ALFAFUELS, A PIONEERING EUROPEAN PROJECT SET TO REVOLUTIONISE SUSTAINABLE AVIATION FUEL PRODUCTION

- **THE INITIATIVE SEEKS TO REDUCE RELIANCE ON FOSSIL FUELS, MITIGATE CLIMATE CHANGE, AND ENHANCE AVIATION'S ENVIRONMENTAL SUSTAINABILITY THROUGH INNOVATIVE TECHNOLOGIES SUCH AS MICROBIAL PRODUCTION AND PHOTOCHEMICAL CO2 CONVERSION**

- **THE PROJECT HAS RECEIVED €4.8 MILLION FUNDING FROM THE EUROPEAN UNION'S HORIZON EUROPE RESEARCH AND INNOVATION PROGRAMME**

Ornskoldsvik (Sweden), January 30, 2024. A European consortium is working on reshaping the aviation industry by introducing innovative **Sustainable Aviation Fuels (SAF)** production technology. The ALFAFUELS project aims to address the need for decarbonisation in the aviation sector and significantly reduce its environmental footprint by offering a novel approach that can play a key role in transitioning away from conventional fossil fuels in the mid and long term.

During 48 months, the project will implement a multi-approach by capturing and utilising CO_2, developing cost-effective and sustainable technological solutions at every stage of the process, and exploring integration possibilities with other sectors to overcome the current key challenges that difficult the technological maturity and commercialization of SAF. To face high production costs, sustainability issues, and technological constraints, ALFAFUELS will develop three technological innovations:

Microbial Production: This approach involves using microorganisms to convert CO_2 into a fuel precursor. Microorganisms perform this process sustainably, which means it has a lower environmental impact.

Solar-Powered Photochemistry: In this method, the energy of the sun is harnessed to convert CO_2-derived molecules into kerosene-like fuel. Instead of using conventional chemical methods, which can be costly and less environmentally friendly, this technique uses solar light to carry out the conversion.

Biorefinery Approach: Rather than wasting any part of the cells of microorganisms used in the process, all parts are used efficiently. This includes the production of starch and hydrogen indirectly from CO_2. In summary, resources are maximised, and waste is reduced.

ALFAFUELS elevates SAF production technologies by designing cost-efficient bioreactors, conducting pilot-scale trials on real, industrially relevant CO_2 streams, and evaluating the produced molecules according to the American Society for Testing and Materials standards. The project also investigates systemic barriers and opportunities for SAF technology implementation in Europe, involving industrial end-users to expedite scaling.

ALFAFUELS presents a unique and groundbreaking approach, utilizing innovative techniques to address the challenges of scaling up and ensuring sustainability in the production of algal renewable fuels. Through the adoption of cutting-edge production methods and a circular, zero-

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waste strategy, ALFAFUELS aims to reduce production costs and improve sustainability across the entire value chain.

In summary, this project will revolutionise the aviation industry by offering a more sustainable and economically viable alternative to traditional aviation fuels, making a significant **contribution to the aviation sector's decarbonization efforts and the broader transition toward a low-emission, sustainable energy future in Europe.**

THE SUSTAINABLE AVIATION FUELS LANDSCAPE

The global transition from fossil-based energy sources to renewables is essential for achieving a low greenhouse gas (GHG) emission economy while meeting future energy demands sustainably and efficiently. Renewable fuels of non-biological origin (RFNBOs), like algal fuels using CO_2 as a carbon source, are expected to play a crucial role, particularly in the transportation sector, due to their potential to capture and utilize CO_2, advancing low-emission solutions. However, the development and scaling of algal and RFNBO applications, especially sustainable aviation fuels (SAF), face short-term economic challenges, low yield and efficiency issues, and GHG emissions concerns. ALFAFUELS addresses these obstacles through a comprehensive solution that converts CO_2 into SAF using photosynthetic cyanobacteria. This approach minimises feedstock costs, enhances resource efficiency, and achieves climate neutrality.

ABOUT ALFAFUELS

Led by the research center RISE Processum (Sweden), the ALFAFUELS project is formed by Industries, SMEs and R&D organizations: the Uppsala University, AddScience, the Catholic University of Leuven, E3Modelling, ENI, Fotosintetica & Microbiologica, IDENER, SkyNRG, Sustainable Innovations, the Technical University of Denmark (DTU), University of Copenhagen, University of Florence, and University of Potsdam. The project has received about €4.8 million in funding from the Horizon Europe research and innovation programme of the European Union under grant agreement number 101122224.

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