



## FuelUp

### **FUEL-UP: Powering a Greener Future for Aviation and Marine Transport**

FUEL-UP is a new EU Horizon funded project aimed at transforming biogenic waste into advanced biofuels to enable the green transition and the defossilization of the aviation and marine transport sectors.

Advanced biofuels are an essential solution to reduce greenhouse gas emissions and achieve the European objectives for tackling climate change. They have the potential to provide 14% of global transport fuel and 45% of global aviation fuel by 2050<sup>1</sup>.

However, there are some challenges that need to be addressed in order to scale up the production and use of advanced biofuels: the complexity of conversion of solid biomass feedstocks and upgrading of liquids products, the need for cost-effective production methods as well as a common EU certification of biofuels in order for them to be adopted in the market and be socially accepted.

FUEL-UP will provide solutions to make a paradigm shift towards the production of renewable sustainable aviation fuels (SAF) and marine fuels by producing stabilized deoxygenated pyrolysis oils (SDPO) from pyrolysis oils (PO) derived from 100% biogenic feedstock that can be subsequently processed towards a fully hydrotreated oil in a refinery. The project will, therefore, validate, at demo scale, a route to produce sustainable liquid biofuels from lignocellulosic streams with 45-50% aviation fuel, 30-35% in the marine diesel range and 20% heavy naphtha at technology readiness level-7 (TRL-7).<sup>2</sup>

*"FUEL-UP will demonstrate at scale the complete value chain of advanced biofuel production from the biomass to the engine through pyrolysis route, tackling bottlenecks that are found in such a multi-step process. SINTEF's role in FUEL-UP is to coordinate the project activities for allowing smooth operation and delivery connecting actions with the existing European research framework for accelerating technology deployment."* said Duncan Akporiaye (SINTEF), coordinator of the project.

The FUEL-UP process is also expected to improve energy efficiency and contribute to several Sustainable Development Goals.

Key objectives of the project include:

- Demonstrating the full value chain of production of advanced biofuels: FUEL-UP will showcase a viable pathway for creating advanced biofuels from readily available resources such as lignocellulosic feedstock and biogenic waste, thus offering a practical solution for de-fossilizing key industries.
- Accelerating the cost-effective conversion of biomass into SAF and marine biofuels: By demonstrating efficient methods like pyrolysis, oil upgrading, refining and utilization of byproducts the project aims at ensuring biofuel price parity and at responding to market demand in biofuels.

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<sup>1</sup> [International Energy Agency "Net Zero by 2050", May 2021](#)

<sup>2</sup> <https://euraxess.ec.europa.eu/career-development/researchers/manual-scientific-entrepreneurship/major-steps/trl>

- Boosting economic productivity and competitiveness: FUEL-UP is expected to contribute to achieving higher levels of economic productivity through diversification, technological upgrading and innovation.
- Mitigating climate change: FUEL-UP aims at achieving up to 80% reduction in GHG emissions compared to fossil fuels and 47% compared to the state-of-the-art advanced biofuels and at providing scenarios for green hydrogen production.
- Paving the way to marine and aviation fuel certification of products and processes in order to ensure that production is compatible with practical usage, and it is socially accepted.

FUEL-UP has been launched on 1 January 2024 by a strong industrial-academic consortium gathering major industrial actors, leading research institutes and small and medium-sized enterprises, covering the entire value chain for the development of next generation of biofuel production technologies for aviation and marine and their implementation in existing refineries.



*The FUEL-UP team at the kick-off meeting at SINTEF in Brussels, Belgium, on February 6-7, 2024.*

### **About FUEL-UP**

FUEL-UP– Production of advanced biofuels via pyrolysis and upgrading of 100% biogenic residues for aviation and marine sector, including full valorisation of side streams – is a 4-year Horizon Europe Innovation Action project. The project Kick-Off meeting took place on 6th and 7th of February 2024 in Brussels, Belgium, hosted by SINTEF.

### **Partners**

The FUEL-UP project is coordinated by SINTEF Industry (Norway) and has a consortium of 12 partners from 8 different EU countries: SINTEF Ocean (Norway), B.T.G. Biomass Technology Group (The Netherlands), BTG-Next (The Netherlands), Tüpras (Türkiye), RANIDO (Czech Republic), AVECOM (Belgium), German Aerospace Center (Germany), Aristeng (Luxembourg), ETA-Florence Renewable Energies (Italy), LIST (Luxembourg), Ketjen (The Netherlands).



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