Heidelberg Materials

evoZero - the world's first carbon captured cement

Susbsidence Forum | evoZero, CCS & carbon accounting | Nina Cardinal

15.10.2025

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Technical Strategy Director, Heidelberg Materials UK

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1. Introduction to Heidelberg Materials
2. Where does the carbon come from?
3. How does carbon capture work?
4. Brevik evoZero project
5. evoZero options in the UK
6. HM UK Padeswood CCS project
7. Key messages
8. Q&A

Introduction to Heidelberg Materials

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

Cement	Aggregates	Concrete	Asphalt
126,5	293,7	45,0	8,2
Million Metric Tons	Million Metric Tons	Million Cubic Meters	Million Metric Tons

Providing the materials to build the future.

- > 150 years company history
- > 3000 locations
- 50 countries
- 51000 employees

About Heidelberg Materials UK

- Leading supplier of lower carbon heavy building materials to the construction industry.
- Producing aggregates (crushed rock, sand and gravel), asphalt, ready-mixed concrete, cement and GGBS.
- Committed to decarbonising the built environment and growing the circular economy.
- Developing digital solutions to improve efficiency, productivity and customer service.

No.1
for cement and concrete

No.2
for aggregates

No.3
for asphalt and contracting

2

Where does the carbon come?

Why do we need carbon capture and storage (CCS)?

CEM I = 840 kg CO_2e/tonne
Source MPA Factsheet 18 (2025)

CO_2 emissions from cement production

Process CO_2

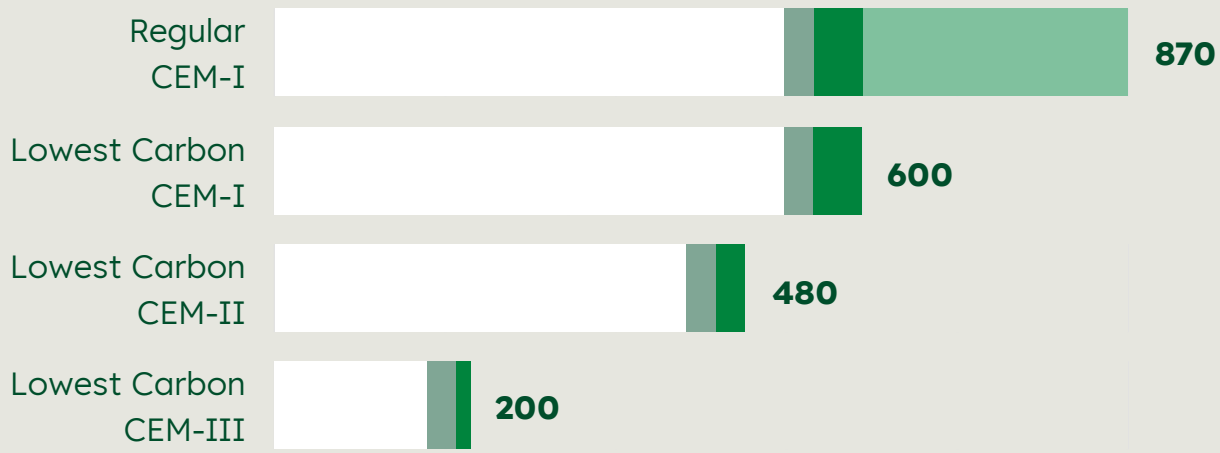
68%

Fuel CO_2

32%

Carbon Capture brings us down to zero without any compromises

CO_2 footprint in CEM types [kg CO_2/t cement][1]



	Clinker share	Strength Class[2]	Reductions
Regular CEM-I	95%	52.5 R	Conventional product
Lowest Carbon CEM-I	95%	52.5 R	**~ 30% reductions** via alternative fuels
Lowest Carbon CEM-II	60%	42.5 N	**~ 45% reductions** via alternative fuels & lower CI
Lowest Carbon CEM-III	30%	32.5 N	**~ 80% reductions** via alternative fuels & lower CI
evoZero net zero[3]	**any**	**any**	**100% reductions** via CCS • No compromises • High performance

☐ Process ■ Scope 3U ■ Scope 2 ■ Fuel

1. Cradle-to-Gate (Scope 1,2 3U) 2. The strength class refers to strength tests after 28 days of hardening & an indication on the strength development speed (i.e., R= Rapid, N = Normal, L = Low early) 3. Includes recarbonation effect; Note: CI = Clinker Incorporation, CCS = Carbon Capture & Storage; Net zero CO_2 footprint secured by allocating CCS savings to dedicated volumes as certified by DNV

