



evozero

Carbon captured near-zero cement

The world's first near-zero carbon captured cement

VBI Ketenkracht, Jan Veenstra

09.07.2026



Presentatie:

1. Heidelberg Materials
2. Cement, beton en CO₂
3. CO₂ reductiedoelen HM
4. CO₂ afvang, HM Brevik, evoZero
5. Beton in een gebouw

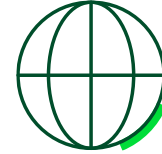
Heidelberg Materials is one of the world's largest building materials companies



51,000
employees
on 5 continents



3,000
locations
worldwide



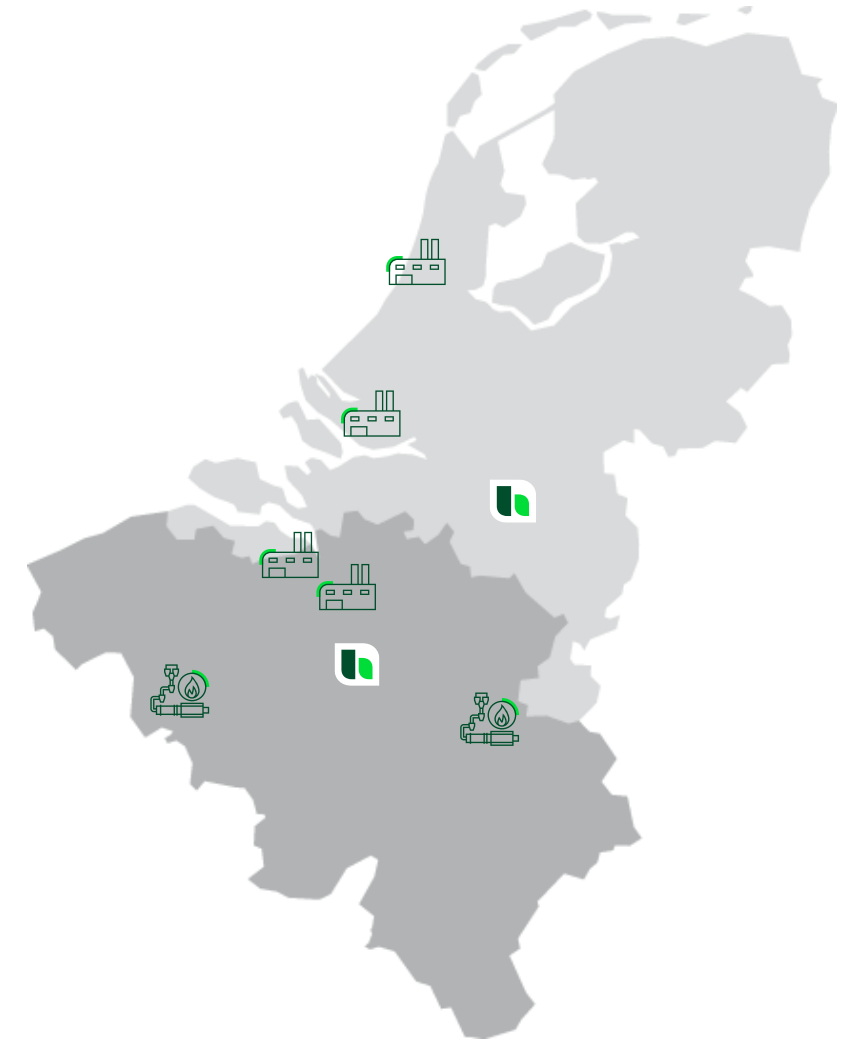
Leading positions in cement,
aggregates, and ready-mixed
concrete



Heidelberg Materials Benelux Cement



- Hoofdkantoren
 - Den Bosch (NL) en Braine-l'Alleud (Be)
- 2 klinkerovens
 - Lixhe en Antoining
- 5 Productielocaties
 - Lixhe, Gent 1 & 2, Rotterdam en Ijmuiden
 - +/- 4 miljoen ton cement



Cement & CO₂

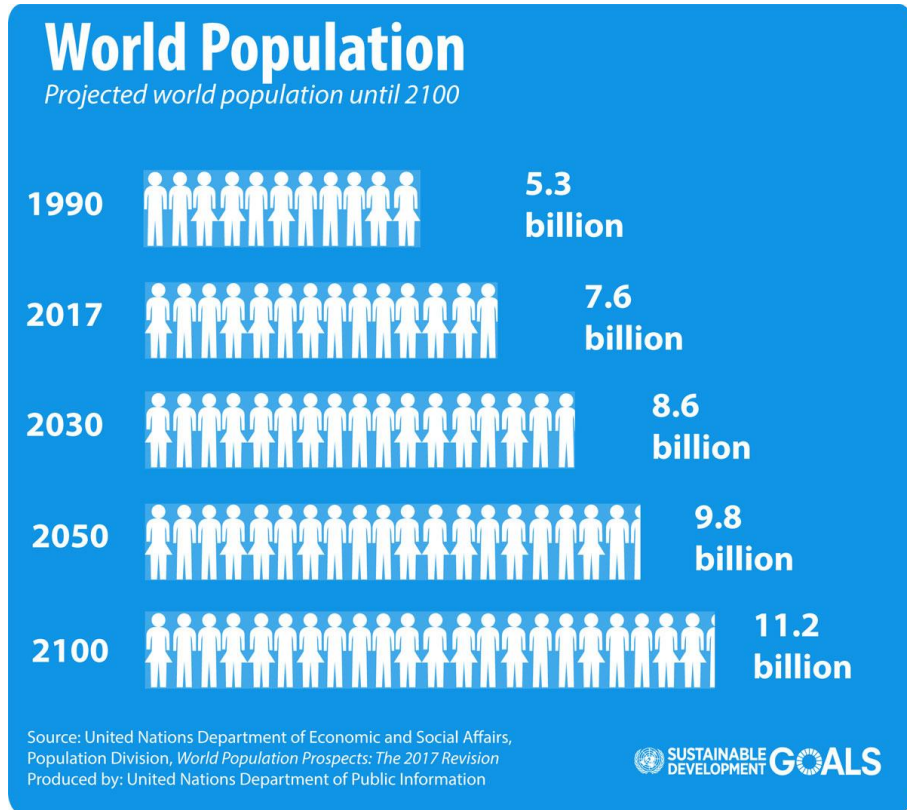


Beton is het meest gebruikte bouw materiaal ter wereld.

