- IDEALFUEL -

Lignin as a feedstock for renewable marine fuels

GRANT AGREEMENT No. 883753

Deliverable Report

D3.1 – Report disclosing optimal catalyst composition and reaction settings for the hydrotreating of CLO feeds into a marine biofuel with HFO-like specs.

Deliverable No.	IDEALFUEL D3.1	
Related WP	WP3	
Deliverable Title	Report disclosing optimal catalyst composition and reaction settings for the hydrotreating of CLO feeds into a marine biofuel with HFO-like specs	
Deliverable Date	31-10-2022	
Deliverable Type	REPORT	
Dissemination level	Confidential (CO)	
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Checked by	Roy Hermanns (TUE) – Project Coordinator Irene Lamme (UNR)	29-11-2023 28-11-2023
Reviewed by	Roy Hermanns (TUE) – Project Coordinator	29-11-2023
Approved by	Roy Hermanns (TUE) – Project Coordinator	29-11-2023
Status	Final	30-111-2023

Disclaimer/ Acknowledgment

Publishable summary

The EU H2020 project IDEALFUEL aims to develop an efficient and low-cost chemical pathway to convert lignocellulosic biomass into a Biogenic Heavy Fuel Oil (Bio-HFO) with ultra-low sulphur levels that can be used as drop-in fuel in the existing maritime fleet. This deliverable, D3.1, concerns the development of solid catalysts, and operational settings thereof, for the hydrodeoxygenation (HDO) process of Crude Lignin Oil (CLO) to produce the above-mentioned bio-HFO. The major aim is to attain a bio-HFO product fitting preset specifications as to oxygen content and viscosity, which are deemed essential to consider application as neat/blending fraction in marine fuels. Lab-scale conversion of well-defined and chemically pure lignin model compounds was used as reference to study the role of different catalyst active sites for the cleavage of the most representative chemical linkages in lignin oligomers. Based on these results, the most appropriate catalysts for HDO of real lignin oils have been designed. Different families of solid catalysts, mainly based on metal oxides and metal-oxide supported metals have been synthesized and characterized, and their HDO catalytic performance studied. The report additionally provides an experimental protocol as the basis for the upscaling of the HDO process of CLO from laboratory- to bench-scale.