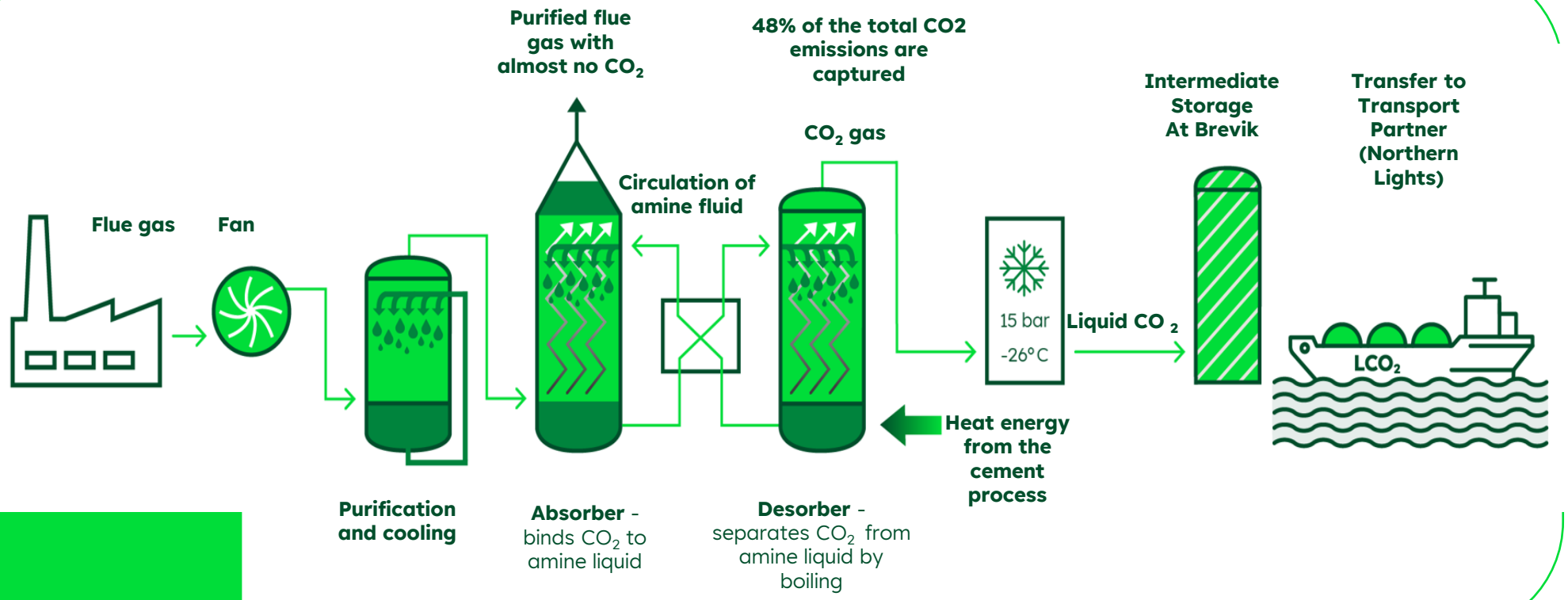
3

How does carbon capture work?

CO_2 is captured at our Brevik site through the use of amine CC technology

CCS plant designed to maximazine volume of captured CO_2 with available heat from cement kiln

