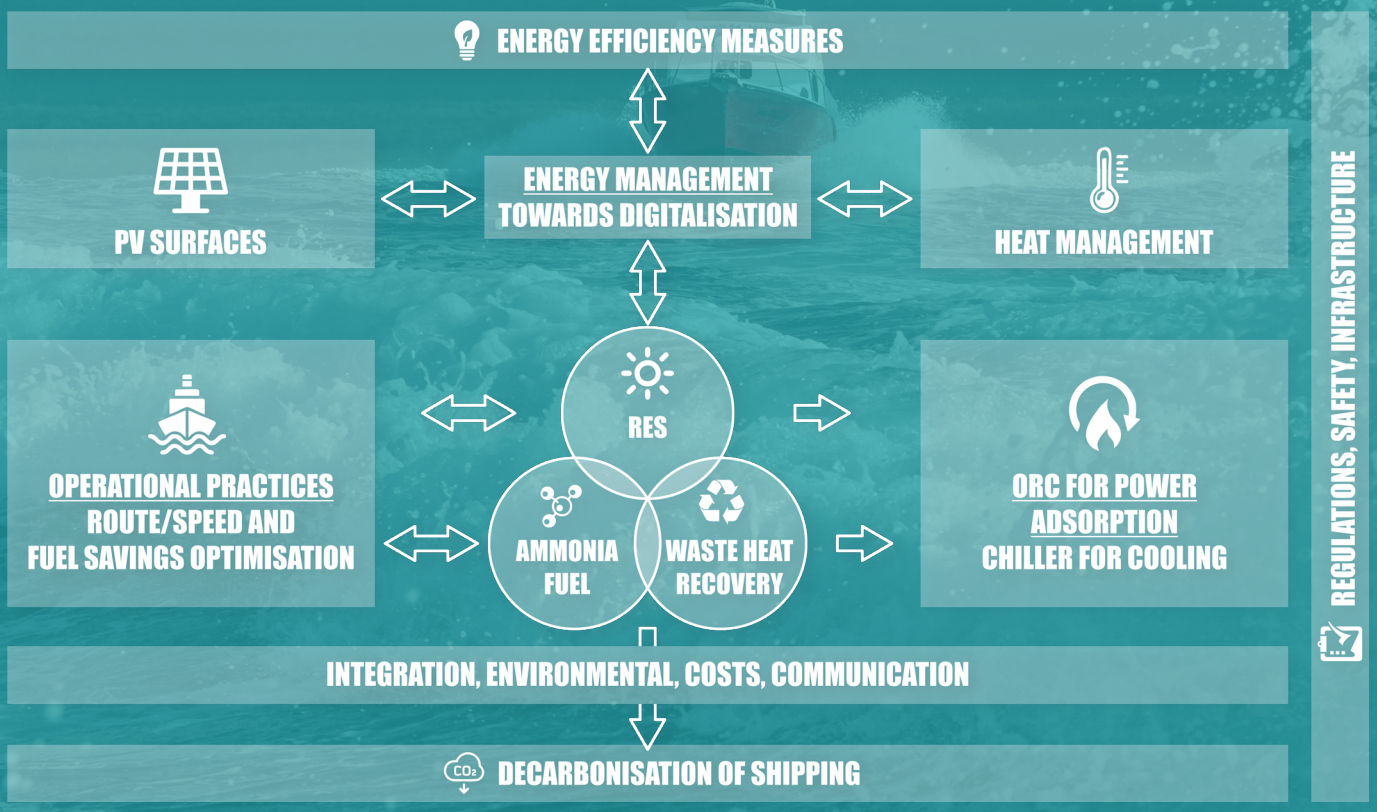
FUNDAMENTALS



PROJECT CONSORTIUM

RINA · National Technical University of Athens · ARISTOTLE UNIVERSITY OF THESSALONIKI · Università di Genova · LUNDS UNIVERSITET · POLITECNICO MILANO 1863 · FAHRENHEIT Cooling Innovation. · C-JOB · RICREATION Energy & Research · orcan The Efficiency Company · tecnal:a MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE · ENAV · DTU Danmarks Tekniske Universitet · METIS CYBERTECHNOLOGY · SEASTEMA · PORTS of GENOA · dnvgl shipping as ltd · HALDOR TOPSOE · TUM · ANEK LINES · MAN Energy Solutions Future in the making

ENGIMMONIA PROJECT

info@engimmonia.eu

@ENGIMMONIA

The filer reflects only the author's view. The European Commission and the European Climate, Infrastructure and Environment Executive Agency (CINEA) are not responsible for any use that may be made of the information it contains.

