THE SUSTAFUELS, THE EUROPEAN CLUSTER TO ADVANCE SUSTAINABLE TRANSPORT FUELS

- **THE CLUSTER UNITES 10 LEADING HORIZON EUROPE PROJECTS TO ACCELERATE THE DEVELOPMENT OF ADVANCED, ALGAE-BASED SUSTAINABLE FUELS**

- **SUSTAFUEL AIMS TO MAXIMISE TECHNICAL INNOVATION, IMPACT, AND OUTREACH TOWARDS A GREENER AND MORE CIRCULAR TRANSPORT SYSTEM**

October 28, 2025 – The European cluster of research and innovation projects, SUSTAFUEL, has been expanded with new initiatives to advance the development and large-scale deployment of sustainable transport fuels. The cluster brings together now nine pioneering Horizon Europe projects — ALFAFUELS, ALGAESOL, CAPTUS, COCPIT, FUELGAE, ICARUS, NIAGARA, SusAlgaeFuel, SUNFUSION and, SUSTEPS— all working towards a common vision: a decarbonised transport sector powered by renewable, bio-based fuels.

By connecting Europe's most innovative research efforts in sustainable fuels, SUSTAFUEL aims not only to amplify the visibility and impact of individual projects but also to create the conditions for technical cooperation," said the cluster coordinators*. "The initiative will help Europe take a step towards achieving its climate neutrality goals."*

The SUSTAFUEL Cluster is designed to go beyond joint communication and dissemination activities. Its members will collaborate on technical topics, share best practices in life-cycle and techno-economic assessments, and align efforts to develop integrated, circular value chains, as well as organise sessions on common topics of interest and participate together in commercial fairs & exhibitions, optimising resources.

By pooling expertise and resources, the cluster will enhance the scalability, resource efficiency, and cost-effectiveness of advanced fuel technologies emerging from participating projects. These projects, many of which focus on CO_2 utilization, solar-driven conversion processes, and microalgae-based biorefineries, are supported by the European Union under the Horizon Europe programme. Collectively, they represent a pan-European network of researchers, innovators, and industrial stakeholders committed to transforming how sustainable fuels are produced and adopted across aviation, maritime, and road transport sectors.

A SHARED COMMITMENT TO EUROPE'S GREEN DEAL

SUSTAFUEL embodies the European Green Deal's ambition to make Europe the first climate-neutral continent by 2050. Through a fully circular and integrated approach to fuel production, the cluster contributes to reducing dependence on fossil resources and promoting a more resilient energy system.

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ABOUT ALFAFUELS

The ALFAFUELS project seeks to develop innovative Sustainable Aviation Fuels (SAF) technology to reduce aviation's reliance on fossil fuels. By addressing key challenges like high production costs and sustainability issues, the project incorporates breakthroughs such as microbial fuel precursor production and solar-driven photochemistry.

More information: www.alfafuels.eu

ABOUT ALGAESOL

ALGAESOL aims to develop cost-effective, sustainable and renewable biofuels based on microalgae and direct solar fuel production and purification technologies in order to accelerate the replacement of fossil-based energy technologies. Solar energy, carbon dioxide and organic wastes will be converted through biologic, photoelectrochemical, electrochemical or bioelectrochemical processes into renewable methanol, methane and biooils, forming the basis for aviation and shipping fuels.

More information: www.algaesol.eu

ABOUT CAPTUS

The CAPTUS project focuses on the production of renewable energy carriers (RECs) from CO2 captured from industrial flue gases, addressing important bottlenecks such as impurities and conditioning steps as well as the optimal integration with renewable electricity surplus to prevent curtailments and ensure sustainable value chains. CAPTUS will provide an industrial roadmap to a net-zero carbon future through EII-integrated solutions from both captured carbon emissions and its efficient conversion into liquid RECs.

