

Partnership Evaluation Report: Zero Emission Waterborne Transport (ZEWT)

Horizon Europe and the Green Transition Interim evaluation support study



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Unit C.1 - Strategy, policy coordination & urban transitions

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Key definitions, acronyms and glossary

Acronym	Description									
CINEA	European Climate, Infrastructure and Environment Executive Agency									
DG	Directorate General									
DUT	Driving Urban Transitions (PS)									
EC	European Commission									
EU	European Union									
FTE	Fulltime Equivalent									
GHG	Greenhouse Gas Emissions									
GT	Green Transition									
H2020	Horizon 2020									
HE	Horizon Europe									
IACS	International Association of Classification Societies									
IF	European Innovation Fund									
IMO	International Maritime Organisation									
IOA	Innovation-oriented approach									
MoU	Memorandum of Understanding									
PO	Project Officer									
PS	Partnership									
PSIP	PS specific impact pathways									
R&I	Research and Innovation									
ROA	Research-oriented approach									
SDG	Sustainable Development Goals									
SRIA	Strategic Research and Innovation Agenda									
TRL	Technology Readiness Level									
WTP	Waterborne Technology Platform									
ZEWT	Zero-Emission Waterborne Transport									

ZERO EMISSION WATERBORNE TRANSPORT (ZEWT)

1. Introduction

This evaluation report is part of the interim evaluation of Horizon Europe's activities related to the Green Transition. The purpose of this evaluation report is to provide an assessment of the Co-programmed European Partnership **Zero Emission Waterborne Transport** (ZEWT) against the following evaluation criteria: relevance, coherence, effectiveness, efficiency, EU-added value, additionality, directionality, international positioning and visibility, transparency, and openness, phasing-out preparedness, and.

The Commission-led PS implementation, monitoring, and assessment of the ZEWT is based on compliance with the criteria referred to in Annex III of Horizon Europe's legal base. This includes the alignment with Horizon Europe monitoring and evaluation provisions, set out in Article 50 and Article 52, as well as PS-specific agendas.

The primary data collection was concluded by July 2023 and based on a CORDA extraction from March 2023. Supplementary data from the forthcoming Biennial Monitoring Report 2024 was incorporated in December 2023. Due to the short runtime of the Horizon Europe Partnerships, it is noteworthy to bear in mind that many of the partnerships' activities are still ongoing and have not yet been fully accomplished.

The assessment of the Partnership (PS) is based on a mixed-method approach¹ of both quantitative and qualitative data analysis comprising an overview of funding and project-related data, desk research activities, and text analysis of the partnership strategic documents and related material, including the monitoring of the Partnership's progress. Five expert interviews with representatives of the PS management board, coordinating managers of the transition pathways, and representatives from the European Commission have been conducted to gain additional insights and validate findings.

2. Background of ZEWT

With around 77 % of EU international trade and 35 % of intracommunity trade being done by sea, the waterborne sector is pivotal in the coming decades, both in Europe and globally, and is already at the core of the EU's economy, creating more than 5.4 million jobs (about 2.25% of all European employment) and currently generating 3.4% of EU GDP². In reply, ZEWT is a new co-programmed PS, launched in 2021. It is a public-private PS aligning partners' R&I efforts to develop and demonstrate zero-emission solutions for all main ship types and services by 2030, which is expected to enable zero-emission waterborne transport by 2050, in addition to increasing safety and fostering growth and competitiveness of the sector. The waterborne community is characterised by a mix of both shared and diverging objectives and operates in a fierce global market compared to other industries.

¹ A detailed description of the methodology can be found in Appendix B (*Methodology and analytical models used*) of the main report.

² According to the Waterborne Technology Platform, SRIA Agenda: <u>https://www.waterborne.eu/images/210420_SRIA_Executive_Summary.pdf</u> [20.09.23].

Although meeting the needs of the entire sector is challenging, it plays a key role in the green transition at the global level, as shipping is, by default, highly international.

The PS develops and implements a shared, coherent, and long-term R&I agenda by bringing together the complex cross-sectoral value chain actors (ship design, ports and infrastructure, vessel equipment, and global shipping transport). ZEWT has no direct predecessor, but several ZEWT-related research topics were funded in collaborative R&D in H2020. ZEWT is being co-funded by the EU and by its currently 126 members (as of June 2023), who can be categorised³ as research, associate, or industrial members. The largest share is based in older Member States of Europe (see Annex 8.1.1, Figure 1), such as France, followed by Germany, Italy, Belgium, Spain, and Greece. This indicates a misbalance with regard to newer Member States, especially in Eastern Europe, that may be representative of the historically and organically grown, highly concentrated European industry sector. The governance structure of ZEWT is comprised of a PS Board, co-chaired by the EC, as a main forum for dialogue and steering. The chairperson of the advisory committee and the States Representatives Group (SRG) may participate in the Board as observers (see Annex 8.1.1 for more details). The partnership created a SRG that meets regularly once a year. No advisory committee hast been created. The impact logic centres around the provision and demonstration of zero-emission solutions for all main ship types and services before 2030, which are expected to enable zero-emission waterborne transport before 2050 (see Annex 8.1.3 for the intervention logic, as well as the Partnership-specific Impact Pathway). Key performance indicators to measure expected outcomes are represented in Annex 8.2.3 (Figure 14).

Overall, at the economic level and according to the SRIA, the activities of the PS are expected to contribute, by 2030, to the "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 re-enter markets presently dominated by Europe's competitors".

ZEWT is based on a Memorandum of Understanding between the EU, represented by the Commission, and the members of the Waterborne Technology Platform (VZW).

3. Implementation State of Play

Call topics related to ZEWT (12 in total between 2021 and 2022; for more information, see Annex 8.2, as well as the section on *effectiveness*, p. 10) contribute to the implementation of the ZEWT SRIA. ZEWT develops, on the one hand, industry-led technology projects; on the other, implements WP-relevant calls for waterborne R&I projects. There are currently 26 ongoing projects involving 306 researchers, only 40 of which declared themselves as female, which is the lowest of all gendered participation partnership scores (see Annex 8.3.2).