Overall capture rate of ~48%



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Brevik evoZero project

From capture to storage

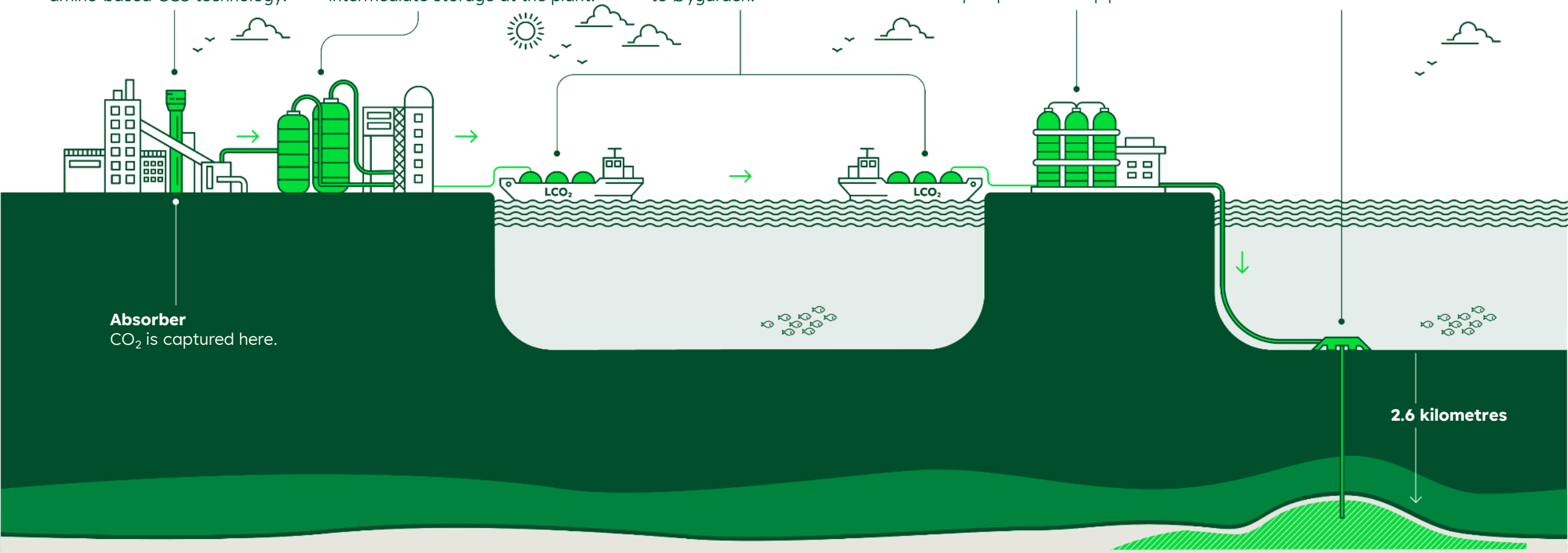
Cement production and carbon capture
CO_2 is captured via amine-based CCS technology.

Preparation for transport
Conversion of CO_2 to liquid form and intermediate storage at the plant.

Carbon dioxide transport by ship
Custom-built vessel that carries liquid CO_2 at -26 °C to Øygården.

Reception terminal
When the CO_2 reaches Øygården it is further compressed and pumped down a pipe.

Permanent CO_2 storage
Storage of CO_2 via 110 km pipeline, 2.6 km below the the bottom of the North Sea.



Absorber
CO_2 is captured here.

Brevik CCS

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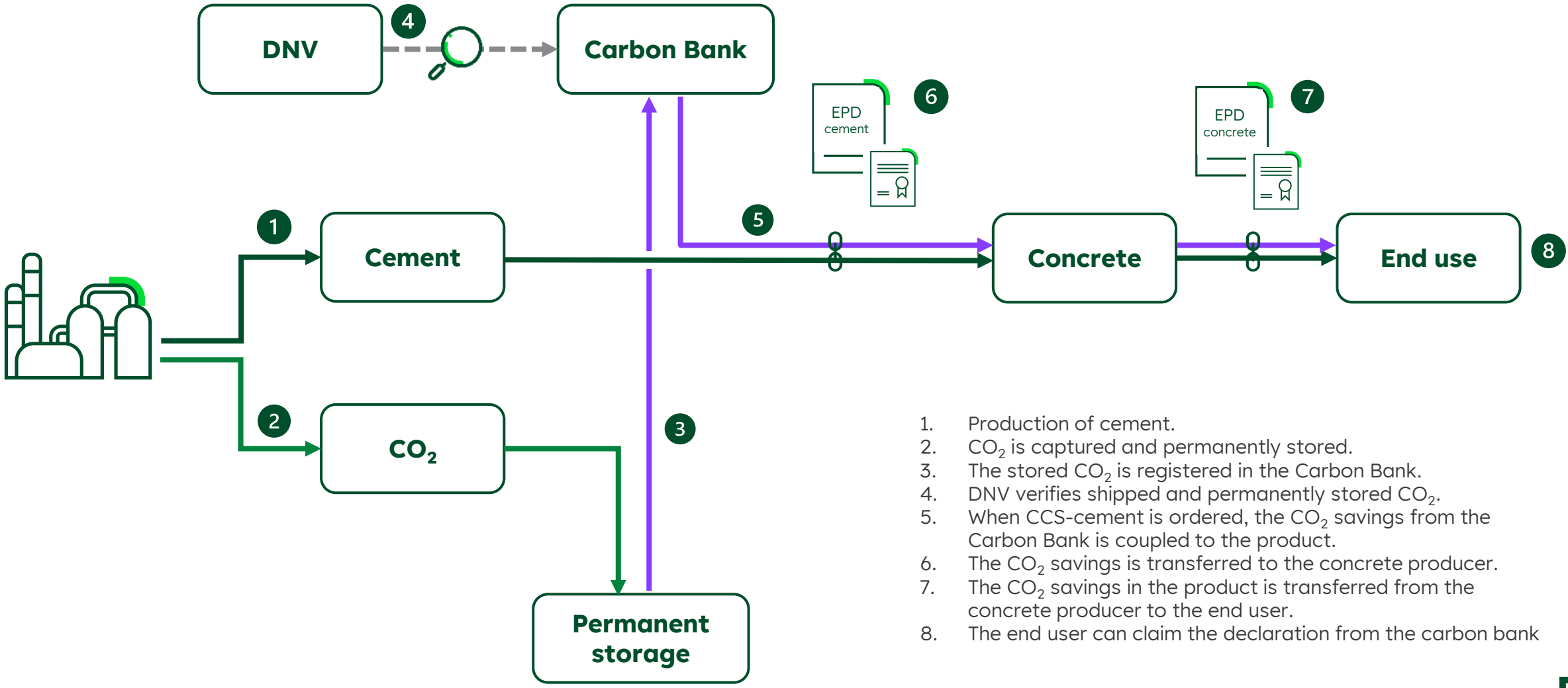
CMA CGM
MAERSK

