

Abstract

BIOCON-CO₂ aims to develop and validate in an industrially relevant environment a flexible platform to biologically transform industrial CO₂ from the iron, steel, cement and electric power industries into value-added chemicals and plastics. Building on the development of novel technologies and strategies, improvements on three different stages in the CO₂ bioconversion process are targeted: CO₂ solubilization, bioprocess development and downstream. The BIOCON-CO₂ consortium is currently developing four Microbial Cell Factories (MCFs) which will ultimately use the raw industrial CO₂ from iron&steel industry as a direct feedstock to produce four chemical building blocks with application in food/feed, chemical and plastic industries. Three different biological systems are being adapted and optimized: anaerobic microorganisms for C3-C6 alcohol production, aerobic quimioautotrophs for 3-hydroxypropionic acid production and multi-enzymatic systems for formic and lactic acid production. A pilot installation in an industrial setting will demonstrate and validate the effectiveness of the developed technologies, MCFs and downstream procedures.

Exploring novel biotechnological solutions, BIOCON-CO₂ 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 CO₂ re-use technologies.

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