According to the interviews, the strategic development and ongoing call improvement is based on continuous dialogue and exchange between the PS and European Commission

³ This categorisation may be subject to change, a current list may be retrieved here: <u>https://www.waterborne.eu/about/members-overview</u>

Services, like DG RTD, DG MOVE, DG CLIMA and CINEA, as well as key stakeholder groups, including close cooperation with relevant other partnerships and Joint Undertakings, observer members and the ZWET alignment group partners. For this, a setup of open consultations and regular meetings, in addition to an equal and accessible membership for all members, are in place.

Furthermore, the broad set of ZEWT member sectors – vessel owners and equipment manufacturers, shipping and transport operators, ports and inland waterway transport – are engaged in a wider range of associations and representative bodies. This offers a low threshold entry point for stakeholders' groups and serves as a marketplace of ideas to enhance the capacity building for waterborne transport-related transitions, as they are described in the ZEWT SRIA. The internal structure of PS works is organised along three main objectives: eliminating GHG emissions from new and retrofitted ships, cutting coastal and inland air pollution by at least 50% compared to current levels, and eliminating water pollution (including harmful underwater noise) from ships. This is done by projects aiming at a critical mass of demonstrators, focusing on lower TRLs (e.g. feasibility and safety of emerging, less market-ready, alternative fuels such as ammonia) for the first two years of the PS to set the foundation for later development (the shipbuilding sector is highly concentrated and long-term focused) as well as on higher TRL "quick-wins" with regard to environmental impact (focused on energy efficiency).

The content of the call topics has been prepared in close cooperation with the members of this PS based on the objectives and priorities of the SRIA. As of September 2023, 26 projects (mostly IA and RIA) have been selected and launched under Horizon Europe (see Annex for details). Under H2020 and HE together, 100 projects in the waterborne transport sector have been funded. These are distributed in the following fields of Coordination (9 projects), Energy Efficiency and Zero Emissions (48), Ship and Shipping Safety (17), Digitalisation and Autonomy (5), Ship Design and Production (18), and Understanding and Protecting Oceans (3). The largest shares of funding are almost equally allocated to Research and Innovation Actions (13 projects) and Innovation Actions (12 projects)⁴.

In general, the selection process is organised by CINEA. External experts are typically entrusted with evaluating and selecting initiatives. One of the evaluation criteria is that the supported projects should demonstrate a strong geographical balance and operational capacity among the participants. Gender is currently not a specific criterion. However, gender is considered in 1) the composition of the Partnership Board, where it is a selection criterion and 2) the organisation of events by the PS, where it tries to find a gender balance.

4. Findings

4.1. Relevance

Given the relevance of international waterborne transport for global climate change and GHG emissions, surpassing those of airborne transport in 2022⁵, in addition to polluting (noise/air/water) Earth's key ecosystems, the oceans. ZEWT and its main objectives are clearly relevant and, given the novelty of the PS, extremely timely. Moreover, waterway transport is globally on the rise, has comparatively long timespans in terms of broad R&D

⁴ Compilation from the full list, available at <u>https://www.waterborne.eu/projects</u> [01.09.23].

⁵ In 2022, GHG emissions for the worldwide shipping sector amounted to 0.89 Gt CO2, compared to 0.78 Gt CO2 for the aviation sector: <u>https://www.iea.org/energy-system/transport</u> [20.09.23].

uptake, and at the same time stands structurally out as a truly global and international sector – including all possible benefits of visibility and positioning – in terms of transforming it sustainably. The lack of a common long-term vision and strategy targeting systemic solutions in a historically reluctant sector regarding change, as well as little interaction among the large cross-sectoral value chain, has been a barrier for developing ZEWT solutions in the past. The further development overcame this (and later update) of the SRIA in an open and transparent process of consultations involving a high degree of stakeholders from all sectors during the PS design and adaptation phases. This drive could be fostered further by increasing synergies between ZEWT's focus on technological demonstrators and Clean Hydrogen JU, BATT4EU, the Oceans Mission, as well as the Blue Economy PS, integrated into a fully-fledged blue international cooperation strategy, which corresponds to the natural characteristics of the waterborne transport industry and sector. As it stands now, from a green transition perspective, concerted action along the entire mitigation and adaptation chain is necessary, including work on standards and regulations, but also targeting shifted consumption, mobility and trade patterns.

On a different note, concerns have been expressed with regard to the potential military dual use of waterborne transport R&I (e.g. underwater noise pollution) through projects but also industry-funded R&D. Certain technologies have already sparked non-civilian interests and may eventually contribute to military armament. This falls clearly out of scope but has been, and will continue to be, a highly complex issue in ZEWT (due to the multiple uses of developed equipment and improvements).

4.2. Coherence

In the early stages of the proposal development, the ZEWT PS identified several neighbouring PSs and established initial discussions for potential synergies (Batt4EU, Hydrogen, Clean Energy, etc). Coherence across PSs is high, which is needed to avoid redundancies in the R&I of fuel and alternative energy technologies. However, to achieve a higher level of relevance, improved integration, overall coherence, and building comprehensive synergies beyond industrial transformation are needed. Based on the experience with former WPs, several interlocutors have critically added the need to bridge related DGs, and to commonly work on new regulations and standards to ensure large-scale uptake and generate different decisions and consumption/acquisition patterns across Europe. For the current WP, there has been tighter cooperation between DG RTD, MOVE, CLIMA, GROW, MARE, ENV, CINEA, and EMSA through the co-creation group, i.e. the cooperation seems to be growing in this regard.

4.3. Efficiency

ZEWT is a new, lean and well-managed PS, putting much emphasis on outreach, transparency and openness. Progress of this PS in attracting new members, funds and regional reach towards South-Eastern Europe has been pointed out in interviews. ZEWT has voiced concerns with not regularly and structurally obtaining project data (deliverables, results, etc.) needed to design better and plan new WPs and calls by including this requirement in the grant agreements. A monitoring exercise has been established based on the monitoring framework set in the SRIA (as required by the MoU). Project coordinators are expected to report back directly to the PS on how they are addressing the KPIs objectives and KPIs of the PS and which of the elements of the KIPs set in the SRIA for each area are being tackled by each project. Similarly, it was expressed that monitoring data about ongoing progress, received proposals, etc., in relevant other PS with regard to mobility and energy alternatives should be regularly made available to all Partnerships.

