

ALGAESOL: Sustainable aviation and shipping fuels from microalgae and direct solar BES technologies

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ABSTRACT

Faced with the pressing challenges of climate change, resource depletion and energy security, it is of utmost importance to work towards a more sustainable and diversified energy landscape. Amongst others, we need to harness the power of the sun to generate clean and renewable energy. This will help to reduce greenhouse gas emissions, mitigate climate change, as well as foster technological innovation, job creation, and energy independence.

Within this context, the recently started EU project ALGAESOL aims to develop cost-effective, sustainable and renewable aviation and shipping fuels based on game-changing microalgae and direct solar fuel production and purification technologies in order to accelerate the replacement of fossil-based energy technologies.

ALGAESOL will improve efficiency of converting solar energy, carbon dioxide and organic wastes into renewable methanol, methane and biooils, forming the basis for aviation and shipping fuels. Various systems (biologic, photoelectrochemical, electrochemical and bioelectrochemical) will be evaluated and smart reactor design will be combined with process improvements. Targets are increasing solar to chemical energy conversion efficiencies, microbial contamination control strategies, and improved algal strains to generate lipid superproducers that will facilitate extraction, followed by innovative purification and hydro-processing technology to deliver the fuels. Enhanced sustainability of the developed fuels is also based on a circular bio economy approach by using waste streams and residual biomass generated in the ALGAESOL value chain will be re-circulated as input for the conversion process. The economic and environmental, as well as social sustainability will guide the design and scale-up at process level and for the whole value chain in alignment with the European Green Deal priorities. Computational modelling and process simulations, sustainability assessments will be used as well as practical engineering approaches.

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KEYWORDS

Biofuels, microalgae, BioElectrochemical Systems, strain improvement, sustainability assessment

REFERENCES

<https://algaesol.eu/>