

RETROFITTING TOWARDS CLIMATE NEUTRALITY

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MISSION & AIMS

Green Marine aims to significantly accelerate climate neutrality of waterborne transport through retrofitting existing fleets with cost and emission control solutions. Retrofitting protocols and a software tool catalogue will be developed and validated to support decision makers.

The consortium will demonstrate these tools and the innovative solutions aimed at post-combustion carbon capture to reduce CO₂ emissions; energy savings for HVAC systems through air-reuse; carbon and water capture with membranes, and use of excess engine heat to produce a syngas and thus reduce fuel consumption.

All solutions will be demonstrated first on a land-based engine followed by the most suitable solution demonstrated on a vessel. Responsible research and innovation will be ensured through demonstrations, simulations, software tools, and eventual dissemination of activities.

OBJECTIVES

Develop and validate retrofitting protocol tools suitable for adapting engines, flue gas carbon capture and utilisation, and integrated energy-saving solutions for ships.

Tailor a (nano)particle and virus removal solution and demonstrate the significant HVAC energy savings that can be achieved by reusing virus-free air in enclosed areas.

Tailor commercially available gas-gas separating membranes for CO₂ and water capture.

Develop and implement a carbon capture solution based on an alkaline solution with Ca and Mg from seawater.

Develop and validate a software tool containing an up-to-date catalogue of suitable solutions for a wide variety of ship types and operation scenarios.

Replicate project learnings and stimulate the use of the developed software tools to further enrich its data.

Firmly position our retrofitting, software tools as a sustainable solution for Carbon Capture Utilisation and Storage (CCUS) market.

INNOVATION & ORIGINALITY

Green Marine aims to accelerate climate neutrality in waterborne transport by retrofitting existing fleets with emission control solutions. These will be achieved via the following technological solutions:

- 1) Flue gases to pass through Carbon Capture Machine whereby CO₂ will be chemically absorbed. Absorbed CO₂ is converted to precipitated calcium carbonates
- 2) Membranes with SepaRaptor to remove particles and CO₂ and also to produce syngas. Thermoelectric element (TEE) will use waste heat of engine and catalysts to produce syngas, which will be re-injected for combustion in the engine
- 3) Manipulation of HVAC system for energy savings. Air will be disinfected for reuse
- 4) Software catalogue tool to: (a) allow federated learning; (b) create value chains; (c) support a bottom-up characterization and simulate the cost-benefits of alternative options for GHG-emission avoidance, for a wide range of ship types/classes, (d) be a decision support tool for industry and communities

Who We Are

Given its knowledge, experience and innovative techniques, methods and tools, the Green Marine consortium will develop and implement real world solutions for retrofitting vessels in an effort to mitigate climate change.

Coordinator:

Partners:



NEWS

Project launch: The Green Marine officially started on 1st February 2023. The project duration is 48 months.

Kick-off meeting held on 15th-16th February 2023. The meeting took place at the premises of CMMI. The consortium discussed the workplan of the project and planned next steps for its smooth implementation.

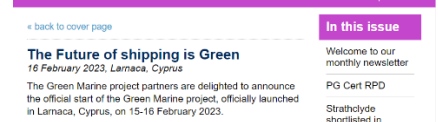
Participation at 12th Annual SNAME Western Europe Section Symposium on 24th - 25th February 2023. Dr George Mallouppas (CMMI, Cyprus) presented and discussed the importance of Carbon Capture, Utilization and Storage systems in the maritime industry including the application of carbon capture technologies onboard ships, a key Green Marine objective!

The Future of shipping is Green! Green Marine at UoS Grad News newsletter. More details at:

<https://universityofstrathclyde.newsweaver.com/14q5zfjzj/1192s46s8h6?lang=en&a=2&p=62870600&t=31139367>

Participation at 4th SAFETY4SEA Limassol Forum: “Key trends towards a sustainable shipping future” on 1st March 2023 by Prof. Elias Yfantis. The Green Marine project and how it brings together different technologies that promote maritime decarbonisation.

Participation at 5th Marine Money Forum at Limassol on 25th April 2023 by Prof. Elias Yfantis. As part of the panel, Prof. Elias Yfantis discussed the general decarbonisation challenges that the shipping sector currently faces and the possibility of mitigating these with the Green Marine activities.



FUTURE EVENTS

2nd Consortium Meeting on 19th - 21st September, 2023, Ancona, Italy

Participation at RIF European Researcher's Night 2023 on 29th September 2023, Nicosia, Cyprus

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Project details also available on CORDIS: <https://cordis.europa.eu/project/id/101096522>



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