

PYROCO₂



Demonstrating sustainable value creation from industrial CO₂ by its thermophilic microbial conversion into acetone

ABOUT

PYROCO₂ is scaling carbon capture and utilization with its breakthrough bioprocess, turning industrial CO₂ and renewable hydrogen into climate-positive acetone, a building block for chemicals and materials with a negative carbon footprint.

The project will build a demonstrator plant using up to 1,000 tonnes of CO₂ per year (equal to the annual emissions of 220 cars) and aims to enable 17 Mt CO₂eq emissions savings by 2050. Funded by the EU's Horizon 2020 programme under the Green Deal call on closing the industrial carbon cycle.

THE PROJECT

PYROCO₂ is accelerating Europe's path to climate neutrality by transforming industrial CO₂ into climate-positive acetone using green hydrogen and an energy-efficient thermophilic bioprocess. The project demonstrates the scalability and economic viability of CCU, enabling sustainable chemicals, synthetic fuels, and recyclable polymers while targeting 17 Mt CO₂eq emissions reductions by 2050 and paving the way for replication across Europe.

The PYROCO₂ demonstrator plant will be able to produce up to 400 tonnes acetone annually from 910 tonnes of industrial CO₂ and green hydrogen. It will be located at SINTEF's piloting area at Tiller, near Trondheim, Norway, while the industrial cluster of Herøya Industrial Park in southern Norway will serve as a primary scenario location for a future full-scale PYROCO₂ production site with guaranteed access to industrial CO₂ feedstock and green energy at a competitive price and connects several carbon-intensive industries with chemical production through industrial symbiosis.

OBJECTIVES

PYROCO₂ will demonstrate that carbon capture and utilization can deliver climate-positive acetone at scale, creating a sustainable platform for chemicals, fuel additives, and materials.

To achieve this, the project will:

- Design and build a demonstrator plant based on industrial symbiosis, proving how carbon-intensive industries can turn CO₂ into value while reducing emissions.
- Demonstrate large-scale thermophilic microbial gas fermentation, producing up to 4,000 t/a of acetone from CO₂ and renewable electricity as a platform for further catalytic upgrading.
- Establish acetone from CO₂ as a competitive alternative to fossil-based production routes.
- Create synergies with CCUS, renewable energy, and hydrogen initiatives supporting Europe's Green Transition.
- Drive the emergence of CCU hubs across Europe, strengthening the chemical industry's leadership in the low-carbon, circular economy.

€ 43 mln
BUDGET

19
PARTNERS

72 months
DURATION

SINTEF

again

DTU

ARKEMA

CNRS

KIT
Karlsruhe Institute of Technology

PNO INNOVATION

axelera

Firmenich
for good, naturally

NORCE

HERØYA
INDUSTRI PARK

CHALMERS
TECHNICAL UNIVERSITY OF
BREMEN

BIOPROCESS
TECHNOLOGY

norner
The Polymer Explorers

SCGC

JM Johnson Matthey
Inspiring science, enhancing life

Ranido

ecoinnovazione
spin off IED

Telemark
FYLKESKOMMUNE

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