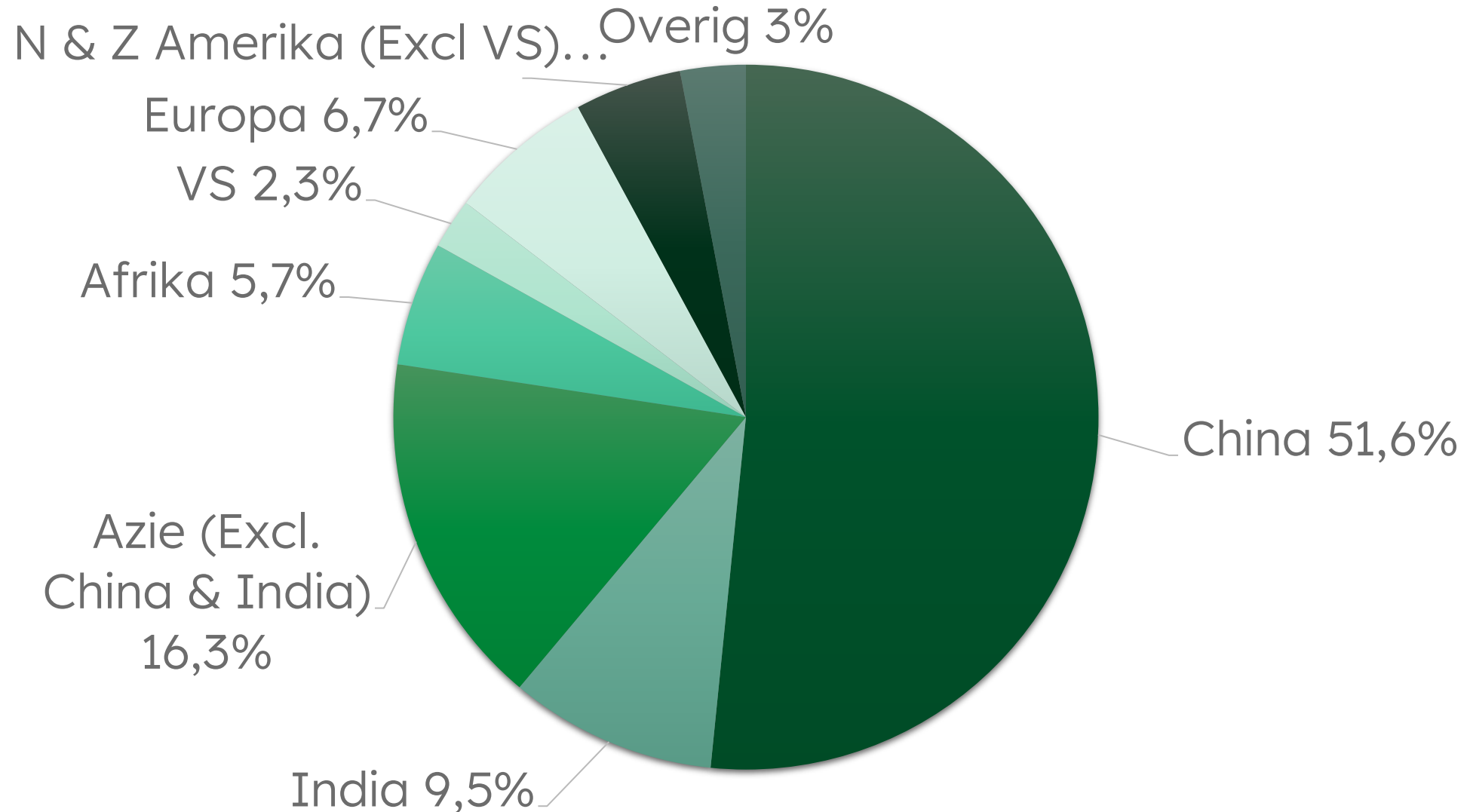
(Ca. 14 miljard kubieke meter/ per jaar, $1,75m^3$ / wereldburger)



Bouwen, bouwen, bouwen... om groei wereldbevolking bij te houden

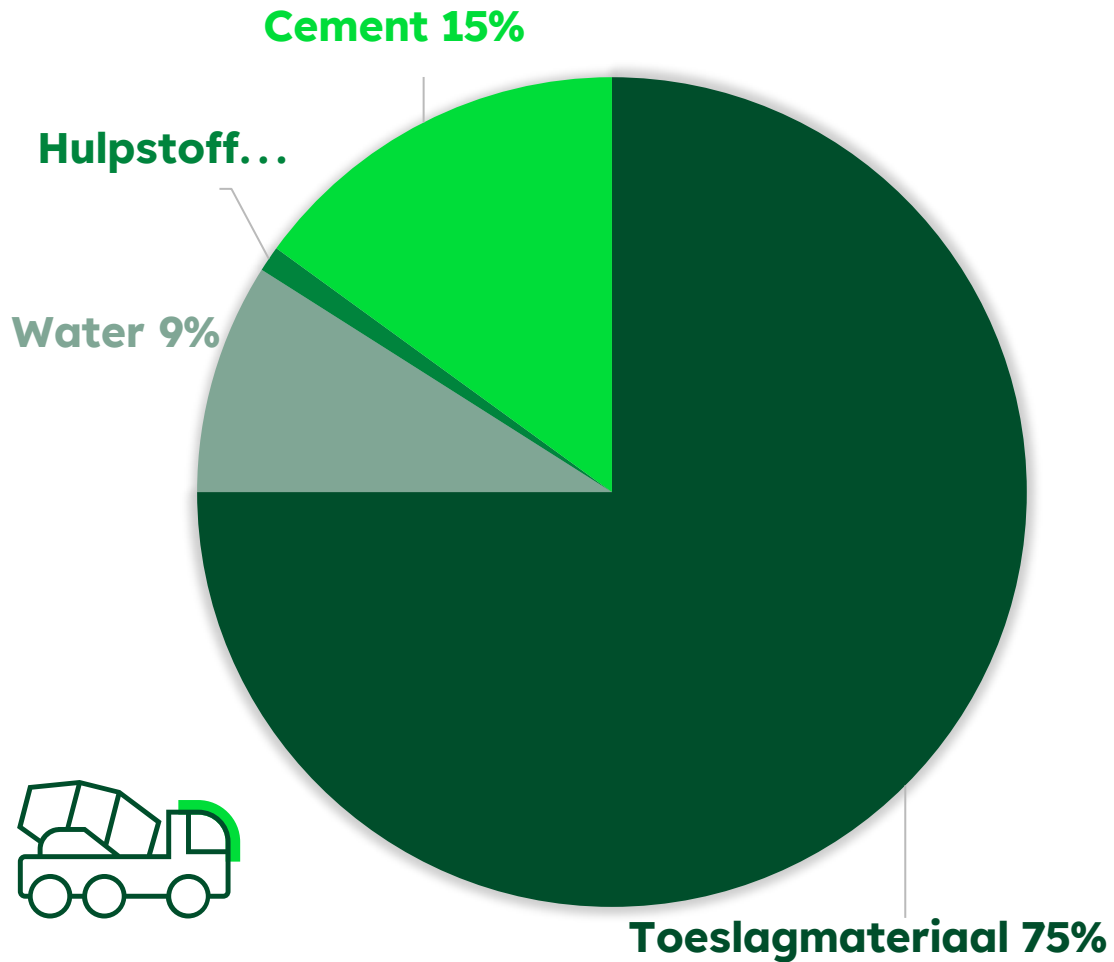


Totale cementproductie wereldwijd: 4,1 miljard ton (2023)

