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Horizon Europe Maritime Event

Welcome!

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31 October 2023



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HORIZON EUROPE

THE NEXT EU RESEARCH & INNOVATION
PROGRAMME (2021 – 2027)

Agenda

10:05 Horizon Europe Programme – *Louise Mothersole, National Contact Point for Transport & Mobility*

10:15 Overview of the Zero Emission Waterborne Transport Initiative – *Jaap Gebraad, Secretary-General of Waterborne Technology Platform*

10:30 Case studies from 4 current UK successes

- *Trevor Downes of Ricardo ([sHYpS](#))*
- *Milad Armin of Liverpool John Moores University ([RETROFIT55](#))*
- *Sam Faraghi of Anemoi Marine Technologies ([OPTIWISE](#))*
- *Pietro Tricoli from University of Birmingham ([V-ACCESS](#))*

11:10 Panel discussion + Q&A

11:30 Refreshments and networking opportunity

12:00 Brief overview of each Horizon Europe Topic

13:00 LUNCH

14:00 Breakout discussions by Topic (Topics 1, 2 and 5)

15:30 Summing up and close – *Sheldon Ryan, Maritime UK*



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Horizon Europe Maritime Event: Introduction to Horizon Europe

Louise Mothersole

Horizon Europe UK National Contact Point for Mobility

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31 October 2023



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UK National Contact Points (NCPs)

Team of national advisors, appointed by the Government to support UK organisations to successfully participate in Horizon Europe by:

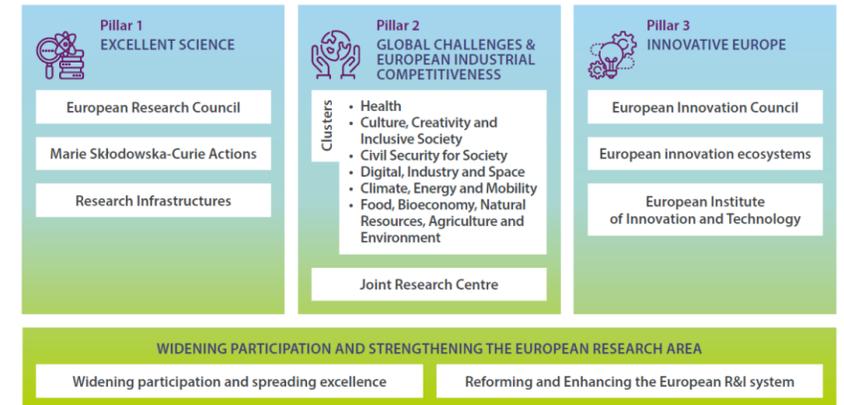
- Raising Awareness of the programme
- Helping you find the right Topic
- Identifying the best ways to find partners
- Navigating the EU funding & tender opportunities portal
- Developing the proposal
- Answering any other Horizon Europe related questions



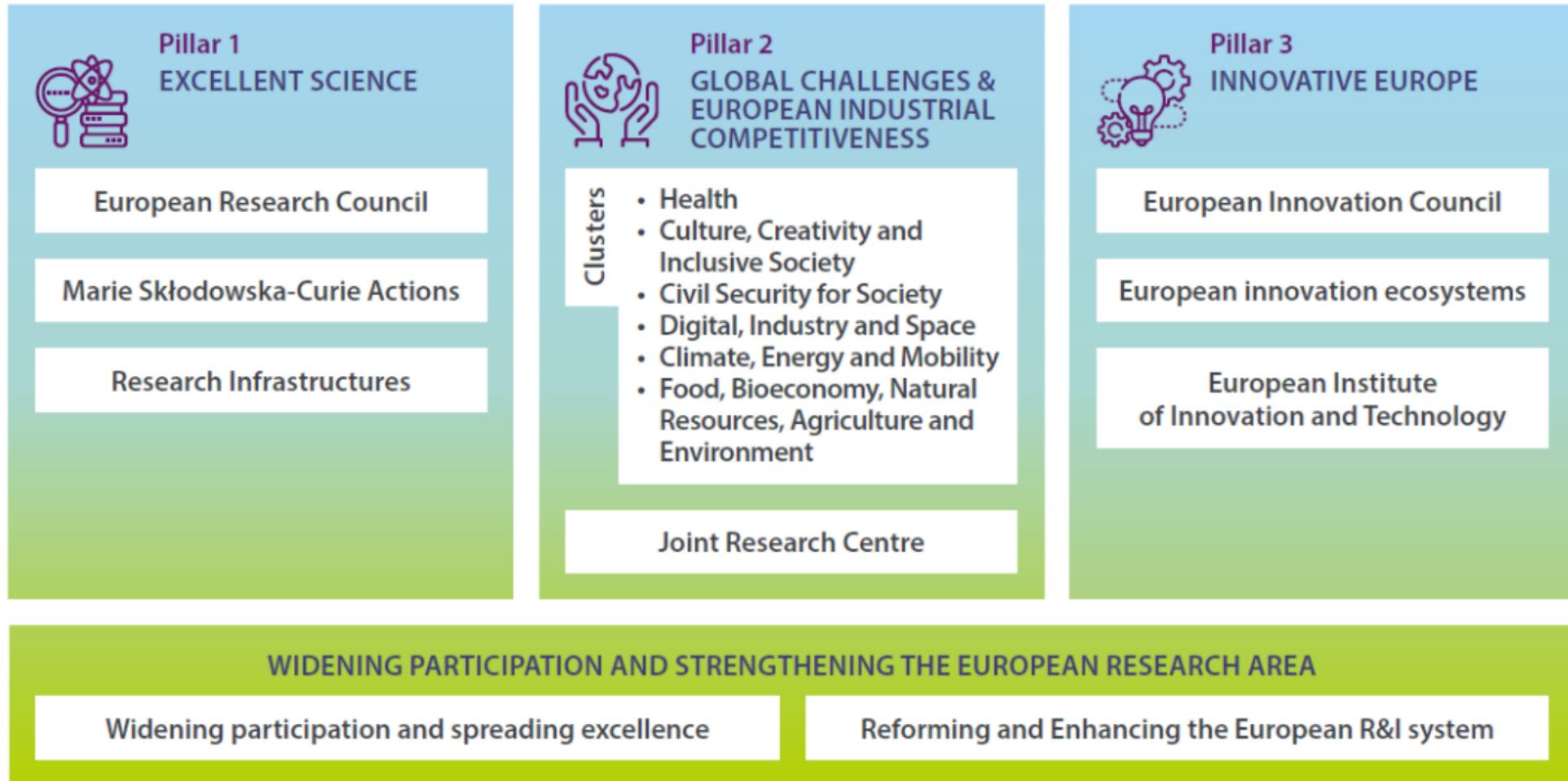
<https://www.gov.uk/business-finance-support/horizon-europe-funding>

What is Horizon Europe?

- Horizon Europe is the current EU's Framework Research and Innovation funding programme.
- It is the largest R&I funding programme in the world, with a budget of over £81bn for 2021-27.
- The programme is divided into **three main parts - Pillars**:
 - Pillar I supports excellence in science;
 - Pillar II focuses on solving global challenges through collaborative research & innovation; and
 - Pillar III supports business growth and competitiveness.
- Other parts of Horizon also include support for research infrastructure and widening participation.
- Key priority areas include food, bioeconomy, climate change, health, digital, transport and mobility, space, energy, industry, civil security and humanities. The programme is open to all types of organisations of all sizes.



Horizon Europe



Cluster 5: Climate, Energy and Mobility

Addresses issues relevant to the twin green and digital transitions and the post-COVID 19 recovery, focussing on the transformation of our economy, industry and society with a view to achieving climate neutrality in Europe by 2050. [2023-2024 Work Programme](#)



Cluster 5: Climate, Energy and Mobility

Six Destinations

1. Climate sciences and responses
2. Cross-sectorial solutions for the climate transition
3. Sustainable, secure and competitive energy supply
4. Efficient, sustainable and inclusive energy use
5. Clean and competitive solutions for all transport modes
6. Safe, resilient transport and smart mobility services for passengers and goods



Call for proposals in Destination 5

Clean and competitive solutions for all transport modes ([link to 2024 call](#))

- Zero Emission Road Transport (2ZERO)
- Aviation
- Zero Emission Waterborne Transport (ZEWT)
- Transport related health and environment
- Cross-cutting actions

Call dates for all of the above

- 2024 call opening 7th Dec 2023; deadline for submissions 18th Apr 2024

Zero Emission Waterborne Transport (ZEWT)

- A Co-Programmed Partnership - Members of the partnership develop the Strategic Research and Innovation Agenda ([SRIA](https://www.waterborne.eu/partnership/partnership)) which is used to create the Work Programme (calls for proposals) <https://www.waterborne.eu/partnership/partnership>



Jaap Gebraad



WATERBORNE

Waterborne Technology Platform





01

WHO ARE WE?

