

INNOVATION FUND

Deploying innovative net-zero technologies for climate neutrality

EVEREST: Improved calcination and carbon capture for the largest lime plant in Europe

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

| Project Factsheet

The objective of the Everest project is to almost completely decarbonise Europe's largest lime plant, located in Flandersbach, Germany. The project will construct a completely new type of lime kiln and a large-scale industrial separation plant, which will allow CO₂ to be captured and stored, both permanently and safely. The project plans to achieve 89% relative greenhouse gas (GHG) emission avoidance compared to the reference scenario.

This innovative project will cover the full CO₂ value chain from an inland lime plant: capture, pipeline transport, liquefaction, shipping, and offshore geological storage. It will bring together all the elements of the carbon capture and storage (CCS) chain, solving potential interface issues and demonstrating the full value chain for the first time on an inland lime plant. For the carbon capture aspect of the project, a CO₂ capturing unit dedicated to flue gas treatment will be connected to a combination of rotary kilns and parallel flow regenerating kilns (PFRK). Moreover, new PFRK Oxyfuel kilns will be built

COORDINATOR

RHEINKALK GMBH

LOCATION

Germany

CATEGORY

Energy intensive industries (EII)

SECTOR

Cement lime

AMOUNT OF INNOVATION FUND GRANT

EUR 228,721,666

EXPECTED GHG EMISSIONS AVOIDANCE

9,309,295 tonnes CO₂ equivalent

STARTING DATE

01 January, 2024

ENTRY INTO OPERATION DATE

31 December, 2029

FINANCIAL CLOSE DATE

31 December, 2025

* Calculated vs. the 2021-2025 ETS benchmark of 6.84 tCO₂e/tH₂, not taking into account additional carbon abatement due to substitution effects in the H₂ end use application, i.e. conservative estimate.

with a specialised technology to capture the CO₂ from these types of kilns which is already highly concentrated. This technology has the potential of wider impact in the sector, since PFRKs are the most commonly used kiln type in the lime industry worldwide. The project is expected to significantly raise the technology readiness level of the key technologies being used, particularly for existing kilns. The fully developed project aims to avoid, through capture and storage, absolute greenhouse gas (GHG) emissions of up to 9.3 million tonnes of CO₂ equivalent over the first ten years of operation.

The project will contribute to the European goals of promoting carbon capture and storage technologies, such as the objective of the Net-Zero Industry Act of achieving 50 megatonnes (Mt)/y CO₂ storage capacity by 2030. Throughout its lifetime Everest will

share its experiences to support other industries in their efforts to contribute to the EU's objective of achieving climate neutrality by 2050 and will be instrumental to create CO₂ supply chains and a new CO₂ economy.

The project will also create potential socio-economic impact, planning to create 40 direct jobs and 500 indirect jobs. Everest shows a high scalability potential on existing plants both at sector level (cement and lime industry), and on an economy-wide level across sectors and across countries, tackling one key "difficult-to-abate" sector. Due to its sheer size, Everest will be a nucleus for the CO₂ infrastructure that is needed in Europe and will it help other CO₂ emitters within and outside the lime industry to develop and establish their own CCS projects.

| Participants

RHEINKALK GMBH	Germany
AIR LIQUIDE DEUTSCHLAND GMBH	Germany
AIR LIQUIDE GLOBAL E&C SOLUTIONS FRANCE	France
AIR LIQUIDE GLOBAL E&C SOLUTIONS GERMANY GMBH	Germany