Seafairer

Sustainable Energy and Alternative Fuels from Advanced Intermediate Renewable Energy carrieR technology

SEAFAIRER is an Innovation Action funded by the Horizon Europe framework programme under Grant Agreement no. 101173002, coordinated by the Technical University of Denmark (DTU), with a total budget of 10 million EUR.

Objective

The objective of SEAFAIRER is to demonstrate the production of improved intermediate biofuels, targeting the decarbonisation of maritime shipping, using an innovative thermochemical conversion process, developed and patented by the **Fraunhofer Institute UMSICHT**.

From biogenic feedstock to advanced biofuel

The SEAFAIRER project will collect, characterise and process 3 different biogenic feedstocks: **rice husk** from the Comunidad Valenciana in **Spain**; b**iowaste sieving material** from Bavaria in Germany; and residual **agave bagasse** from the tequila and mezcal industry of Jalisco in **Mexico**, the latter facilitated by the Associated Partner from Mexico, **Centro Mario Molina**.
All feedstocks are strategically selected from exclusively fair sources **without indirect land use change** (iLUC) issues and in accordance with Annex 9 of the RED II Directive for advanced biofuels.
The thermochemical process, which consists of a single-stage intermediate pyrolysis and an integrated post-reforming process, converts these feedstocks into **three value-added products: carbon-negative biochar, raw oil (intermediate biofuel) and syngas**.

The biofuel, which is the focus of the project, then engages in two different pathways:
Pathway A (No upgrading) – direct use of intermediate biofuel, validated by engine and component testing at **FVTR;**
Pathway B (Minor upgrading) – integration of intermediate biofuel in existing refinery infrastructure by **Galp**.

Throughout the project, a life-cycle analysis and techno-economic assessment are performed, as well as a cost analysis of the novel value chain in collaboration with **UABIO**. This data will feed into a business plan, driven by **KPMG**, to enable the technology´s commercial deployment by **SAGAVA**.

The grand finale of SEAFAIRER is a real-world demonstration of the advanced biofuel in a vessel on a 30-day campaign working on the port of Valencia, organised by **Fundación Valenciaport**. Emissions and fuel performance are tracked live onboard in order to quantify the benefits of the use of this alternative fuel for the maritime sector.

SEAFAIRER consortium

SEAFAIRER has a total duration of 48 months starting September 2024 and expected to end August 2028. The consortium, coordinated by DTU, counts 10 partners:

DTU

UABIO

FVTR

Fraunhofer UMSICHT

FVP

KPMG

Petrogal

TERGY SAGAVA

ETA-Florence

Centro Mario Molina

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