WVW



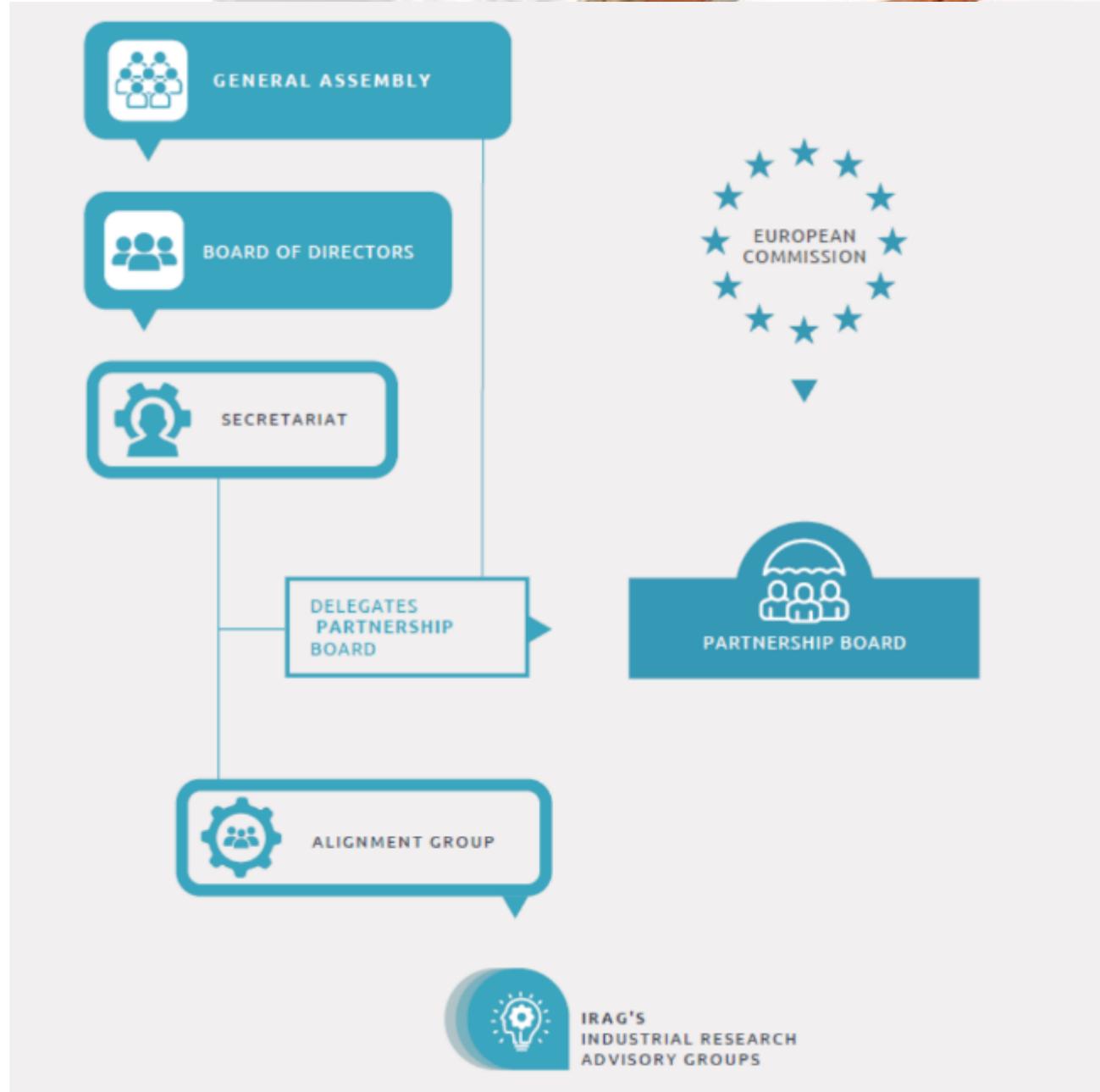
Waterborne TP Association

A European Technology Platform for the Waterborne sector

- All waterborne stakeholders such as ship-owners, shipbuilders, maritime equipment manufacturers, infrastructure and service providers, classification societies, universities or research institutes, waterway and port operators;
- Currently 128 members, representing the main stakeholders of the European waterborne transport sector (shipyards, maritime equipment manufacturers, shipowners, research institutes, academia, associations, etc....),
- Waterborne = Maritime + Inland Navigation and lakes + Ports!
- cPP on Zero-Emission Waterborne Transport and other activities
- Three working groups: Ships & Shipping, Ports & Logistics and Blue Growth



Waterborne TP Association – Organisational structure



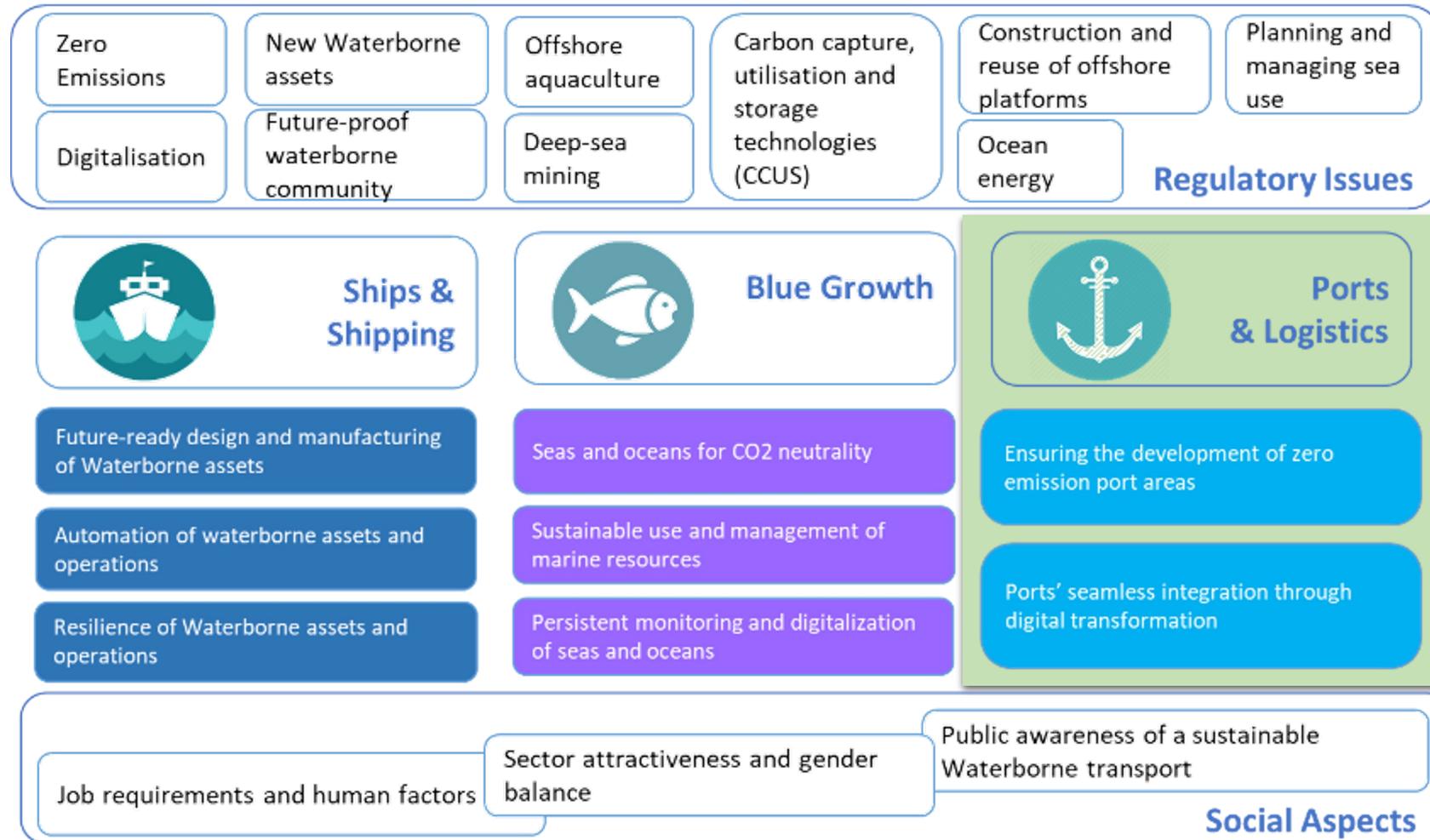


02

**SRIAs OF
THE WATERBORNE SECTOR**



Strategic Research and Innovation Agenda (SRIA) for the European Waterborne Sector – Global view

