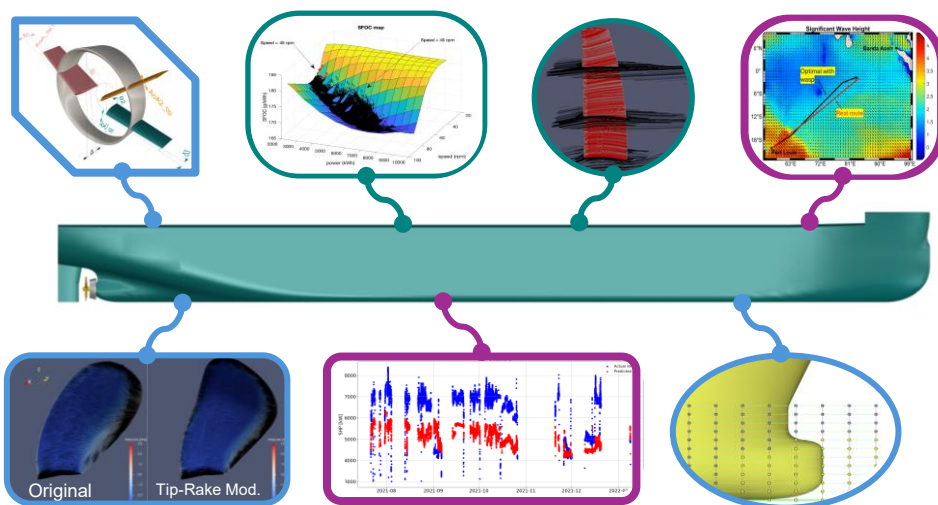




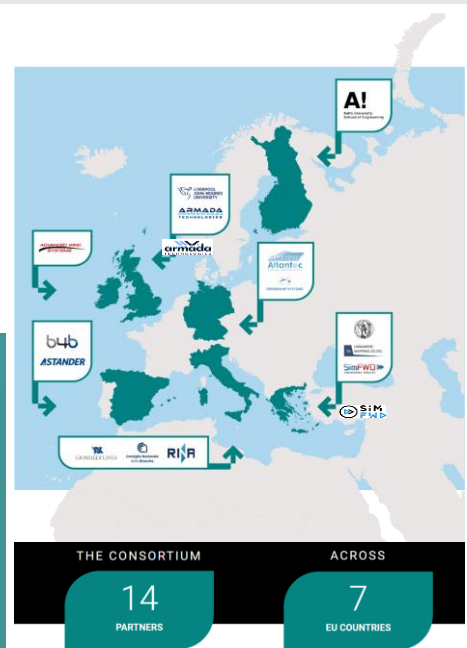
- ❑ RETROFIT55 explored a range of retrofitting technologies to reduce the carbon footprint of the existing vessel fleet
- ❑ With the project having ended in June 2026, some interesting results along with relevant plots have been included in this final issue

- ❑ **Hydrodynamic** and **Operational Synthesis** are documented here

- ❑ All results have already been published on our website and on various scientific publications. For more follow this [link](#)



Partners



Inside this Issue:

- ✓ Results of RETROFIT55 project
- ✓ Operational Synthesis
- ✓ Hydrodynamic Optimization
- ✓ Decision Support System (DSS)
- ✓ Synergy with sister projects

Website: <https://www.retrofit55.eu>

Read more about:

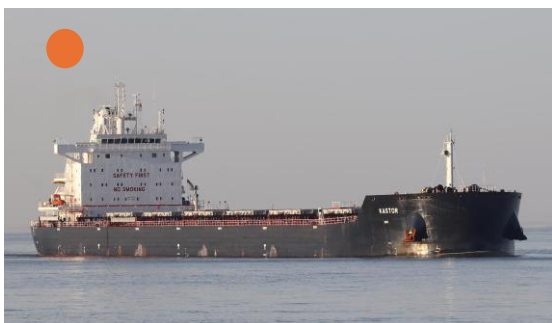
- ✓ The project [here](#)
- ✓ The partners [here](#)

Check EU CORDIS factsheet published in [here](#)