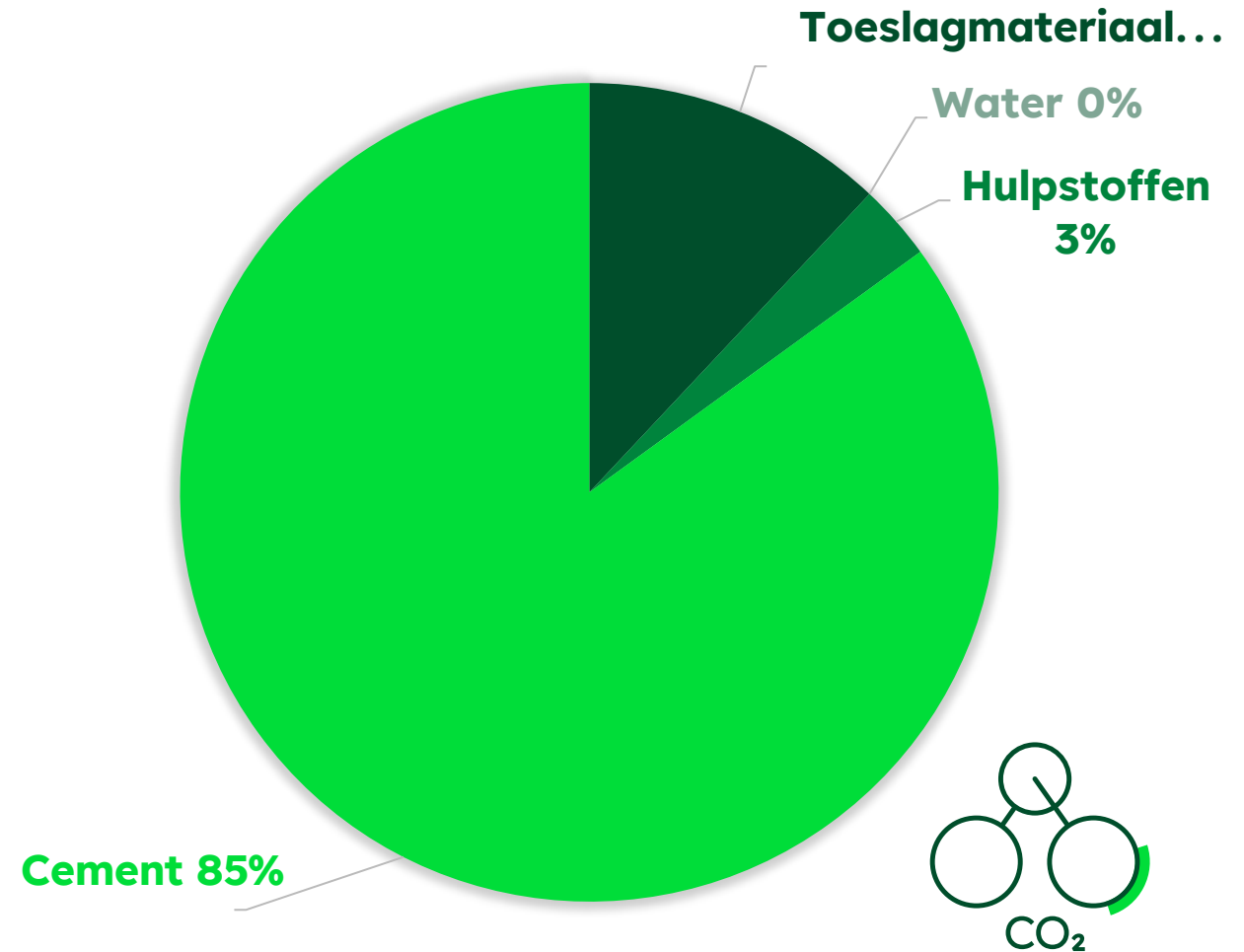


Invloed van cement op CO₂ in portlandcementbeton

SAMENSTELLING BETON



CO₂-BIJDRAGE



CO₂ emissie vanuit productie van Portlandklinker

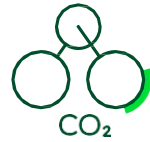


Our industry-leading carbon reduction targets for 2030



**We are the
deepest
decarbonising
company in
the sector**

By 2030



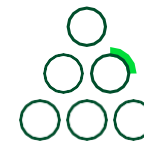
Specific Near CO₂/t of
cementitious material (scope 1)

<400kg



**Alternative
fuel rate**

>50%
prev. 45%



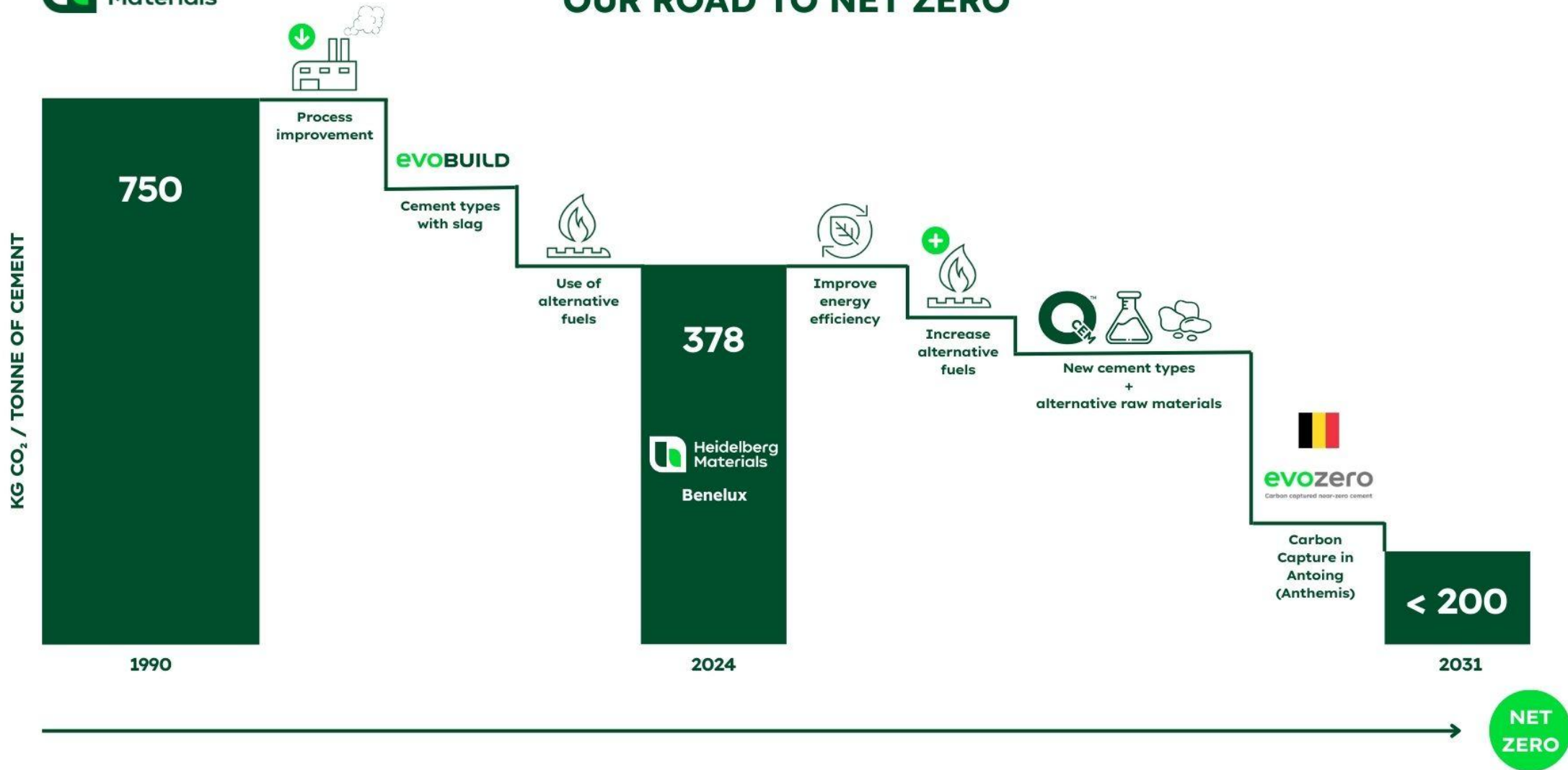
**Clinker
incorporation
rate**

64%
prev. 68%

2030 target as well as our 2050 Near-zero target validated by Science Based Targets initiative (SBTi)



OUR ROAD TO NET ZERO



Veel stappen zijn nodig om te verduurzamen

Minder CO₂ in
klinker

- EvoZero (CCUS)
- Alternatieve brandstoffen

Minder klinker in
cement

- Klinker reductie
- Nieuwe cementen, vb Q-CEM

Minder cement in
beton

- Optimalisatie mengsel
 - Korrelpakking

Minder beton in
betonconstructies

- Slimmer ontwerpen
 - Hogere sterkte beton

(Meer)
Carbonatatie

- Natuurlijk proces



HM EPD's



EcoReview
Part of the solution.