Although CINEA organises the project application and selection processes, it has no say in the evaluation of the projects. Members value the budget, considered as a relevant budget to build up an ecosystem that brings together about 120 members willing to contribute to a common roadmap.

4.4. Effectiveness

In 2021, 8 topics dedicated to ZEWT were launched in HE, resulting in 14 funded projects (8 RIA, 5 IA, 1 CSA). In 2022, another 4 topics followed, resulting in 12 funded projects (5 RIA, 7 IA). The funding of these 26 projects in total amounted to an EC net contribution of roughly 168 m€. In terms of geographic distribution, most of this funding went to Norway (30.5 m€), Italy (19.9 m€), France (17.9 m€), Germany (16.8 m€), and the Netherlands (16.1 m€), to name the top receivers. In terms of share of participation, the order is slightly reversed, i.e. Italy (12.9 %), Norway (10.8 %), the Netherlands (9.3 %), France (8.7 %), and Greece (8.4 %); for more details, see Figure 7 and onward.

The industrial embeddedness of ZEWT is strongly related to its effectiveness. The perceived high level of trust in and relevant networks of partners, especially those from progressive regions with regard to sustainability and technical efficiency in the field, such as Scandinavia, results in higher engagement, steering coherence, and easier consensus for strategic development. According to interviewees, a major outcome has been achieved in coordination, collaboration, and capacity-building across combined sectors with often contrasting needs, objectives, and strategies. Here, speeding up the green transition has, as one of the interviewees concluded, become a common language and goal in a naturally reluctant and diverse sector in terms of needs and objectives (ports, shipbuilding industry, shipping fleet owners, etc.). This achievement was made possible through radical openness and an active dialogue with R&D funding agencies in the Member States and businesses (e.g. in Greece, a key country for the European and worldwide shipping sector), in addition to prolific innovation clusters in the making.

Market creation and uptake of greener solutions beyond successful demonstration are still awaiting to be explored. However, this would also require more sustained work on system development, especially legal prescriptions and regulations for transport – which is slow in the international realm (IMO-concerned) and frequently extends in scope beyond European policy impact (alone).

There are concerns about the selection of projects under the exclusive criterion of "excellence", leaving out highly relevant dimensions such as geography (the unequal European port distribution, for instance) and effectiveness trade-offs in terms of funding allocation versus the potentially most impactful means to contribute to the green transition. Therefore, the geographical distribution should also be additionally taken into account when selecting projects for funding. For instance, the demonstration of vessels in the North Sea is comparatively higher than in the Mediterranean or Atlantic Sea; also, funded projects have so far been concentrated around a core group of a few countries, none of which are located in the newer Member States. The situation might be exacerbated due to the drive to fund large-scale demonstrators, which may intensify the existing imbalance.

Regarding projects focused on inland waterways, the situation has been described as even more concentrated. This rather discouraging context, according to some interlocutors, may hinder new Member States' stakeholders from becoming part of project consortia, thereby slowing down ownership of a truly European Green Transition. In this regard, it has been suggested to explore creating a mechanism similar to the award of the EU "seal of excellence"⁶ known from HE Pillar I to award evaluated projects that are deemed excellent but remain unfunded under the ZEWT PS. While this problem is not unique to ZEWT, the PS may consider reallocating remaining call budgets at a later stage to excellent and most green-transition-contributing proposals, which may have a high potential to contribute to the PS objectives.

4.5. EU added value

According to several interlocutors, the EU-added value stems from bringing a highly fragmented sector with very diverging strategic ambitions to the table. Addressing key sectors through integrated and holistic ZEWT perspectives crystallises as a central node for EU transformations – and potentially worldwide. Given its international nature, ZEWT stands out as a lighthouse at the global level if successfully transformed with immediate impact thanks to its inherent interdependencies (vessels require different port-related energy supply and storage, linking directly to the availability of goods, etc.). The added value of the ZEWT PS is the alignment of agendas, resources, and efforts among sectors and businesses, including SMEs that dominate in the field, in addition to pledges of additional resources for research, dissemination, capacity building, and general sensibilisation. One major achievement of the PS is seen in the capacity-building of all actors through knowledge, technological solutions, and co-creation. ZEWT aims at engaging people in transitions and enabling them to further engage knowledgeably and actively, not simply through symbolic participation.

4.6. Additionality

According to the MoU, the targeted leverage factor is roughly 1:6.2 (1 EU/public, 6.2 times private R&I funding); as of mid-2023, it stands at 1:3 or 1:4 within the PS, with a good outlook to achieve the overall target. According to recent BMR data, the in-kind contribution target at the cut-off date in August 2023 achieved 100%; nothing has been reported for the in-cash contribution.

It may be worth considering that, for the waterborne transport sector, private R&D (e.g. digital equipment to enhance fuel efficiency, but also certain parts of propulsion technology) can and does find markets outside maritime or inland waterway use.

4.7. Directionality

SRIA has been approved by the PS Board in January 2024, to include developments in the sector between June 2021 and December 2023, as well as recent regulatory changes within the EU and economic developments such as unstable fuel prices. Indeed, clear awareness regarding global challenges and competitiveness of the relevant sectors have been confirmed in interviews, but also through the PS website, listing all ongoing research projects. It has been suggested that more could be done by taking an approach that would transform regions comprehensively, e.g. by focusing on pilot regions. Such an approach would target highly efficient transport, shipbuilding, energy supply/storage and port regulations, safety and infrastructure. This would also increase impact and visibility to citizens. However, to speed up the delivery of results, cross-sectoral collaboration and

⁶ https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/seal-excellence_en [20.09.23]

synergies across funded initiatives (including relevant Joint Research Centres, Missions and key partnerships), and particularly administrative funding may need to be topped up.

