
TRANSITION TO HYDROGEN POWERED SHIPPING

SUMMARY

In this project, OSE and cooperating partners investigated the potential for a full refit of a hydrogen-based propulsion system on the research vessel RV Prince Madog.

The project analysed current operation and regulatory frameworks and provided a concept level design for a fully decarbonised engine room layout, including on-board hydrogen storage.

Through extensive numerical modelling and a detailed physical tank testing campaign, an optimised propeller and duct arrangement was proposed based on the leading-edge tubercles found on the fins of the Humpback Whale.

Results of the extensive testing showed that significant energy savings of up to 30% can be achieved which resulted in a theoretical offshore endurance of up to two weeks following a full refit including a fuel cell and battery arrangement.

The Transition to hydrogen powered ocean-going and short-sea shipping with enabling retrofit technologies (TransShip) is part of the Clean Maritime Demonstration Competition, funded with an overall budget £682k by the Department for Transport and delivered in partnership with Innovate UK. Announced in March 2020, and part of the Prime Minister's Ten Point Plan to position the UK at the forefront of green shipbuilding and maritime technology, the Clean Maritime Demonstration Competition is a £20m investment from government alongside a further c.£10m from industry to reduce emissions from the maritime sector. The programme is supporting 55 projects across the UK, including projects in Scotland, Northern Ireland and from the South West to the North East of England. As set out in the Clean Maritime Plan (2019), Government funding has been used to support early stage research relating to clean maritime. The programme will be used to support the research, design and development of zero emission technology and infrastructure solutions for maritime and to accelerate decarbonisation in the sector.

PROJECT PARTNER



IMPRESSIONS

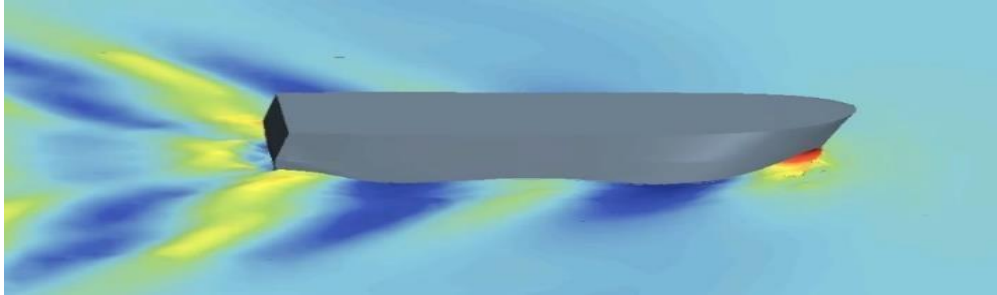


Figure 1 - CFD Simulations of Prince Madog

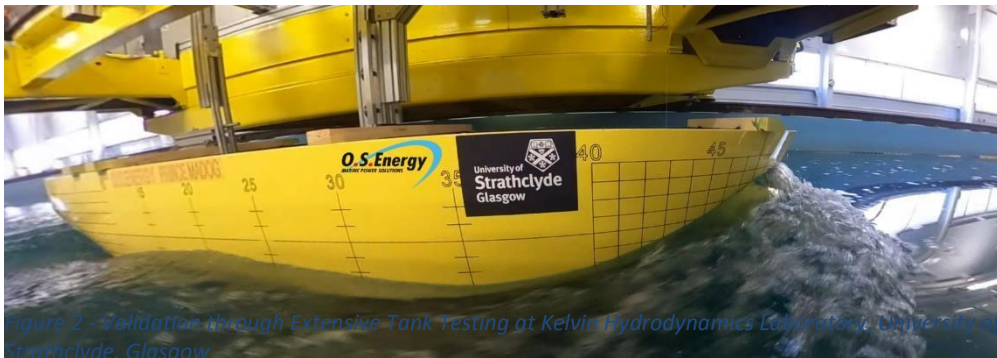


Figure 2 - Validation through Extensive Tank Testing at Kelvin Hydrodynamics Laboratory, University of Strathclyde, Glasgow