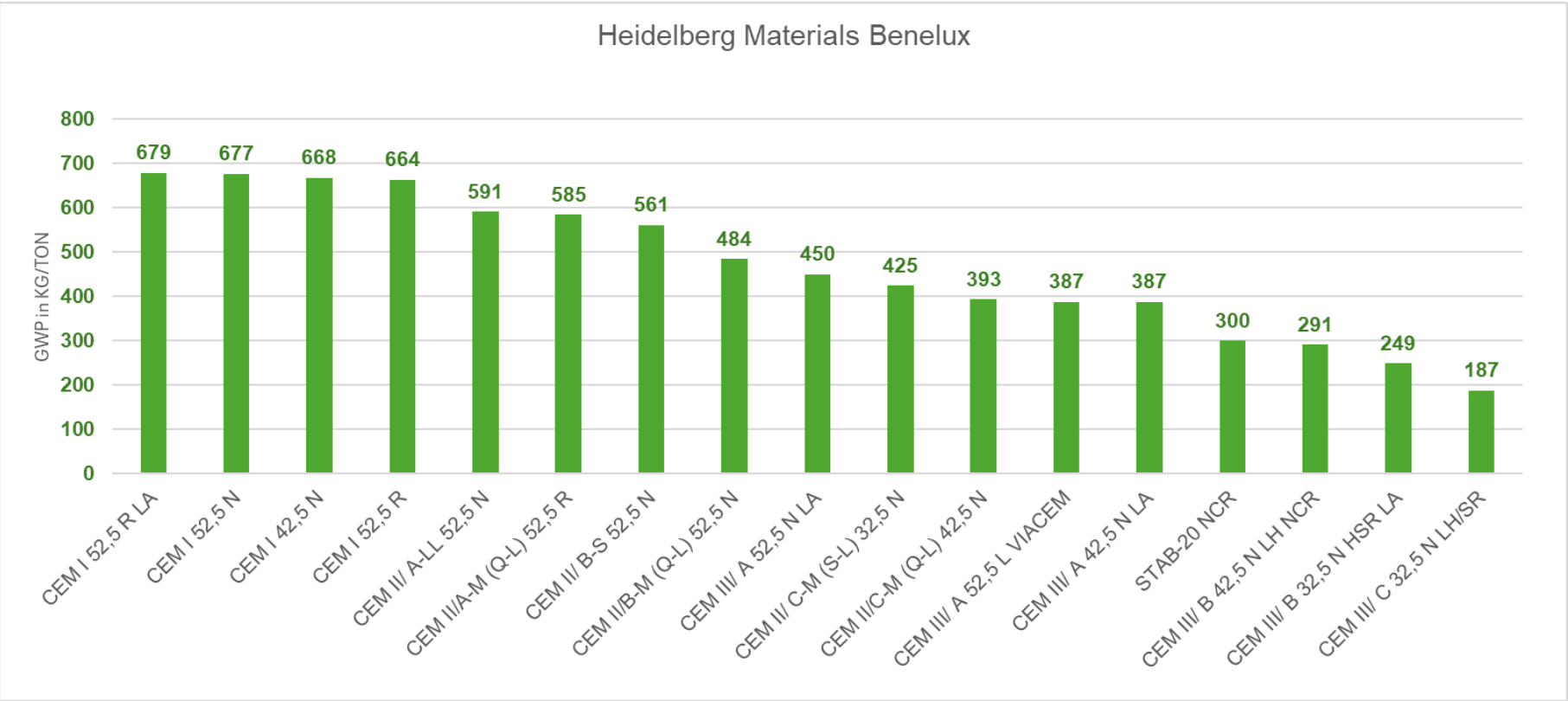
Environmental Product Declaration
Declaration according to
EN 15804+A2 &
NMD Assessment Method 1.2



Environmental Product Declaration
According to EN 15804+A2
(conform NMD AM 1.2 & NL-PCR Cement)



Product Declaration Unit (DU or FU)	CEM I/B-M(Q-L) 52,5 N(Conform-PCR) – Gent 2 1 ton	LCA study by	EcoReview B.V.
Declared by	Heidelberg Materials Nederland Cement B.V.	Calculation number	2025_081
Owner of Declaration	Heidelberg Materials Nederland Cement B.V.	Issue Date	30-06-2025
Verifier	SGS Intron B.V.	Expiry Date	30-06-2030





CCUS technology at a glance



Carbon

CO₂ emissions which are released into the atmosphere



Capture

process of capturing CO₂ emissions from the industrial process before they enter the atmosphere



Utilisation

captured CO₂ is used in various applications, such as enhanced oil recovery, building materials, or converting it into useful products



Storage

long-term storage of CO₂ in geological formations to prevent its release into the atmosphere



evozero

We will be the first worldwide
to offer carbon captured
near-zero cement at scale



Brevik Plant, Norway

evozero

**CO₂-afvangen is
onmisbaar in de
cementindustrie...**

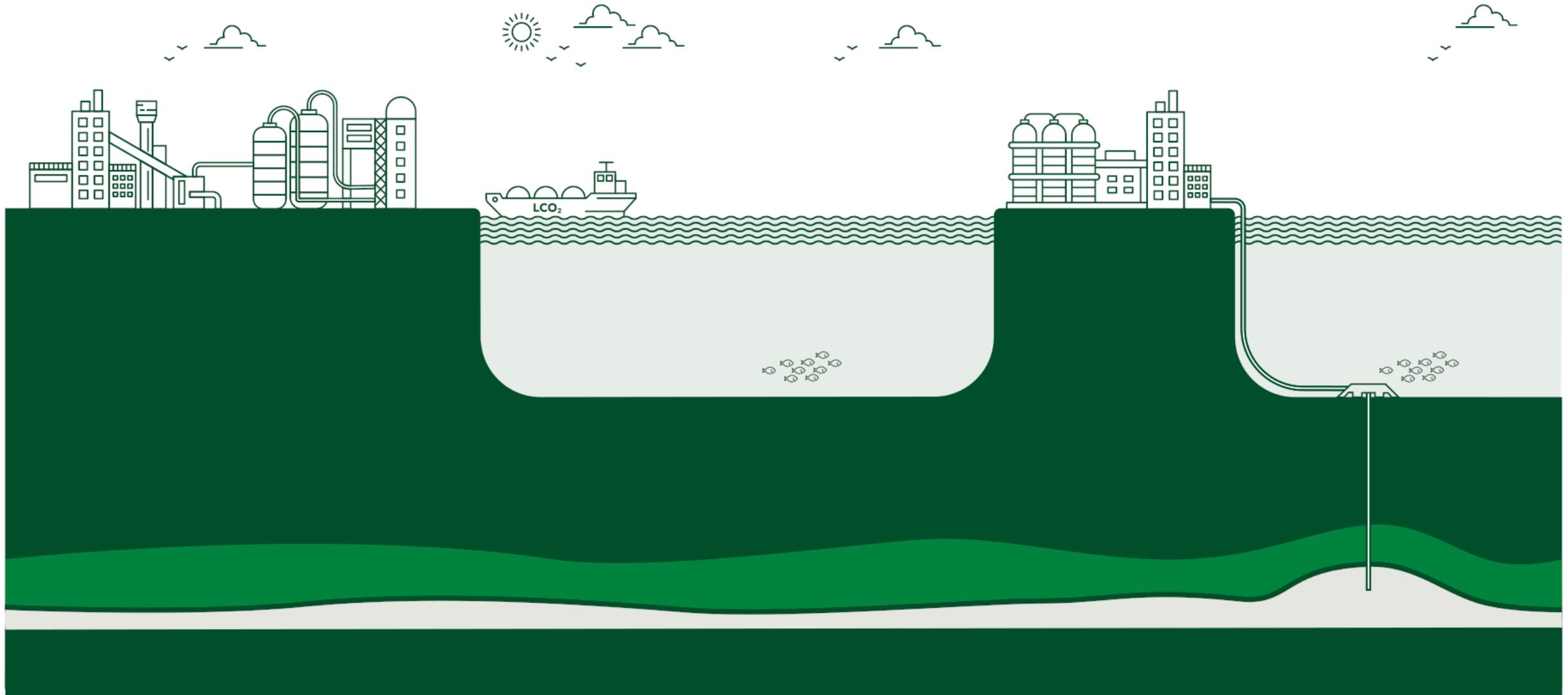
**Zonder worden we
niet net-zero**

Heidelberg Materials



The process in a simplified view

The CO₂ journey from capture to storage



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.



From vision to reality



Capacity of **1.5 mt/year**

Two ships under construction for transport of CO₂ from capturing plant(s)



