Heidelberg Materials



Demonstrating evoZero® cement's low-carbon credentials through carbon accounting

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Carbon captured near-zero cement

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Heidelberg Materials' evoZero® carbon captured near-zero cement is now available in the UK from Brevik cement works in Norway.

The product is the first of its kind, setting new standards for low carbon construction, and gains its near-zero credentials from the use of carbon capture and storage and chain of custody models.

Nina Cardinal, Technical Strategy Director at Heidelberg Materials UK, explains the importance of carbon accounting when specifying evoZero®:



Nina Cardinal
Technical Strategy Director
at Heidelberg Materials UK

It is well known that the production of cement is carbon intensive, largely due to unavoidable process emissions from calcination and fuel combustion during clinker production. As a result, the only way to produce this essential construction material without emitting large amounts of carbon, is to capture and store these emissions before they enter the atmosphere.

In June 2025 Heidelberg Materials opened the **world's first carbon capture facility** at a cement works at its site in Brevik, Norway, demonstrating its leading role in decarbonising the cement sector through carbon capture and storage (CCS).

Brevik CCS will capture approximately 50 per cent of the plant's CO_2 emissions once it is fully operational – around 400,000 tonnes a year – which are then liquified and transported to permanent storage 2.6km under the seabed as part of the Norwegian government's **Longship project**.

The implementation of CCS technology has allowed the launch of **evoZero® carbon captured near-zero cement**, which is setting new standards for sustainable building materials and is already available to customers in the UK and across Europe from Brevik.

Assigning carbon emission reductions

Using a chain of custody model known as free-attribution mass balancing, the captured emissions are fully assigned to specific cement volumes.

The concept of mass balancing isn't new and is already used in other industries such as power generation when green electricity is being sold. In the case of evoZero®, Environmental Attribute Certificates (EACs) are used to assign emission reductions from a deeply decarbonised facility – such as the CCS-equipped kiln at Brevik – to standard products from other Heidelberg Materials cement plants across Europe.

The company has taken thorough measures to establish the credibility of the CO_2 reductions and hence the EACs generated by its CCS project. To prevent any risk of double counting, we have implemented a secure virtual carbon accounting tool (referred to as Carbon Bank) on a public distributed ledger.

Tracking carbon reductions with the Carbon Bank

Each deposit into the **Carbon Bank** occurs only when two criteria are met: the verified production of one tonne of clinker under carbon capture conditions and the permanent geological storage of CO_2, both assured by a third-party verifier. All deposits to the Carbon Bank already account for any emissions generated by the day-to-day operation of the CCS infrastructure.

Heidelberg Materials AG engaged with DNV Business Assurance Germany GmbH to provide limited assurance on Carbon Bank transactions. This verification ensures that allocations to products do not exceed the Carbon Bank's available balance and that no double counting has taken place.

The Carbon Bank works on a similar basis as a traditional bank: carbon captured and stored through CCS is 'deposited' into the carbon bank and 'withdrawn' on delivery of the physical product from Brevik or the 'virtual' option, which is supplied from a local Heidelberg Materials' cement works.

For each tonne of physical evoZero® from Brevik transported and sold in the UK, 652kg of CO_2 is withdrawn from the Carbon Bank. This equates to the Global Warming Potential (GWP) of CEM I cement produced at Brevik without carbon capture (693kg CO_2e), minus the 41kg CO_2e associated with Scope 2 and 3 emissions – such as those from internal transport and electricity used for grinding – as per the product's Environmental Product Declaration (EPD).



