



European Commission

 CEMENT AND LIME



# INNOVATION FUND

Deployment of net-zero and innovative technologies

**GeZero: First German inland cement plant Geseke becomes net carbon negative by implementing a full CCS chain**

The Innovation Fund is 100% funded by the EU Emissions Trading System

## | Project Factsheet

GeZero (Geseke Zero Emissions) is a full-chain and a full-scale Carbon Capture and Storage (CCS) project (from source to sink) for Geseke, a Heidelberg Materials' cement plant in North Rhine-Westphalia (Germany). The project plans to build a new second generation Oxyfuel kiln on an industrial scale. This will be combined with several innovations to improve the technical, economical, and environmental performance of the plant, leading to approximately 100% relative GHG emission avoidance compared to the reference scenario.

The first-of-its-kind project will contribute to the development of an entire CCS value chain solution for a location which is not in close proximity to the coast nor to inland carbon dioxide (CO<sub>2</sub>) storage options. Starting to operate in 2029, the project aims to safely capture and store approximately 700 000 tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e)

### COORDINATOR

HEIDELBERG MATERIALS AG

### LOCATION

Germany

### CATEGORY

Carbon capture and geological storage (CCS)

### SECTOR

Cement lime

### AMOUNT OF INNOVATION FUND GRANT

EUR 190,905,744

### EXPECTED GHG EMISSIONS AVOIDANCE

7,265,868 tonnes CO<sub>2</sub> equivalent

### STARTING DATE

01 January, 2024

### ENTRY INTO OPERATION DATE

31 December, 2028

### FINANCIAL CLOSE DATE

31 December, 2025

annually beneath the North Sea. This is equivalent to about 3.5% of the annual CO<sub>2</sub> emissions of the German cement industry, or the yearly average CO<sub>2</sub> footprint of 66 700 Germans (calculated according to the Federal Environment Agency, 2023). The project is expected to transform the Geseke plant into one of the first fully decarbonised European plants to produce cement and clinker.

The project includes a new cutting-edge oxyfuel kiln combined with upstream Oxygen (O<sub>2</sub>) production through an Air Separation Unit (ASU). The purification (concentration) and liquefaction of the CO<sub>2</sub> will take place in a Cryogenic Processing Unit (CPU). GeZero's logistical concept includes rail loading and interim storage facilities. The CO<sub>2</sub> will be transported via train to Wintershall Dea's hub "CO<sub>2</sub>nnectNow" in Wilhelmshaven and from there via ship and pipeline to the final permanent storage site. This transport solution by rail will bridge the gap until a CO<sub>2</sub> pipeline infrastructure is available. The electrical energy demand will be met exclusively by renewable energy. For example, a

new solar farm at the factory premises will help to cover a small portion of this demand. In addition, biomass will be used for thermal energy generation and to capture the associated CO<sub>2</sub>, which will create so-called negative emissions, thus sustainably contributing to the EU's CO<sub>2</sub> reduction targets.

GeZero contributes significantly to reaching the climate goals of the industrial sector and to establishing a future carbon management infrastructure. In addition, due to its demand for green energy, the project underlines the need for energy transition and aims to be part of the solution by installing its own solar power farm. GeZero will serve as a CO<sub>2</sub> collection hub for smaller local emitters, giving them access to intermediate storage and rail loading infrastructure. Located near four other cement plants, GeZero plays a crucial role to help making this part of Germany a model region for climate-neutral cement production, ensuring the creation of future-proof jobs.

## | Participants

HEIDELBERG MATERIALS AG

Germany