The Longship project

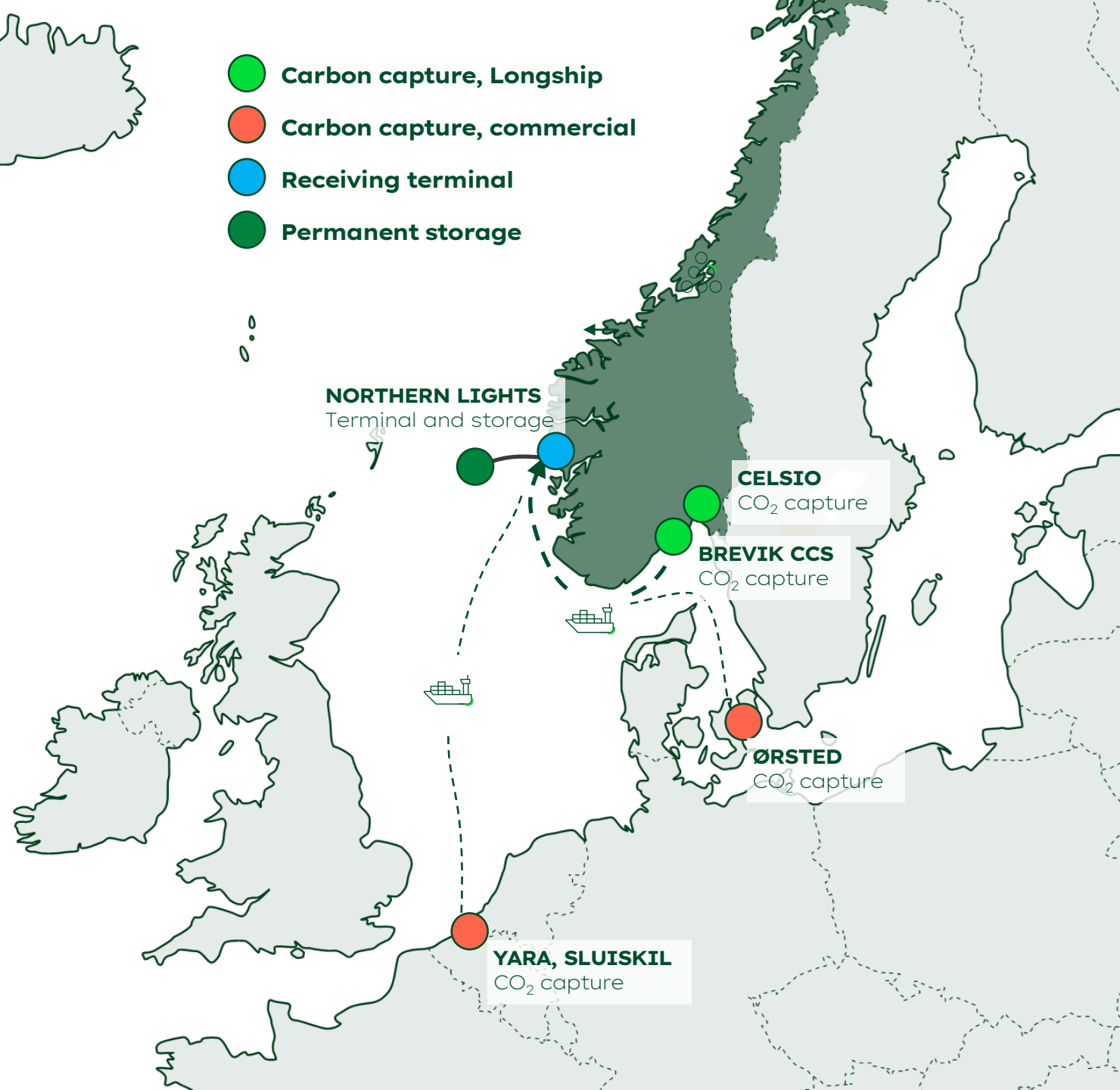
01 | Carbon capture from **industrial sources incl.**
Brevik cement plant, Heidelberg Materials

02 | Transport to Øygarden, Northern Lights

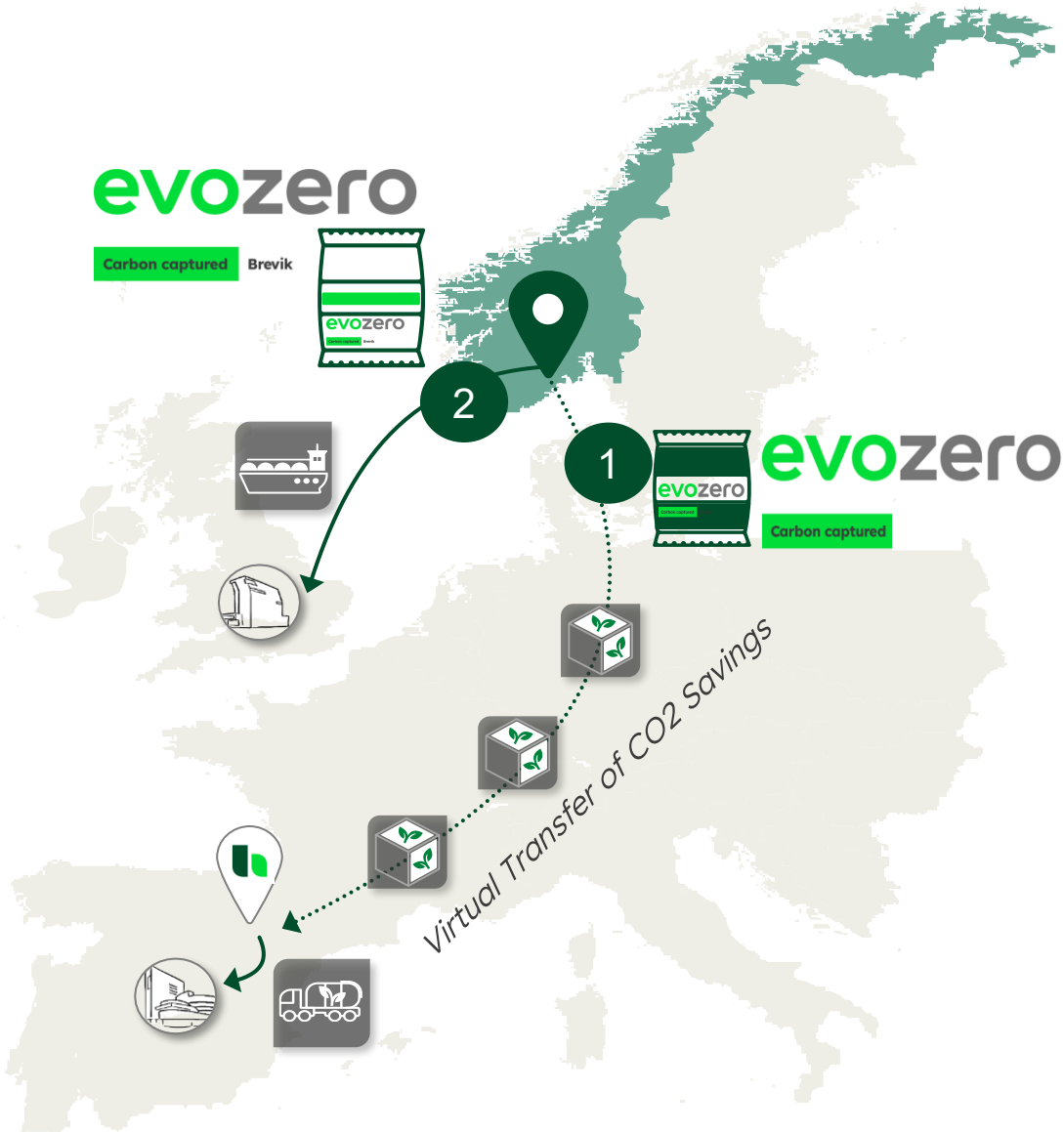
03 | Pipeline to storage in North Sea, Northern Lights

Supported by state funding for installation
and 10 years operation

- Carbon capture, Longship
- Carbon capture, commercial
- Receiving terminal
- Permanent storage



evoZero Carbon Captured: We will offer two types of unique products



Process resulting in two products



For distant projects,
carbon savings
virtually transferred to
a nearby construction
site

For projects closer to
Brevik evoZero
Brevik cement
shipped directly to
construction project