Pictured left and opposite:
The world's first CCS plant in Brevik, Norway

Heidelberg Materials' Carbon Bank evoZero® Carbon Captured

Physical versus virtual evoZero®

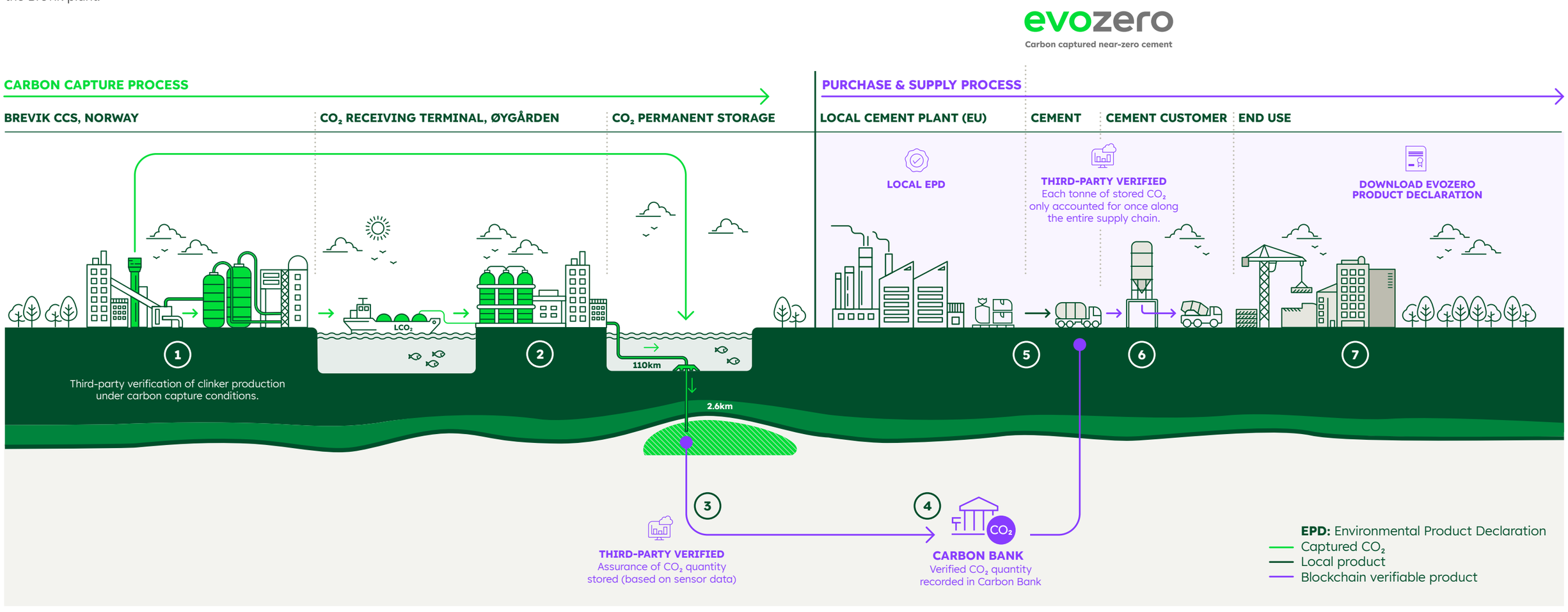
In countries like the UK that are not local to Brevik, customers can also choose to use the 'virtual' evoZero® product to avoid any transport emissions that would be incurred by shipping the physical product from Brevik. In this case, customers source cement from their local Heidelberg Materials' works.

A Carbon Bank withdrawal is then made to reduce the corresponding GWP of the locally produced UK cement to zero (e.g. 804kg CO_2e per tonne of CEM I in the UK). The Carbon Bank's block chain-like solution supports traceability back to reductions achieved at the Brevik plant.

It means that when an invoice is raised for supplying evoZero® to a customer, it triggers a withdrawal from the Carbon Bank, which enables the creation of an evoZero® Product Declaration from the Carbon Bank. This documents the total carbon reductions attributed to evoZero® for their project.

The journey of evoZero® materials via the Carbon Bank

1. Clinker production and carbon capture.
2. Shipment and permanent storage of captured CO_2.
3. Third-party verification of clinker produced under carbon capture conditions and volumes of permanently stored CO_2.
4. Registration in the carbon bank.
5. Upon purchase of evoZero® Carbon Captured, the Global Warming Potential (GWP) specified in the local plant's Environmental Product Declaration (EPD) is balanced by Environmental Attribute Certificates (EACs) from the Carbon Bank. The required EACs are calculated based on the GWP stated in the EPD of the corresponding local product.
6. After delivery and invoicing of evoZero®, a Carbon Bank withdrawal is triggered.
7. An evoZero® Product Declaration may now be issued and included as a voluntary disclosure in customers' sustainability reporting.



Disclaimer: Chain of custody models are not part of EPDs. Carbon reductions will be provided by an evoZero Product Declaration. 'Carbon reductions' refers to the volumes of carbon permanently stored, calculated as the total amount of CO_2 stored minus the CO_2 emissions generated across the CCS value chain.

The role of CCS in decarbonising cement production

It is widely accepted that, in addition to established decarbonisation levers, CCS is required to decarbonise the cement industry. The role of CCS is recognised by governments across the world. In fact, in the UK, The **Climate Change Committee** has described CCS as "a necessity and not an option." [1]

Based on the knowledge and experience gained at Brevik, Heidelberg Materials has around a dozen other CCS projects under consideration, most of which are looking at higher carbon capture rates. These include the **Padeswood CCS** project in north Wales, which is set to be operational in 2029.