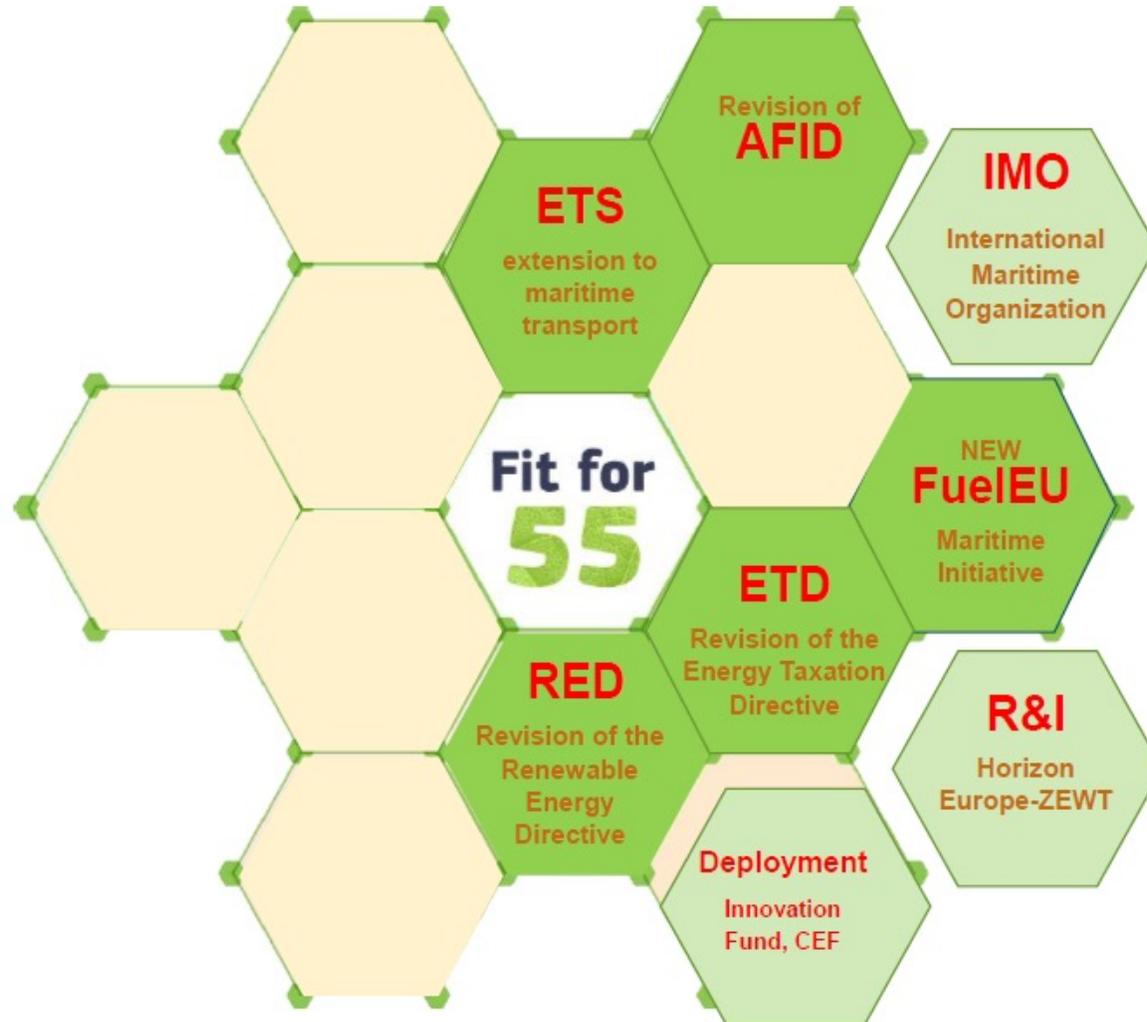




Partnership



Decarbonising Waterborne Transport: “Basket of Measures”



MARITIME

ZEWT= Zero Emission Waterborne Transport Partnership

What is an EU Partnership

- Collaboration between the EU and the Waterborne Association (crucial role of Member States and Associated Countries)
- Definition of roadmap for research, innovation, and technology development
- co-Programming of EU calls for research, including demonstration
- EU will run calls and projects in the normal way
- Spin-off: much more attention for maritime sector in other EU funds (Innovation Fund, CEF)
- Recognition of the importance of the sector (all actors in the waterborne transport ecosystem)

Zero-emission waterborne transport partnership

(Co programmed partnership, lead by Waterborne TP which mobilises a critical mass of over 100 partners, over €0.5 Bn EU funds leveraged 6 times with private investment to achieve zero-emission waterborne transport vessels)

Strategic Research and Innovation Agenda:

R&I to develop and demonstrate zero-emission solutions for all main ship types and services by 2030 which will enable zero-emission waterborne transport by 2050.

Eliminating **GHG emissions** from new ships and retrofitted existing ships by means of sustainable alternative climate-neutral fuels, renewable energies, electrification and energy efficiency.

Cutting coastal and inland pollution to air by at least 50% compared to current levels

Elimination of pollution to water (including harmful underwater noise) from ships

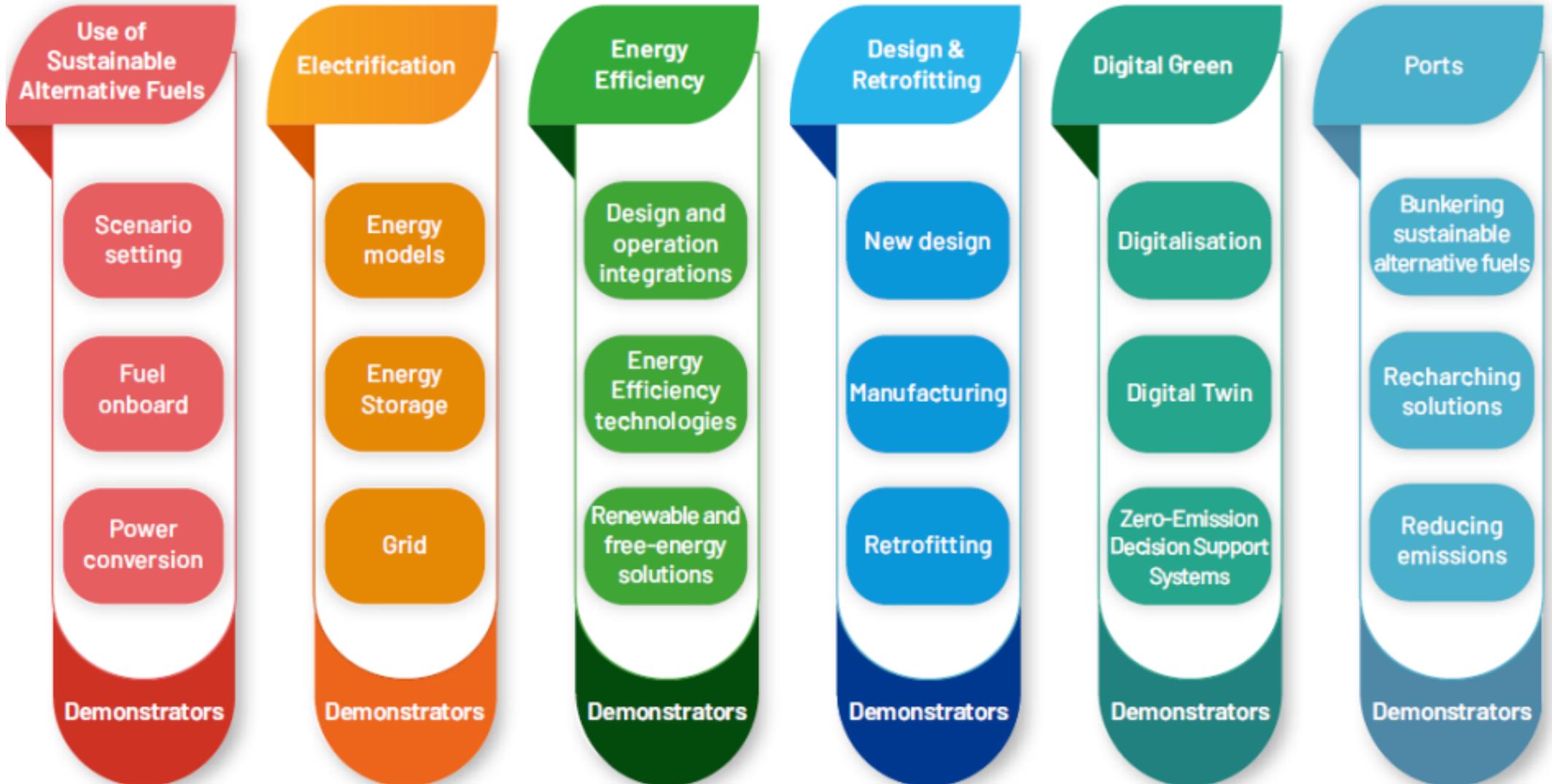


Implementation pathways

- Simplification of fleet into 6 ship types
 - Long distance ships
 - Cruise ships
 - Ferries
 - Inland vessels
 - Short-sea ships
 - Offshore ships
- Distinction made in trade
 - Liner or tramp service
- Both newbuilt as well as retrofiting



Activities



Specific Economic Objective

By 2030:

Implementation of economically viable **European new technologies** and concepts regarding zero-emission waterborne transport,
to strengthen the competitiveness of European industries in growing green ship technology markets and
provide the **capability to enter new markets**, presently dominated by Europe's competitors.

Specific Societal Objectives

Facilitate **development of regulations and policies** at national and international level including the **development of standards** to enable the implementation of technological solutions for zero-emission waterborne transport.

Facilitate the **uptake** of innovative zero-emission waterborne transport technologies and solutions within the European waterborne transport sector supporting economic growth and **European employment**.



Deployment

- Commitment of the waterborne transport sector;
- Standardisation;
- Rules and regulations;
- Legal certainty;
- Support for first movers:
 - Connecting Europe Facility;
 - Innovation Fund



03

TOPIC DEVELOPMENT

WVW



Topic Development

- Based on SRIA for ZEWT;
- Bottom-up approach in Waterborne;
- Co-creation with European Commission Services
- Comitology in Programme Committee Horizon Europe, Cluster Climate, Energy and Mobility
- Topics 2021 / 2022 / 2023 developed, and tenders closed;
- Topics 2024: opening December 2023, topics for collaborative research





WATERBORNE

Thank you!



Case Studies

(Slides shared where permission gained)



Co-funded by
the European Union

The sHYpS project is co-funded by the European Union under Horizon Europe, the European Union's research and innovation programme under Grant Agreement Number 101056940. The consortium of members represents 5 European countries: Italy, France, Czechia, Germany, Norway and UK. UK participants are supported by UK RI grant numbers 10038162 (Ricardo UK) and 10039049 (Lloyd's Register). Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or Innovate UK. Neither the European Union nor Innovate UK can be held responsible for them.



sHYpS - Sustainable Hydrogen powered Shipping



Case study and general Horizon Europe experience

Trevor Downes, Chief Engineer

Horizon Europe UK Maritime Information Day

31st October 2023



RETROFIT55

RETROFIT SOLUTIONS TO ACHIEVE 55% GHG REDUCTION BY 2030

Horizon Europe Maritime Information Day and Brokerage Event- *London – 30 OCT 2023*



Milad Armin
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optiwise

OPTimized Wind
Supported vEssels

10
Partners

7
Countries

36
Months

5,1m
Budget

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VESSEL ADVANCED CLUSTERED AND COORDINATED ENERGY STORAGE SYSTEMS

Multidisciplinary approach to accelerate the development of innovative energy storage systems to complement batteries for zero-emission vessels

Project Overview

Professor Pietro Tricoli (Scientific Coordinator)
University of Birmingham, UK
p.tricoli@bham.ac.uk



UOB is co-funded by UKRI, project
10056039

Panel Discussion + Q&A

- Where did your R&D need come from?
- How did you find your partners?
- What support did you receive?
- What advice would you give to people thinking of leading a Horizon Europe project?
- What advice would you give to people thinking of partnering on a Horizon Europe project?
- What did you wish you had known before starting your application or project?
- How will this project impact your future business?

