FUELGAE Project Press Release

FUELGAE reaches key milestones in advancing sustainable biofuels from microalgae across Europe

The project

FUELGAE is a pioneering EU-funded project that unites leading research organisations, industry partners, and innovation experts from across Europe to convert CO_2 emissions into sustainable advanced biofuels. By integrating innovative microalgae technologies with digital modelling and industrial processes, the consortium is developing scalable, low-carbon solutions aimed at accelerating the decarbonisation of aviation, shipping, and other transport sectors.

Vienna, Austria – 27.05.2026

FUELGAE has successfully completed its second period, achieving major progress in developing innovative, sustainable biofuel solutions for transportation. The project is driving forward low-carbon fuel production pathways by integrating microalgae cultivation, CO_2 capture, and advanced biofuel conversion technologies.

From research to validated solutions

FUELGAE entered its development phase, transitioning from early-stage research to demonstration, validation, and exploitation of results. These results demonstrate the project's growing capability to deliver scalable and impactful solutions for sustainable transport fuels. Key achievements include:

- **Optimised microalgae strains**, including Adaptive Laboratory Evolution (ALE)-enhanced species, demonstrating improved productivity under CO_2-rich conditions
- **Pilot-scale photobioreactor systems commissioned**, supporting real-world validation of microalgae cultivation processes
- **Development of advanced catalysts** enabling efficient conversion of bio-based intermediates into advanced liquid biofuels
- **Production of biocrude and biochar via hydrothermal liquefaction (HTL)** with promising yields and energy content
- **Integration of Digital Twin technologies**, combining sensors, modelling, and predictive tools for process optimisation

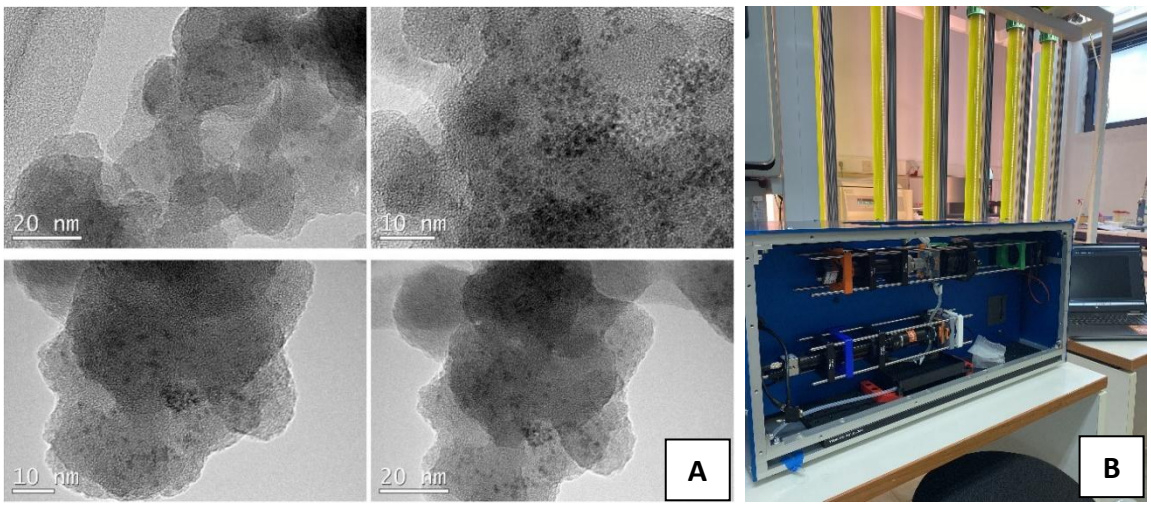

Figure 1 A) TEM micrographs of MoP/SiO2 (top) and MoP/SiO2-t (bottom): Published in Catalysis Today and B) PAT system installed and tested on CERTH's photobioreactors © CERTH (2025)

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Next steps: scaling solutions towards market uptake

In its final phase, FUELGAE will move towards large-scale validation by expanding pilot operations in real industrial environments, including biorefineries and energy-intensive sectors. The project will focus on advancing concrete commercialisation pathways, supporting the uptake of microalgae-based fuels by industry, and refining business models for market deployment. At the same time, partners will strengthen the project's intellectual property portfolio by advancing patenting activities and defining clear exploitation strategies for key results. FUELGAE will also deliver detailed sustainability assessments, techno-economic analyses, and policy-relevant recommendations to support regulatory frameworks for advanced biofuels. Through these targeted actions, the project aims to accelerate the transition of its innovations from research to market and contribute directly to Europe's climate-neutral transport ambitions.

Driving impact for Europe's green and energy transition

FUELGAE directly contributes to key EU priorities, including the European Green Deal, climate neutrality objectives, and sustainable aviation fuel (SAF) development. The project supports:

- Reduction of greenhouse gas emissions through CO_2 utilisation
- Development of non-food-based biofuels, avoiding competition with food supply
- Strengthening of Europe's bioeconomy and industrial competitiveness
- Deployment of circular, resource-efficient production systems

> *"The progress achieved during this phase demonstrates how European collaboration can accelerate the development of sustainable biofuels and transform CO_2 emissions into valuable resources."*
>
> — Dr Silvia Morales de la Rosa, Project Coordinator, ICP-CSIC

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