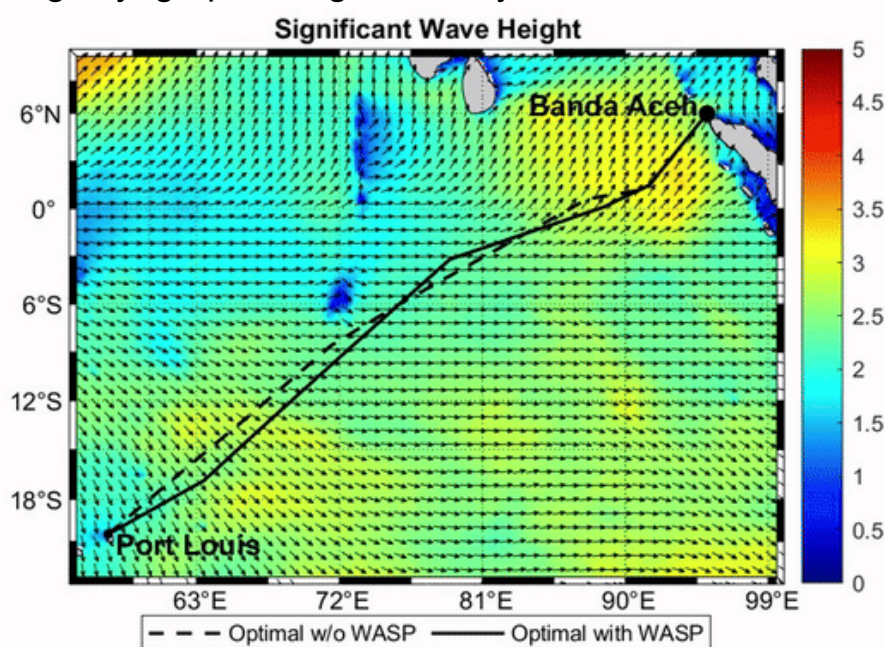
Case study vessels

- ✓ Laskaridis Shipping Co. and Grimaldi Lines provided all the necessary input data for two vessels respectively, a **Bulk Carrier** and a **RoRo**



Operational Synthesis and Optimization

Weather routing tools were developed during the course of the project, leading to more energy-efficient, fuel-saving, and environmentally friendly maritime operations by optimizing vessels' trajectories based on real-time weather conditions, while also enhancing navigational safety and improving voyage planning efficiency.





Hydrodynamic Design Optimisation

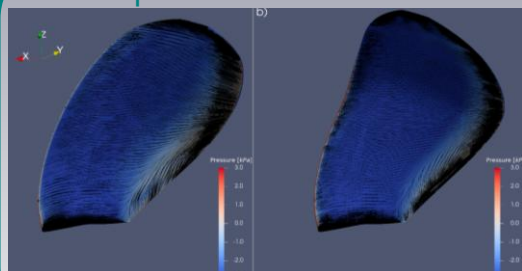
Propeller Optimization

NTUA explored the possibilities to improve the performance of the Bulk Carrier's propeller

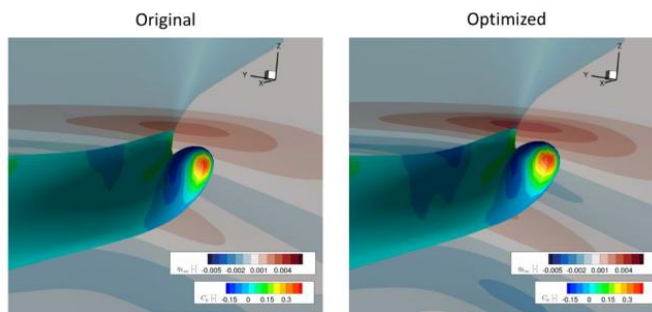
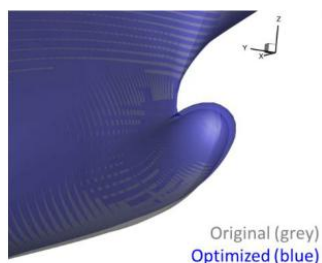
Blade Roughness investigation to control cavitation