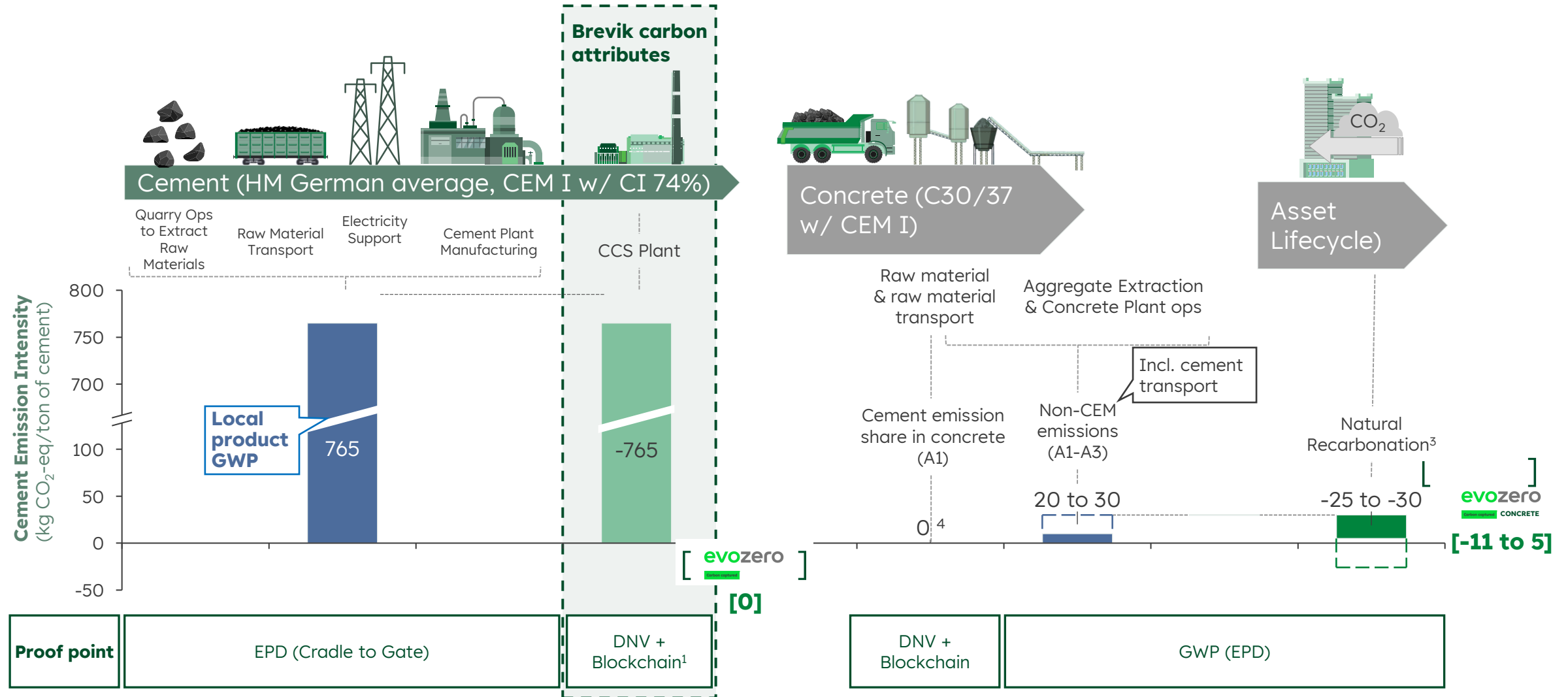
**400 000t of CO₂ emissions are captured p.a.,
resulting in 500.000 t of BREVIK NET ZERO CLINKER**

Captured CO₂ & emission accounting are **certified
by DNV and accounted for via blockchain**

**Both evoZero products are delivered with an EPD
from their respective cement plant + a Carbon
Bank certificate that reduces the GWP**



Technical explanation: Positioning of evoZero



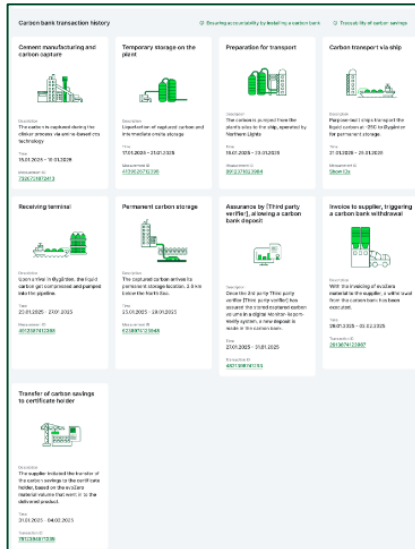
Carbon emissions
Carbon savings

- Blockchain as immutable ledger to track carbon reductions.
- In future, recarbonation benefits potentially recognized in the EPD notes (for cement) with reference to B1 and D in downstream LCAs (initial view after first discussions w/ EPD Norway).
- Assuming a recarbonation rate of 20% - 25 % (summing up to 23% per IVL study), applied to 388.5 kgCO₂/t cem from clinker process emissions (clinker emissions * clinker incorporation * cement content of concrete * recarbonation = 525kg CO₂/t * 0.712 * 0.328 * 0.2 to 0.25
- Based on C30/37 concrete w/ CEM I with ~0.32 tons cement within 1m³ concrete. → [+765 kgCO₂/t cem (GWP) - 765 kgCO₂/t (BAC)] * 0.32t/m³ = 0 kgCO₂/m³

The 'carbon bank' is a digital solution for managing carbon savings through the value chain

Transparency and traceability

Each carbon savings transaction is **unique** and **follows the product** throughout the supply chain.



Thorough third-party verification

Assurance at the time of storage that each carbon saving is **accounted for** only **once** and that no **overselling** can occur*.

Assurance by [Third party verifier], allowing a carbon bank deposit



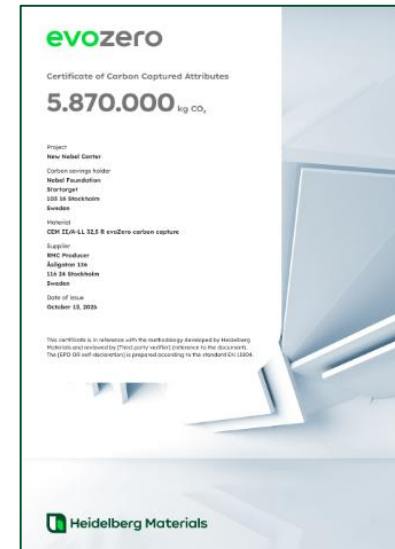
Description
Once the 3rd party Third party verifier [Third party verifier] has assured the stored captured carbon volume in a digital Monitor-Report-Verify system, a new deposit is made in the carbon bank.

Time
27.01.2025 - 31.01.2025

Transaction ID
[4821398741293](#)

Carbon savings declaration

The customer receives a **declaration** for the acquired amount of carbon savings that can be used with **an EPD** to give a full picture of carbon savings.



***We maintain a 10% safety buffer in the carbon bank to account for unforeseen adjustments**



CCUS Project 2031: Anthemis



Antoing, België

Hybride OxyCal-amine technologie

| Capaciteit: 800 kt CO₂

Het project zal ongeveer 800.000 ton CO₂ per jaar afvangen, waarbij het gebruik van alternatieve brandstoffen en grondstoffen zelfs tot een negatieve CO₂-uitstoot kunnen leiden.

