BIOCON-CO_2

BIOtechnological processes based on microbial platforms for the CONversion of CO_2 from the iron and steel industry into commodities for chemicals and plastics

www.biocon-co2.eu


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PROJECT OBJECTIVE

The overarching objective of BIOCON-CO_2 is to reduce greenhouse gas emissions and avoid overexploitation of natural sources. BIOCON-CO_2 aims to develop and validate a platform of flexible and versatile techniques capable of using biological processes to transform raw CO_2 waste from the iron, steel, cement and electric power industries into value-added chemicals and plastics. Exploring novel biotechnological solutions, the project intends to generate new knowledge to develop commercially viable strategies for reducing Europe's dependency on fossil fuel resources. This will lead to the increased sustainability of the chemical industry and provide support for European leadership in CO_2 re-use technologies.

THE CHALLENGE

Carbon dioxide (CO_2) is a naturally occurring greenhouse gas present in the Earth's atmosphere. However, human activities have led to an exponential increase in levels of the greenhouse gas through actions such as the burning of fossil fuels for industrial production. CO_2 acts to trap heat in the atmosphere, leading to global warming. Currently CO_2 re-use via biological processes is one of the most promising and valuable technological ways to reduce otherwise harmful CO_2 emissions, potentially making CO_2 a valuable commodity rather than a pollutant. However, research behind full development of CO_2 re-use technologies is in its infancy and several technical issues remain unresolved, including industrial-scale implementation.

AT A GLANCE

PROGRAMME: Horizon 2020 (BIOTEC-05-2017)

TOTAL BUDGET: €7 million

INSTRUMENT: Research and Innovation Action (RIA)

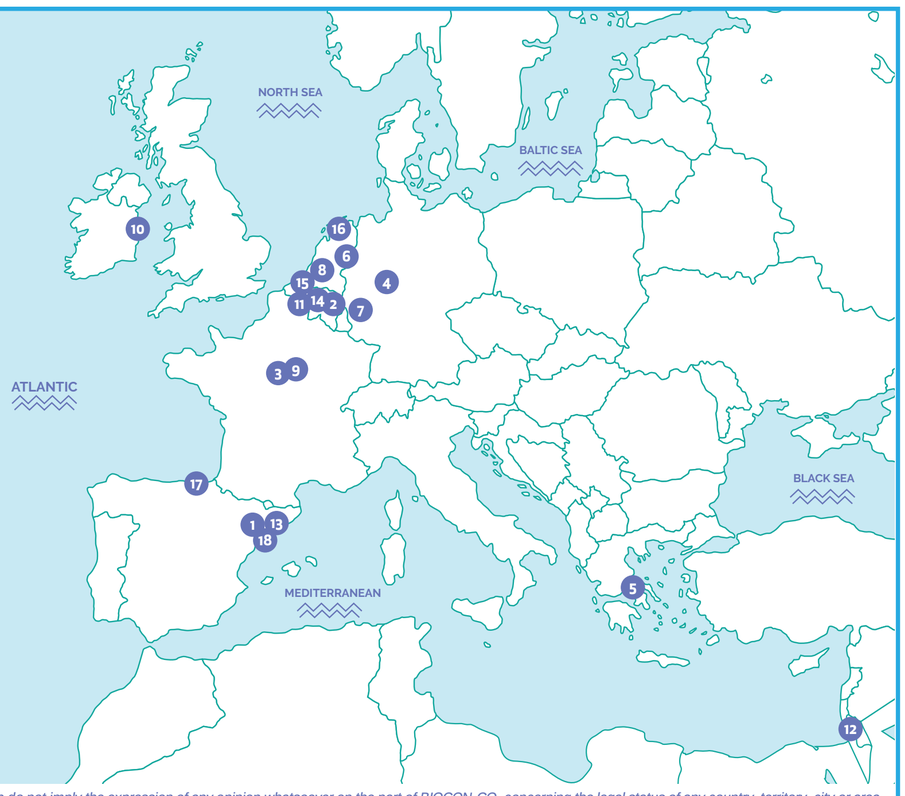
DURATION: January 2018 – June 2022 (54 Months)