Northern Lights reception terminal at Øygarden, Norway

The Carbon bank – keep track of the savings



1. Production of cement.
2. CO_2 is captured and permanently stored.
3. The stored CO_2 is registered in the Carbon Bank.
4. DNV verifies shipped and permanently stored CO_2.
5. When CCS-cement is ordered, the CO_2 savings from the Carbon Bank is coupled to the product.
6. The CO_2 savings is transferred to the concrete producer.
7. The CO_2 savings in the product is transferred from the concrete producer to the end user.
8. The end user can claim the declaration from the carbon bank

Brevik Project – Current Position

- Carbon capture plant fully commissioned
- 18,000 kt of CO_2 captured
- Processed assured by DNV
- Transport, pipeline and storage commissioned
- Northern Lights' transport and storage DNV assured
- First carbon credits are now in HM's carbon bank

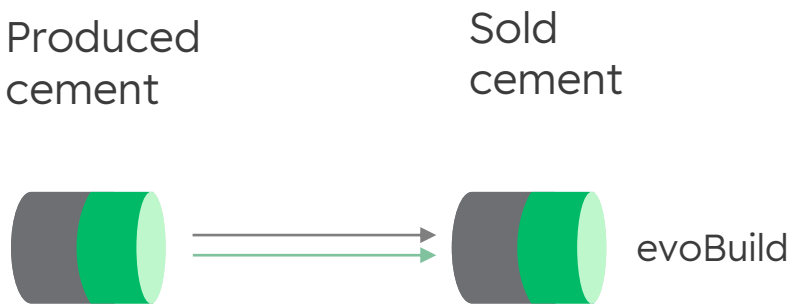
5

evoZero options in the UK

Two principal product ranges based on CCS in Brevik will be offered

evoBUILD

CO_2 reduction from CCS is attributed proportionally to the cement produced in Brevik.



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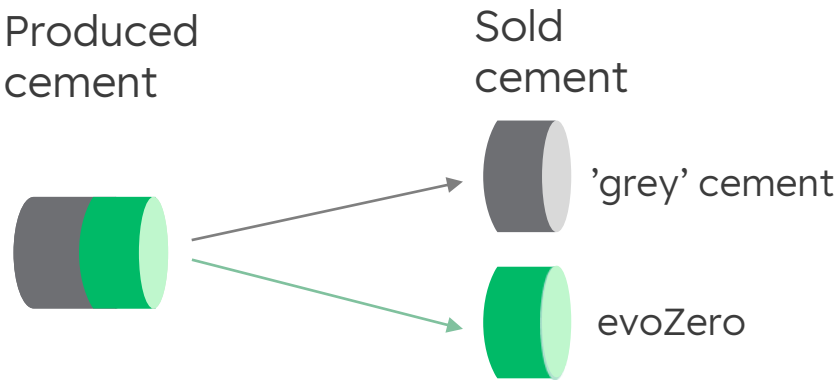
CO_2 reductions is attributed specifically to one product range according to free-attribution mass balance principle.

Mass balancing will be certified by DNV, who will also audit the accounting of the CO_2.



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Industry leaders in Europe have access to two products

1

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Carbon captured Brevik

The ‘traditional way’: net-zero carbon cement **delivered directly from the Brevik plant** to the site of the project or production.