Louise Mothersole – Topics Intro

Horizon Europe Maritime Event: Introduction to Topics

Louise Mothersole

Horizon Europe UK National Contact Point for Mobility

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31 October 2023



Introduction to Zero Emission Waterborne Transport (ZEWT) Topics 2024

- Full details of the Topics can be found in the *Horizon Europe Work Programme 2023-2024; 8. Climate, Energy and Mobility; (European Commission Decision C(2023) 2178 of 31 March 2023)* - https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2023-2024/wp-8-climate-energy-and-mobility_horizon-2023-2024_en.pdf
- European Commission Information Session available to watch <https://webcast.ec.europa.eu/horizon-europe-info-days-cluster-5-parallel-session-2-2023-10-17> 11:45 to 12:04 for ZEWT
- Note that Waterborne refers to both maritime and inland waterway transport

Funding rates and main types of Action

Research and Innovation Action (RIA)

- Typically, low(ish) Technology Readiness Level
- Consortium of at least three different legal entities from three different eligible countries (all UK legal entities are classed as eligible). At least one consortium member must be from a Member State (MS)
- All participants receive 100% of eligible direct costs plus 25% for indirect costs

Innovation Action (IA)

- Typically, high(er) Technology Readiness Level
- As above
- All not-for-profit participants receive 100% of eligible direct costs plus 25% for indirect costs
- All for-profit participants receive 70% (**60% for some co-programmed partnerships**) of eligible direct costs plus 25% for indirect costs

Coordination and Support Action (CSA)

- As name suggests, for coordinating and supporting activities such as working groups, networking, regulation review, communications, organising EU conferences, etc
- Formally do not need a collaborative approach but often do to meet the scope. Must have at least one partner from a MS
- All participants receive 100% of eligible direct costs plus 25% for indirect costs

ZEWT Topics opening on 7th Dec and closing 18th April 2024 (1/2)

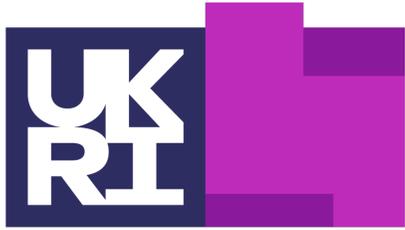
Topic Identifier	Competition (Topic)	Type of Action	Topic Budget	Number of projects to be funded
<u>HORIZON-CL5-2024-D5-01-11</u>	Achieving high voltage, low weight, efficient electric powertrains for sustainable waterborne transport	RIA	€15.0m	2
<u>HORIZON-CL5-2024-D5-01-12</u>	Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030	IA	€15.0m	2
<u>HORIZON-CL5-2024-D5-01-13</u>	Demonstration of Technologies to minimise underwater noise generated by waterborne transport	IA	€6.0m	1
<u>HORIZON-CL5-2024-D5-01-14</u>	Demonstrating efficient fully DC electric grids within waterborne transport for large ship applications	IA	€15.0m	2
<u>HORIZON-CL5-2024-D5-01-15</u>	Advanced digitalisation and modelling utilizing operational and other data to support zero emission waterborne transport	IA	€7.7m	1

ZEWT Topics opening on 7th Dec 2023 and closing 18 April 2024 (2/2)

Topic Identifier	Competition (Topic)	Type of Action	Topic Budget	Number of projects to be funded
HORIZON-CL5-2024-D5-01-16	Structuring the Waterborne transport sector, including through changed business and industrial models in order to achieve commercial zero-emission waterborne transport	CSA	€0.85m	1
HORIZON-CL5-2024-D5-01-17	Coordinating and supporting the combined activities of member and associated states towards the objectives of the Zero Emission Waterborne Transport partnership so as to increase synergies and impact	CSA	€1.5m	1

Note that as these two are Coordination and Support Action (CSA) projects, they are not technology development and so are more suited to organisations such as trade bodies, funding agencies, policy influencers, etc., although technology developers are often welcomed.

Topics Overview



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Horizon Europe Maritime Event: HORIZON-CL5-2024-D5-01-11

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HORIZON-CL5-2024-D5-01-11: Achieving high voltage, low weight, efficient electric powertrains for sustainable waterborne transport - 1/5

Specific Conditions

<i>Expected EU contribution per project</i>	The Commission... these outcomes to... and selection of a... 0 million would allow... not preclude submission
<i>Indicative budget</i>	The total indicative...
<i>Type of Action</i>	Research and Inn...
<i>Eligibility conditions</i>	The conditions are... use satellite-base... services, benefici... services may add... <div data-bbox="848 531 1913 1142" data-label="Complex-Block">  <h3>Technology Readiness Levels</h3> <ul style="list-style-type: none"> TRL 0: Idea. Unproven concept, no testing has been performed. TRL 1: Basic research. Principles postulated and observed but no experimental proof available. TRL 2: Technology formulation. Concept and application have been formulated. TRL 3: Applied research. First laboratory tests completed; proof of concept. TRL 4: Small scale prototype built in a laboratory environment ("ugly" prototype). TRL 5: Large scale prototype tested in intended environment. TRL 6: Prototype system tested in intended environment close to expected performance. TRL 7: Demonstration system operating in operational environment at pre-commercial scale. TRL 8: First of a kind commercial system. Manufacturing issues solved. TRL 9: Full commercial application, technology available for consumers. </div>
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 5 by the end of the project – see General Annex B .

HORIZON-CL5-2024-D5-01-11: Achieving high voltage, low weight, efficient electric powertrains for sustainable waterborne transport - 2/5

Expected Outcome: Project outputs and results are expected to contribute to the following expected outcomes:

- Demonstrate increased performance, efficiency, feasibility and reliability of battery installations in high voltage on board distribution systems and thereby facilitate the greater deployment of battery electric shipping.
- Development and validation of battery real-time condition monitoring systems with predictive analytics integrated algorithms.
- Demonstration of high-capacity energy storage systems above 1 MWh directly interfaced to medium voltage AC (3.3 kV or above) or DC (above 1 kV) power systems, by modular approaches.
- Demonstrate the feasibility of an innovative low weight, high-energy density battery concept in demonstrators, considering maritime and inland waterway transport applications, including demonstration of on-board battery safety.
- Efficient modular redundant conversion systems with low voltage battery modules at floating potential and insulation for cost effective integrated battery modules and conversion systems are designed.
- Evaluation of sustainable life cycle management of electrical energy storage systems

HORIZON-CL5-2024-D5-01-11: Achieving high voltage, low weight, efficient electric powertrains for sustainable waterborne transport - 3/5

Scope:

The voltage level of battery installations on-board vessels is typically limited and within the regulations for low voltage installations. By increasing the voltage level of the onboard distribution system, the energy conversion can achieve higher efficiencies and be more compact, due to the smaller cross-sectional area of conductors and lower losses. However, for waterborne transport (waterborne transport refers to both maritime and inland waterway transport) applications, challenges remain related to the design of conversion systems and insulation methods for integrating low voltage battery systems in high voltage AC or DC distribution systems. The necessary regulatory aspects also need to be defined to facilitate market take up for waterborne transport. Although e.g. high-voltage Li-Ion battery packs may be presently applied, the current state-of-the-art still offers solutions that are too heavy to enable electrification of a wider range of larger waterborne transport assets. However new developments show potential for a reduction of battery pack weight. Further study of the adaptation and the on-board integration solutions available for recently developed technologies, such as Li-Ion NMC, LTO, LFP is needed.

Building on the current state of the art solutions should contribute towards the battery electrification of a wider range of vessel types, for both maritime and inland waterway transport which are characterized by the need for larger battery systems and longer autonomy.

HORIZON-CL5-2024-D5-01-11: Achieving high voltage, low weight, efficient electric powertrains for sustainable waterborne transport - 4/5

Projects are expected to address all of the following aspects:

- Design of battery management systems of high voltage battery installations for AC and DC distribution systems in waterborne transport
- Design and control of conversion systems, insulation design and insulation coordination.
- Adoption of low weight electrical energy storage designed to be integrated on board (e.g. not an on-deck ISO container).
- Sustainability and circularity criteria to be preferably adapted for whole life of on-board battery pack solutions (i.e. second-life applications).
- Identification and characterisation of the specific requirements needed for inland waterway and maritime transport.
- Development of battery safety concept that is in principle suitable for class approval, especially for large battery spaces on-board, considering detection, ventilation and fire suppression technology.
- Identify and, if necessary, support the development of any new standards and certification procedures which will be required to facilitate deployment of the developed new technologies and solutions.

HORIZON-CL5-2024-D5-01-11: Achieving high voltage, low weight, efficient electric powertrains for sustainable waterborne transport - 5/5

The new solutions should also contribute significantly to the overall safety for on-board battery applications (i.e. for toxic emissions, fire propagation, etc.). The form factor, the battery management system and the interface with the shore side electric grid should also be considered.

The projects are expected to ensure synergies with the Horizon Europe Batteries Partnership and are encouraged to envisage clustering activities with the project funded from the topics [HORIZON-CL5-2021-D2-01-02](#) and [HORIZON-CL5-2021-D2-01-03](#).