Tip Vake Modification



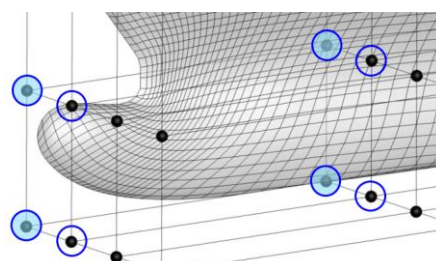
CNR
predicted
power saving
up to 2%



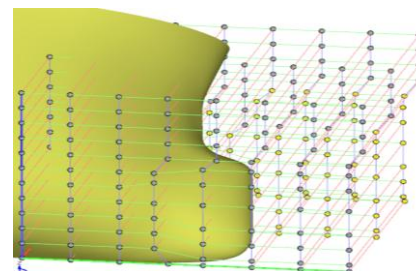
Bow Retrofitting

Partners from **NTUA** and **CNR** used Free-Form Deformation techniques to optimize the geometry of bulbous bows of the respective vessels.

Parameterization of RoRo's bulbous bow

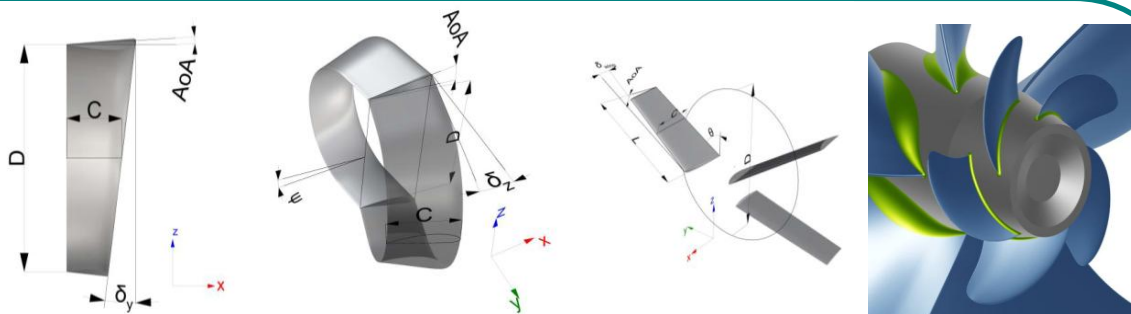


Parameterization of BC's bulbous bow

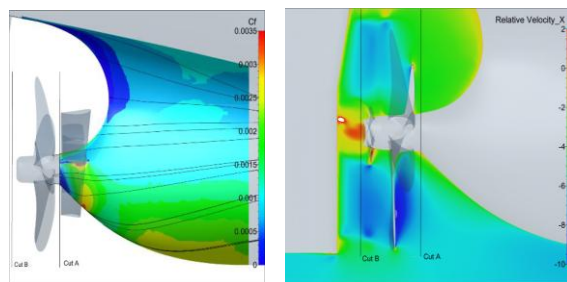




Energy Saving Devices (ESDs) Retrofitting

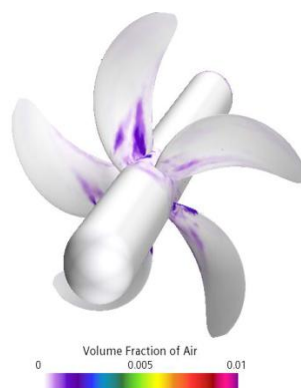
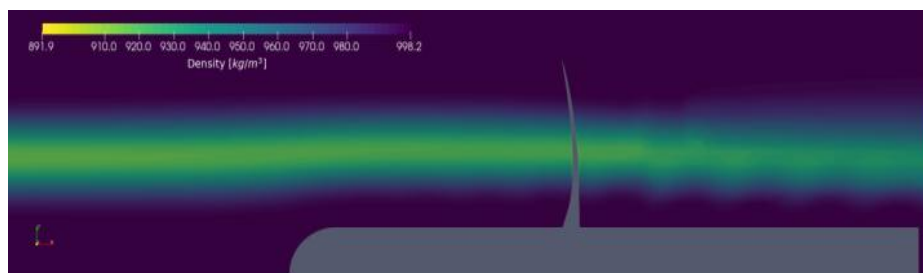


Pre- and Post-Swirl Devices are well-known for enhancing hydrodynamic efficiency. This collaborative effort between SFD and FSYS focused on the efficient parameterization of ESDs and their evaluation for the Bulk Carrier vessel.