2

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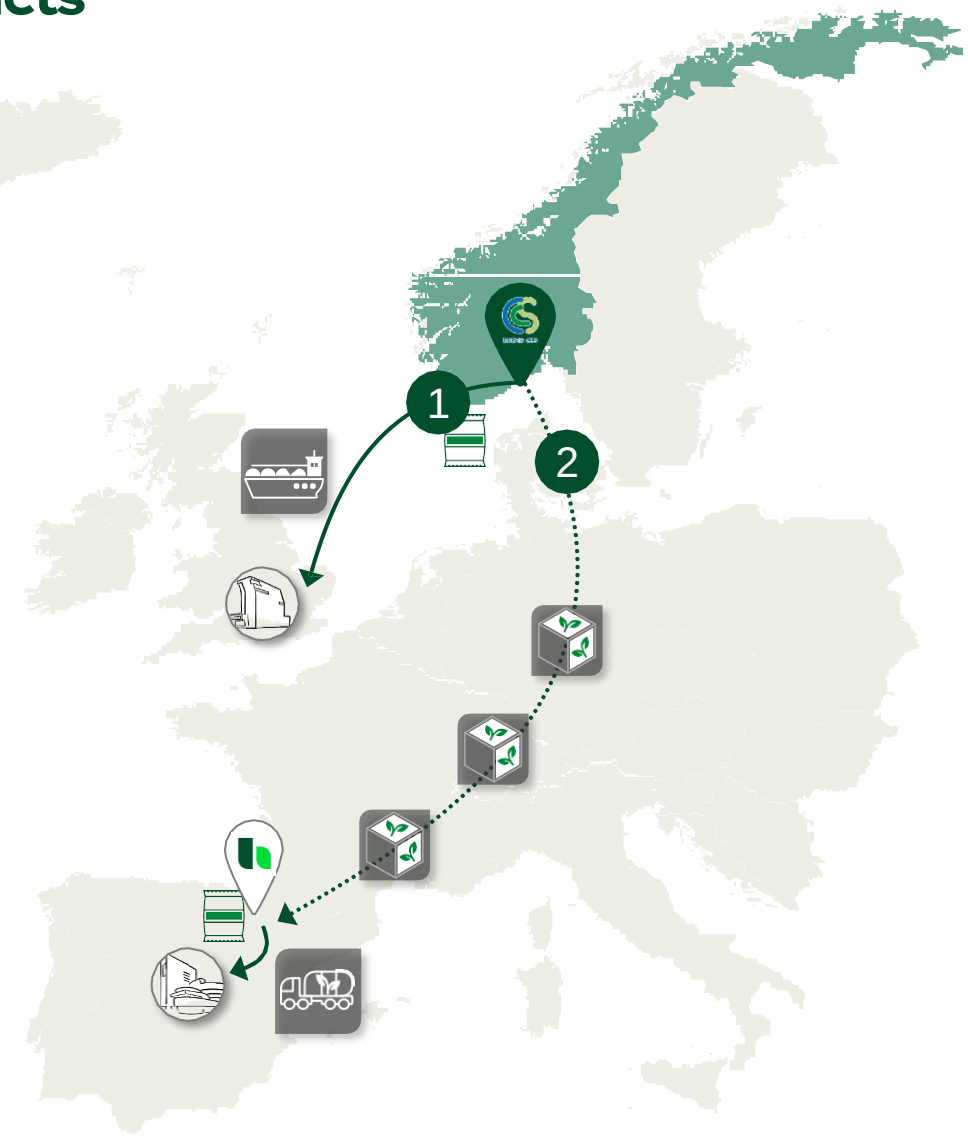
Carbon captured

For projects far away, CO_2 savings can be transferred and attributed **leveraging the local availability of Heidelberg Materials’ products in every given country**