This topic implements the co-programmed European Partnership on [‘Zero Emission Waterborne Transport’](#) (ZEWT). As such, projects resulting from this topic will be expected to report on results to the European Partnership ‘Zero Emission Waterborne Transport’ (ZEWT) in support of the monitoring of its KPIs.



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Horizon Europe Maritime Event: HORIZON-CL5-2024-D5-01-12

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HORIZON-CL5-2024-D5-01-12: Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030 - 1/6

Specific Conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B . The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 7 by the end of the project – see General Annex B .
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G . The following exceptions apply: The funding rate is 60% of the eligible costs, except for non-profit legal entities where the funding rate is up to 100% of the total eligible costs

HORIZON-CL5-2024-D5-01-12: Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030 - 2/6

Expected Outcome: Project outputs and results are expected to contribute to the following expected outcomes:

- Development of at least three market ready vessel design solutions to address short sea shipping, inland waterway transport and high seas shipping making innovative use of combinations of close to market (TRL 7 or higher) emission reduction and efficiency improvement technologies to reduce emissions from shipping in line with the expectations within the EUs ["Fit for 55"](#) legislative package.
- Quantitative assessment of the designs towards achieving significant emissions reductions consistent with the EU's ['Fit for 55'](#) package objectives and the [IMO's Carbon Intensity Indicator](#) through verifiable KPI's.
- Facilitation of the continuous improvement and upgrading of existing vessels to increase efficiency and reduce emissions through the measurement and bench marking of operational profiles.
- Quantification of the contribution towards cutting emissions from a range of emission reduction technologies on a life cycle basis. Including the separate and joint consideration of design and operations within relevant environments. Enable assessment of the retrofit and refurbishment options of applied emission reduction technologies.
- Support accelerated conversion of inland and maritime vessels towards better energy efficiency and reduced emissions.
- Development of robust business models for the design concepts, to ensure a high probability of commercial European deployment and the expectation of becoming operational by 2030.

HORIZON-CL5-2024-D5-01-12: Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030 - 3/6

Scope: Legislative proposals within the EU's ["Fit for 55"](#) package targeting the reduction of waterborne transport emissions will assess emissions reductions based on operational data collected within the framework of the EU's [MRV regulation](#). Internationally, for global maritime shipping, the forthcoming IMO Carbon Intensity Indicator and Data Collections System (DCS) will be used. Vessels visiting EU ports will need to provide data to ensure compliance with both MRV (EU) and DCS (IMO) data requirements. This change from assessing emission reductions based on design to the direct measurement and verification of actual operational emissions requires a new approach to design. Consequently, the vessel design process will need to employ modelling and simulation techniques which take into account the vessel's expected operational profile and life cycle so as to ensure that the delivered vessel or modification will deliver the expected emission reductions in the "real world"

For new builds, present improvements in ship energy efficiency have reduced consumption by 15-30% compared to equivalent reference ships in 2008. Contributing to fit for 55 objectives, the challenge is to develop at least three concept vessels which will further improve energy efficiency by at least 20%, compared to a 2022 reference performance for equivalent ships.

HORIZON-CL5-2024-D5-01-12: Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030 - 4/6

This “design for operation” approach will integrate and combine both operational energy savings and emission reduction technologies. Several technologies and solutions to be combined and integrated should be chosen so as to provide the largest impact and these are expected to already be individually demonstrated or developed to TRL 7. This could for example concern various combinations of; power conversion/electrification /energy devices, sustainable climate neutral low emission fuels, HVAC, energy storage, operations, smart energy monitoring, renewables including wind assistance, hydrodynamics, cold ironing, slow steaming, just in time scheduling, propeller designs etc.

HORIZON-CL5-2024-D5-01-12: Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030 - 5/6

In order to address the above-mentioned challenge, proposals are expected to address all the following aspects:

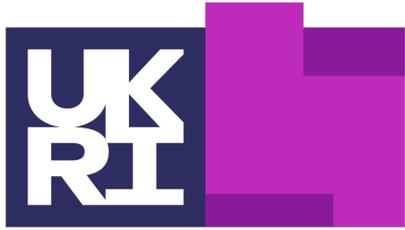
- Energy system modelling and fast simulation assessment to demonstrate the expected energy efficiency gains and life-cycle emission reductions achieved by the resulting designs within their operating reference cases. A holistic/systemic approach should be applied to the design, which is to be based upon total vessel energy needs for use within reference operating profiles and business cases.
- A minimum of three vessel concept designs and use cases are expected to be developed including the following vessel types: short-sea, inland waterway and high-seas. For each vessel type, retrofit solutions for the baseline design (from 2008) should be proposed, as well as a completely new design.
- Development of an open-source design assessment tool which can be used to assess the operational Carbon Intensity of vessel designs.
- Development of decision-support or automation systems to facilitate the most effective implementation of operational energy efficiency improvements

HORIZON-CL5-2024-D5-01-12: Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030 - 6/5

- Plans for exploitation and dissemination of results should include a strong business case and sound exploitation strategy. Development of business models to facilitate the deployment of the resulting vessel design concepts, in particular addressing financing, market needs and possibilities to support first of a kind deployment. Considering the potential of opportunities within EU support schemes such as the Connecting Europe Facility, Climate Change Innovation Fund and regional funds. Proposals are expected to demonstrate a clear and credible pipeline from the development to the operational deployment of the developed designs by 2030. This should include preliminary plans for scalability, commercialisation, and deployment (feasibility study, business plan) indicating the possible funding sources to be potentially used.

When appropriate, activities may also address the definition of a secure knowledge sharing platform to enable the necessary data-transfer to obtain detailed operational performance information.

This topic implements the co-programmed European Partnership on [‘Zero Emission Waterborne Transport’](#) (ZEWT). As such, projects resulting from this topic will be expected to report on results to the European Partnership ‘Zero Emission Waterborne Transport’ (ZEWT) in support of the monitoring of its KPIs



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HORIZON-CL5-2024-D5-01-13: Demonstration of Technologies to minimise underwater noise generated by waterborne transport - 1/5

Specific Conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 6.00 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 6.00 million
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B . The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B .

HORIZON-CL5-2024-D5-01-13: Demonstration of Technologies to minimise underwater noise generated by waterborne transport - 2/5

Expected Outcome: Project outputs and results are expected to contribute to the following expected outcomes:

- Demonstration of underwater radiated noise (URN) reduction through large scale demonstrators or retrofitted ships employing URN reduction modifications and assessment through verifiable KPIs.
- Demonstration of the effectiveness, safety and cost-effectiveness of noise mitigation devices, mitigation measures and management options and assessment through verifiable KPIs.
- Development of standards for the specification of source noise levels by equipment suppliers and shipyards, which build upon the current state-of-the art.
- Has increased the awareness of European ship owners of the environmental impact from underwater noise and the possibilities to reduce noise and its harm to the marine environment.
- Provide evidence to regulators concerning waterborne transport underwater noise to better take into account operational conditions and environmental impact within any forthcoming regulation.

HORIZON-CL5-2024-D5-01-13: Demonstration of Technologies to minimise underwater noise generated by waterborne transport - 3/5

Scope: Whilst on-going research seeks to characterize the underwater radiated noise (URN) which poses the greatest threat to aquatic species and the marine environment as well as characterizing potentially promising solutions to reduce the impacts of URN, the demonstration of technologies to minimize the harmful impacts from waterborne transport URN remains less developed. Current on-site URN measurement campaigns do not address all potential waterborne transport related noise sources and selecting suitable mitigation measures remains a challenging task as there are many options for URN reduction. Consequently, assessments need to be made on a case-by-case basis considering environmental, operational and economic factors and when relevant taking into account previous work such as the [European Marine Board position paper on underwater noise](#). An important challenge is to predict URN at the design stage to be able to implement less noisy environmentally friendly solutions from an early stage. This challenge is faced both at equipment design level and at the ship integration stage. Consequences of the noise reduction solutions for GHG emissions should be considered.

Current approaches to the regulation of URN focus on controlled criteria (fixed speed, no waves etc.), whilst ships operate at various speeds, loads and sea states which further complicate the challenge of designing a quiet ship suitable for a wide range of conditions. A further challenge is to be able to operate a noise measurement system on-board which can provide instantaneous information to the crew on the ship's operational radiated noise. Noting that an informed balance may also need to be taken between GHG emissions and URN.

HORIZON-CL5-2024-D5-01-13: Demonstration of Technologies to minimise underwater noise generated by waterborne transport - 4/5

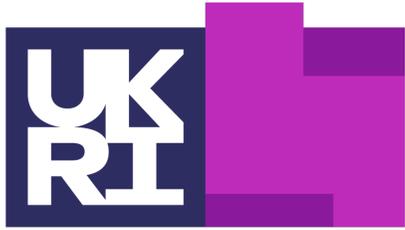
In order to address the above-mentioned challenge, proposals are expected to address all the following aspects:

- Development of methods and models to predict under water radiated noise levels in the design phase.
- Conduct modelling and field studies to improve the effectiveness, safety and cost-effectiveness of noise mitigation devices, mitigation measures and management options in different sea states and in different ship loads. The identified solutions should be tested and demonstrated through large scale demonstrators that may, when appropriate, and feasible, also include the monitoring of the response of key susceptible species.
- Projects should develop systems for on-board measurement of noise, and decision support systems to reduce radiated noise whilst maintaining energy efficiency in normal operation.
- The project should build upon the current state of play, for example taking into account the H2020 project [SATURN](#) and the LIFE+ project [PIAQUO](#) to support the development of standards for the specification of source noise levels by equipment suppliers and shipyards. The projects are expected to propose synergies and clustering with related projects and activities addressing underwater noise, including from nontransport sources.

