

A Groundbreaking Technology: Carbon Capture, Utilisation, and Storage (CCUS)

At Heidelberg Materials, we focus on expanding our portfolio of sustainable products, reducing our CO₂ emissions quickly and significantly, and proving that net-zero carbon products are possible on a large scale. With the reduction of specific net CO₂ emissions to 400kg/t of cementitious material by 2030, we have set ourselves the most ambitious climate target in our industry.

To date, a considerable proportion of carbon emissions generated in the process of cement manufacturing is unavoidable and cannot be tackled using established techniques. Carbon Capture, Utilisation, and Storage is therefore key to achieving net-zero carbon emissions in our sector. Heidelberg Materials is investing 1.5 billion EUR in CCUS projects until 2030.

How does CCUS work?

1. **Capture:** CO₂ from clinker production is captured directly from the kiln or separated from the flue gas for the purpose of utilisation or storage, to prevent it from reaching the atmosphere. To gain experience with all important CO₂ capture technologies, Heidelberg Materials is developing different technologies and cooperating with qualified partners. Promising projects can thus be scaled up to industrial-scale timely and cost-effectively.
2. **Utilisation:** Alongside geological storage, we are working on a number of ways to turn the CO₂ into a valuable raw material – e.g., for the [recarbonation of recycled concrete paste](#), for use in the [food and beverage or chemical industries](#), to produce [synthetic fuels](#), or to [grow microalgae](#) which can then be used as animal feed.
3. **Storage:** Once the CO₂ emissions are captured, they can be transported by pipeline, train, or ship to injection wells to be safely stored deep underground, either offshore or onshore. Thorough monitoring measures are in place to verify that there is no CO₂ leakage from the storing. The CO₂ will be only stored in geological suitable formations (e.g. saline aquifers or depleted oil and gas fields) that are covered by impermeable thick rock formations, called cap rocks. These avoid any leakage of CO₂ to the surface.

Transforming the building materials industry: The Brevik CCS project

At our plant in Brevik, Norway, the world's first industrial-scale carbon capture plant in the cement industry is currently being built. Once operational, 400,000 tonnes of CO₂ per year (50% of the plant's emissions) are to be captured and transported by ship to an onshore terminal on the Norwegian west coast. From there, the liquefied CO₂ will be transported by pipeline to the storage site under the North Sea, where it will be permanently stored.

As part of the project, the carbon capture plant is being integrated into the current cement plant without disrupting the ongoing cement production. Construction is progressing well and on track.

Brevik has a special significance for Heidelberg Materials and the entire cement industry as a pioneer project – here we are showing that industrial-scale Carbon Capture and Storage (CCS) is indeed possible in our sector. The experiences and 'lessons learnt' from the CCS realisation and operation in Brevik will be valuable for both the cement industry and other process industries.

Scaling up CCUS: Our project portfolio

Based also on the knowledge gained in Brevik, Heidelberg Materials has launched [around a dozen other CCUS projects](#), some of which come with significantly higher capture rates and will completely decarbonise some of our cement plants already before 2030.

To further roll out carbon capture solutions at scale, businesses need clarity about infrastructure and acceleration of permitting and funding procedures. Suitable storage sites, and the necessary infrastructure connecting emission sources to those sites, are a decisive factor. Germany and others can learn from Norway how to implement low-carbon breakthrough technologies on a large, industrial scale.

evoZero, the world's first carbon captured net-zero cement

Under our new [evoZero brand](#), Heidelberg Materials has been introducing the world's first carbon captured net-zero cement to customers in Europe in November 2023. evoZero achieves its net-zero footprint through the application of carbon capture and storage technology at the Heidelberg Materials plant in Brevik, Norway, without compensation from credits generated outside the company's value chain.

"The launch of our unique evoZero products is a paradigm shift in the decarbonisation of our sector. Carbon capture and storage is a breakthrough technology for the building materials industry, and we are frontrunners in deploying it at scale. With evoZero, we are offering the industry's most innovative, globally unique product for our customers, enabling them to drive cutting-edge, environmentally friendly construction projects." **Dominik von Achten, Chairman of the Managing Board**