Third-party approved process

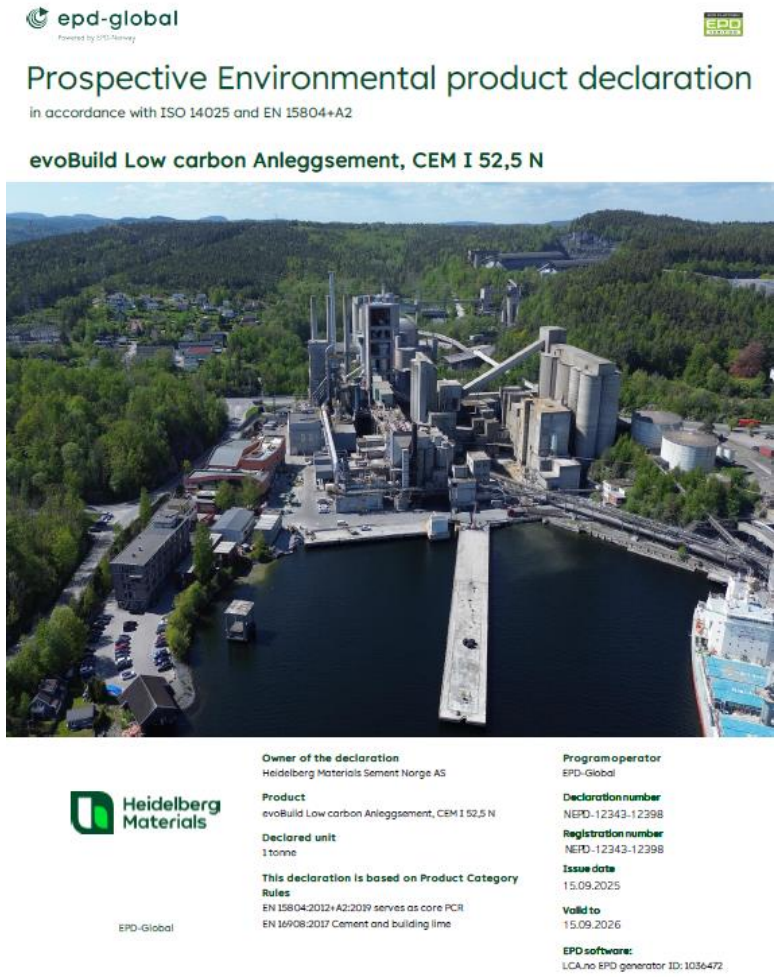
Transparent allocation

EPD based claims

EPD for evoZero – Global Warming Potential (GWP)

GWP kg CO_2/t, gross

	Grey	evoZero	Documentation
evoZero Carbon Captured Brevik	693	41 + 10	P-EPD + Declaration
evoZero Carbon Captured	804	0	Declaration


epd-global

Prospective Environmental product declaration

in accordance with ISO 14025 and EN 15804+A2

evoBuild Low carbon Anleggsement, CEM I 52,5 N

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EPD-Global

Owner of the declaration
Heidelberg Materials Sement Norge AS

Product
evoBuild Low carbon Anleggsement, CEM I 52,5 N