HORIZON-CL5-2024-D5-01-13: Demonstration of Technologies to minimise underwater noise generated by waterborne transport - 5/5

- In addition, the project should address communication towards the European ship owners and operators to raise awareness, inform about the environmental impact and on the technical possibilities to reduce their noise and its impact on the underwater environment.
- Engage with regulators to raise awareness on noise from waterborne transport depending on operational status, weather conditions, loading conditions, water conditions (depth, type of bottom, temperature salinity etc.) the frequency and type of noise and its impact on the environment for the purpose of considering them in future potential regulations.

This topic implements the co-programmed European Partnership on '[Zero Emission Waterborne Transport](#)' (ZEWT). As such, projects resulting from this topic will be expected to report on results to the European Partnership 'Zero Emission Waterborne Transport' (ZEWT) in support of the monitoring of its KPIs.



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Horizon Europe Maritime Event: HORIZON-CL5-2024-D5-01-14

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31 October 2023



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HORIZON EUROPE

THE NEXT EU RESEARCH & INNOVATION
PROGRAMME (2021 – 2027)

HORIZON-CL5-2024-D5-01-14: Demonstrating efficient fully DC electric grids within waterborne transport for large ship applications - 1/5

Specific Conditions	
<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.50 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 15.00 million
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B . The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-8 by the end of the project – see General Annex B .
<i>Legal and financial set-up of the Grant Agreements</i>	The rules are described in General Annex G . The following exceptions apply: The funding rate is 60% of the eligible costs, except for non-profit legal entities where the funding rate is up to 100% of the total eligible costs

HORIZON-CL5-2024-D5-01-14: Demonstrating efficient fully DC electric grids within waterborne transport for large ship applications - 2/5

Expected Outcome: Project outputs and results are expected to contribute to the following expected outcomes:

- Enabling reduced emissions from waterborne transport through increased electrification including hybrid power systems.
- Demonstration of the feasibility of a secondary smart DC grid (engineering framework, distribution/protection devices).
- Demonstration of smart management and control of hybrid electric plants, combining different energy sources, including sustainable climate neutral fuels so as to minimize total lifecycle net GHG emissions
- Development of a new configuration for the entire power generation architecture for large scale waterborne transport ready to be deployed.
- Development of new power electronic systems for AC/DC converters and DC circuit breakers within the electrical network with higher efficiency.
- Assessment of the waterborne transport emission reduction from increased electrification including hybrid power systems. Benchmarking and quantification of achieved GHG emission reduction through relevant quantifiable KPIs.
- Assessment through verifiable KPIs of the operating costs reductions and the reduction in emissions by cutting energy consumption and extending service intervals of the generator sets.
- Assessment through verifiable KPIs of the efficiency and power density improvements to reduce the overall volume and weight

HORIZON-CL5-2024-D5-01-14: Demonstrating efficient fully DC electric grids within waterborne transport for large ship applications - 3/5

Scope: Primary DC systems are now applied on multiple types of ships, employing battery energy storage. The application of DC grids on-board has already started and will grow significantly because of its promising aspects such as reduction of complexity, increased modularity and improved integration. However, further progress is required to unlock the full potential of an on-board DC grid for large ship applications (over 5000 GT) addressing the entire network for both primary and secondary (auxiliary) distribution system, taking into account the various on-board applications of ship's electrification systems (e.g. high-power fuel cells, batteries, etc.) The challenge is to focus not only on secondary distribution, but also on the integration/interconnection of new sustainable primary power systems within a DC grid network serving the entire ship

In order to address the above-mentioned challenge, proposals are expected to address all the following aspects:

- Develop high TRL innovative power electronic systems (e.g. converters, circuit breakers with logic selectivity) adapted and certified for waterborne transport applications.

HORIZON-CL5-2024-D5-01-14: Demonstrating efficient fully DC electric grids within waterborne transport for large ship applications - 4/5

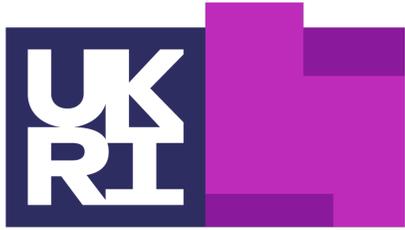
- Develop a new concept of smart, flexible, plug-and-play DC power grid which leverages the capability of new power electronic systems and allows for different DC power generation systems based on sustainable alternative energy sources.
- Research the impact of design choices, safety measures and integration on the ship. This will require the development and on-board integration of high-power equipment and systems to complement the electrical grid (e.g. solid-state protection, solid-state transformers, Silicon-Carbide Power Devices,
- Develop a prototype system at small scale (min. 100kW) within a real waterborne transport environment. Demonstrate the functionality and the integration of its components, prove the possibilities for further upscaling. Prove the feasibility and benefits of distributing main power based on DC instead of AC.
- Validate the system with classification societies ensuring the highest standards for safety and reliability.
- Develop standards for on-board DC microgrids and communication protocols which are particularly valuable for large ships where there is differentiation between the electrical supplies towards different zones (e.g. zones with ICE and zones with RES systems).
- Integrate new power electronic systems within the ship's network with advanced control systems to cope with variable loads and high levels of DC currents to interrupt.

HORIZON-CL5-2024-D5-01-14: Demonstrating efficient fully DC electric grids within waterborne transport for large ship applications - 5/5

- The emissions, efficiency and operational savings are expected to be demonstrated on a relevant ship type to validate the research results. The transferability of the applications to be applied has to be proven towards a range of vessel types, including those which have larger battery systems and longer autonomy. The demonstration is expected to serve as a reference for a wide spectrum of ship's types using electrical propulsion and auxiliary power.
- Where relevant, synergies and collaboration should be planned with the related activities and projects arising from linked Horizon Europe initiatives, in particular the [Batteries](#) and [Clean Hydrogen JU](#) partnerships.
- Plan for the exploitation and dissemination of results should include a strong business case and sound exploitation strategy, as outlined in the introduction to this Destination. The exploitation plans should include preliminary plans for scalability, commercialisation, and deployment (feasibility study, business plan) indicating the possible funding sources to be potentially used.

All relevant stakeholders (electrical distribution and protection manufacturers, engineering companies, manufacturers of electrical equipment, users, shipyards, etc.) should participate in proposals in view of the systems development.

This topic implements the co-programmed European Partnership on '[Zero Emission Waterborne Transport](#)' (ZEWT). As such, projects resulting from this topic will be expected to report on results to the European Partnership 'Zero Emission Waterborne Transport' (ZEWT) in support of the monitoring of its KPIs.



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Horizon Europe Maritime Event: HORIZON-CL5-2024-D5-01-15

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31 October 2023



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HORIZON EUROPE

THE NEXT EU RESEARCH & INNOVATION
PROGRAMME (2021 – 2027)

HORIZON-CL5-2024-D5-01-15: Advanced digitalisation and modelling utilizing operational and other data to support zero emission waterborne transport - 1/5

Specific Conditions

<i>Expected EU contribution per project</i>	The Commission estimates that an EU contribution of around EUR 7.70 million would allow these outcomes to be addressed appropriately. Nonetheless, this does not preclude submission and selection of a proposal requesting different amounts.
<i>Indicative budget</i>	The total indicative budget for the topic is EUR 7.70 million
<i>Type of Action</i>	Innovation Actions
<i>Eligibility conditions</i>	The conditions are described in General Annex B . The following exceptions apply: If projects use satellite-based earth observation, positioning, navigation and/or related timing data and services, beneficiaries must make use of Copernicus and/or Galileo/EGNOS (other data and services may additionally be used).
<i>Technology Readiness Level</i>	Activities are expected to achieve TRL 6-7 by the end of the project – see General Annex B .

HORIZON-CL5-2024-D5-01-15: Advanced digitalisation and modelling utilizing operational and other data to support zero emission waterborne transport - 2/5

Expected Outcome: Project outputs and results are expected to contribute to the following expected outcomes:

- Development and demonstration of a platform for Integrated Green Vessel Digital Twins that will provide a basis to continuously improve the environmental performance of vessels over their entire life cycle.
- Improved environmental performance through verifiable KPIs.
- Proven applicability of the platform to a wide variety of vessel operations throughout the vessels' lifetime, by using model-based systems engineering, simulation and hardware in the loop approaches.

Scope: Scope: State-of-the-art of Digital Twins (DT) applied to waterborne transport are typically characterised by a focus on specific limited aspects of the design or operation of a vessel based on numerical simulations. Integrated Green Vessel DTs, which take an integrated approach to combine design and operation to improve efficiency and reduce emissions are not well addressed. Furthermore, aspects of open (software) architecture, data standards, security guarantees and data sovereignty of data owners are also not comprehensively addressed. Whilst some advances in data integration for different applications have been made, a comprehensive global integration of data remains missing.

HORIZON-CL5-2024-D5-01-15: Advanced digitalisation and modelling utilizing operational and other data to support zero emission waterborne transport - 3/5

These higher levels of integration between different functions of an Integrated Green Vessel DT (e.g. during design and operation of waterborne transport assets) require both complex multi-physics simulations and advanced levels of data organisation. This leads to the need for higher computational efficiency to meet future requirements in terms of accuracy, and the integration of the digital representation of suitable technologies for the transformation of vessels into “Green Vessels” within an Integrated Green DT that will aim to improve the vessels environmental performance.

Integrated Green Vessel DTs need to be applicable throughout the life cycle of the vessel, from initial design, to detailed design, engineering and production, operation, retrofitting, and circular end of life. To make best use of an Integrated Green Vessel DT, it should allow addressing optimisation for enhanced energy efficiency and reduced environmental footprint in a consistent way throughout the lifecycle of the vessel. This will require a thorough consideration of potential operational conditions as well as possible future regulatory changes. The Green Vessel DT will play a key role in design and operation of future zero or low emission vessels as well as their through-life sustainability upgrades. Mapping all relevant data influencing operational environmental performance, it will be the basis for decision support for operational (AI-based) optimisation, for considering the use of for example propulsion changes, retrofits, alternative fuel options, use of renewable energies solutions) and predictive maintenance.