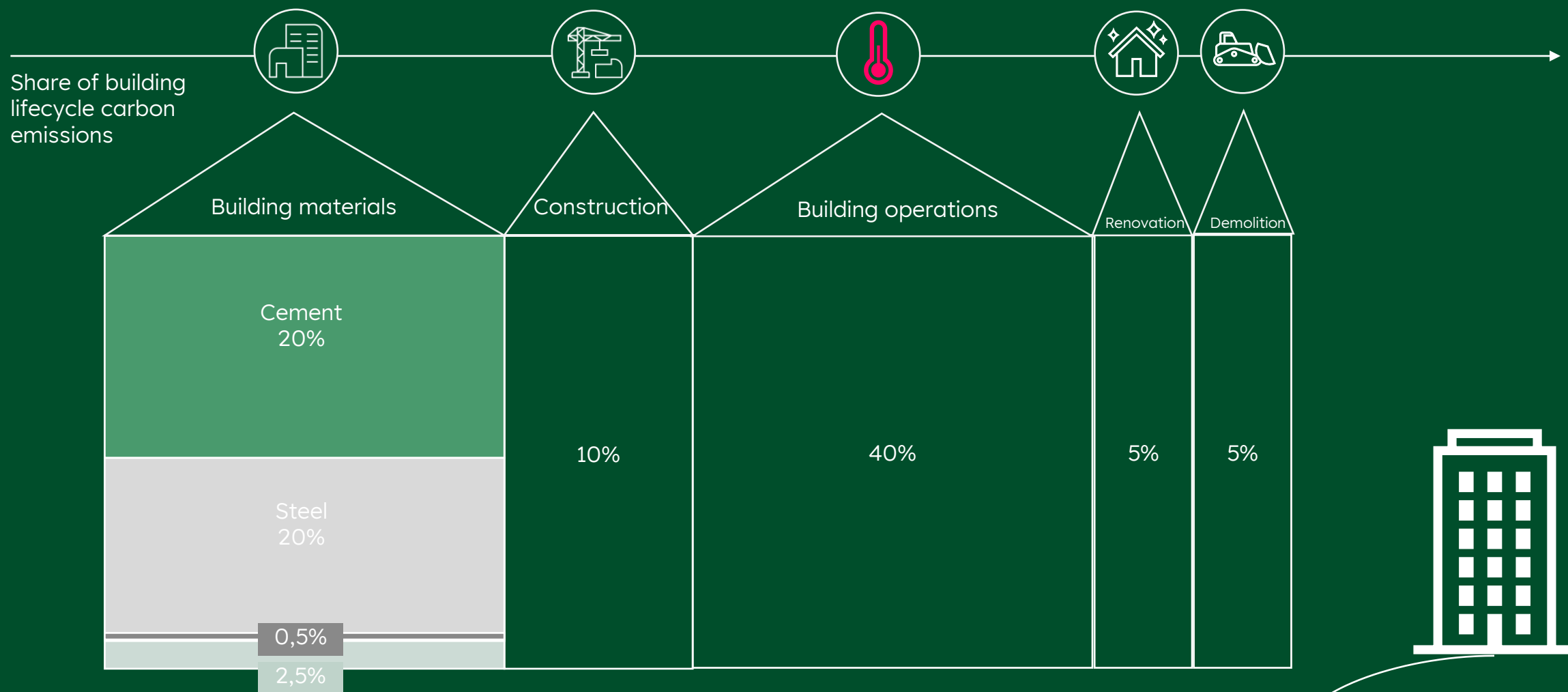
www.anthemis-ccs.com



Beton in een gebouw

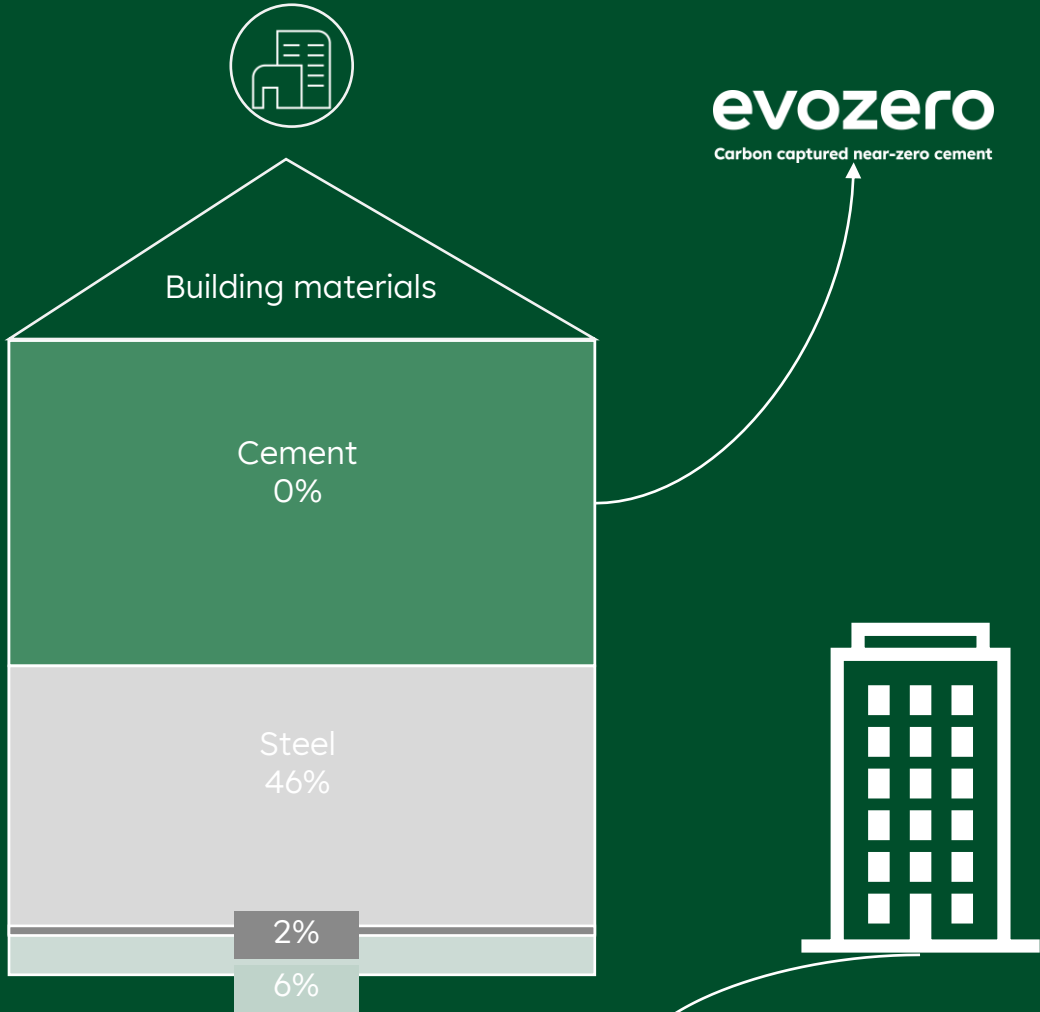
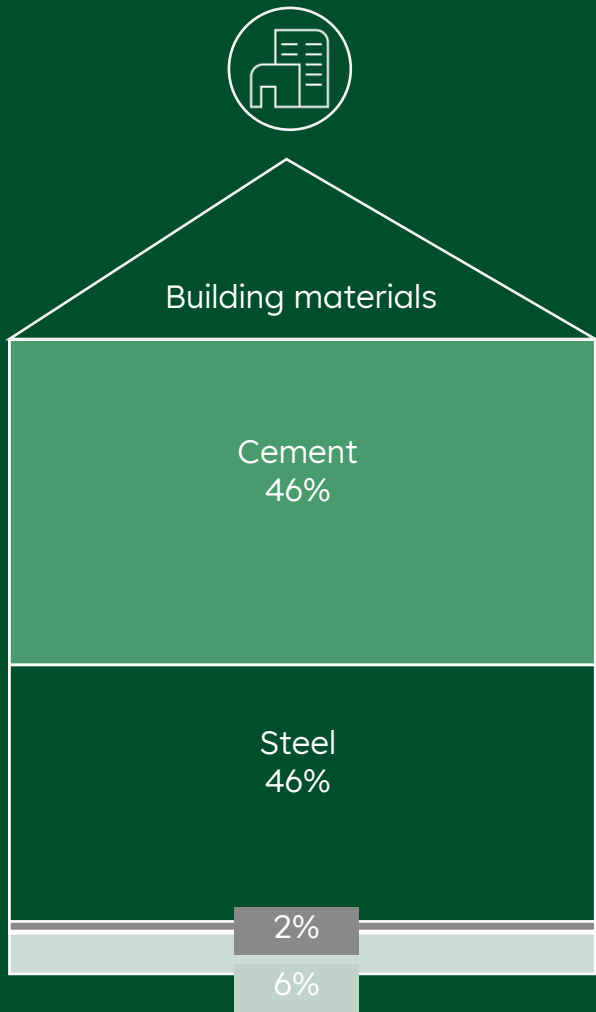


Lifecycle emissions: building materials are a significant emission source



1. Six-story apartment building, embodied carbon by raw materials and component (kg CO₂/qm/year; based on 1000qm floor and assumed 50-year life; Insulation includes rock wool, EPS and glass wool; tiles, paints, sealants etc. are excluded from chart (as a sum <0.5% of lifecycle carbon emissions)).