More information: www.captusproject.eu

ABOUT COCPIT

The COCPIT Project focuses on the cultivation of microalgae in intensified photobioreactors (PBRs) enclosed in a photovoltaic shell (STPV) that produces both biomass and solar energy, and the transformation of algal biomass into SAF is studied using two alternative pathways: the HEFA (hydrotreated esters and fatty acids) and HTL (hydrothermal liquefaction) pathways, both leading to the production of biofuels for aviation and maritime use that meet ASTM certification standards. The project will also deliver a decision-making tool based on Techno-economic and life cycle assessments to choose the between both developed pathways.

More information: www.cocpit-horizon.eu

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ABOUT FUELGAE

The FUELGAE project represents a new approach to eliminating CO_2 emissions and transforming them into advanced liquid fuels, thus converting one of the pollutants most responsible for global warming into a sustainable product and providing a more environmentally sustainable solution for air and sea transport and heavy vehicles that are so difficult to electrify. Importantly, all fractions are fully utilised to avoid generating any waste.

More information: www.fuelgae.eu

ABOUT ICARUS

The ICARUS Project is dedicated to advancing Sustainable Aviation Fuel (SAF) production by addressing critical technology limitations in three key routes: Biocrude from hydrothermal liquefaction; Isobutanol from lignocellulosic biomass; and Synthetic Fischer-Tropsch from biomass gasification.

www.icarus-biojet.eu

ABOUT NIAGARA

NIAGARA aims to transform European biogenic waste streams—such as wastewater, digestate, and sewage sludge—together with microalgae into advanced biofuels for clean electricity generation through innovative fuel cell applications. The process integrates an advanced hydrothermal carbonisation (HTC) technology to convert biogenic wastes and microalgae into hydrochar and an aqueous phase. The hydrochar is gasified, while the liquid phase undergoes aqueous phase reforming (APR). Captured CO_2 is then reused through advanced sorbent technologies, and the resulting biofuel powers solid oxide fuel cells (SOFCs). NIAGARA's integrated process is designed to operate with a minimal carbon footprint and holds the potential to become carbon-negative over time, driving progress toward a circular, low-carbon bioeconomy.

More information: www.niagaraproject.eu

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ABOUT SUSALGAEFUEL

The EU has set a highly ambitious goal to increase the share of SAFs in the aviation industry from 2% in 2025 to 64% by 2050. Microalgae can play a critical role in meeting this fuel target, directly capturing carbon dioxide and contributing to the development of circular bioeconomy through the recovery of waste nutrients from agri-food-bioenergy sectors. The commercialisation of biofuels from microalgae has been hampered by systemic and technological limitations. SusAlgaeFuel aims to develop a range of innovative approaches based on waste treatment, digital sensors, cascading biorefinery, and multifunctional catalysts to enable a more sustainable and cost-competitive production of microalgae aviation fuels.

More information: www.susalgaefuel.eu

ABOUT SUNFUSION

The EU-funded SUNFUSION project aims to revolutionise biofuel production by converting microalgae and oleaginous yeasts into advanced biofuels using innovative technologies. The project combines cutting-edge systems, including specialised cultivation methods for microalgae and yeasts, a solar-powered hydrothermal liquefaction reactor, and a solar-aided thermal energy storage system for prolonged green energy supply. By leveraging concentrated solar thermal technologies to produce biofuels with zero emissions and waste, SUNFUSION targets an impressive solar-to-biocrude energy efficiency of over 50 %. The project's mobile platform could bring renewable energy to off-grid locations, marking a major step towards sustainable, decentralised biofuel production.

www.sunfusion.eu

ABOUT SUSTEPS

SUSTEPS project is an ambitious initiative dedicated to the sustainable production of advanced biofuels, particularly aviation fuels, from microalgae. The project seeks to revolutionize renewable fuel technologies by advancing every step of the microalgae-based biofuels (jet fuel, renewable diesel) value chain. At its core, SUSTEPS aims to develop technologies that meet the market standards for replacing fossil fuels in the transport sector. SUSTEPS proposes a bio-refinery concept where microalgae-based biofuel is produced with the introduction of several elements oriented towards sustainability and cost efficiency like carbon dioxide (CO_2) fixation via microalgae, feeding on wastewater, integrating green hydrogen, valorizing side aqueous streams.

More information: www.susteps.eu

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