HORIZON-CL5-2024-D5-01-15: Advanced digitalisation and modelling utilizing operational and other data to support zero emission waterborne transport - 4/5

Proposals are expected to address all of the following aspects:

- Development of an Integrated Green Digital Twin.
- Make best use of available (simulation) concepts and consider all relevant life-cycle aspects, including end of life disposal.
- Incorporate all relevant aspects of physics simulation, design and operational planning and optimisation as well as data organisation and storage, integrating also real data obtained from monitoring and measurements.
- Ensure the system will be adaptable to consider all potentially relevant retrofits needed to meet future regulations and changes in operational profile both during initial design and throughout the vessels lifecycle.
- Assessment of the environmental performance through verifiable KPIs.
- Optimisation of the vessel's equipment in operational conditions in order to provide the best environmental and economic solution for a given waterborne transport operation.

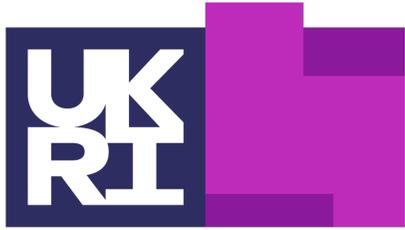
HORIZON-CL5-2024-D5-01-15: Advanced digitalisation and modelling utilizing operational and other data to support zero emission waterborne transport - 5/5

- Use open standards, libraries and tools to create generic and reusable solutions applicable to a wide range of waterborne assets.
- Ensure the interoperability of data models, address data ownership and integrity of data sets as well as ensuring security against cyber and physical threats.
- For case studies on at least 2 different ship types, test and demonstrate the developed digital twin model to quantify the improved environmental performance and efficiency achieved as a result.

Plan for the exploitation and dissemination of results should include a strong business case and sound exploitation strategy, as outlined in the introduction to this Destination. The exploitation plans should include preliminary plans for scalability, commercialisation, and deployment (feasibility study, business plan) indicating the possible funding sources to be potentially used.

This topic implements the co-programmed European Partnership on '[Zero Emission Waterborne Transport](#)' (ZEWT). As such, projects resulting from this topic will be expected to report on results to the European Partnership 'Zero Emission Waterborne Transport' (ZEWT) in support of the monitoring of its KPIs.

Joining a Winning Consortia



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Horizon Europe Maritime Event: Joining or Forming Winning Consortia

Louise Mothersole

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31st October 2023



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HORIZON EUROPE

THE NEXT EU RESEARCH & INNOVATION
PROGRAMME (2021 – 2027)

Formal consortium building mechanisms

Participant portal – Every topic has a ‘Partner Search’ function where you can upload your profile and review others that have done so

Partner Search – under the ‘How to participate tab’ on the EU funding and tender opportunities portal where you can search for past projects and organisations -

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/partner-search>

Brokerage tools – European Commission, Technology Platforms, Co-Programmed Partnerships, Enterprise Europe Network, UK’s KTN, NCPs from around Europe, etc will virtual hold events with e.g., Meeting Mojo, B2B and other tools - <https://horizoneuropencppportal.eu/ncp-networks/cluster-5/greenet-partner-search-tool>



Searching the formal consortium building mechanisms is a bit like looking for a needle in a needlestack – they all look like needles so finding the ones for you can be difficult

How to find partners with a track record of success

- Search [Cordis](#) using key words for relevant projects already underway
 - E.g. searching for 'ZEWT' returns 27 projects
 - 1st listed is [NEMOSHIP](#): New modular Electrical architecture and digital platform to Optimise large battery systems on SHIPs
 - Gives project coordinator as COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES of France and gives opportunity to contact them and their partners
 - Contact is to the Project Participant, not just a central administrative function
 - Write them a note explaining what you want/intend to do and how their participation would be a great idea

COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES

Address

Rue leblanc 25
75015 Paris

 France 

Region

Ile-de-France > Paris

Activity type

Research

Links

[Contact the organisation](#)  [Website](#) 

[Participation in EU R&I programmes](#) 

[HORIZON collaboration network](#) 

The best ways to form winning teams

Being an *effective networker* is much more useful than submitting a profile into a portal and awaiting contacts. Don't wait to be invited to the party, push yourself forward

- Use your existing professional networks – if you don't know who the sector leaders are in Europe then you should find out
- Search [CORDIS](#) for previous, related projects and contact the participants. All projects must disseminate their results and often hold workshops, conferences, etc.
- Use Linked In to connect to people from possible consortium partners
- When attending events, make yourself known – be an active participant not a passive attendee
- **Join the relevant networks, associations and partnerships, ask your NCP for suggestions**
 - Be an *active* member – say 'hi' when you join the virtual room. Ask questions, support others' opinions, act as if you are already well known to all in the virtual room
 - Volunteer to draft working papers, take notes, send in useful information – be helpful
 - Speak up at workshops – demonstrate Thought Leadership
 - Show that you would be a valuable partner for collaborative projects and that without you they won't win – you have the secret sauce that is necessary for their success

Other relevant European Associations

SEA Europe www.seaeurope.eu

SEA Europe represents close to 100% of the European shipbuilding industry in 16 nations, encompassing the production, maintenance, repair and conversion of all types of ships and floating structures, commercial as well as naval, including the full supply chain with the various producers of maritime systems, equipment material, and services. SEA Europe is a key player in the Waterborne Technology Platform.

European Council for Maritime Applied R&D - ECMAR www.ecmar.eu

ECMAR is the Voice for Europe's maritime applied research community (only research institutes) and

- Contributes to common Strategic Research Agenda
- Supports adoption of research priorities at EU level
- Fosters Members in development of proactive research policy and industry strategy
- Provides information on, and input to, policies, programmes & projects.

ECMAR is a member of the Waterborne Technology Platform.

Marine University Association WEGEMT www.wegemt.com

WEGEMT aims to update and extend the skills, knowledge and competence of practising engineers and postgraduate students working at an advanced level in marine technology and related sciences.

What constitutes a winning consortium?

One that can **deliver** the expected outcomes within the stated scope and budget (and give the evaluators confidence that they can)

Common to see universities, big business, small business, research and technologies organisations, consultancies, local authorities, national authorities all within the one consortium. There is no 'typical' or 'model' consortium structure/membership

Useful to include exploitation partners – someone who is going to take the outputs of the project and actually implement them (e.g. an automotive/aerospace/marine/rail/etc., industry) to show immediate impact

Useful to include the end user community, possibly as an advisory board or associate partners (not direct beneficiaries but costs e.g. travel can be included in 'other costs'), again to demonstrate route to implementation

Eligibility criteria

There are several types of eligibility, and it does get confusing:

- Eligibility to be part of a consortium/project
- Eligibility to receive funding as part of a consortium/project
- Eligibility to be one of the minimum number of participants necessary in a consortium/project



Eligibility criteria explained

Stated in the [General Annexes](#)

- **Any legal entity**, regardless of its place of establishment, including legal entities from non-associated third countries or **international organisations** (including international European research organisations) is eligible to participate (whether it is eligible for funding or not) *although exceptions may apply in specific topics so check the text*
- To be **eligible for funding**, applicants must be established in one of the eligible countries, i.e.:
 - Member States of the European Union, including their outermost regions;
 - Overseas Countries and Territories (OCTs) linked to the Member States
 - Eligible non-EU countries:
 - Countries associated to Horizon Europe
 - Low- and middle-income countries
 - Legal entities which are established in countries not listed above will be eligible for funding if provided for in the specific call conditions, or if their participation is considered essential for implementing the action by the granting authority
- **Consortium Composition:**
 - At least one independent legal entity established in a Member State; and
 - At least two other independent legal entities, each established in different Member States or Associated Countries

International Participation

Some topics state international participation is **essential**, e.g. “In addition to the conditions described in General Annex B, the consortium must include at least three legal entities from three different African countries”

Some topics state international collaboration is **advised**, e.g. “In order to achieve the expected outcomes, international cooperation is advised, in particular with projects or partners from the US, Japan, Canada, South Korea, Singapore, Australia”

Some topics state **limitations** on international collaboration, e.g. “participation to the call is limited to legal entities established in Member States, associated countries, OECD countries, African Union Countries, and MERCOSUR, CARIFORUM, and Andean Community”

Most countries around the world have Horizon Europe National Contact Points – find their [details here](#) and there is a full list of [participating countries](#) published too

International Cooperation in Horizon Europe

- International cooperation in Horizon Europe
 - Horizon Europe, the research and innovation funding programme 2021-2027 is one of the main tools to implement Europe's strategy for international cooperation: the global approach to research and innovation.
 - The programme is open to researchers and innovators from around the globe who are encouraged to team up with EU partners in preparing proposals.



