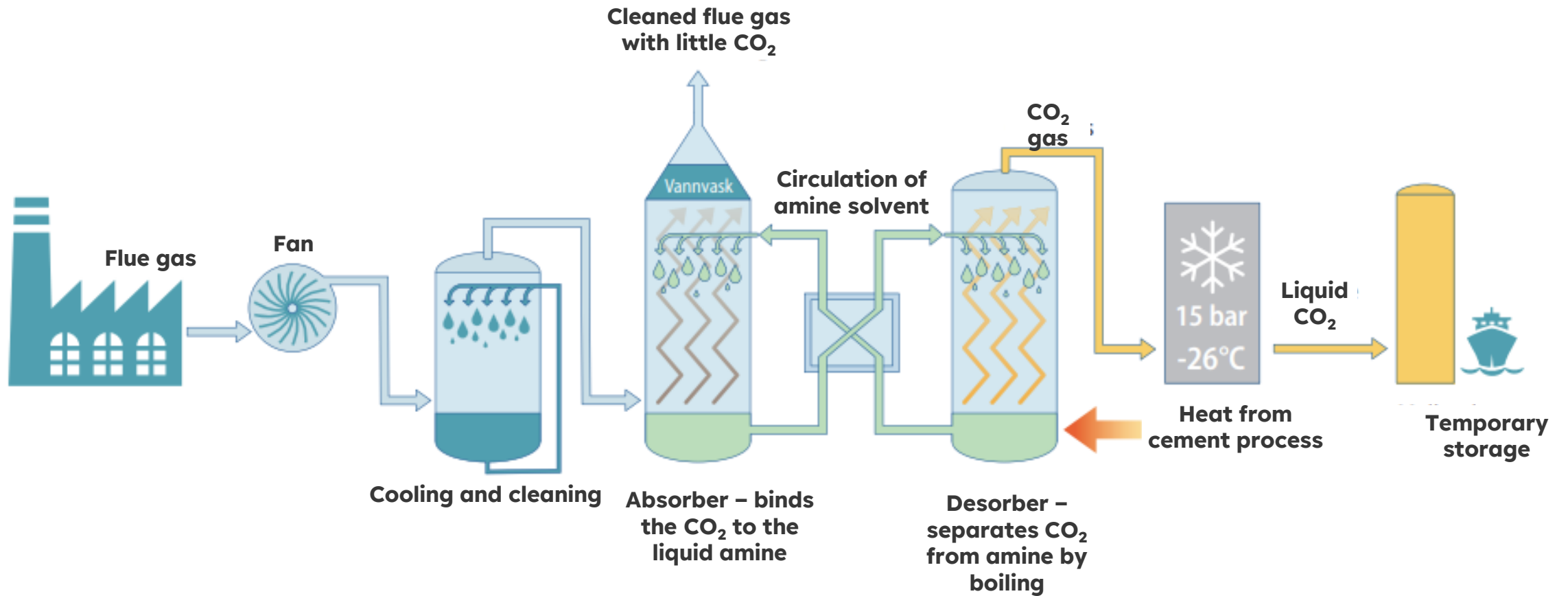
When all traditional levers are fully utilised, what's next? **Capturing CO₂**



Demonstrate that **it is possible to decarbonise** a hard to abate sector



How to catch the carbon dioxide – and store it



Brevik CCS: A journey with many steps – paving the way for future projects

>7,500 h

testing with
Aker's Mobile Test Unit



2005

Full scale
desk study

2011

Pre-
engineering

2013

Kick off TCB

2014

Technology
testing

2016

Feasibility
study

2016

Concept
study

2018

FEED study

2019

Decision
process
government

2021

Realisation

2025

Operational

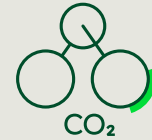
3,000 h

testing of pilot Waste
Heat Recovery Unit

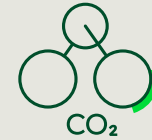




Overview of the project



400,000 tonnes
of CO₂ per year



55 tonnes
of CO₂ per hour



Capturing **50% of the plant's CO₂ emissions** – limited by **available waste heat**