CONSORTIUM: 18 partners in 8 countries

COORDINATOR: Acondicionamiento Tarrasense Asociación (LEITAT), Spain

CONSORTIUM
18 PARTNERS

1. Acondicionamiento Tarrasense Asociación (LEITAT), Spain
2. ArcelorMittal Belgium NV (ARCELORMITTAL), Belgium
3. Arkema France (ARKEMA), France
4. Fraunhofer-IME (FRAUNHOFER), Germany
5. National Technical University of Athens (NTUA), Greece
6. Pervatech B.V. (PTECH), Netherlands
7. Rheinisch-Westfälische Technische Hochschule Aachen (AVT.BioVT), Germany
8. Stichting Wageningen Research (WFBR), Netherlands
9. ARTTIC (ARTTIC), France
10. AquaTT UETP CLG (AQUATT), Ireland
11. Nutrition Sciences N.V. (NS), Belgium
12. Nesher Israel Cement Enterprises Ltd (NESHER), Israel
13. Universitat Autònoma de Barcelona (UAB), Spain
14. Belgisch Laboratorium van de Elektriciteitsindustrie (ENGIE Laborelec), Belgium
15. Bio Base Europe Pilot Plant VZW (BBEPP), Belgium
16. Rijksuniversiteit Groningen (RUG), Netherlands
17. Fundación Tecnalia Research & Innovation (TECNALIA), Spain
18. Artificial Nature, S.L. (DAN*NA), Spain



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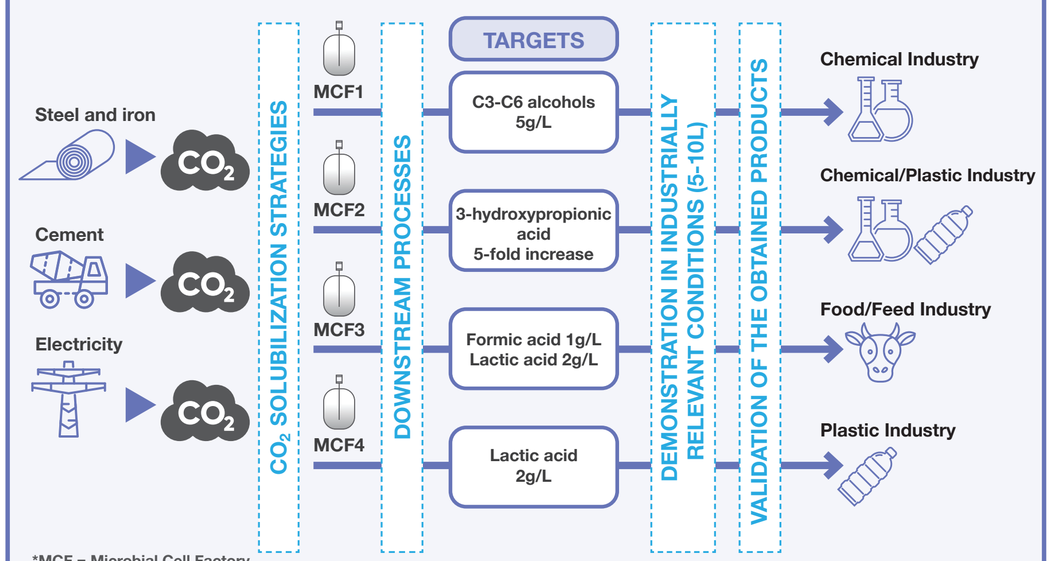
WORKFLOW OF BIOCON-CO_2

CO_2 CAPTURE GOAL
Midterm: 1.4 Mtonnes CO_2/YEAR
Longterm: 3.5 Mtonnes CO_2/YEAR



*MCF = Microbial Cell Factory


Steel casting production process ©ArcelorMittal

EXPECTED RESULTS

- Assessment and validation of **three low-energy microbial processing systems** capable of converting **CO_2** emissions from iron and steel manufacturers into valuable industrial products.
- **Production of four chemical building blocks** that have application in the food/feed, chemical (acrylates, polymers, surfactants) and plastic industries.
- Pilot installation in an industrial setting to demonstrate and validate the effectiveness of four chemical building blocks produced using **CO_2** re-use technologies.
- **Improved public perception of CO_2 re-use technologies** through transparent and responsible communication, dissemination, knowledge transfer and exploitation of outcomes of the project.

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