Global approach to research & innovation

*Europe's strategy for international cooperation in a changing world**

The gender dimension

Eligibility: Gender Equality Plan

Participants that are public bodies, research organisations or higher education institutions established in a Member State or Associated Country must have a gender equality plan in place, fulfilling mandatory process-related requirements

Award Criteria: Integration of the gender dimension (55 minutes into [this video](#) from EC)

Addressing the gender dimension in research and innovation content entails taking into account sex and gender in the whole research & innovation process

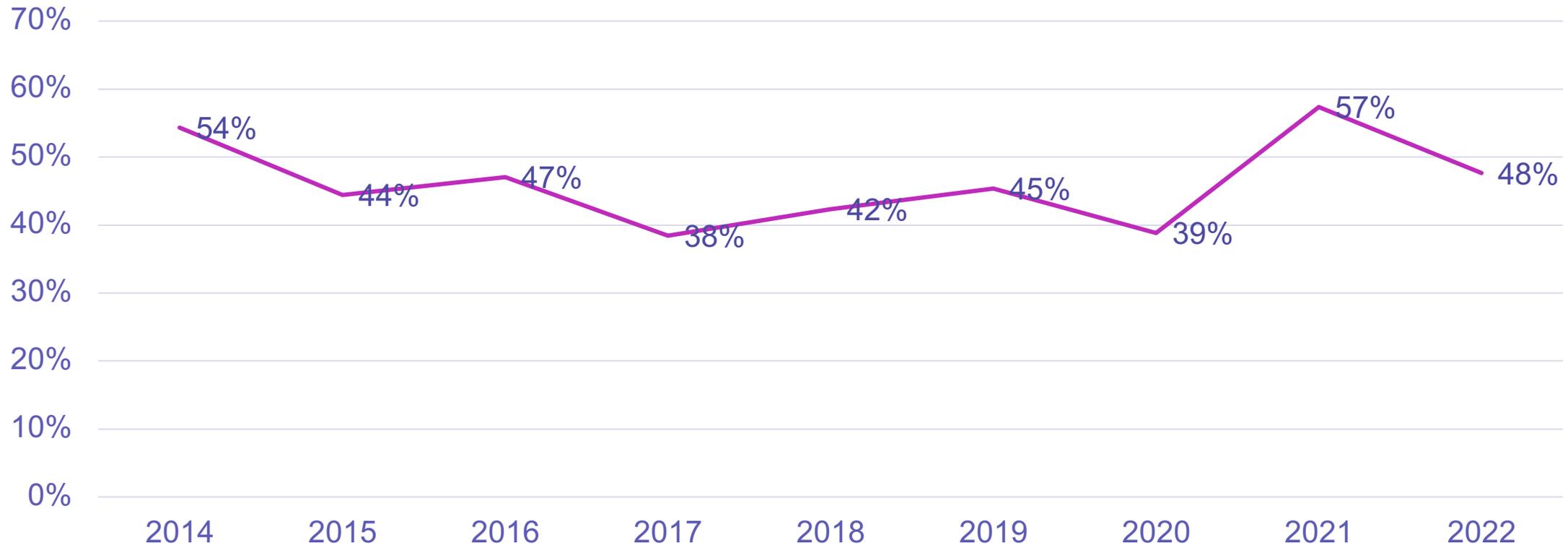
Ranking Criteria (for tied scores): Gender balance

Third criteria - Gender balance among personnel named in the proposal who will be primarily responsible for carrying out the research and/or innovation activities, and who are included in the researchers table in the proposal

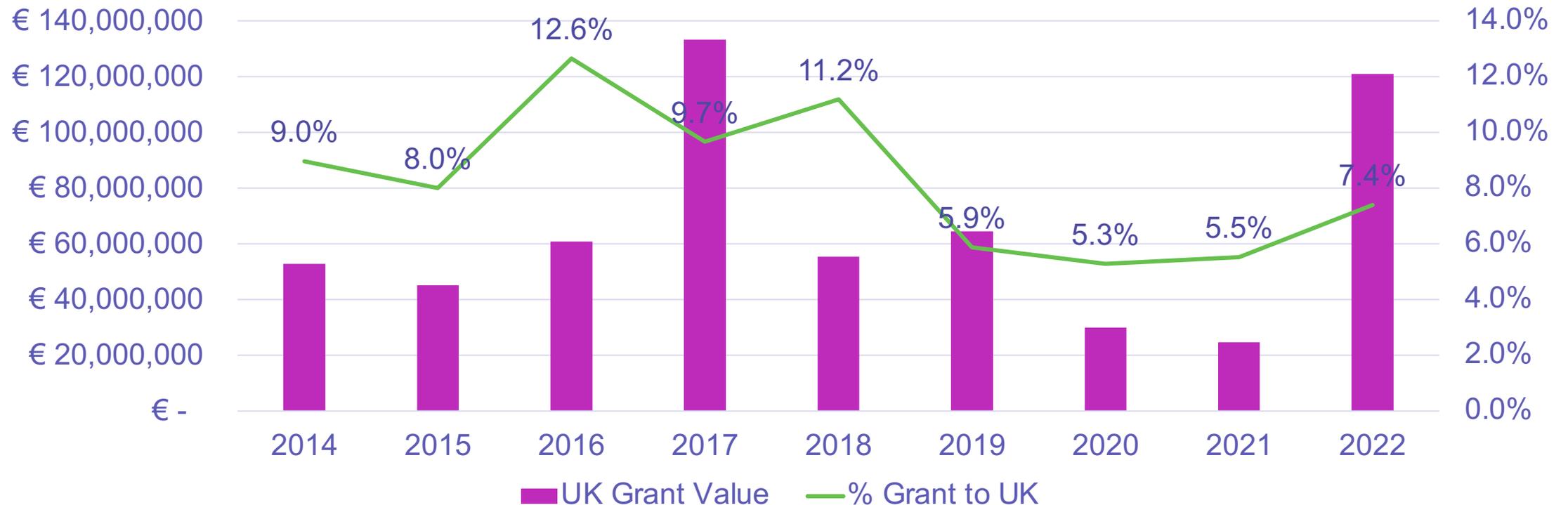


UK Track Record in Transport Projects

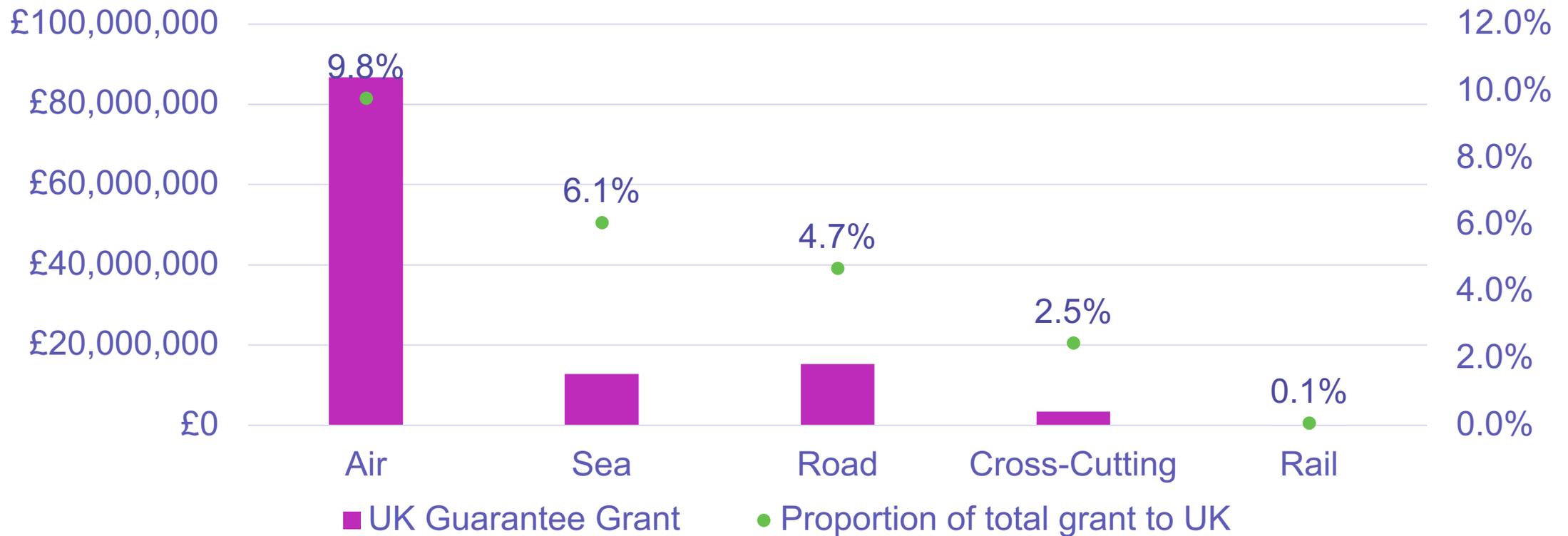
Proportion of transport projects with UK partners by Call year



UK share of available grant funding for transport projects by Call year



Grants to UK organisations for Horizon Europe Transport projects in 2021 and 2022 combined





**UK Research
and Innovation**

Thank you

Twitter: **@UK_Mobility_NCP**

Email: **NCP-Mobility@iuk.ukri.org**

Newsletter Subscription: **<https://eufunding.ukri.org/subscribe>**



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BREAKOUT TOPICS

Breakouts by Topic on different tables - Introduction from each member of the group on why they are interested and what they could potentially bring to a partnership and what they might need. Opportunity to discuss ideas for the Topic e.g., what would be in and out of scope?

14:10 TOPIC 1

HORIZON-CL5-2024-D5-01-11 Achieving high voltage, low weight, efficient electric powertrains for sustainable waterborne transport (ZEWT Partnership)

14:40 TOPIC 2

HORIZON-CL5-2024-D5-01-12 Combining state-of-the-art emission reduction and efficiency improvement technologies in ship design and retrofitting for contributing to the "Fit for 55" package objective by 2030 (ZEWT Partnership)

HORIZON-CL5-2024-D5-01-13 Demonstration of Technologies to minimise underwater noise generated by waterborne transport (ZEWT Partnership)

HORIZON-CL5-2024-D5-01-14 Demonstrating efficient fully DC electric grids within waterborne transport for large ship applications (ZEWT Partnership)

15:10 TOPIC 5

HORIZON-CL5-2024-D5-01-15 Advanced digitalisation and modelling utilizing operational and other data to support zero emission waterborne transport (ZEWT Partnership)