

# VALZEO

Valorisation of agro-industrial wastes via the production of zeolite-based composite materials and their use in environmental remediation and biofuel production



**Call:** HORIZON-MSCA-2021-SE-01

**Duration:** 31/20/2025

**Project Coordinator:** Roberto Boada

**Project Start:** 01/01/2023

**Budget:** € 883.200,00

**Project Manager:** Gustavo Pérez

**Coordinating Partner:** UNIVERSITAT AUTÒNOMA DE BARCELONA

**Keywords:** Zeolites, water treatment, biodiesel production, rice valorisation

## TARGET AUDIENCES

### **SOCIAL**

**TG1)** Local communities, where local citizens are affected by air contamination due to RHAs.

**TG2)** Media to highlight and explain important yet little known, or poorly understood issues linked to RHAs threats, challenges, and technological solutions.

### **BUSINESS**

**TG3)** Rice industry that have RHAs as residues of their activity (they can have an added value from their waste instead of generating an environmental problem).

**TG4)** EU Industrial related water treatment sector (i.e., Water EU group) to support bridging the gap to market of developed solutions.

**TG5)** EU-CU Industrial related with biofuels production capitalizing new catalysers.

### **SCIENTIFIC**

**TG6)** Science and engineering ER and ESR long term employability enhanced because of ToK derived from new materials for environmental applications.

**TG7)** Technology transfer units interested on new IP derived from VALZEO.

**TG8)** Scientific community engagement to discuss about the benefits and risks of developed materials.

### **POLITICAL**

**TG9)** EU-CU Policy stakeholders willing to evaluate feasible treatment solutions to address drugs, pesticides and dyes under the future update of EU Urban Waste Water Treatment Directive or alternative approaches to produce biofuels under EU Directive 2018/2001 on the promotion of the use of energy from renewable sources.

## EXPECTED RESULTS

**ER1)** 20 Kg of RHAs as raw material characterized and transformed into 15 Kg of VALZEO materials, that prevent 100 Kg of RHs to be improperly disposed.

**ER2)** 6 new zeolites, MONs, and MOFs manufacture methods implemented, and tested.

**ER3)** 2 viable alternatives to valorize RHAs through 2 materials with adsorbent and photocatalytic properties for water treatment and 2 catalyzer candidates for biodiesel production.

**ER4)** A water treatment pilot plant including development materials able to treat 3 types of pollutants (drug, dye, or pesticide) during demonstration stages at 10 L/h flow.

**ER5)** 2 Tested catalyzers (at 1-3% wt. ratio) able to treat 200 L/day of used cooking oil with yield 92-98% to obtain 184-196 L of biodiesel/day.

**ER6)** 3 alternative exploitation routes for VALZEO outputs, including scalability and economic feasibility studies reports.

**ER7)** 26 disciplines of 5 research areas contributing through 6 types of activities to achieve 5 ToKs.

**ER8)** 120 13 secondments for a total of 210 p/m

**ER9)** 33 ER, 7 ESR, 3 TECH, 1 MNGT with acquired skills on the development of functionalized porous materials for water treatment and biofuel catalysis, covering material fabrication and characterization, synthesis of nanoparticles, mechanisms of adsorption and photodegradation, analytical chemistry, and water treatment or biodiesel engineering.

**ER10)** A DMP for all the materials development, pollutant (drug, pesticides, and dyes) adsorption/degradation and catalysis for biofuels production, including the derived portfolio of publications and potential patents, depending on IPR evaluation analysis.

**ER11)** Enlargement of the original partnership to address future collaborative actions by engaging 3 additional research institutions and 3 companies, one for each of the target research avenues (RHAs valorisation, water treatment and biodiesel production)



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