Declared unit
1 tonne

This declaration is based on Product Category Rules
EN 15804:2012+A2:2019 serves as core PCR
EN 16908:2017 Cement and building lime

Program operator
EPD-Global

Declaration number
NEPD-12343-12398

Registration number
NEPD-12343-12398

Issue data
15.09.2025

Valid to
15.09.2026

EPD software:
LCA.no EPD generator ID: 1036472

6

Heidelberg Materials' UK Padeswood CCS project


Padeswood carbon capture
and storage (CCS)
THE
WORLD'S
FIRST
The world's first fully decarbonised
cement production process
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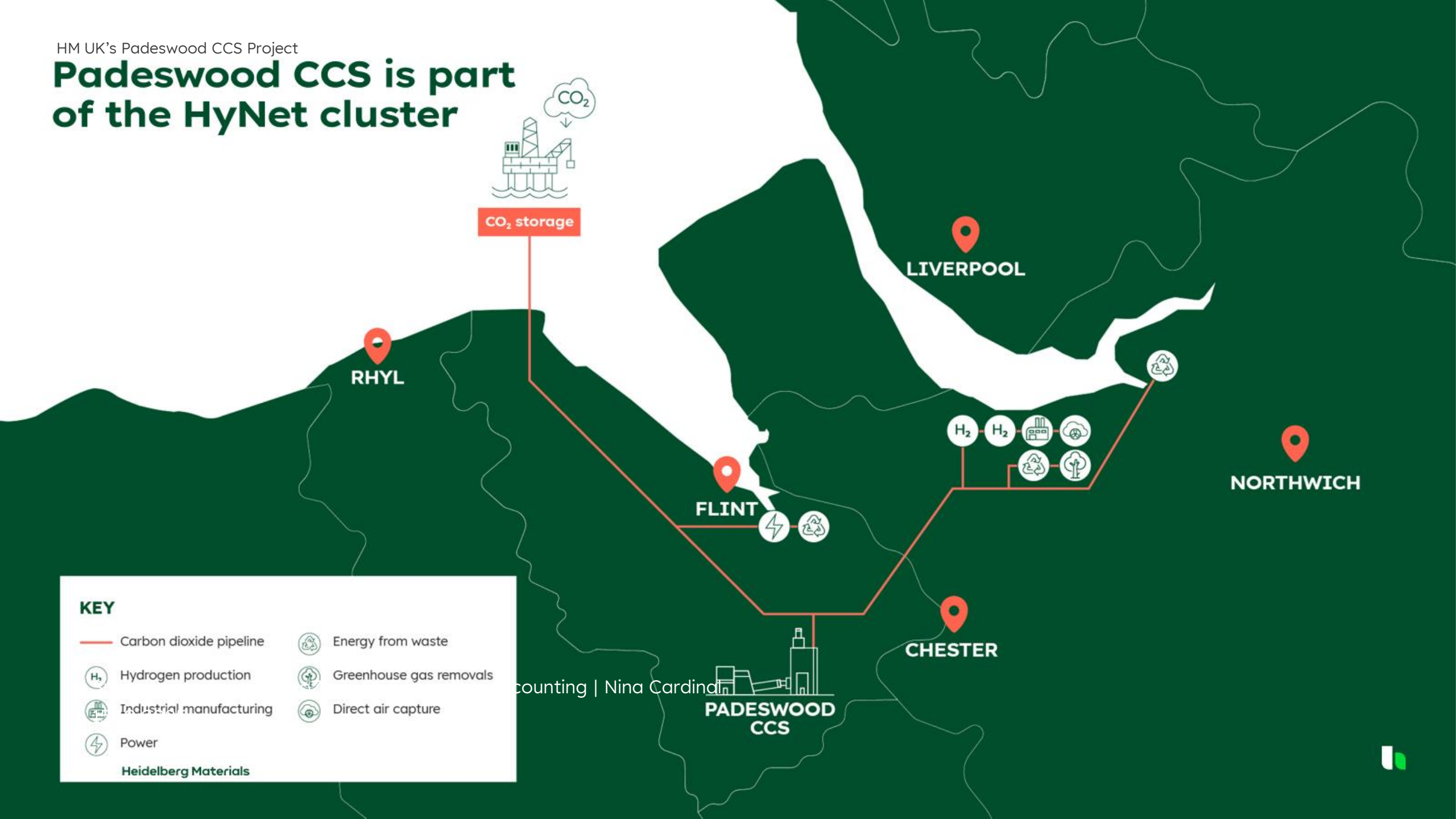
Padeswood CCS project update