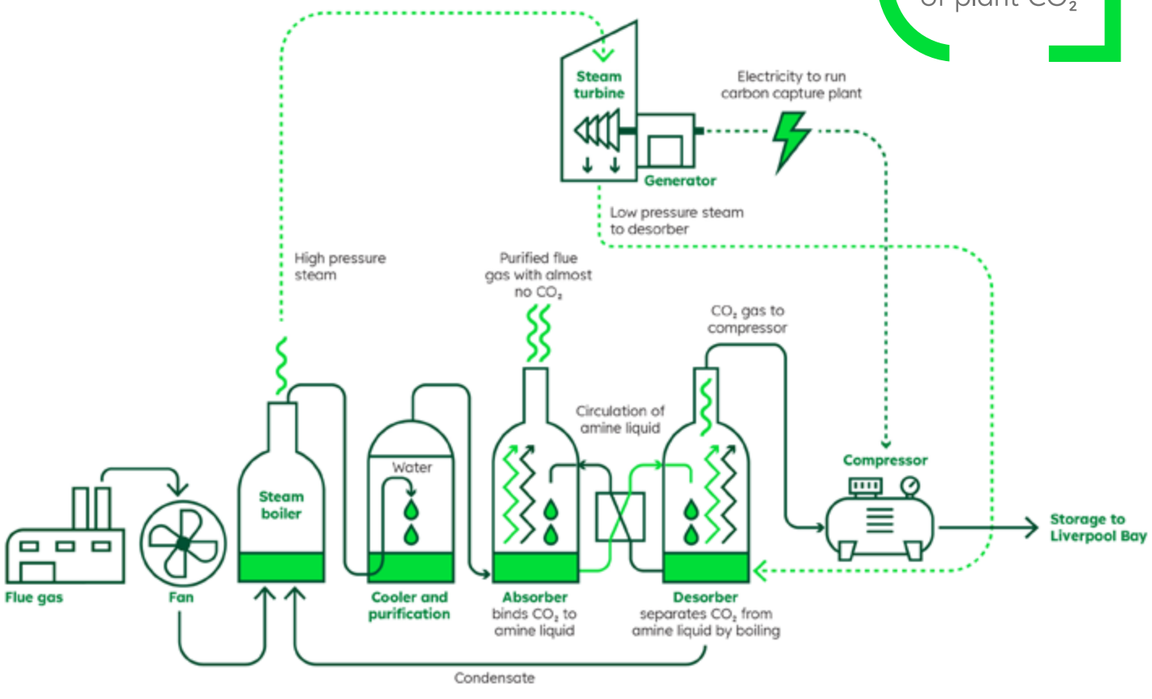
Padeswood CCS reached a **final investment decision** with the UK Government in September 2025 and construction is underway. Here, the carbon capture facility is designed to capture almost all (around 95 per cent) of the CO_2 emissions from the plant – about 800,000 tonnes a year – when fully operational.

These will then be compressed and transported via an underground pipeline for secure and permanent storage under the seabed in Liverpool Bay as part of the **HyNet North West** project.

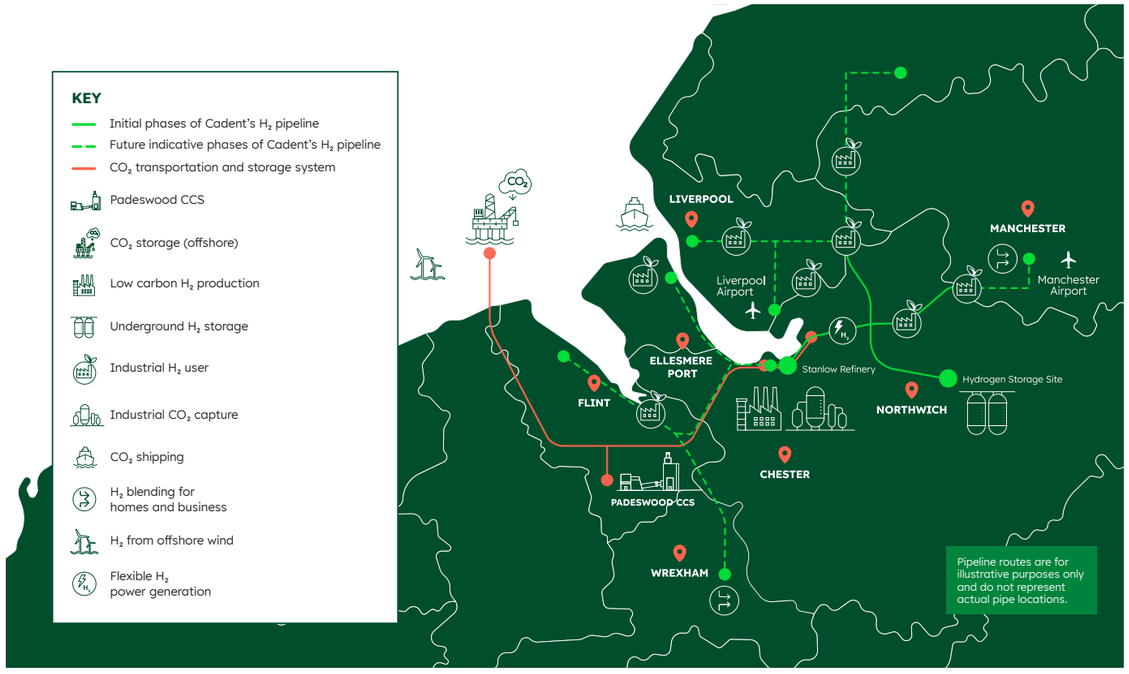
[1] **Net Zero - The UK's contribution to stopping global warming - Climate Change Committee**

The carbon capture process at Padeswood

Designed to capture around **95%** of plant CO_2



HyNet North West map





Heidelberg Materials' existing Padeswood cement works and location for the UK's first CCS project.

CCS is a growing sector worldwide and Brevik, as well as the UK's Padeswood project, are exemplars that will help pave the way to decarbonising the cement industry and help the construction sector reach its net zero goals by using the lowest carbon cement available.



The first tanker of evoZero® arrives in the UK from Brevik.

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