

Call – Transformation of the
existing fleet towards
greener operations through
retrofitting



Conditions for the Call

HORIZON-CL5-2022-D5-01-04

- Type of action: IA - **Innovation Actions**
- Budget in 2022 – 25M / 5 projects to be funded
- We can aim to **5M**
- The expected duration of the project is up to **4 years**
- Activities are expected to achieve **TRL 7-8** by the end of the project
- Planned opening date - 02 December 2021
- Deadline date - **26 April 2022**



Expected Outcome – Big ones

- Accelerated achievement of climate neutrality of waterborne transport through **retrofit modifications** to the **existing fleet**.
- Ensuring **cost effective solutions** for retrofitting existing ships, thus supporting ship owners in the process of making the European fleet more **environmentally friendly**.
- Business models, industry standards, regulatory approvals, best practice guidance, and easy-to-customise strategies for retrofitting **removing the commercial risk** of deployment.
- **Increased competitiveness** of European shipyards, repair yards, and European marine equipment providers within the domain of green shipping technology.



Expected outcomes (1)

Project outputs and results are expected to contribute **concretely** to the following expected outcomes:

- **Demonstrated retrofitting solutions** for sea-going and inland navigation vessels in operation.
- Retrofit solutions to **reduce GHG emissions** that are developed and ready to deploy. The target is to achieve a GHG emissions reduction of at least **35%** compared to the original design.
- Retrofit solutions involving climate neutral fuels making vessels GHG emission free. These solutions are expected to have a significant R&I content going beyond a simple exchange of fuels through minor technical adaptations.
- Establishment of an **up-to-date catalogue of suitable solutions** for a wide variety of ship types and operation scenarios.



Scope

For **inland navigation and/or maritime shipping** projects are expected to **address one or more** of the following:

- Retrofit solutions to **significantly reduce air or water pollution** without increasing fuel consumption and hence GHG emissions, for **example main engine abatement systems** or engine and propulsion system modifications.
- Retrofit solutions which significantly reduce GHG emissions through partial or full electrification, clearly progressing beyond the state of the art. Indicative examples are battery ICE hybridisation for the main propulsion system and auxiliary power, electric network reconfiguration, electrical power management.
- Retrofit innovative hydrodynamic improvements (hull, hull management, appendages) to significantly improve energy efficiency and reduce GHG emissions by reducing fuel consumption.



Scope(2)

- **Climate neutrality** of waterborne transport achieved more quickly by means of **retrofit** solutions that **improve** the performance of the **existing fleet** - **fast** and **tangible results** are needed
- **Technically** and **economically efficient** retrofitting of the ship along these main lines. **Cost efficiency** of the proposed solutions will come from **standardised** and **modular solutions** applicable to different ships.
- May require **new business models** and **implementation strategies** based on a **catalogue** of solutions including smart maintenance. Attention will be paid to solutions which are **not causing secondary emissions** to air or water and which will **not significantly increase fuel consumption**.



Destination

- Enabling **climate neutral, clean, smart, and competitive** waterborne transport
- **2018 Mannheim Declaration**, which incorporates the EU GHG reducing targets for inland navigation and these efforts are supported through Horizon Europe.
- **Keywords:** Green deal, improved air quality, reduction of environmental impacts, lower fuel consumption, innovative port infrastructure, elimination of all harmful pollution to air and water, advanced green technologies
- Co-programmed European Partnership “**Zero Emission Waterborne Transport**” (ZEWT) to mobilise resources and leverage private and public investments- Projects under ZEWT partnership topics are expected to provide up to two presentations on progress made to the ZEWT partnership members, also with the aim to support the monitoring of the ZEWT partnership performance as well the necessary underlying development to make these achievements possible within the time frame of the partnership.



Evaluation of previous proposal and lessons learned (1)

- Total score of 12.5/15
- **+ Soundness, credible methodology, excellent and convincing idea, high innovation potential, interdisciplinary approach**

Criticism	How to address
not sufficiently elaborate on how the technology will be scaled up in terms of power . Also, it is not convincingly argued that the proposed technology will not result in an increase in CO2 emissions because the power requirements are insufficiently defined.	?
the potential impact of the technology on other parts of the vessel, e.g. back pressure on engines which would decrease their efficiency , and the problem of keeping any remaining funnel exhaust gases at a sufficient temperature level to avoid condensation effects, are inadequately addressed.	scrubber, fixed bead/ roll/pitch vibration, EB source, Control, system as such – container on the top deck
The expected impact of "retrofit solutions to reduce SOX, NOX and PM" is convincingly argued. The proposal will enhance European competitiveness and support European jobs and growth and facilitate deployment of innovative green waterborne transport technology. However, regarding the expected impact of "Significantly increase the take up of retrofit emission reduction solutions in existing vessels", the issue of cost effectiveness , including measurable targets, is not sufficiently taken into consideration.	specific energy cons. For ensuring necessary purification

Evaluation of previous proposal and lessons learned (2)



Criticism	How to address
Substantial impacts not mentioned in the work programme include; potential emissions reductions for VOC (PAH) and COx; helping to advance regulation and policy instruments; and creating new market opportunities. For example, Electronic Beam technology has the potential to be applied in other fields such as, for example, decontamination of wastewater, sanitising seeds and herbs in agriculture, physicochemical refining of plastics, curing lacquers, medical sterilisation, etc.	platform for other tech. developments, hybrid tech
the exploitation of the prototype beyond the proposed project's timescale is not sufficiently elaborated.	?
the allocation of resources between work packages is not sufficiently well balanced. For example, WP3 is under resourced while WPs 1 and 6 are overestimated.	more resources to WP3 (dev. of exhaust gas-cleaning system), better explanation and allocation
the critical risks table of the proposed project fails to adequately address health and safety related risks.	address more in detail