

HELENUS: High Efficiency Low Emissions Nautical Solid Oxide Fuel Cell

Dheeraj B. Gosala

(1) DLR Institute of Maritime Energy Systems, Geesthacht, Germany

Tel.: +49-4152-8488-102, Mobile: +49-151-22050-986

dheeraj.gosala@dlr.de

Abstract

The HELENUS project pioneers the integration of a 500 kW solid oxide fuel cell (SOFC) system into an MSC ocean going cruise vessel. Operating in combined heat and power mode, the SOFC produces both electricity and high-grade heat that will be integrated onboard of the ship. The HELENUS SOFC solution promises over 23% fuel savings compared to traditional internal combustion engine systems when scaled up to 20 MW in a future installation.

The project will demonstrate the scalability of SOFC technology to 10 MW and beyond, applicability to other maritime use cases such as dredging and offshore vessels, and its flexibility with low carbon maritime fuels, ensuring robustness for future energy transitions. The HELENUS consortium, comprising diverse stakeholders, aims to commercialize multi-megawatt SOFC products, expand their use across various maritime applications, and accelerate the sector's transition to renewable and carbon-neutral fuels.

By fostering innovation and developing a technological foundation, HELENUS supports the creation of regulatory frameworks and class rules for SOFC systems on large ships. The project will enhance the European maritime industry's competitiveness and generate skilled job opportunities, contributing significantly to the sector's decarbonization and sustainable transformation.

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