46 MW waste heat recovery – **ca 30 MW** from cement kiln, **16 MW** from **CO₂ compressor**



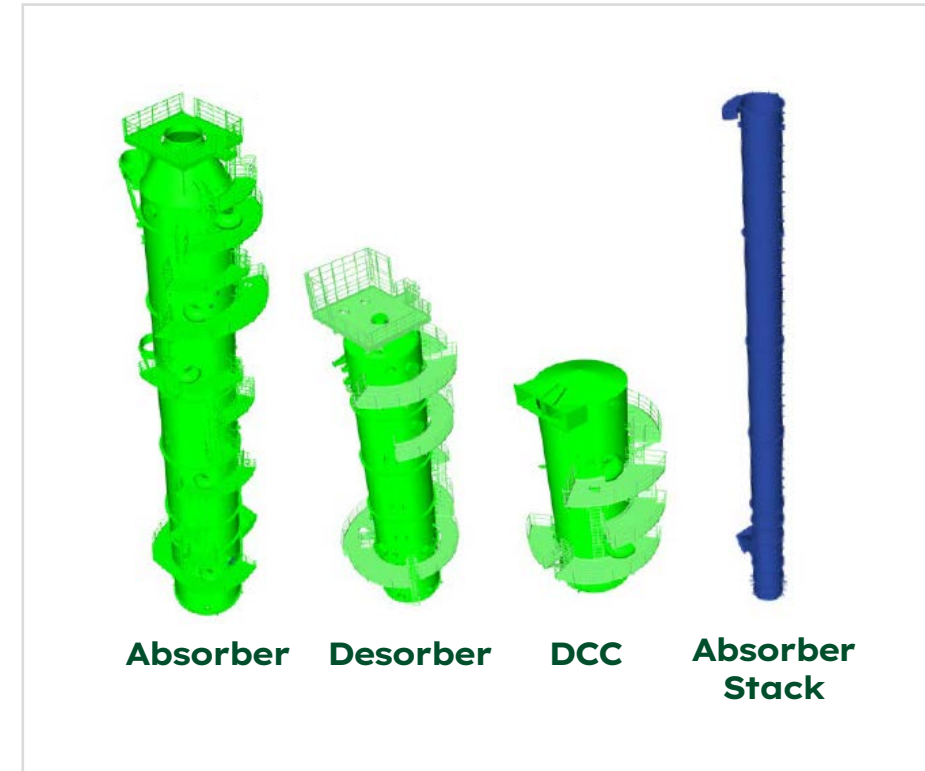
Mounting the CCS plant: 4 heavy-lift campaigns in 2023 and 2024



The challenge

Several components weighing **200 tonnes** or more had to be lifted onto the factory premises ...

... and assembled with **millimetre precision.**





People & project

More than **900,000 working hours**, very good performance on health & safety records

15 “Carbon Catchers” (operators + process engineers) have been hired, are being trained on a simulator and will be involved in commissioning

In total, plant will have **195 full-time employees** once the CCS facility is operational, of which 29 will be working for the CCS project



Temporary storage and ship loading



Storage capacity: 5,000 m³

6 storage tanks with a total capacity of 5,000 m³ – enough to store the CO₂ from 4 days of production

Preparing the CO₂ for transport

CO₂ is compressed to 16 bar pressure and cooled to -26° C – liquid state, suitable for transport and interim storage.



