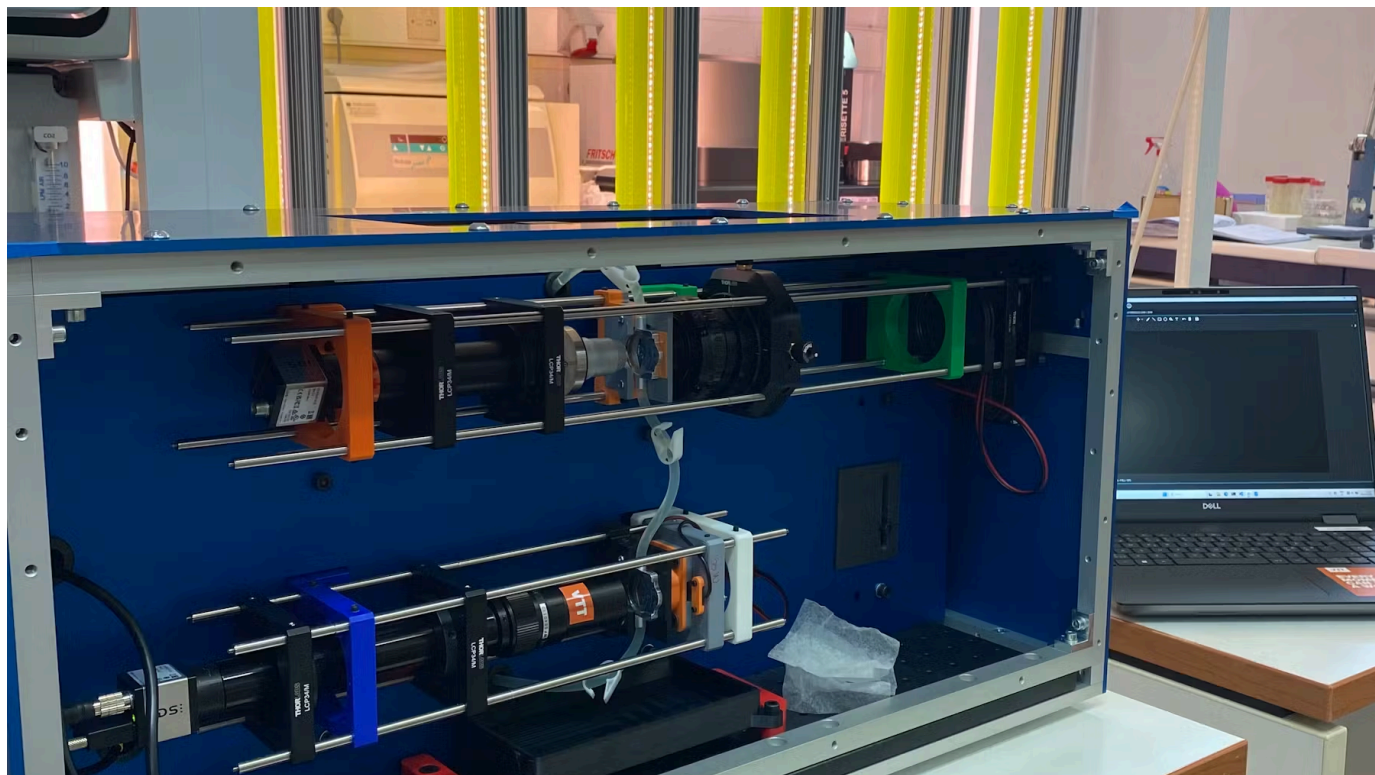


Microalgae biofuels move towards validation

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The European research project FUELGAE has completed its second implementation phase and reported further progress in the development of sustainable transport fuels from microalgae.



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Supported by European Union funding, the consortium brings together research organisations, industrial partners and technology developers to convert carbon dioxide emissions into advanced biofuels. The project combines microalgae cultivation, carbon dioxide capture, digital process optimisation and fuel conversion technologies to develop scalable production pathways for low-carbon transport fuels.

Transition from research to validation

During the second project phase, FUELGAE moved from laboratory research towards demonstration and

validation under practical conditions. The consortium focused on improving biological processes, increasing conversion efficiency and integrating digital tools for process control.

Researchers optimised several microalgae strains, including species developed through Adaptive Laboratory Evolution, to improve productivity under carbon dioxide-rich conditions. The project also commissioned pilot-scale photobioreactor systems to validate cultivation processes at a larger scale.

In parallel, project partners developed catalysts for converting bio-based intermediates into advanced

liquid biofuels. Hydrothermal liquefaction processes produced biocrude and biochar with promising energy characteristics, while digital twin technology combined sensor data, modelling and predictive analysis to support process optimisation.

Focus on industrial deployment

During the final project phase, FUELGAE will expand pilot activities in industrial environments, including biorefineries and energy-intensive industries. The consortium aims to validate the technology under operational conditions and prepare pathways for commercial deployment.

Further work will focus on business model development, technology exploitation and intellectual property management. In addition, the project will complete sustainability assessments, techno-economic analyses and recommendations to support future regulatory frameworks for advanced biofuels. These activities are intended to facilitate the transfer of project results into industrial applications and contribute to the development of low-carbon transport fuels in Europe.

Project background

FUELGAE is a European collaborative research project that develops integrated technologies for microalgae biofuel development. By combining carbon dioxide utilisation, advanced cultivation systems, biofuel conversion processes and digital optimisation tools, the consortium seeks to support the decarbonisation of aviation, maritime transport and other transport sectors.

Source: FUELGAE



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