DESIRED

Direct co-processing of CO2 & water to sustainable multicarbon energy products in novel photocatalytic reactor

PHOTO2FUEL

ARTIFICIAL PHOTOSYNTHESIS TO PRODUCE FUELS AND CHEMICALS

Funded by European Union

Consorzio Interuniversitario REATTIVITA' CHIMICA e CATALISI

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JOINT WORKSHOP

DESIRED and Photo2Fuel EU FUNDED PROJECTS

UNA Hotel Regina Bari

September 4th, 2024
SP57, Parco Scizzo-Parchitello
BARI

Photo2Fuel & DESIRED Project Synergies

Data handling in innovative projects

18.00—18.10 Angela Dibenedetto
Introduction

18.10—18.15 Michele Aresta
Moderator

Speakers

18.15—18.45 Javier Doufur

18.45—19.15 Juan Diego Medrano Garcia

19.15—20.00 Open discussion

The **DESIRED project** aims at transforming CO2 photo-reduction to multi-carbon solar fuels a practical, sustainable, secure, and cost-efficient chemical process for CO2, water and solar energy conversion into products with their own market as fuels or as intermediates of drop-in fuels and even chemicals.

Javier Doufur: Professor at Rey Juan Carlos University.
Research Professor and Head of the Systems Analysis Unit of IMDEA Energy Institute (Spain). Currently, he is Leader of the Cross-Cutting Activities Technical Committee of Hydrogen Europe Research. Formerly, He was Operating Agent of Task 36 Life Cycle Sustainability Assessment (2014-2017) for the Hydrogen TCP of the International Energy Agency. Coordinator of several projects focused in the sustainability and circularity of hydrogen systems. Other research interests are focused on process optimization, eco-design and energy planning of energy systems.

I**MDEA Energy** is a research institute, founded in 2007 by the Regional Government of the Community of Madrid, whose main mission is to develop R&D activities that contribute to the transition towards a sustainable and decarbonised energy system. Its strategic plan is based on scientific excellence, international projection and cooperation with industry. IMDEA Energía's main research topics include concentrating solar power, the production of sustainable fuels from waste, hydrogen as an energy vector, the design of efficient energy storage devices, the intelligent management of electricity grids, the development of highly energy-efficient systems, the valorisation of CO2 emissions and the evaluation of the sustainability of energy systems through life cycle analysis.

The **Photo2Fuel project** will develop a breakthrough technology that converts CO2 into useful fuels and chemicals by means of non-photosynthetic microorganisms and organic materials, using only sunlight as energy source. Photo2Fuel's technology is based on the artificial photosynthesis concept and will use a hybrid system of non-photosynthetic microorganisms and organic photosensitisers to produce acetic acid and methane, using *Moorella thermoacetica* (bacteria) and *Methanosarcina barkeri* (archaea) strains, respectively. The project will also focus on product separation, sustainability analysis, and market evaluation, advancing the technology to TRL-4 and supporting Europe's climate neutrality by 2050.

Juan Diego Medrano Garcia: studied Chemical Engineering at the University of Alicante in Spain and pursued a PhD in the area of Process Systems Engineering at the same university. His study aims at the implications of alternative CO2 consumption in chemical processes, for which integer non-linear mathematical programming and LCA was used. Actually, his research focuses on sustainable process design for chemicals and fuels, industrial symbiosis and sector coupling.

ETH Zurich, one of the leading universities in the world, is particularly renowned for its engineering, technology, and natural sciences programs. There are currently around 21,000 students enrolled in Bachelor, Masters, and PhD programs, with 35% of this number being from abroad. The university boasts 500 professors, 260 senior scientists and 1500 postdocs, contributing to its strong academic and research environment. ETH Zurich has fostered 583 spin-off companies, demonstrating its commitment to innovation and entrepreneurship.