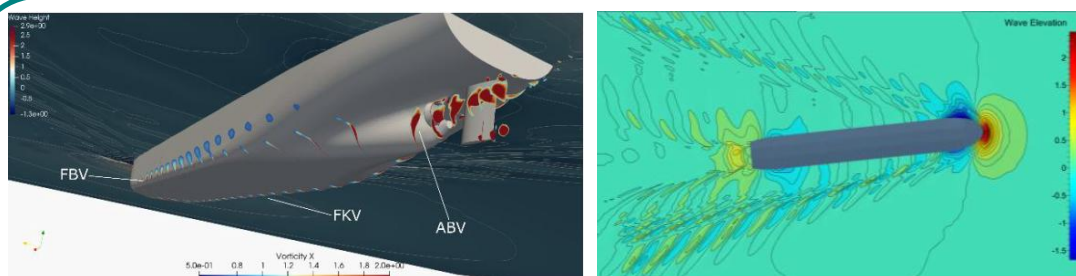
Hydrodynamic Aspects of ships with ALS

Passive air lubrication introduces an air-water mixture into the propeller inflow. NTUA and LJMU carried out dedicated simulations to investigate the effects of this mixture on propeller performance.





Hydrodynamic Aspects of Ships with WASPs



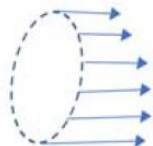
SFD and **FSYS** studied the effects of WASP-induced drift and heel on hull hydrodynamic performance.



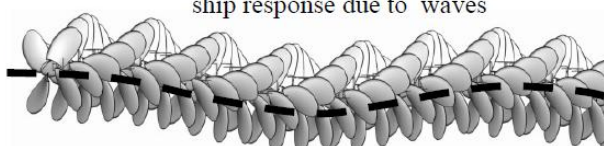
Furthermore, **FSYS** investigated a hull shape modification involving the addition of a stern deadwood, with the aim of reducing the extra resistance generated under drift conditions.

Performance prediction in waves

ship viscous wake



propeller motion including stern
ship response due to waves

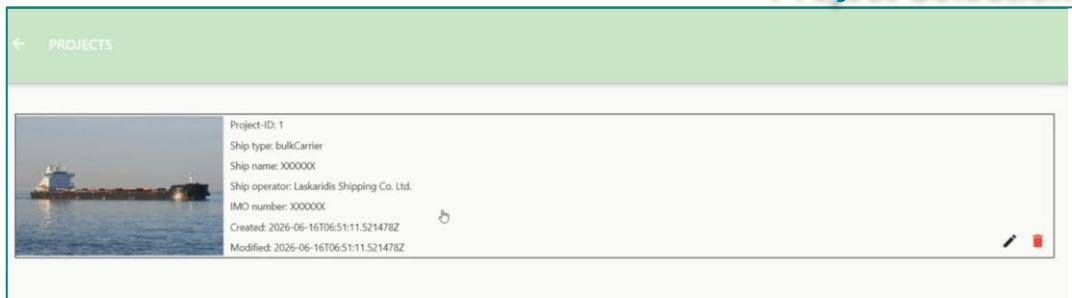




Decision Support System

Combination of the different technologies accounting for safety aspects, cost- effectiveness and life-cycle costs, including the decommissioning phase.

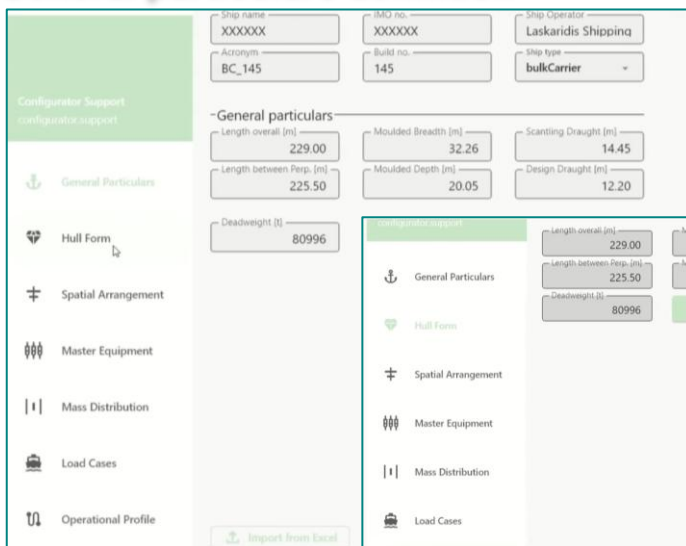
Project Selection



← PROJECTS

Project-ID: 1
Ship type: bulkCarrier
Ship name: XXXXXX
Ship operator: Laskaridis Shipping Co. Ltd.
IMO number: XXXXXX
Created: 2026-06-16T06:51:11.521478Z
Modified: 2026-06-16T06:51:11.521478Z