4.8. International positioning and visibility

The sector lends itself to global visibility and leadership and should receive much more attention - even more so in the context of the ongoing United Nations Decade of Ocean Science for Sustainable Development (2021-2030). This, however, would require bundling all activities of the Ocean Mission, DG MOVE, DG MARE, DG RTD, IF, JRCs, Member States, and internationalisation efforts much tighter and more comprehensive. In this regard, it has been critically commented that ZEWT's goals to increase European competitiveness and growth in a highly competitive global market (transport and ship construction) limit openness to members from outside Europe who are more concerned with efficiency gains and nature conservation. To support the identification of the most important knowledge, regulatory, standardisation and technological gaps, ZEWT PS monitors (multilateral) level as well as through its regional subsidiary networks, but no further details were disclosed. The developments of international organisations such as the IMO (in particular its Marine Environment Protection Committee). In addition, the Partnership intended to follow the process of establishment of the International Maritime Research and Development Board (IMRB) with a view to avoiding effort duplication and to stimulate the development of rules and regulations; this has not fully developed yet.

4.9. Transparency & Openness

ZEWT has been actively involved in reaching out to mobilise new members, in particular in the case of Greece, which is the leading ship registry number in Europe. Generally, this PS is highly transparent and open, including open consultations on the work programme design phase to the broad public. Female project participation, however, lags behind comparable partnerships in terms of project volumes. The annual cost of a PS membership amounts to only EUR 3000 € for all members to lower barriers to access for SMEs in particular. Research results are shared across members; however, exclusively industry-funded R&D results and marketisation are at the discretion of its members. The central management team of the PS justifies its actions, which has contributed to the PS's cohesion. All partners are expected to comply with the established PS by-laws⁷.

4.10. Phasing out preparedness

There is currently no phasing-out preparation underway. The MoU⁸ indicates a renewal or a phasing-out to be discussed in the context of the next SRIA update.

5. Conclusions

Overall, in the light of global challenges and the green transition, the new ZEWT partnership targets highly relevant objectives in line with its strategic implementation plan, put forward by a lean management and governance structure, which envisages ample synergies across relevant other partnerships, Missions, LIFE programme and other European and international initiatives and arenas, especially the International Maritime Organisation (IMO).

⁷ Available at <u>https://www.waterborne.eu/images/22_09_23_Annex_4_By-laws_3.0_clean_final_copy.pdf</u> [20.09.23].

⁸ <u>https://www.waterborne.eu/images/220304_MoU_Signed.pdf</u> [20.09.23].

The concerned European waterborne transport sector, comprised of several sub-sectors with quite diverging and contrasting needs and priorities, has so far achieved to work closely together on the agreed TRL-related focus for the first half of Horizon Europe.

With regard to the PS' predominant focus on Europe, projects appear to work well in terms of efficiency and effectiveness, and towards promising results. There are, however, a few challenges which could be transformed into positive drivers, such as diverging priorities with regard to achieving the ZEWT objectives, linked to different technological progress levels already in place: for instance, efficiency gains between Scandinavian partners or technology-based R&D of new propulsion and alternative power supply for the shipping sector between South-eastern European members. Being an industry-driven PS in a highly competitive global sector, green transition, safety and regulations, as well as growth-related goals are at the same level as structural objectives, making it difficult for newer Member States to fully partake and thrive.

6. Lessons Learned & Recommendations

The following recommendations emerged through qualitative assessments with relatively strong significance (repeated topical occurrence in interviews):

- Waterborne transport is uniquely positioned for adapting and mitigating climate change, in addition to being highly internationalised and globally visible by nature. Currently, CO2 emissions are equal or higher than those of the aviation sector, though ZEWT had no PS precursor in earlier years.
- ZEWT research activities and funding should focus on the maritime dimension, as the inland waterway sector is comparatively well-funded. Increasing efforts on decarbonising maritime transport can be expected to achieve more with regard to the reduction of GHG emissions in absolute terms.
- It is imperative to open the evaluation (next to excellence) and selection of projects by taking the geographical distribution of allocated funds and their relevance (in terms of funding volumes) into account, but also the expected positive impact on the green transition more broadly, in particularly the ratio between inland waterway and maritime transport.
- The internal monitoring and assessment process should be fostered by obliging funded projects to report back to the PS Board and Alignment Group. In addition, more transparency across relevant PS is desired, as well as improving synergies with regard to boosting policy uptake towards new regulations and standards between partnerships, pillar II and III activities, Missions, Innovation Fund and LIFE programme overall. To this end, the PS would require faster and better data and access to ongoing activities in relevant other actions, e.g. to adapt the selection and formulation of WP calls and avoid redundancies, but also to increase positive impact where needed with regard to the green transition.
- Civil and military dual use of technology development (e.g. curbing underwater noise emissions) should clearly be addressed in the MoU. However, many potential dual uses of ship equipment and propulsion technology are not foreseeable at the moment of development or remain at the discretion of the industry sector.

7. Sources

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PS ZEWT SRIA 2021

Waterborne Vision 2025: WATERBORNE TRANSPORT & OPERATIONS

MEETING THE CHALLENGES THROUGH AMBITIOUS INNOVATION

Memorandum of Understanding for the Co-Programmed European Partnership for Zero-Emission Waterborne TP

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Council of the European Union, <u>ERAC: Transnational Forum for EU R&I Partnerships:</u> FINAL REPORT. 25 November 2020 (WK 14589/2020 INIT)

A framework for the Biennial Monitoring Report on European Partnerships: Second Interim Report

Performance of European Partnerships: Biennial Monitoring Report 2022 on Partnerships in Horizon Europe

Cluster 5 Review of the Main R&I Outputs Achieved in the Different Areas of the European Green Deal

Foresight Expectations and assumptions for the future in the Work Programme 2021-2022 of Horizon Europe: Synopsis Report

Looking into the R&I future priorities 2025-2027

The integration of key transformative R&I principles in European policies

EC DG RTD, <u>Assessing European partnerships against European policy priorities</u> – Developing and illustrating a methodology for assessing the relevance of European Partnerships as instruments to address current and future European policy priorities.