Sustainable technologies for future long distance shipping towards complete decarbonization

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 955413.

WWW.ENGIMMONIA.EU

THE PROJECT

The 2018 directive of the International Maritime Organisation – IMO - aimed to reach the 50% reduction of greenhouse gas - GHG - emissions due to international maritime transport by the 2050, pushed the shipping sector to study practical innovative solutions.

The ENGIMMONIA project develops a strategy to decarbonise the maritime transport promoting the use of ammonia as an alternative fuel and the on-board exploitation of clean energy technologies already available for terrestrial applications. ENGIMMONIA would adapt sustainable energy (photovoltaic) and waste recovery solutions on-board to avoid uncontrolled pollutants dispersion.

Demonstrators of the project will be three pilot vessels: an oil tanker, a ferry and a container ship.

22 PARTNERS | **48 months** | **8 EU countries** | **9.35 M Funding**

AMBITION

- Promoting ammonia as the cleanest and most promising fuel for the shipping sector studying how to abate all global warming potential -GWP- emissions from ammonia fueled engines, also understanding how to facilitate ship refueling;
- Demonstrating on-board clean energy solutions to promote renewable power production and waste heat recovery via technologies already proved for terrestrial applications, but still facing non-technical/ regulatory challenges;
- Fostering replicability at business, regulatory, policy and naval classification level, interacting with on-going international initiatives and bodies (IMO, European maritime security agency -EMSA-, International association of classification societies-IACS).

AMMONIA COMBUSTION WITH LOW GWP

CLEAN ENERGY TECHNOLOGIES INTEGRATED ON BOARD

REPLICABILITY AT THE REGULATORY & BUSINESS LEVEL

THE APPROACH

Thanks to its demonstration campaign on-board of three different types of vessels (a ferry, an oil tanker, a container ship), ENGIMMONIA represents a revolutionary road to clean energy for shipping, bringing technologies from TRL 4 up to 6/7, thus favouring their future take over thanks to the proactive engagement of shipping companies and vessel owners, the preparation of regulatory/ policy certification authorities and studying how to adapt EU port infrastructure.

PROJECT STARTS **2021** TRL 4 → **2024** TRL 5 → PROJECT ENDS **2026** TRL 6/7 → **2027** TRL 9

Project Starts

Project Drivers

- *Maritime and Shipping sectors have to heavily reduce their emissions*
- *Ambitious IMO and EC targets*
- *Alternative fuels more and more promoted by IMO, IACS, EC*
- *RES more and more widespread in EU and stored via power-to-fuel systems*

Technological Barriers:

- *design and production with relative costs of ammonia engines, ammonia storage systems.*
- *refueling procedures*
- *integration of clean energy technologies on board*

Non Technological Barriers:

- *Best practice and measures for clean energy solutions sizing and installation on board*
- *HSE certification*
- *Naval permissions for sailing in more EU countries*
- *Social acceptability*

Further Demonstrations & Marketing

- *Demonstration of the ENGIMMONIA Solutions Interoperability/on-board integration in large scale and in different ship purposes*
- *Demonstration of different refueling procedures and widespread of ammonia refuelling infrastructure*
- *Selection of the first entry markets: Greece, Netherlands, Germany, Scandinavia, Denmark, Spain, Italy etc.*
- *Promotion in Nautical sector (especially for PV surface and energy management optimization)*

DEMO APPLICATIONS

Oil tanker, Shipping, Ferry

ADDITIONAL MARKET

All type of short sea
Long distance shipping

Nautical Sector