

PRESS RELEASE

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A change of tune for the chemical industry: VIVALDI turns CO₂ emissions into sustainable bio-products

The European Union has awarded 7M€ to the VIVALDI project to transform the bio-based industry into a new, more environmentally friendly and competitive sector

To reach climate targets, industries need to accelerate the transition towards a low-carbon, resource efficiency and circular economy. The chemical sector is one of the most challenging, but also a very promising one, in that context. At the forefront of waste reutilization, bio-based industries (BIs) have the potential to lead the way and create a new and more sustainable sector based on the principle of carbon capture and utilization (CCU) also called CO₂ recycling. Based on this circular concept, BI's will reduce their greenhouse gas (GHG) emissions, their dependency on fossil carbon import and the exploitation of key resources such as energy, raw materials, land and water.

Starting from June 2021, the EU Horizon 2020 project VIVALDI - *innovative bio-based chains for CO₂ VALorisation as aDded-value organic acids*, will develop a set of breakthrough biotechnologies to transform real off-gases from key BI sectors (Food & Drinks, Pulp & Paper, Bioethanol and Biochemicals) into novel feedstock for the chemical industry. The core of VIVALDI solution is to capture, enrich and transform in a two-steps process (electrochemical and biological) the CO₂ captured into four platform organic acids. These resulting compounds have various applications: they can be used in the same site, enhancing the sustainability and circularity of BIs processes and products, or open new business opportunities as building blocks for novel biomaterial (e.g. bioplastics and animal feed). By integrating this concept, industries will "kill two birds with one stone": not only BI's carbon emissions will be reduced, but the production of organic compounds that today is very energy-intensive will become cheaper and more sustainable. Replicability will be a key aspect of VIVALDI solutions, allowing other biorefineries and other industrial sectors to become more circular and reduce their environmental impact.

The success of the project will be ensured by a multidisciplinary and international consortium led by the GENOCOV research group of Universitat Autònoma de Barcelona. The 16 partners range from BIs (SunPine AB, Damm and Bioagra) and technology developers (VITO, UFZ, LEITAT, Processium, Avantium, Universitat Autònoma de Barcelona, University of Natural Resources and Life Sciences - Vienna, Luleå University of Technology) to end-user (Nutrition Sciences). Novamont will research how to use CO₂ along its entire value-chain: from the capture of their CO₂ emissions to the conversion of it into new biochemicals. The team is complemented by three knowledge hubs: the sustainability and circularity expert group (BETA from Universitat de Vic), the technology and innovation consultancy (ISLE) and the European Association representing the Carbon Capture and Utilisation community in Europe (CO₂ Value Europe).

The consortium is ready to transform biorefineries, envisioning a new CO₂-based industrial sector that contributes to largely decrease the carbon footprint of the industry and boost the EU's economy.

Prof. Albert Guisasola i Canudas (GENOCOV, UAB), VIVALDI project coordinator, said:

“VIVALDI will tackle the issue of CO₂ emissions with a comprehensive approach. We have an enthusiastic multidisciplinary team aiming to develop tailor-made value chains for each type of company. We will boost the circularity of the plants with the use nutrients recovered from the same industries and will pave the way for the emerging CO₂-based sector.”

Anne Kuchenbuch and Prof. Falk Harnisch (Helmholtz-Centre for Environmental Research GmbH – UFZ), commented:

“VIVALDI brings together partners with excellent expertise in different fields that would not have the chance to join their forces without this project. We are confident that VIVALDI will allow to generate the essence of a sustainable technology and thus to provide a blueprint thereof.”

Prof. Blanca Antizar (ISLE Utilities), VIVALDI innovation manager, stated:

“VIVALDI exploitation and business strategy plan for a fast integration of innovative VIVALDI solutions into the market will provide new business models for BIs, reinforcing EU competitiveness, sustainability, resources efficiency and resource security, boosting the cooperation between researchers and CO₂ emitters. We will align with the EU Green Deal and trigger an industrial symbiosis with nearby companies embracing a circular economy scenario to be replicated in other BIs or other industrial sectors with CO₂ emission issues.”

Dr. Geert Bruggeman (Nutrition Sciences) said:

“In the agri-food chain there are plenty of new opportunities to cope with greenhouse gases, and one of them is transforming CO₂ into functional metabolites as in the VIVALDI project. Nutrition Sciences will use these sustainable feedstocks to produce healthier livestock, less dependent on antibiotics and tackle antimicrobial resistance, improving the health of animals and humans.”

For more information, please do not hesitate to contact us.

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