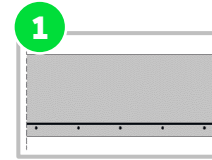
Traditional vs. evoZero: How to reduce your CO₂ impact on cement



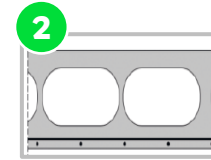
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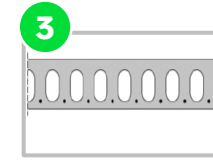
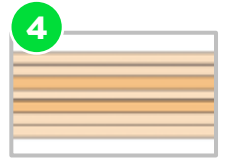
Comparing the GWP of different slab types



Solid slab



Hollow slab

Prestressed
hollow core slab

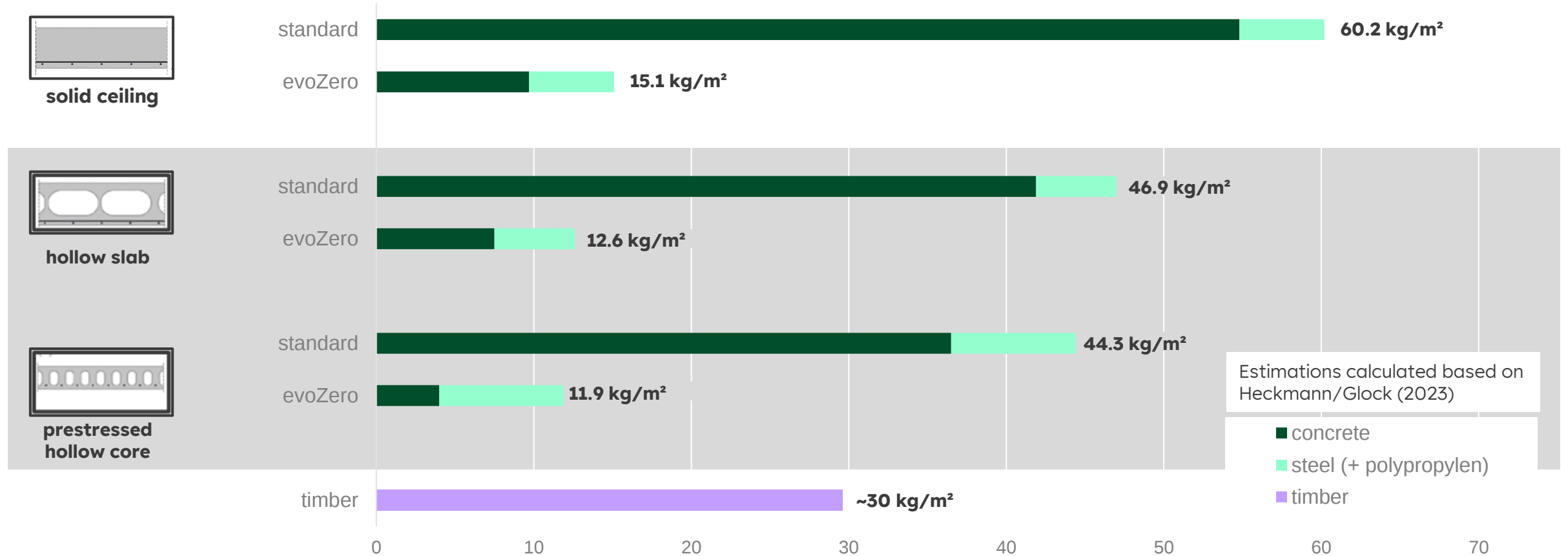
Timber

Static		Loading	
Static System	single-span girder	Dead load	Depending on the system
Stressing	uniaxially stressed	Additional load	1.60 kN/m ²
Span	6.00 m	Payloads	3.50 kN/m ²

Source: M. Heckmann, C. Glock (2023): Ökobilanzen im Bauwesen – Treibhausgasemissionen praxisüblicher Deckensysteme

The combination of evoZero and efficient design enables us to achieve unique carbon savings

GWP of different slab types [kg CO₂-eq./m²]



Source: M. Heckmann, C. Glock (2023): Ökobilanzen im Bauwesen – Treibhausgasemissionen praxisüblicher Deckensysteme; own calculations w/evoZero

Heidelberg Materials delivering evoZero to the Netherlands

Spaansen Group is a family-owned enterprise founded in 1946, headquartered in Winkel, the Netherlands. They produce around 3,500 per year using prefab elements.

”

evoZero distinguishes itself from other materials because with evoZero we already have the means to move directly towards CO₂-neutral cement.

Johan Valkering
Sustainability Coordinator
Spaansen Bouwsystemen



By integrating evoZero into prefab concrete products, Spaansen can deliver building systems with a near-zero footprint.

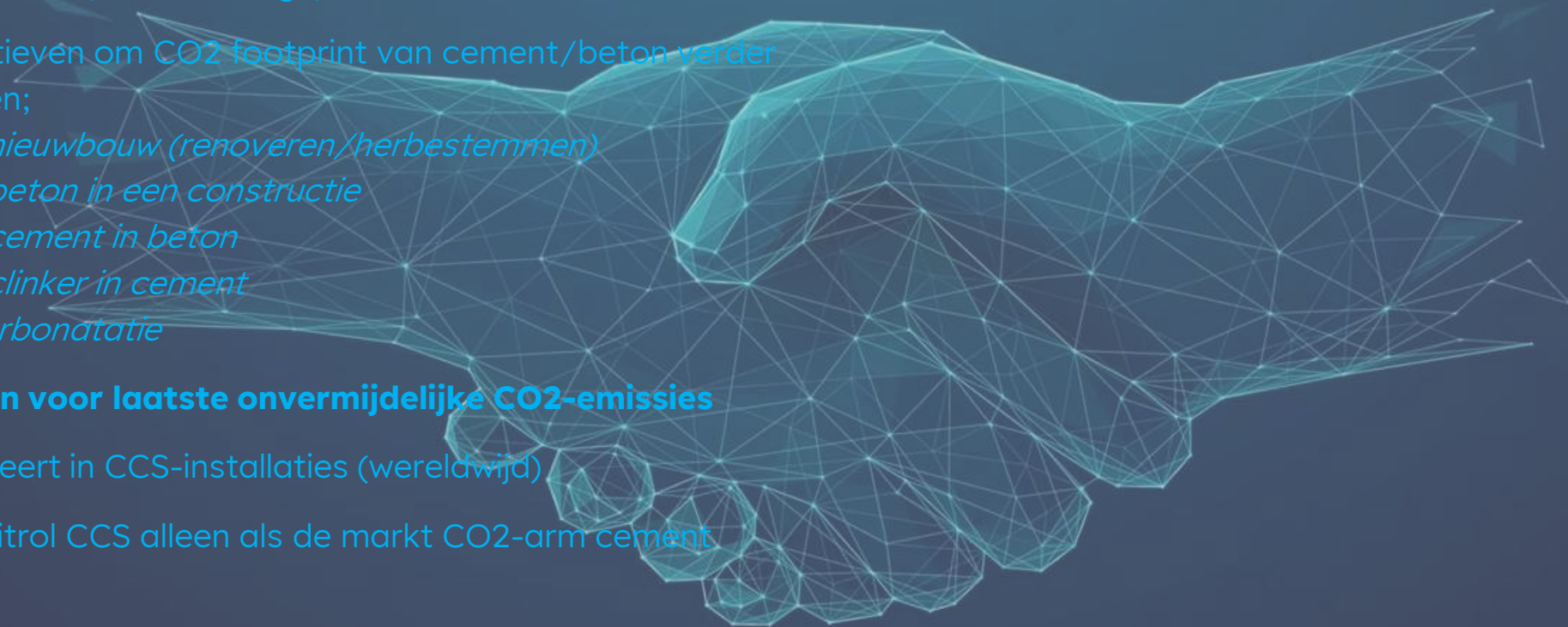


evoZero is a strategic choice for Spaansen because it combines innovation, sustainability, and market leadership.



CO2-neutraal beton alleen haalbaar door samenwerking

- Beton is en blijft een onmisbaar bouw materiaal
- Cement is en blijft het belangrijkste bindmiddel
- veel initiatieven om CO2 footprint van cement/beton verder te verlagen;
 - *minder nieuwbouw (renoveren/herbestemmen)*
 - *minder beton in een constructie*
 - *minder cement in beton*
 - *minder clinker in cement*
 - *meer carbonatatie*
- **CCS alleen voor laatste onvermijdelijke CO2-emissies**
- HM investeert in CCS-installaties (wereldwijd)
- Verdere uitrol CCS alleen als de markt CO2-arm cement omarmt
- **HM zoekt 'rolmodellen' om CO2-arm beton verder uit te rollen**





Heidelberg
Materials