- We have agreed funding with the UK Government
- We will create the world’s first carbon capture facility to enable fully decarbonised cement production
- It marks a new era in sustainable cement production
- Construction starts in 2025
- It will produce evoZero carbon captured net zero cement in 2029
- It brings environmental and economic benefits

HM UK's Padeswood CCS Project

Padeswood CCS is part of the HyNet cluster



counting | Nina Cardinal

Padeswood project timeline

2025-2029
Capture plant construction and commissioning

Feasibility study

2021

- Heidelberg Materials pre-feasibility
- IDC feasibility study
- HyNet selected track 1 cluster

Pre-FEED

2022

- Cluster sequencing phase 2
- **Aug:** Project shortlisted
- **Oct:** Pre-FEED and community engagement

FEED

2023

- **March:** Padeswood selected for ICC contract negotiation
- **Feb:** Non-statutory consultation
- **Nov:** FEED started

Consultation & permit application

2024

- **May:** Statutory consulation
- **Sept:** Planning and permit application submitted

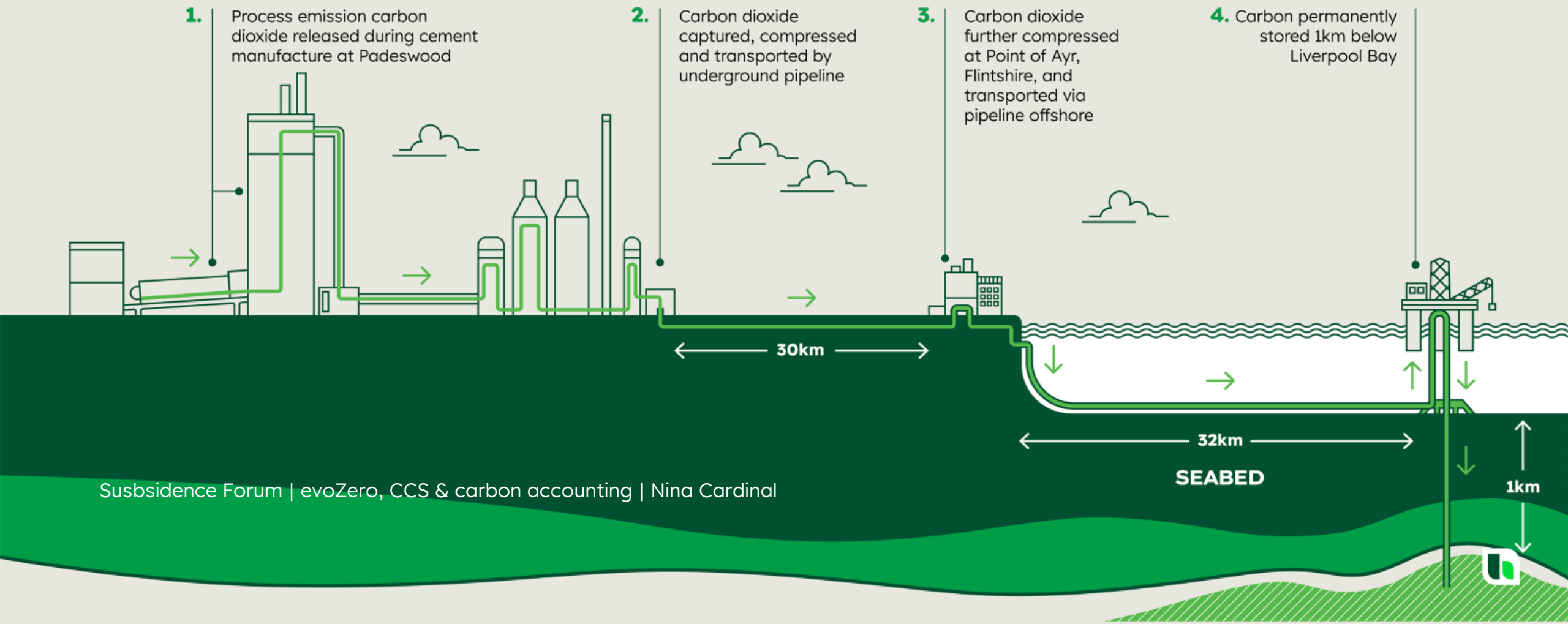
Construction and commissioning

2025

- **April:** Transport and storage network take FID
- **June:** Padeswood spurline planning submitted by T&Sco
- **Sept:** Heidelberg Materials takes FID

2029 Commercial operation

What is Padeswood CCS?



Follow our progress

- For more information visit:

  padeswoodccs.co.uk

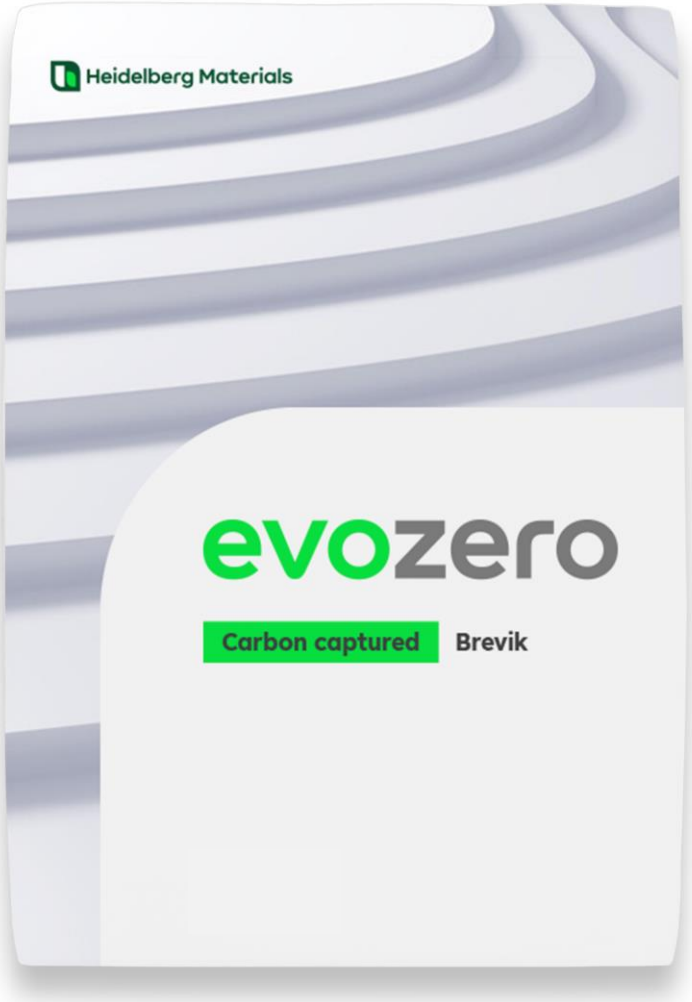
- Contact us:
  padeswoodccs@heidelbergmaterials.com

6

Key messages

Key messages

- evoZero is the first carbon captured cement globally
- evoZero is available in the UK now
- No change to the cement: CEM I 52,5N
- CO_2 storage is permanent
- Padeswood will capture almost all CO_2 emissions
- evoZero is more effective in producing low carbon concrete than any SCM
- evoZero helps clients meet their climate targets
- evoZero reduces the carbon footprint of construction projects




Any
questions?