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GLAMOUR



GLycerol to Aviation
and Marine prOducts
with sUstainable Recycling

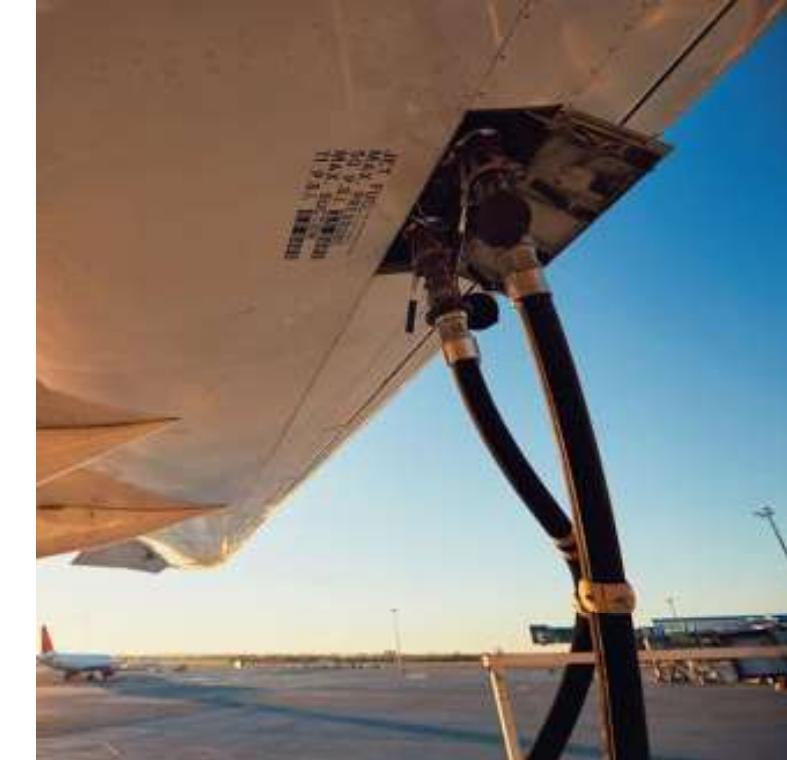
PROJECT

The objective of the GLAMOUR project is the design, scale-up and validation of an integrated process that converts the waste bio-based feedstock such as crude glycerol into aviation and marine diesel fuels. The focus of the project will be a combination of high pressure, auto-thermal reforming/gasification using chemical looping to produce syngas and the integration of Fischer-Tropsch compact reactor integrated with 3D printed structured catalyst. The GLAMOUR process will achieve full conversion of the crude glycerol into synthetic paraffine kerosene (FT-SPK) to be used as jetfuel and into marine diesel oil (MDO) with an energy efficiency of 65%. These improvements would increase the overall revenue of existing 2nd generation bio-diesel plants reducing the cost for large scale biomass-to-liquid production processes up to 35% and the CO₂ emissions up to 70%. The project will focus on the scale up of the two processes to achieve a final TRL5 demonstration for 1000 hours by using 2 kg/h of glycerol in a packed bed chemical looping systems and a downstream FT reactor.

The consortium includes two universities, three large research centres and 5 industries (including SMEs) which will combine fundamental knowledge on gas-solid and catalytic reactions, material design and engineering process design, economics, environmental analysis, societal and policy making decision. In the long term, GLAMOUR could unlock low cost feedstock with cost decrease of 65%, increase the production of biofuel to achieve the overall bio-jet fuel production to move 19% of the EU passengers reducing the CO₂ emissions up to 27 Mt/year and generating a scalable business up to 11 bln/years.

OBJECTIVES

- To develop, test and scale-up new catalyst formulations for chemical and calcium looping reforming
- To select, test and scale-up a new 3D-printed structured catalyst for FT synthesis
- To integrate and demonstrate the glycerol-to-syngas conversion and fuel synthesis in a single process prototype at TRL5 after 1000 hrs of operation
- To perform the overall techno-economic analysis and optimisation of the process for full scale applications
- To assess the overall economics of the process
- To implement the business plan of the GLAMOUR process of the entire value chain
- To improve the social sustainability of bio-fuels and inform policy makers



IMPACT

GLAMOUR has the potential to:

- Produce advanced biofuel from new bio-waste and low-grade feedstocks, with a potential cost decrease higher than 35% compared to other benchmark technologies.
- Scale-up the biofuel supply, to decrease emissions equivalent to the 15% of aviation-based GHGs in EU, over a 10 years perspective.
- Generate a scalable business up to 11 bln/year in EU thereof.