8. Annexes

8.1. Supplementary evidence: Background to the initiative

8.1.1. Governance

The European Waterborne Technology Platform⁹ represents the partners in ZEWT other than the European Union. It is organised as an international non-profit association. It differentiates between full members and observing members. As of mid-2023, the category¹⁰ of full membership is divided as follows:

- Industry members: private companies based in the EU active in the fields of the PS, especially ship building industry, smart systems industry, logistics companies and freight transport users.
- Research members: research organisations and universities active in the field of ship engineering and design, waterborne transport technologies and transport research.
- Association members: represent non-governmental organisations involved in European waterborne transport research and facilitation.
- Observers: Other parties can also participate at no cost, subject to board approval; these may include civil society organisations and representatives of national administrations sole criterion of excellence needs to be reviewed as well, adding dimensions of structurally positive and driving impact to the green transition.



MEMBERS PER TYPE

Figure 1: members per type¹¹

⁹ <u>https://www.waterborne.eu</u>

¹⁰ Further details can be retrieved from the respective section of the Waterborne Technology Platform: <u>https://www.waterborne.eu/about/members-overview</u>

¹¹ European Commission, Directorate-General for Research and Innovation, Performance of European PSs – Biennial Monitoring Report (BMR) 2022 on PSs in Horizon Europe, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/144363, p 317



Figure 2: Geographical coverage and total number of ZEWT members in 2022, according to the Biannual Monitoring Report from 2022

The Partnership is governed by a Partnership Board. This Board steers the Partnership towards achieving its SRIA, supervise the process of interaction with industry and Member States, and approve the research programme as set out in the SRIA and the specific topics to be addressed in Horizon Europe calls. The actual decision on the calls to be published is taken following the comitology procedure. At the time the study underlying this report was carried out, the PS Board had 15 representatives and showed a slight gender imbalance. There has been an update since which shows that the situation has been rectified. The composition of the current PS Board can be gathered at the WTP website¹².

The Partnership Board laid down its Rules of Procedure (PS By-Laws) based on a harmonised proposal provided by the European Commission, covering, among other things, rules on confidentiality, transparency and avoidance of conflicts of interest.

The Partnership is assisted by a Secretariat which the Waterborne TP association provides. The private side of the Partnership is organised within the Waterborne TP association. Within the Partnership's working groups, members of the Partnership discuss the technical requirements and research progress for the Partnership. Representatives of EU Member States, Association Countries and European Commission services are regularly invited to participate in the technical meetings of the working groups.

¹² <u>https://www.waterborne.eu/partnership/partnership-board</u>

For the update of the SRIA and the input to multi-annual calls, a highly open and transparent process has been established (see Figure 3: Governance Structure of ZEWT):

- 1. The Partnership undertakes a broad assessment of the current state-of-the-art and challenges for the different ship types and services. On this basis, the SRIA has been developed for 7 years, addressing the main objectives and activities.
- 2. Every 1 or 2 years, the SRIA is updated, taking into consideration the results achieved (within or outside the Partnership), the technological developments available in the market and the immediate priorities of the sector;
- 3. Through its members and with the help of CINEA, the Partnership maintains an overview of ongoing projects and research outcomes (including policy recommendations). This overview is not limited to EU-funded research, but through its members and its contact with the Member States, the Partnership acquires information on relevant national or industrial projects, as well as assesses reports within the wider press and journals.



Figure 3: Governance Structure of ZEWT¹³

¹³ PS Proposal (2020), p. 43

8.1.2. ZEWT Members

Table 1: Full List of Current Industrial and Research ZEWT Members

Source: based on PS Admin indications from August 2023

Resea	arch Members	Indus	trial Members
No.	Name	No.	Name
1	Sintef Ocean	1	Fincantieri
2	CNR	2	Rina Services Spa
3	Aimen Technology Centre	3	Kongsberg Maritime AS
4	Cetena S.p.a.	4	Navantia
5	Marin	5	Naval Group
6	TNO	0	DAMEN RESEARCH DEVELOPMENT &
7	Centre for Research and Technology Hellas	6	Chantiers de l'Atlantique
8	Balance	0	Mover Worft CmbH & Co. KC
Q	Bulgarian Shin Hydronomics Centre	0	Meyer Went Gribh & Co. KG
Ŭ		9	Wärtsilä Netherlands B.V.
10	Fundación Centro Tecnológico Soermar	10	Royal Belgian Shipowners Association
11	Fundacíon Valenciaport	11	Llovd's Register
	HSVA Hamburgische Schiffbau-		
12	Versuchsanstalt GmbH	12	DNV
13	Cerema	13	Bureau Veritas Marine & Offshore
14	VTT Technical Research Centre of Finland Ltd	14	MAN Energy Solutions SE
	Sabiffhautaabniaaba Varauabaanatalt in	15	Royal IHC
15	Wien GmbH	16	The European Inland Waterway
16	SSPA Sweden AB		
17	RISE Research Institutes of Sweden	17	Royal Association of Netherlands Shipowners
18	CEA-Liten	I	I

Research Members			Industrial Members			
19	IRT Jules Verne	18	European Fuel Manufacturers Association			
20	Ricardo UK Ltd	19	MV Werften Wismar GmbH			
21	Institute for Energy Technology (IFE)	20	Popont			
22	Fondazione CMCC	20				
23	ORE Catapult	21	ABB Oy Marine and Ports			
	Mærsk Mc-Kinnev Møller Center for	22	Airseas			
24	Zero Carbon Shipping	23	Cantiere Navale Vittoria			
25	Expertise- en InnovatieCentrum Binnenvaart	24	Engitec Systems International Ltd			
		25	One sea c/o DIMECC			
26	Frazer-Nash Consultancy	26	NAPA			
27	Eigen Vermogen Flanders Hydraulics	27	ABS Hellenic			
28	Fraunhofer Gesellschaft zur Forderung der Angewandten Forschung e.V.	28	A.P. Moller - Maersk			
29	BlueOASIS	29	Cosnav Engineering S.r.l.			
30	Magellan Circle	30	Intecsa Industrial			
	CIMNE - Centro Internacional de	31	Brodosplit JSC			
31	Metodos Numericos en la Ingenieria	32	MSC Cruises SA.			
32	INLECOM	33	Elkon			
33	Deutsches Zentrum für Luft- und Raumfahrt	34	Polish Register of Shipping			
34	CLEOS		Parker Hannifin Manufacturing			
35	Tecnalia	35	Germany GmbH & Co. KG			
-	CMMI – Cyprus Marine & Maritime	36	CMA CGM			
36	Institute	37	Future Proof Shipping			
L		38	Siemens Energy Global GmbH & Co. KG			

