



# SEASTARS

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SUSTAINABLE EMISSION ABATEMENT STRATEGIES & TECHNOLOGIES  
FOR ADVANCED REVOLUTION SHIPS

## D1.2

### Consortium Operation procedures



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|                     |                                                                                        |
|---------------------|----------------------------------------------------------------------------------------|
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## Abbreviations and Terminology

| Partners - Abbreviations   |                                                                                        |
|----------------------------|----------------------------------------------------------------------------------------|
| <b>AMC</b>                 | ALFA MARIN TECHNIKH SYMVOULEYTIKH MELETON KAI ERGON EPE                                |
| <b>ATHINA</b>              | ATHINA KENTRO NAFTIKIS KATARTISIS KAI EXELIXIS ANONYMI ETAIREIA                        |
| <b>AURELIA</b>             | AURELIA DESIGN B.V.                                                                    |
| <b>Bound4Blue</b>          | BOUND 4 BLUE SL                                                                        |
| <b>COMPOSITE RECYCLING</b> | COMPOSITE RECYCLING SA                                                                 |
| <b>DG TWIN</b>             | DG TWIN SRL                                                                            |
| <b>Erma First</b>          | ERMA FIRST ESK ENGINEERING SOLUTIONS SA                                                |
| <b>HEMEXPO</b>             | ELLINES KATASKEVASTES NAFTILIAKOU EXOPLISMOU ASTIKI MI KerdoskopiKI ETAIREIA (HEMEXPO) |
|                            | QUADRISE INTERNATIONAL LIMITED                                                         |
| <b>MARIN</b>               | STICHTING MARITIEM RESEARCH INSTITUUT NEDERLAND                                        |
| <b>MERCURIUS</b>           | MERCURIUS SHIPBUILDING BV                                                              |
| <b>METACON</b>             | METACON MONOPROSOPI ANONYMI ETAIREIA                                                   |
| <b>MINERVA</b>             | MINERVA MARINE INC. TRUST COMPANY COMPLEX,                                             |



|                      |                                                               |
|----------------------|---------------------------------------------------------------|
|                      |                                                               |
| <b>NEPTUNE LINES</b> | <b>NEPTUNE LINES SHIPPING AND MANAGING ENTERPRISES S.A.</b>   |
| <b>PFD</b>           | <b>Process Flow Diagrams</b>                                  |
| <b>P&amp;ID</b>      |                                                               |
| <b>RINA</b>          | <b>RINA HELLAS ETAIRIA PERIORISMENIS EVTHINIS NIOGNOMONAS</b> |
| <b>UoB</b>           | <b>THE UNIVERSITY OF BIRMINGHAM</b>                           |
| <b>UOS</b>           | <b>UNIVERSITY OF STRATHCLYDE</b>                              |
| <b>VERTORO</b>       | <b>VERTORO BV</b>                                             |
| <b>Voyex</b>         | <b>Voyex B.V.</b>                                             |

| <b>Abbreviations</b> |                                                                                                           |
|----------------------|-----------------------------------------------------------------------------------------------------------|
| <b>AI</b>            | <b>Artificial Intelligence</b>                                                                            |
| <b>AIP</b>           | <b>Approval-In-Principle</b>                                                                              |
| <b>Assoc.</b>        | <b>Associated</b>                                                                                         |
| <b>bioMSAR</b>       | <b>A blend of heavy residual oils and glycerine with small amounts of specialist chemicals and water.</b> |
| <b>CAPEX</b>         | <b>Capital Expenditures</b>                                                                               |
| <b>CII</b>           | <b>Carbon Intensity Indicator</b>                                                                         |



|                  |                                                                               |
|------------------|-------------------------------------------------------------------------------|
| <b>CLO®</b>      | <b>Crude Lignin Oil</b>                                                       |
| <b>COLREG</b>    | <b>Collision Regulations</b>                                                  |
| <b>CSO®</b>      | <b>Crude Sugar Oil</b>                                                        |
| <b>CSRD</b>      | <b>Corporate Sustainability Reporting directive</b>                           |
| <b>D.</b>        | <b>Deliverable</b>                                                            |
| <b>EC</b>        | <b>European Commission</b>                                                    |
| <b>EEDI</b>      | <b>Energy Efficiency Design Index</b>                                         |
| <b>EFRAG</b>     | <b>European Financial Reporting Advisory Group</b>                            |
| <b>ES-TRIN</b>   | <b>European Standard Technical Requirements for Inland Navigation vessels</b> |
| <b>EU</b>        | <b>European Union</b>                                                         |
| <b>ETS</b>       | <b>Emissions Trading System</b>                                               |
| <b>GA</b>        | <b>Grant Agreement</b>                                                        |
| <b>GHG</b>       | <b>Green House Gas</b>                                                        |
| <b>H2</b>        | <b>Hydrogen molecule</b>                                                      |
| <b>HHG</b>       | <b>Hydrogen Generator</b>                                                     |
| <b>IMO</b>       | <b>International Maritime Organization</b>                                    |
| <b>ISPS code</b> | <b>International Ship and Port Facility Security Code</b>                     |
| <b>KPI</b>       | <b>Key Performance Indicator</b>                                              |
| <b>kW</b>        | <b>kilowatt</b>                                                               |
| <b>LNG</b>       | <b>Liquefied Natural Gas</b>                                                  |
| <b>LOHC</b>      | <b>Liquid Organic Hydrogen Carriers</b>                                       |
| <b>MARPOL</b>    | <b>International Convention for the Prevention of Pollution from Ships</b>    |
| <b>MBSE</b>      | <b>Model-Based Systems Engineering</b>                                        |
| <b>MOPSO</b>     | <b>Multi-Objective Particle Swarm Optimization</b>                            |



