

PRESS RELEASE

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New EU project funded to develop cost-effective sustainable aviation fuel using CO₂ emissions and renewable energy

The European Union awards 5M€ to the Take-Off project for helping the aviation sector reach the EU 2050 climate-neutrality targets

Aviation is one of the most challenging sectors when it comes to reducing CO₂ emissions. One of the reasons is that common alternatives such as electrification or hydrogen propulsion, are not expected to be a suitable substitute to kerosene for long haul flights in the coming decades. Sustainable aviation fuel (SAF) produced from non-fossil resources is the only approach that could significantly reduce greenhouse gas emissions related to air transport in the near term. Launched in January 2021, the EU project Take-Off, *Production of synthetic renewable aviation fuel from CO₂ and H₂*, will, in the next 4 years, generate a detailed picture of the technical, environmental and economic performances of their promising power-to-liquid SAF production route. This project will contribute to reduce the aviation's carbon footprint and reach several sustainable development goals (SDGs 7, 9 and 13).

Take-Off will enable the development and industrial validation of the complete technology chain from CO₂ to SAF. This technology route aims to deliver a highly innovative process which produces SAF at lower costs and higher energy efficiency compared to other power-to-liquid alternatives. The Take-Off route consists of capturing CO₂ from industrial flue gas which reacts with hydrogen produced by renewable electricity to create light olefins. These light olefins are subsequently chemically upgraded into SAF. All innovative steps upgrading CO₂ will be demonstrated under industrially relevant conditions.

The project consortium, led by TNO, gathers partners coming from the entire technology chain ranging from a leading energy supplier (RWE Power), power and energy solution company (Mitsubishi Power Europe), interdisciplinary research institutions (TNO, CNRS, RWTH, SDU), design/engineering companies (AKEU, FEV) and the European Association representing the Carbon Capture and Utilisation (CCU) community in Europe (CO₂ Value Europe). Pioneer and global leader in sustainable SAF, SkyNRG is involved to analyse the fuel quality and report on its suitability for usage in aircraft. A strong advisory board including key players of the aviation industry and major oil & gas companies has been assembled to support the project consortium, guide the research and ensure the uptake of the lessons learned.

Prof. Dr Ing. Earl Goetheer, Principal Scientist at TNO stated:

"Take-Off will deliver a next step development to convert CO₂ in an efficient manner towards sustainable aviation fuel, making flying in the future CO₂ neutral. Take-Off has collected the best minds in Europe to work together on this challenge and to be able to demonstrate the technical-economic and environmental merit of its methodology."

Misha Valk, Head of Future Fuels at SkyNRG said:

"We support the diversification of Sustainable Aviation Fuel (SAF) technologies, especially when CO₂ is used as feedstock. We believe this is a promising pathway. We are proud to contribute to the Take-Off project by providing our knowledge, and over 10-year experience in SAF."

Tilman Bechthold, Vice President Research and Development at RWE Power commented:

"Take-Off is an important step in the production of sustainable aviation fuel from recycled CO₂ and renewable electric power. The Take-Off demonstrator at RWE's Innovation Center at Niederaussem is a milestone on the path towards commercialization of the technology and provides a blueprint for sector coupling and climate change mitigation."

Prof. Dr Emmanouil Kakaras, Head of New Business at Mitsubishi Power Europe stated:

"Being a partner of the project allows us to bring our know-how to move the aviation industry towards zero-emission technology in the long term. This is what we are committed to as a company."

For more information, please do not hesitate to contact us.

Acknowledgements

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