SimFWD

Research Members	Indus	strial Members
	40	AS LTH-Baas
	41	Air Liquide
	42	Equinor Energy AS
	43	Compass Ingeniería y Sistemas, SA
	44	Spear Power Systems
	45	NAVTEK Deniz Teknolojisi A.Ş.
	46	Dassault Systèmes SE
	47	BlueCentury
	48	The State Enterprise Lithuanian Inland Waterways Authority
	49	Thordon Bearings Inc
	50	Cargotec
	51	EURONAV NV
	52	Rhoé
	53	NVL BV & Co. KG
	54	Nippon Kaiji Kyokai (UK) Ltd (ClassNK)
	55	Fintraffic Vessel Traffic Services Ltd
	56	EHT S.C.p.A
	57	MarineTraffic
	58	Ardmore Shipping Services (Ireland) Limited
	59	Green Marine

Intervention Logic

The ZEWT intervention logic is based upon specific needs related to the diverse and partly contrasting needs and contexts of the sectors – e.g. ship and equipment builders, maritime and inland waterborne transport, port management and development¹⁴ – and focuses on specific objectives, problems and drivers, as outlined in the figure below.



Figure 4: Objective tree according to the ZEWT Partnership Proposal (2020)¹⁵

Envisaged is therefore to:

- 1. demonstrate deployable technological solutions for the decarbonisation of the sector; especially: Delivering future-ready design, manufacturing, and automation of waterborne transport assets and operations towards a Zero-Accident Waterborne Industry
- 2. the contribution to new standards, policies and regulations by 2030 and the facilitation of innovative zero-emission waterborne transport technologies and solutions, as to: Achieving carbon-neutrality, persistent monitoring and digitalisation of seas and oceans along with a sustainable use and management of marine resources
- 3. supporting growth, competitiveness, overall safety and employment in Europe.

¹⁴ The waterborne sector comprises shipyards, ship owners, maritime equipment manufacturers, flag states, waterway and port authorities and operators, river commissions, classification societies, energy companies, infrastructure companies, environmental non-profit organisations, research institutes, universities, citizens' associations, as well as various competent authorities, banks, insurance companies, etc.

¹⁵ <u>https://research-and-innovation.ec.europa.eu/system/files/2020-05/european_partnership_for_zero-emission_waterborne_transport.pdf</u> [2023-10]

In terms of Sustainable Development Goals (SDGs), the PS is expected to contribute to SDG 13 (Climate Action), SDG 3 (Health and Well-Being) and SDG 14 (Life Below Water). The PS specific impact pathways (PSIP) towards these priorities and goals are depicted in Figure 5 below.



Figure 5: Partnership-specific Impact Pathway for ZEWT

*Objective (SO1): deployable technological solutions applicable for the decarbonisation and the elimination of other harmful emissions of main ship types and services

**Objective (SO3): development and implementation of regulations and policies at national and international level, including the development of standards;

***Objective (SO2): implementation of economically viable European new technologies and concepts regarding zeroemission waterborne transport, to strengthen the competitiveness of European industries in growing green ship technology markets

**** Objective (S04): uptake of innovative zero-emission waterborne transport technologies and solutions within the European waterborne sector.



Figure 6:Schematic illustration of the ZEWT intervention logic (own elaboration).

8.2. Supplementary evidence: Implementation state of play

The European Green Deal provides ambitious pathways and valuable opportunities for the European maritime industry, and in particular for the waterborne transport sector, where Europe leads in high-quality equipment manufacturing, ship design (but not vessel building and assemblage), high technology and green energy efficient shipping development. Digitalisation is key to cutting emissions and increasing efficiency while increasing the safety, security, and reliability of waterborne transport need to be maintained. Generally, energy efficiency can be achieved in different ways: by reducing emissions (based on a balanced mix of alternative low and zero-emission propulsion means) by developing new propulsion means, including new energy storage technology, or a mix of both. This choice and the required steps are impacting the business models and dynamics of the sector. Yet, with technology innovation at roughly 70% ready (according to interviews) and successful improvement from TRL 3 or 4 to TRL 5 to 6 in many cases, market uptake, internationalisation, and upscaling of solutions – requiring more structural change of business models linked to policy changes, e.g. effective regulations and standardisations – lags.

In part, this reflects the sectors' conservatism and reluctance to change unless driven by regulation. It is also hindered by the complex commercial structures and finance models, which can distance the interests of ship owners who commission new builds, financiers who commoditise vessel value by type, operators who can benefit from lower fuel consumption as well as cargo owners who may benefit from 'environmentally friendly image' and final points of sale where the use of low emission shipping can be a potential commercial advantage.

In response, ZEWT has put an important emphasis on R&I in **ship design** and **retrofitting**, in addition to coping with **alternative propulsion**, **energy storage**, underwater **noise reduction**, elimination of **air and water pollution**, and **maritime safety** regulations linked to these fields and respective advancements therein. The SRIA does not provide explicit transition pathways, but rather identifies problem drivers, which become addressed through work programmes, call development and project submissions. SRIA co-designing process (2 years, from 2020 to 2021), but also regular updates (currently ongoing), public consultations, monitoring tasks, work programme planning and call development operate on a tightly adjusted schedule over the year. Consultations are open to members, but also the general public more broadly.

Generally, work programmes operate on a logic that pursues progress throughout the PS, gradually getting closer to achieving the overall objectives. For instance, since ship and vessel development, market launches and lifespans are quite long processes, the first two rounds of calls focused on "greener" vessel design, retrofitting and alternative fuel and storage. This way, demonstrators will be ready in the upcoming years. The next round will focus on the required infrastructure and regulations, while market and structural issues of competitiveness will be tackled later on.

