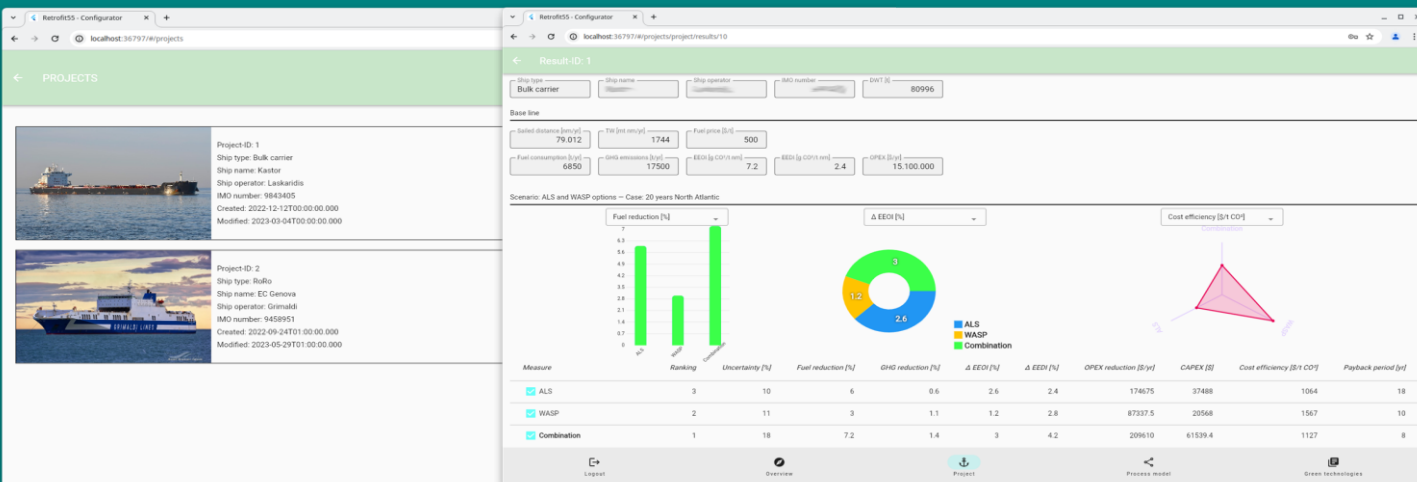




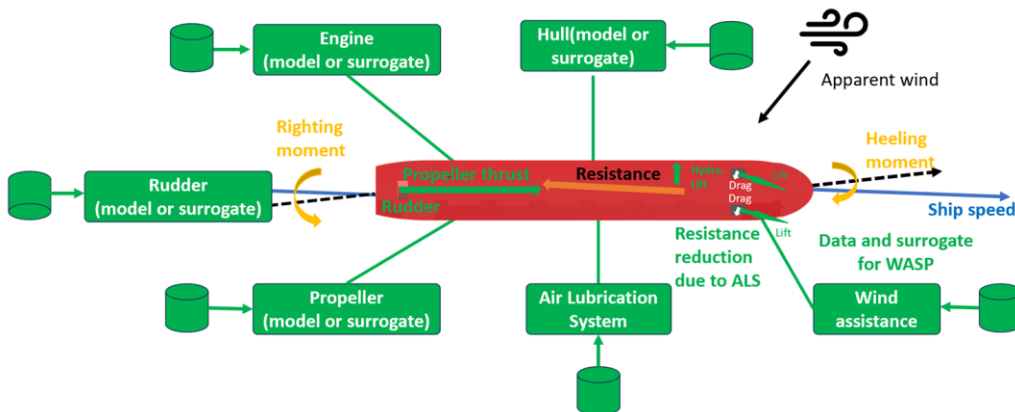
## General Objective

The project's general objective is to create an advanced **web-based Decision Support System (DSS)**, featuring a catalogue of retrofitting solutions that are up-to-date and ready to be deployed at the end of the project and shall be easily extendable afterwards. The DSS will allow combination of retrofitting solutions in order to achieve a GHG emission reduction of 35% compared to the original design



## Approach

The project addresses the targets of the Zero-Emission Waterborne Transport Partnership, i.e. to develop and demonstrate solutions reducing the fuel consumption of waterborne transport by at least 55% before 2030 compared to 2008



