

INNOVATION FUND

Deploying innovative net-zero technologies for climate neutrality

CUSTARD: carbon Capture and Use at a STEel plant with an Advanced solution to Reach Decarbonisation

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

Project Factsheet

CUSTARD aims to reduce the carbon dioxide (CO₂) emissions of a steel plant (managed by Acciaierie Bertoli Safau Spa). Thanks to innovative Carbon Capture and Usage (CCU) technology, about 13 000 tons of CO₂ will be captured annually from the flue gases of a reheating furnace and used in a chemical reaction with caustic soda to produce a high value-added chemical compound (sodium bicarbonate) to be sold on the market. In terms of relative greenhouse gas reduction, around 40% CO₂ equivalent (CO₂e) with respect to the most adopted method for bicarbonate production (the Solvay process for reference), will be saved during the first 10 years of operation.

The sodium bicarbonate production route proposed by CUSTARD will be based on caustic soda production from green electrolysis and the available use of waste heat, thus reducing the final product's carbon footprint. After passing through a carbon capture and concentration unit and a caustic soda scrubbing unit, the reagents enter a 3-phase reactor where sodium

COORDINATOR

ACCIAIERIE BERTOLI SAFAU SPA

LOCATION

Italy

CATEGORY

Energy intensive industries (EII)

SECTOR

Iron & steel

AMOUNT OF INNOVATION FUND GRANT

EUR 4,150,000

EXPECTED GHG EMISSIONS AVOIDANCE

179,040 tonnes CO₂ equivalent

STARTING DATE

01 July, 2024

FINANCIAL CLOSE DATE

31 March, 2027

ENTRY INTO OPERATION DATE

31 March, 2029

CALL NAME

InnovFund-2022-SSC

* 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.

bicarbonate is generated, followed by its crystallisation and purification to reach food grade quality. Furthermore, no by-products are generated. Similar CCU applications are already present in other industrial sectors, such as in energy; however, no CCU technologies of this kind (characterised by flue gases with variable flowrates and CO₂ concentration) have been tested in the steel sector.

The CCU technology will impact the steel industry as a climate mitigation measure and energy intensive industries in general. The reduction of CO₂ could contribute to the decarbonisation goals set in the European Green Deal in all sectors. Once it has been industrially applied in the steel sector, the technology

could be replicated in other steel plants in Europe as well as in other hard-to-abate (i.e. cement, glass, ceramic) industries, including the chemical sector.

The local community will benefit from CUSTARD thanks to the creation of new jobs both in the direct workforce of the new plant and in the possible related services. The Region will increase its gross domestic product since both sodium bicarbonate and caustic soda will be produced in the same local area. Moreover, CUSTARD will promote the development of a regional centre of competence for circular carbon chemistry, including a private research centre (Serichim s.r.l.) with local universities that already collaborate with the project partners.

| Participants

ACCIAIERIE BERTOLI SAFAU SPA

Italy

DANIELI & C OFFICINE MECCANICHE SPA

Italy

Additional information on the [EU Funding and Tenders Portal](#).