Each proposal must involve at least three partners from three different countries (eligible for funding) and be oriented into a research-oriented approach (ROA) or an innovation-oriented approach (IOA). Proposals must include organisations, institutions, companies (legal entities). Research organisations, government authorities, consumers, and civil society representatives (local organisations, non-governmental, non-for-profit, and citizen's representatives and a consortium with at least one coordinator.

8.2.1. Participating partners

8.2.1.1. Number of participants broken down by organisation type and member state and associated country

The indications above are also reflected in the large share of RIA and IA projects (26 total) so far.



Figure 7: Participations by sector of ZEWT projects

Source: elaboration by Science Matrix based on ecorda data

Group of Action /instrument	Number of Participations		EC contri	bution	EC Contr. per part.	
Group of Action/Instrument	projects	Nb	Share (%)	EUR (1,000)	Share (%)	(EUR 1,000)
IA	12	155	46,5%	77.857,7	46,3%	502,3
RIA	13	171	51,4%	89.899,9	53,4%	525,7
CSA	1	7	2,1%	523,4	0,3%	74,8
All types	26	333	100,0%	168.281,0	100,0%	505,3

Figure 8: Participations by type of action/instrument of ZEWT

Source: elaboration by Science Matrix based on ecorda data

Participation in projects is predominated by the Central and Western European (EU-14) member states, largely reflecting the historical and economic composition of the market and industry. The leading participating countries are repeatedly present in practically all ongoing projects.

	Number of	Participations		EC contribution		EC Contr. per	Number of
Group of country	projects Nb		Share (%)	EUR (1,000)	Share (%)	part. (EUR 1,000)	countries
EU-27	26	256	76,9%	133.816	79,5%	522,7	22
EU-14	26	232	69,7%	122.267	72,7%	527,0	13
EU-13	17	24	7,2%	11.550	6,9%	481,2	9
Associated (excl. UK)	16	46	13,8%	34.244	20,3%	744,4	3
United Kingdom	16	26	7,8%	0	0,0%	0,0	1
Third Countries	5	5	1,5%	221	0,1%	44,1	2
All-countries	26	333	100,0%	168.281	100,0%	505,3	28

Figure 9: Participations and budgets by group of countries (26 projects overall).

	Number of	Participations		EC contribution		EC Contra nor	
Top 15 country	projects	Nb Share (%)		EUR (1,000)	Share (%)	part. (EUR 1,000)	Order
Netherlands	17	31	9,3%	16.136	10%	520,5	1
Italy	17	43	12,9%	19.887	12%	462,5	2
United Kingdom	16	26	7,8%	0	0%	0,0	3
Greece	15	28	8,4%	10.273	6%	366,9	4
Norway	14	36	10,8%	30.549	18%	848,6	5
Germany	14	24	7,2%	16.776	10%	699,0	6
France	14	29	8,7%	17.876	11%	616,4	7
Belgium	10	19	5,7%	9.239	5%	486,3	8
Spain	9	25	7,5%	9.186	5%	367,4	9
Cyprus	7	9	2,7%	5.241	3%	582,4	10
Finland	7	11	3,3%	11.027	7%	1.002,5	11
Sweden	6	11	3,3%	9.043	5%	822,1	12
Switzerland	4	4	1,2%	110	0%	27,5	13
Austria	3	5	1,5%	734	0%	146,8	14
Poland	3	3	0,9%	531	0%	177,0	15
Turkiye	3	5	1,5%	1.218	1%	243,6	16

Figure 10: Participations and funding share by country (26 projects overall).

8.2.2. Partnership Network Visualisation (based on participating countries)

The same picture as in the previous section can be derived from the network analysis of ZEWT HE Project Portfolio of 2021.



Figure 11:Network Visualisation of participations and funding share by country (26 projects overall).

			-
DESTINATI	TOPIC NUMBER	TITLE 001-07F TOPIC	TYPE OF
D5	01-07	Enabling the safe and efficient on-board storage and integration within ships of large quantities of ammonia and hydrogen fuels	IA
	01-08	Enabling the full integration of very high power fuel cells in ship design using co- generation and combined cycle solutions for increased efficiency with multiple fuels	RIA
	01-09	CSA identifying waterborne sustainable fuel deployment scenarios	CSA
	01-10	Innovative on-board energy saving solutions	RIA
	01-11	Hyper powered vessel battery charging system	IA
	01-12	Assessing and preventing methane slip from LNG engines in all conditions within both existing and new vessels	IA
	01-13	Digital Twin models to enable green ship operations	RIA
	01-14	Proving the feasibility of a large clean ammonia marine engine	IA

Figure 12:8 ZEWT Calls in Horizon Europe Cluster 5 of 2021¹⁶

¹⁶ Table by Miriam de Angelis, APRE Italia, 2021. Accessible via: <u>https://errin.eu/system/files/2021-03/210324miriam-</u> <u>de-angelis.pdf</u> [01.09.23].



Figure 13: Full depiction of waterborne transport projects under Horizon 2020 (2014-2021) by CINEA¹⁷

¹⁷ Full report available at: <u>https://cinea.ec.europa.eu/document/download/e33f4e6b-80e8-46b0-9fd8-45a806d5c5b_en?filename=Waterborne%20Transport%20Projects%20-%20Horizon%202020%20projects%20managed%20by%20CINEA%20and%20opportunities%20for%20synergies_0.pdf [22.09.23].
</u>

8.2.3. Key Performance Indicators

KPI NAME	UNIT OF MEASUREMENT	BASELINE	TARGET 2023	TARGET 2025	TARGET 2027	AMBITION >2027
	RESOURC	ES (INPUT), PR	OCESSES A	ND ACTIVIT	IES	
Established Innovation clusters	#	N/A	3	6	10-15	
Inclusion of building users and occupants	# Involved In demonstration	N/A	TBD	TBD	600*	
		ουτα	OMES			
Low carbon solutions & renovation packages	#	TBD	TBD	TBD	100**	
Certification & verification tools	# developed	TBD	TBD	TBD	20***	
Training capacity (in hours per year)	#	TBD	TBD	TBD	3000****	
		IMP	ACTS			
New skills creation	#	N/A	TBD	TBD	30****	
Sustainable & healthy neighbourhoods	% of B4P projects with demonstrated impact	N/A	TBD	TBD	30%*****	
Healthy built environ- ment	% of B4P projects with demonstrated health, social and wellbeing	N/A	TBD	TBD	90%*****	
Safeguarding cultural heritage	% of B4P projects that demonstrate Improved outcomes for heritage buildings	N/A	TBD	TBD	15%*****	

PARTNERSHIP'S KEY PERFORMANCE INDICATORS

* Target assumptions: 60 projects, each involving average 10 users per project

" Target assumptions: 60 projects, 1-2 new solutions or packages per project

***Target assumptions: 60 projects, one-third develop training or a new certification tool

****Target assumptions: 60 projects, each delivering average annual training capacity to roll out relevant new content to 50 people per annum

*****Target assumptions: average new jobs / skills per project: 0.5-1, anticipating ≈ 60 projects considering a whole B4P budget of EUR 380 million.