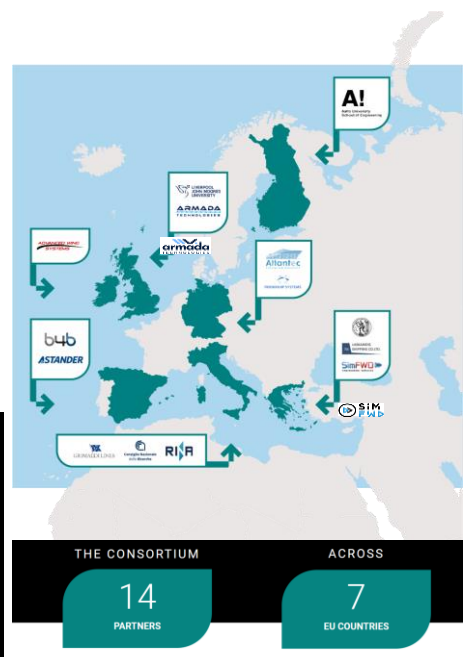


### RETROFIT55 OUTPUTS

- ✓ Solutions exploited by the project address the ship efficiency improvement (**Air Lubrication Systems, Smart Energy Management, holistic Hydrodynamic and Operational optimization**), as well as renewables or zero- and low-emission energy sources (**Wind Assisted Propulsion, Fuel Cells, and hybridization of the propulsion system**).
- ✓ A **Decision Support System (DSS)** will be developed featuring a catalogue of retrofitting solutions that are up-to-date and easily extendable afterwards, while developed and demonstrated at **TRL 7-8**, suitable for different ship types and operational contexts accounting for safety aspects, cost- effectiveness, and life-cycle costs

### Partners

### Inside this Issue:



- ✓ Explore RETROFIT55
- ✓ Find out about the project's structure
- ✓ What are the objectives of each Work Package
- ✓ Which technologies are being evaluated
- ✓ How we target to achieve 55% reduction of GHG emissions

### Website:

<https://www.retrofit55.eu>

### Read more about:

- ✓ The project [here](#)
  - ✓ The partners [here](#)
- Check EC CORDIS factsheet published in [here](#)

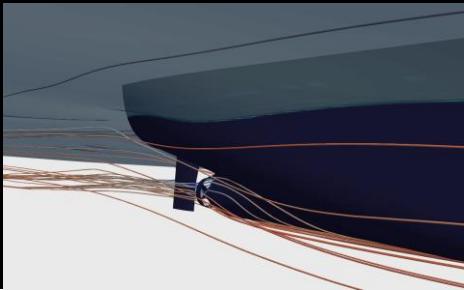


### Hydrodynamic Optimization (WP2)

Explore and provide retrofitting solutions for *improving the ship's hydrodynamic design*

#### Specific objectives

- **Optimize** realistic operational profile based on operational data
- Interaction between hydrodynamic design and **energy saving devices**
- Hydrodynamic optimization with Wind Assisted Propulsion (**WASP**)
- Hydrodynamic optimization with Air Lubrication System (**ALS**)

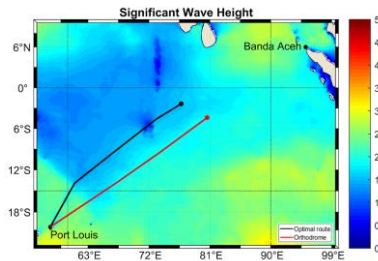


### Operational Synthesis and Optimization (WP3)

- *Evaluating and optimising for the current ship performance status*
- *Evaluation of the impact of retrofit measures (e.g., WASP & ALS) in realistic operational and weather conditions*

#### Specific objectives

- **Monitoring** of ship performance (hull, propeller, fuel reduction)
- **Optimizing** maintenance options
- Evaluation of **anti-fouling** measures
- Combined effect with **weather routing**
- Optimization of the **retrofit system** use



### Wind Assisted Ship Propulsion (WP4)

*Provide tangible examples of WASP for inclusion in the overall ship model and digital twin*

#### Specific objectives

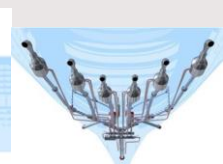
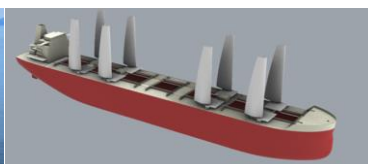
- Specification of a wind propulsion system **suitable for retrofit** to existing vessels
- Ensure **compatibility** with operational requirements
- Evaluate risks and gain class **approval in principle**
- Provide **design inputs** for numerical analysis for digital twin
- Development of **prototypes** for demonstration, trials, measurement and validation

### Air Lubrication System (WP5)

*Develop a Passive Air Lubrication System (PALS) from TRL4 to TRL 7 to deliver 8-12 % fuel savings*

#### Specific objectives

- Determine the full PALS System design and layout
- Optimise the system to deliver 8-12 % fuel savings
- Evaluating risks and devising mitigation plans
- Obtaining Classification Approval in Principle (AIP)





### Electrification and Energy Management of on-board Systems (WP6)

Design of retrofitting solutions for increased ship electrification with carbon-free solutions

#### Specific objectives

- Combination of batteries and renewable sources (e.g, FCs and PVs)
- Hybridization of electrical power drives
- Integration of a suitable energy management system

### Technology Demonstration (WP7)

Technology demonstration activities: feasibility of the combined use of technologies developed/assessed in real conditions

#### Specific objectives

- WASP systems installation and sea trial protocol
- Sea trial data processing using AI methods
- Real demonstration of weather routing system
- Virtual demonstrations of WASP and ALS systems



### Safe and sustainable retrofitting solutions (WP1)

Develop and validate an AI informed Decision Support System for the selection, combination and implementation of various RETROFITTING technologies

#### Objectives

Demonstrate that suitable synthesis of techs may lead to at least 35 % reduction in GHG emissions

### Project Structure