General particulars definition



Ship name: XXXXXX
IMO no.: XXXXXX
Ship Operator: Laskaridis Shipping
Acronym: BC_145
Build no.: 145
Ship type: bulkCarrier

General particulars

Length overall [m]: 229.00
Moulded Breadth [m]: 32.26
Scantling Draught [m]: 14.45
Length between Perp. [m]: 225.50
Moulded Depth [m]: 20.05
Design Draught [m]: 12.20
Deadweight [t]: 80996

Configure Support
configure support

General Particulars

Hull Form

Spatial Arrangement

Master Equipment

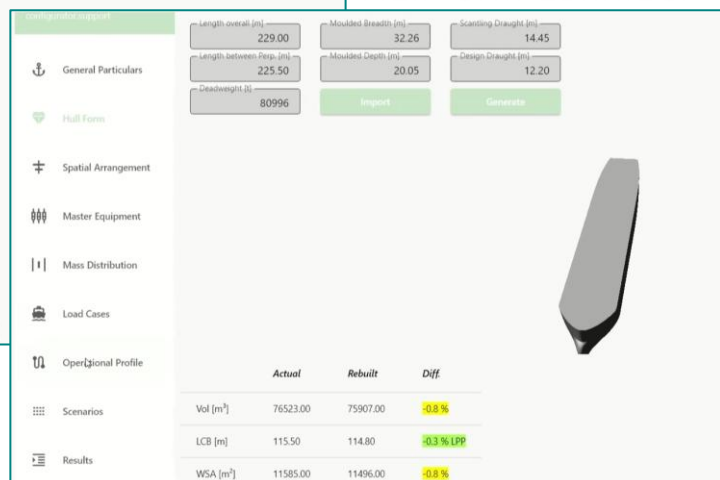
Mass Distribution

Load Cases

Operational Profile

Import from Excel

Hull form definition



General particulars

Length overall [m]: 229.00
Moulded Breadth [m]: 32.26
Scantling Draught [m]: 14.45
Length between Perp. [m]: 225.50
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Design Draught [m]: 12.20
Deadweight [t]: 80996

