



LIQUID RENEWABLE ENERGY CARRIERS FROM CAPTURED CARBON EMISSIONS

Start of new Horizon Europe project CAPTUS - Demonstrating energy intensive industry-integrated solutions to produce liquid renewable energy carriers from CAPTURED carbon emissions

We are happy to announce the start of CAPTUS, an innovation action project funded by the European Union's research and innovation programme Horizon Europe, with the aim to demonstrate sustainable and cost-effective pathways to produce high-added value renewable energy carriers (RECs) in energy intensive industries (EIIs) by the valorisation of their carbon emissions and the integration of renewable energy sources.

Nowadays, due to ambitious climate policies, EIIs are facing a major challenge: to remain competitive on globalised markets while taking steps to drastically reduce their carbon emissions. In this scenario, carbon capture utilisation and storage (CCUS) will play a key role in this transition, and technologies at different levels of maturity and performance are being explored. The conversion of CO₂ to high-value RECs using renewable electricity is a promising strategy to close the anthropogenic carbon cycle and meet reductions goals and energy requirements. Various conversion processes are available, but most are still demanding in terms of materials and energy, being costly and inefficient.

CAPTUS will demonstrate sustainable and cost-effective pathways to produce high-added value RECs in EIIs by valorising industrial carbon emissions and integrating renewable electricity surplus. Three complete REC value chains will be demonstrated at 3 different demonstration sites:

1. A bioprocess based on a two-stage fermentation to produce triglycerides in a steel plant.
2. Lipids-rich microalgae cultivation followed by hydrothermal liquefaction to produce bio-oils in a chemical plant.
3. Electrochemical reduction of CO₂ to produce formic acid in a cement plant.

The proposed technologies will be tested and endorsed from lab to pilot scale, and the obtained RECs will be validated by quality assessments and upgrading studies for the formulation of high-performance fuels. Also, CAPTUS will analyse the integration of the validated solutions in EIIs regarding economic, environmental, societal, regulatory and geo-political criteria. Furthermore, CAPTUS will develop guidelines and strategies for a decarbonization roadmap, improving awareness and acceptance of CCU technologies and the obtained RECs, as well as creating suitable business cases and replication opportunities.

The CAPTUS consortium consists of 18 partners from 8 countries, combining multidisciplinary competencies and resources from academia, research, engineering, industries and universities:

1. FUNDACIÓN CIRCE CENTRO DE INVESTIGACIÓN DE RECURSOS Y CONSUMOS ENERGÉTICOS (Coordinator) - Spain
2. SINTEF AS - Norway
3. UNIVERSIDAD DE CANTABRIA - Spain
4. AGENCIA ESTATAL CONSEJO SUPERIOR DE INVESTIGACIONES CINETÍFICAS - Spain
5. UNIVERSITA DEGLI STUDI DI GENOVA - Italy
6. STEINBEIS INNOVATION GGMBH - Germany
7. ETHNIKO KENTRO EREVNAS KAI TECHNOLOGIKIS ANAPTYXIS - Greece
8. BIO BASE EUROPE PILOT PLANT VZW – Belgium
9. NOVIS GMBH – Germany
10. APRIA SYSTEMS SL - Spain
11. DRAXIS ENVIRONMENTAL SA – Greece
12. A4F ALGAFUEL SA – Portugal
13. GOODFUEL BV – Netherlands
14. RINA CONSULTING SPA - Italy
15. ARCELORMITTAL BELGIUM NV - Belgium
16. HYCHEM, QUÍMICA SUSTENTÁVEL SA - Portugal
17. CEMENTOS PORTLAND VALDERRIVAS SA - Spain
18. ENERGY EFFICIENCY IN INDUSTRIAL PROCESSES ASBL - Belgium

The project, with a duration of 48 months (starting on the 1st of June 2023) and a total budget of 10 million euros, celebrated its kick-off meeting on the 15th and 16th of June 2023 in Zaragoza, Spain.



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Project Details

Project No: 101118265

Start Date: 01/06/2023

Project Duration: 48 months

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