|                       |                                                                                                   |
|-----------------------|---------------------------------------------------------------------------------------------------|
| <b>MS</b>             | <b>Microsoft</b>                                                                                  |
| <b>MSAR®)</b>         | <b>Multiphase Superfine Atomic Residue</b>                                                        |
| <b>Nox</b>            | <b>Nitrogen Oxide (x indicating any oxide)</b>                                                    |
| <b>NSGA-II</b>        | <b>Non-dominated Sorting Genetic Algorithm</b>                                                    |
| <b>NSGA-III</b>       | <b>Non-dominated Sorting Genetic Algorithm</b>                                                    |
| <b>O.</b>             | <b>Objective</b>                                                                                  |
| <b>OPEX</b>           | <b>OPerating EXpenditures</b>                                                                     |
| <b>P&amp;ID</b>       | <b>Piping and Instrumentation Diagrams</b>                                                        |
| <b>PCTC</b>           | <b>Pure Car and Truck Carrier</b>                                                                 |
| <b>PFD</b>            | <b>Process Flow Diagrams</b>                                                                      |
| <b>PM</b>             | <b>Particulate matter</b>                                                                         |
| <b>PO</b>             | <b>Project Officer</b>                                                                            |
| <b>R&amp;D</b>        | <b>Research and development</b>                                                                   |
| <b>ROI</b>            | <b>return on investment</b>                                                                       |
| <b>CO<sub>2</sub></b> | <b>Carbon dioxide</b>                                                                             |
| <b>SEASTARS</b>       | <b>Sustainable Emission Abatement Strategies &amp; Technologies for Advanced Revolution Ships</b> |
| <b>SOX</b>            | <b>sulfur oxide</b>                                                                               |
| <b>SSOT</b>           | <b>Single Source Of Truth</b>                                                                     |
| <b>T.</b>             | <b>Task</b>                                                                                       |
| <b>TCO</b>            | <b>Total Cost of Ownership</b>                                                                    |
| <b>TQ</b>             | <b>Technology Qualification</b>                                                                   |
| <b>TRL</b>            | <b>Technology Readiness Levels</b>                                                                |
| <b>vZel</b>           | <b>zero emission lab in MARIN</b>                                                                 |
| <b>WP</b>             | <b>Work Package</b>                                                                               |



|                  |                                                                   |
|------------------|-------------------------------------------------------------------|
| <b>ZeroMSAR™</b> | <b>Zero Multiphase Superfine Atomic Residue, QUADRISE product</b> |
|------------------|-------------------------------------------------------------------|

| <b>Terminologies</b> |                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Arcadia</b>       | <b>Arcadia is a tooled method devoted to systems &amp; architecture engineering, supported by Capella modelling tool.</b>                                                                                                                                                                                                                                                 |
| <b>CAPELLA</b>       | <b>Open-access design and decision-support tool related to Arcadia (see above)</b>                                                                                                                                                                                                                                                                                        |
| <b>Fit for 55</b>    | <b>A set of EU legislative proposals designed to achieve a 55% reduction in net greenhouse gas emissions by 2030, compared to 1990 levels, and to make the EU climate-neutral by 2050.</b>                                                                                                                                                                                |
| <b>FLEXCAP</b>       | <b>An energy saving device that builds on the proven capabilities of propeller boss cap fins to optimise maritime efficiency and sustainability. By enabling fins to catch and absorb the rotating water force, the solution weakens the propeller hub vortex, reduces torque and means more energy can be channelled back into the propulsion drive train as thrust.</b> |
| <b>SPEC</b>          | <b>Ship Power and Energy Concepts</b>                                                                                                                                                                                                                                                                                                                                     |



## Executive Summary

The SEASTARS project is an ambitious initiative under Horizon Europe, dedicated to helping the maritime industry transition towards a more sustainable and energy-efficient future. With shipping emissions under increasing regulatory and environmental scrutiny, SEASTARS aims to deliver real, practical solutions by combining innovative retrofit technologies and newbuild vessel designs. The goal is to achieve at least a 30% reduction in well-to-wake greenhouse gas (GHG) emissions by 2030, along with a 20% improvement in energy efficiency compared to 2022 levels. Also the new designs will fulfil the EU regulation requirements “Fit for 55” which aims at reducing emissions by 55% by 2030. SEASTARS is funded under call no. HORIZON-CL5-2024-D5-01.

For a project of this scale and complexity, clear coordination and well-defined operational procedures are essential. **Deliverable 1.2 – Consortium Operation Procedures** aims to address those procedures as planned and agreed within the consortium. This document lays the foundation for how the consortium will collaborate, work and administer within the boundaries specified in the grant agreement.

It serves also the function of ensuring that all partners understand their roles, responsibilities, and how their contributions fit into the bigger picture.

The deliverable builds on the work of **Task 1.1 – Definition of Project Requirements**, where the scope of work for each entity is outlined, along with clarified responsibilities, and aligned expectations. It also incorporates baseline scenarios, which help us assess technology readiness, port infrastructure, economic viability, regulatory frameworks, and future trends. These scenarios serve as reference points, helping to navigate the challenges ahead and make informed decisions.

At its core, this document is designed to be a practical guide for all SEASTARS partners, whether they are deliverable contributors, work-package leaders, project managers etc.. It ensures smooth collaboration, streamlined decision-making, and alignment with the Grant Agreement (GA) and European Commission requirements.

By setting clear procedures and expectations from the outset, **Deliverable 1.2** helps keep SEASTARS on track, making sure that all partners can work effectively towards our shared mission of shipping decarbonization.

This document also re-confirms the scope of work throughout the work-packages and can be used by external stakeholders as an introduction to the project and a clear indication of the work and outcomes expected of the project.