Import

Generate

Hull Form

Spatial Arrangement

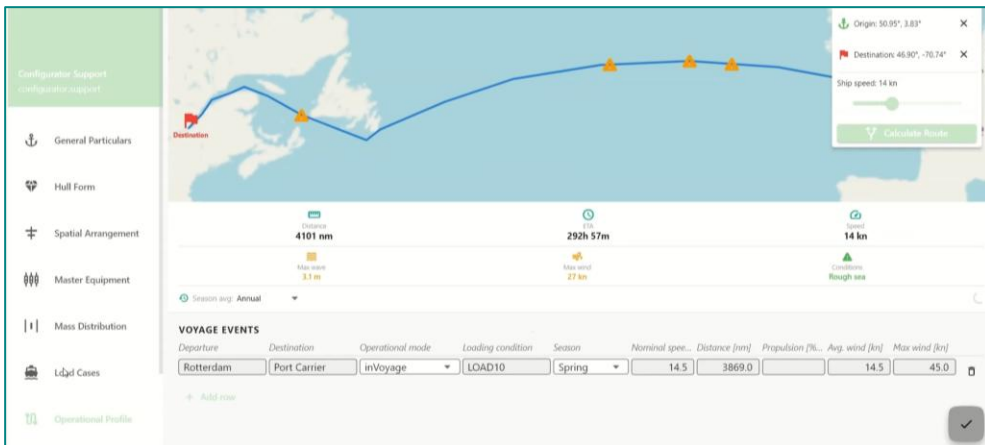
Master Equipment

Mass Distribution

Load Cases

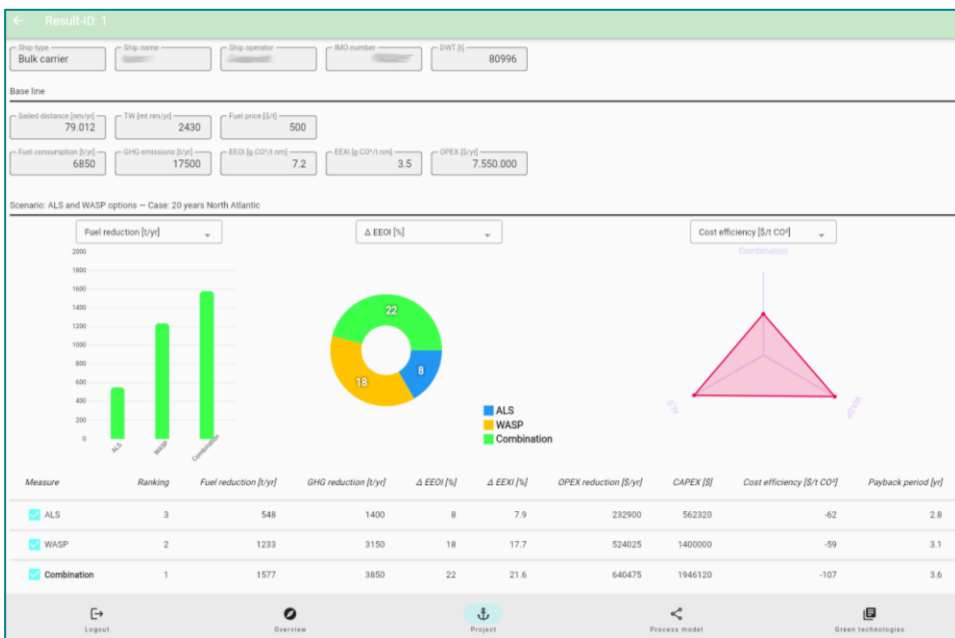
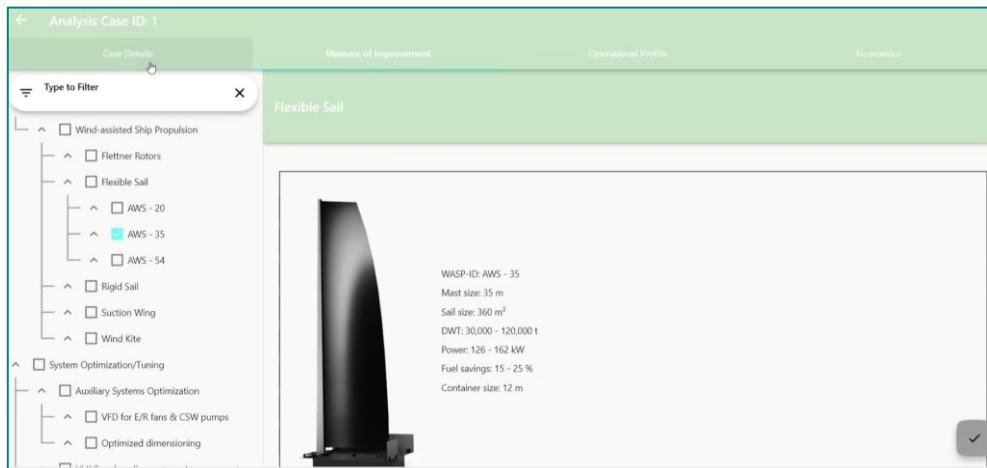
Operational Profile

	Actual	Rebuilt	Diff
Vol [m³]	76523.00	75907.00	-0.8 %
LCB [m]	115.50	114.80	-0.3 % LPP
WSA [m²]	11585.00	11496.00	-0.8 %



Operational profile definition

EET selection



Results assessment



Synergy with projects funded under the same EU funding call

Throughout the implementation of the RETROFIT55 project, the consortium actively engaged with other EU-funded research and innovation projects addressing complementary aspects of maritime decarbonization. These collaborations promoted knowledge exchange, strengthened synergies, and maximized the collective impact of Horizon Europe initiatives.



Events



2026

RETROFIT55 Final Workshop, organized at the Development Centre for Ship Technology and Transport Systems (DST) in Duisburg, Germany

2025

IMAM



2024

Posidonia

