

PRESS RELEASE

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New EU Project ICO₂NIC to Transform Industrial CO₂ Waste into Valuable Feedstock

The European Union has awarded €14 million to the ICO₂NIC project to help advance CO₂ capture and electrochemical conversion to improve economic sustainability.

Converting industrial CO₂ waste streams into feedstock in an economical and energy-efficient manner is essential for sectors to meet EU climate targets and boost their competitiveness. Many production processes still rely heavily on fossil energy carriers and non-renewable raw materials. Carbon Capture and Utilisation (CCU) can reduce the carbon footprint of products derived from these resources. Additionally, electrifying conversion processes and integrating renewable energy sources can significantly lower CO₂ emissions and energy consumption across sectors.

A Building Block in the EU's Twin Transition

Launching in January 2025, ICO₂NIC (*Innovative electrochemical CO₂ Conversion to Versatile Feedstock*) is an EU-funded project within the Process4Planet partnership of the Horizon program. The ICO₂NIC strategy focuses on promoting CO₂ capture and electrochemical conversion to transform industrial CO₂ waste into valuable feedstock, with the goal of reducing energy consumption, cutting CO₂ emissions and enhancing economic sustainability. The project aims to capture and valorise waste CO₂, making CCU economically viable, and paving the way for substantial reductions in global emissions. ICO₂NIC will combine advancements in CO₂ capture technology based on polymer membranes with a new gas diffusion electrochemical cell to convert CO₂ into formic acid. This formic acid will then be processed through biochemical methods to produce high-value goods and materials. ICO₂NIC will create opportunities for substantial long-term CO₂ capture in the EU refinery sector, supporting decarbonisation efforts.

"We are excited to launch the ICO₂NIC project, which will transform industrial CO₂ waste into valuable resources, advancing both sustainability and competitiveness. By integrating renewable energy and innovative technologies, we aim to make CCU economically viable, significantly reducing emissions while creating high-value products. This project is a crucial step toward achieving the EU's climate goals and fostering a more sustainable industrial future" said ICO₂NIC Project Coordinator, Bernd Wittgens.

The ICO₂NIC Consortium

The ICO₂NIC consortium will be led by [SINTEF](#) and will establish a comprehensive value chain, from the CO₂ emitter, on-site demonstrator and executor ([TUPRAS](#)) to the end consumers ([TUPRAS](#) and [Procter & Gamble](#)). The process consists of carbon collection and purification ([Cool Planet Technologies](#)), electrochemical conversion to formic acid ([Avantium](#)), followed by bioconversion and up-grading ([b.fab](#) and [NoPalm Ingredients](#)), and the scaling up the fermentation process ([BBEPP](#)) to microbial oils. These

oils and their chemical derivatives will be evaluated by Procter & Gamble and TUPRAS as a feedstock for the Hydrotreated Esters and Fatty Acids (HEFA) process in Sustainable Aviation Fuel (SAF) production. This industrial model could provide a viable economic framework for all stakeholders, even without external financial support, and will be validated through the project's implementation.

By integrating renewable energy systems with digital monitoring and control technologies ([Idener](#)), leading Research and Technology Organisations will validate the concept's cost-effectiveness, environmental performance, and scalability through the development of a strong Technical and Economic Assessment and process design (SINTEF) and Life Cycle Assessment ([TNO](#)). The communication and dissemination of ICO₂NIC will be led by the European association [CO₂ Value Europe](#), ensuring that the project's findings reach a wide audience and contribute to global efforts in sustainable industrial innovation.

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