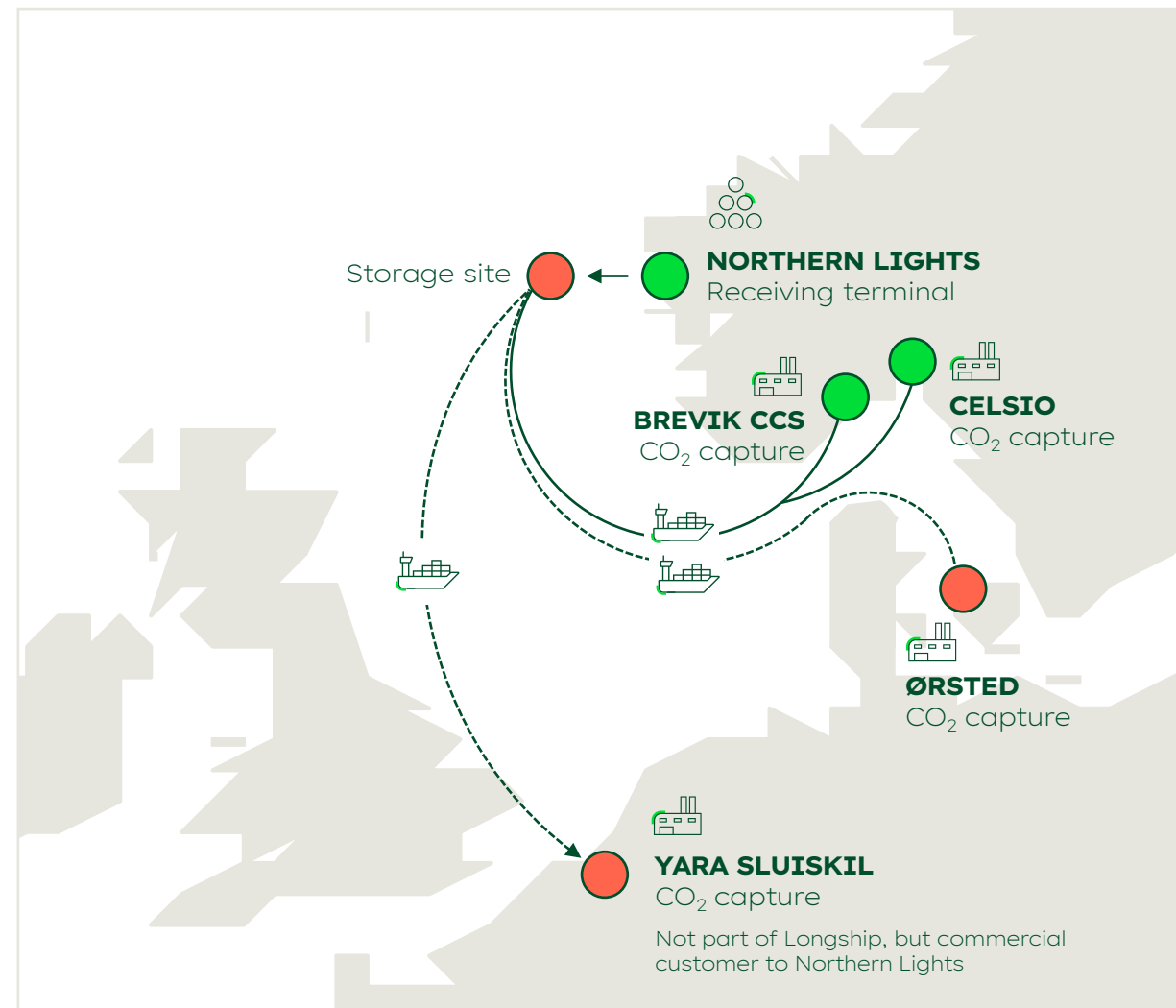
The Longship project

01 | Carbon capture from **industrial sources incl.**
Brevik cement plant

02 | Transport to Øygarden

03 | Pipeline to storage in North Sea

Supported by state funding for installation
and 10 years operation

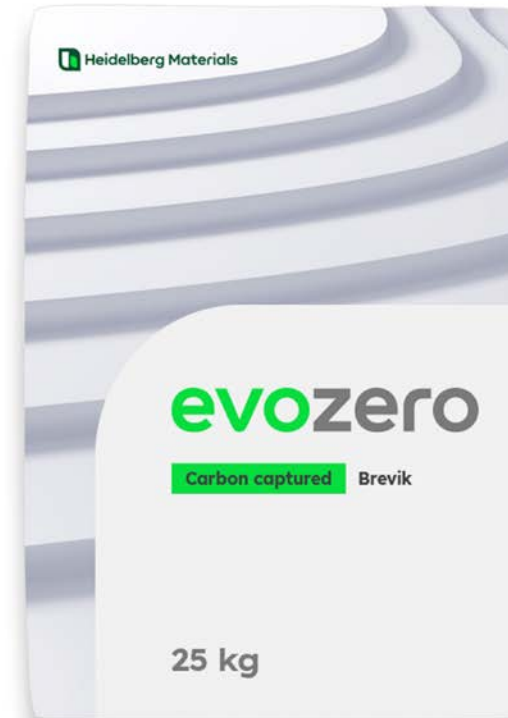


evoZero®: The world's first carbon captured net-zero cement

evozero

Applies to cement and concrete products

- Globally unique product: CCS technology enables net-zero carbon footprint of evoZero®
- Broadest product application combined with lowest CO₂ footprint
- Transparent CO₂ capturing and accounting process



Enabling forward-thinking construction projects

Innovative go-to-market approach: evoZero® will be available in two versions, depending on the customer location

evozero

Carbon captured

Brevik



New Nobel Center opts for net-zero concrete



By Richard High, 14 February, 2024

