Co-funded by the European Union

ΕΣΠΑ 2021-2027
Βιώσιμη Ανάπτυξη για Όλους
Partnership Agreement 2021-2027

Programme Central Macedonia

Programme: "CENTRAL MACEDONIA" 2021–2027

Action: "Investments for the creation, expansion or upgrading of RTDI infrastructure in public academic or research institutions in the Region of Central Macedonia"

Project Title:

«Equipment PURchasE for the development and optimization of catalytic materials and PROcesses towards the production of environmental and alternative Fuels, biofuels and biocommoditieS, (PURE-PROFS)».

Description:

The Centre for Research & Technology Hellas (CERTH), is participating in the "Central Macedonia" Programme of the "Partnership Agreement on Regional Development 2021-2027" through the Action "Investments for the creation, expansion or up grading of RTDI infrastructure in public academic or research institutions in the Region of Central Macedonia" co-funded by the European Union and National Resources.

The project titled "Equipment PURchasE for the development and optimization of catalytic materials and PROcesses towards the production of environmental and alternative Fuels, biofuels and biocommoditieS, (PURE-PROFS)" aims to support the research activities of the Laboratory of Environmental Fuels and Hydrocarbons (LEFH) of CPERI/CERTH, which are related to the development of innovative catalytic processes with direct application in the Research Field: **Environment and Circular Economy**, targeting applications for both waste management and utilization, CO_2 utilization from energy-intensive industry, to produce added value products (chemical products, materials and fuels), as well as innovative technologies for flue gas treatment.

In line with national and regional priorities of the 2021-2027 programming period, the project aims at generating new knowledge and fostering innovation through:

(1) ***thermochemical/catalytic conversion of residual biomass to produce sustainable biofuels, bio-products***. (Development and implementation of innovative technologies and systems for waste management to produce products of added value, such as fuels, materials: WASTE MANAGEMENT in the corresponding value chain of the Regional Innovation Strategy RIS3) (2) ***production of primary raw materials***: (Development of methods/useful applications of materials through recycling and recovery of raw materials: CIRCULAR ECONOMY in the corresponding RIS3 value chain). LEFH achieves these objectives through the processes of hydrothermal liquefaction and catalytic pyrolysis of biomass.

(3) ***Methane/biomass utilization to produce high-value carbon nanostructures and green hydrogen*** (without simultaneous CO_2 emissions), as well as ***CO_2 valorization to produce alternative fuels (methanol, jet fuels, etc.)***: (Development of LOW ENVIRONMENTAL FOOTPRINT TECHNOLOGIES for the production of chemical products, materials and fuels from CO_2, originating from energy-intensive industry, as well as INDUSTRIAL

SYMBIOSIS/SECONDARY RAW MATERIALS actions aiming at saving resources and protecting the environment in the corresponding RIS3 value chains).

The social impact of the project lies in the development of innovative catalytic processes targeting both waste management and utilization applications, CO_2 valorization, as well as innovative technologies for the abatement of gaseous pollutants, contributing overall to a cleaner environment and simultaneously following the principles of the circular economy. Multiple are the benefits for LEFH facilitating both in terms of quality of results and speed of data processing/acquisition, its current research needs and thus directly strengthening its research prestige and the competitiveness of the entity in attracting new public and/or private funding. As a result, LEFH, contributes to areas of common interest for both the Region, Greece, and Europe, such as environmental protection and the use of alternative renewable raw materials, strengthens its research entity and ensures its continuous evolution/development. Finally, the benefits for human scientific potential are undeniable, through supporting existing staff, and/or creating new jobs and attracting new scientists (either to LEFH or to the new spin-off companies created).

The objective of the project is: through the new infrastructure to enhance the innovation of the research carried out in LEFH of CPERI/CERTH, which has to do with a completely different approach to waste management, which instead of being considered as problematic wastes, related to a number of pollution problems for the atmosphere, soils and water are treated as a valuable and renewable biomass supply, valorized to produce a multitude of sustainable biofuels, bio-products (e.g. carbon nanostructures) and primary materials. Of similar importance and innovation is the development of low environmental footprint technologies for CO_2 – free H_2 production and CO_2 utilization from energy-intensive industry as a feedstock for the production of fuels or chemical products, all in the spirit of INDUSTRIAL SYMBIOSIS.

The project's results are:

- Establishment of advanced research infrastructure in LEFH Laboratory of CPERI/CERTH for the development of innovative catalytic technologies
- Development of innovative materials and processes targeting new waste management and valorization concepts, towards the production and use of biofuels or alternative fuels (H_2) and management (reduction or valorization) of atmospheric pollutants (CO_2 emissions)
- Facilitating production of scientific and technological knowledge in the fields of clean energy, environment, and circular economy.
- Contribution to regional and national priorities of the RIS3 strategy

Duration: 16/6/2025-31/12/2027
Total Project Budget: 992.272,80€