European Commission

RESEARCH & INNOVATION FOR SUSTAINABLE AVIATION FUELS

April 2021

With the European Green Deal, the EU has set the target to become the **first climate neutral continent** by 2050. This includes also decarbonisation of aviation, where research & innovation has and will contribute to new transformative technologies, optimised operations and the development of sustainable aviation fuels.

Horizon Europe will present a transformative aviation roadmap and together with the **ReFuelEU Aviation initiative** will boost the production and uptake of sustainable aviation fuels.

Sustainable aviation fuels offer immediate advantages, mitigating climate change while improving local air quality and not affecting food security. However, because of their **high price and low production rates**, they have had insignificant impact on the environmental footprint of global commercial aviation.

The EU Framework Programmes for Research and Innovation together with the European Green Deal **aim to change that.** FP7 and H2020 research have delivered **novel fuel pathways** to increase production efficiency, decrease price and provide **aircraft and engine technologies** that will allow the novel fuel introduction far beyond the 50% blending limits. The EU is also looking at regulatory, market related measures to scale up, learn and further reduce the costs of these sustainable fuels.

This factsheet celebrates and complements the achievements of Clean Sky 2, in view of its annual event on April 22. Horizon Europe will further accelerate the efforts that have contributed to the recent **A350 test flight with 100% sustainable fuels.**

"The EU has set the world-leading ambition to become climate-neutral by 2050. Making transport and, in particular, aviation greener and more sustainable is one of the major challenges facing us. We are fully committed to continue to work with the European aviation sector, supporting the European Green Deal through Research and Innovation and Horizon Europe, to achieve decarbonised aviation."

Mariya Gabriel, EU Commissioner for Innovation, Research, Culture, Education and Youth

Research and Innovation

SELECTION OF FP7 & HORIZON 2020 PROJECTS CONTRIBUTING TO SUSTAINABLE AVIATION FUELS

Serving as showcase for airports around the globe, **ITAKA** **demonstrated the use of 50% HEFA biojet blend mixed in the conventional airport fuel systems** (tanks, pipelines, hydrants) during conventional operations of airports and in long and short haul flights. It has also **demonstrated the declaration of the use of biojet fuel in the ETS (Emissions Trading System),** from the supply in one country to the declaration in another country through a single airline. It has also shown environmental benefits of more than 70% GHG savings for the full value chain, 50% particulate matter emission reduction, and 30% improvement of local air quality at airports.

Demonstrating the **first large industrial-scale production and use of sustainable aviation fuel in Europe (HEFA),** obtained from residual lipids such as Used Cooking Oil, **BIO4A** will investigate the alternative supply of sustainable feedstocks produced from drought-resistant crops such as Camelina.

The new approach and process of **KEROGREEN** **reduces overall CO2 emission** by creating a closed carbon fuel cycle and at the same time creates long-term large-scale energy storage capacity which will strengthen the EU energy security and **allow creation of a sustainable transportation sector.**

Alternative fuel producers and, air framers and aero-engine OEMs need knowledge based screening tools. **JETSCREEN** has developed a **screening and optimization platform for alternative fuels,** that integrates distributed design tools & generic experiments that will assess the risks and benefits and optimize alternative fuels for a maximum energy per kilogram of fuel and a reduction of pollutants emissions.

Switching to hydrogen is feasible and must complement research and development into advanced airframes, propulsion systems and air transport operations. **ENABLEH2** aims to **revitalise the enthusiasm in liquid hydrogen research for civil aviation.** Combined, these technologies can more than meet the ambitious long-term environmental and sustainability targets for civil aviation.

The Fuel via Low Carbon Integrated Technology from Ethanol **FLITE** aims to **expand the supply of low carbon jet fuel in Europe** by designing, building, and demonstrating an innovative ethanol-based Alcohol-to-Jet technology in an Advanced Production Unit. This unit will produce jet blendstocks from non-food/non-feed ethanol with over 70% GHG reductions than conventional jet.

Sustainable aviation fuels are receiving increased attention. **TAKE-OFF** is an industrially driven project that will be a **game-changer in the cost effective production of sustainable aviation fuel from CO2 and hydrogen.** The unique TAKE-OFF technology is based on conversion of CO2 and H2 to sustainable aviation fuel via ethylene as intermediate.

The next generation of technologies for the **production of advanced bio jet fuels from abundant and sustainable biomass feedstocks** like second-generation biomass and macroalgae will be developed by the project **HIGFLY**.

More information on the projects funded by Horizon 2020 is available at *cordis.europa.eu*

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