*****Target assumptions: 30% of projects will demonstrate health impacts, including at neighbourhood level

****** Target assumptions: given the people-centric nature of the partnership, all projects should be aiming to hit this, hence a high target is appropriate – but recognises that some projects may not achieve their stated goals

*******Target assumptions: 10-15 % of projects address heritage buildings

More detailed information on the partnership's activities, performance and impacts is found in activity reports available here

Baselining exercises will be done during 2022 by a dedicated working group. Data from the predecessor partnership, EeB cPPP, will be used as much as is relevant to calculate the baseline and will then be further complemented with other sources as necessary.

Figure 14: Key Performance Indicators for ZEWT, according to the Biannual PS Monitoring Report of 2022¹⁸

¹⁸ European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, <u>https://data.europa.eu/doi/10.2777/144363</u>

8.2.4. Synergies

According to the SRIA, Waterborne TP nominates interlocutors who act on behalf of the PS to liaise on the developments of the PS with other relevant initiatives in order to avoid duplication of efforts, as well as to discuss necessary prioritisation. Representatives of the Partnerships, Missions, Technology Platforms and other relevant initiatives are invited to attend meetings with the Waterborne TP on a regular basis to discuss the issues at stake, the creation of possible synergies, to develop joint work plans and common calls (where possible) and any other issues relevant to the execution of the tasks of the PS.

The following figure displays the thematically "closer" partnerships to ZEWT PS, in addition to all other actions and instruments regarded as relevant:



Figure 15: Synergies between PS with regard to ZEWT, taken from ZEWT PS SRIA

In addition to these, there are a number of Missions (Healthy Oceans, Seas, Coastal and Inland Waters; Climate Neutral and Smart Cities; Adaptation to Climate Change) and EU programmes seen as relevant with regard to the implementation of technologies:

- Innovation Fund (DG CLIMA)
- Modernisation Fund (DG CLIMA)
- Connecting Europe Facility-Transport (DG MOVE)

- Connecting Europe Facility Transport Blending (European Commission and EIB) via InvestEU
- European Fund for Regional Development (DG REGIO)

SYNERGIES WITH OTHER EUROPEAN AND NATIONAL INITIATIVES

SYNERGIES: STORY 1

A first synergy that is building up is the involvement and cooperation of the broader waterborne transport sector, throughout the EU. Recently, the major ship owning companies (e.g. Maersk, CMA CGM) joined the partnership in the broader discussions on RD&I and the transition towards zero-emission waterborne transport. This is a step change concerning the involvement of the broader sector. This reinforced cooperation will ensure that the technologies developed are in accordance with customer needs and will have a quick(er) market roll-out.

SYNERGIES: STORY 2

Another synergy that is building up concerns the cooperation of ZEWT with other partnerships, in particular Clean Hydrogen and BATT4EU. An MoU had recently been signed between private associations (members of both partnerships) with the former, and another MoU is under discussion with the latter. Moreover, frequent exchanges between the ZEWT and Clean Hydrogen representatives regarding the next calls for hydrogen-related projects for waterborne transport are taking place regularly. The overall aim is to establish a strong cooperation between the three partnerships, ensuring strong RD&I support for waterborne transport research and avoiding duplications.

SYNERGIES: STORY 3

The members are also working on synergies with other EU funding programmes, particularly the Innovation Fund. This is seen as an essential tool to help bring ZEWT's results to market. Several actions have already been taken in this direction by the partnership, such as organising a dedicated workshop on the new Innovation Fund calls (autumn 2022). Moreover, some of the members have already been preselected for funding from the first Innovation Fund call, showcasing the importance of synergies between the initiatives.

Figure 16: Synergies and related stories, taken from the Biannual Monitoring Report 2022¹⁹

¹⁹ European Commission, Directorate-General for Research and Innovation, Performance of European Partnerships – Biennial Monitoring Report (BMR) 2022 on partnerships in Horizon Europe, Publications Office of the European Union, 2022, <u>https://data.europa.eu/doi/10.2777/144363</u>

8.3. Supplementary evidence: Results

8.3.1. Notes on data collection

The data collection process for the partnership evaluation comprised two phases, incorporating information from both H2020 and the initial phase of the partnerships in Horizon Europe. The primary data collection was concluded by July 2023 (CORDA data in March 2023). Supplementary data from the forthcoming Biennial Monitoring Report 2024 was incorporated in December 2023. Due to the short runtime of the Horizon Europe Partnerships, it is noteworthy to bear in mind that many of the partnerships' activities are still ongoing and have not yet been fully accomplished.

partnership	Nb projects	Nb participations (organizations)	Nb participations (researchers)	Average share female participants	Share female participations	Nb female participations	Nb male participations	Nb non-binary participations
ER (Shift2Rail								
successor)	6	452	152	15%	15%	23	129	0
Batt4EU	50	702	626	25%	25%	155	470	1
Clean Steel	10	102	96	24%	24%	23	73	0
2ZERO	20	420	363	18%	17%	63	300	0
CLEANH2	45	498	417	23%	22%	93	324	0
Built4People	6	132	113	30%	29%	33	79	1
CLEAN-AVIATION	20	492	440	18%	16%	70	370	0
CCAM	18	348	310	24%	22%	69	241	0
CBE	21	293	274	39%	39%	108	166	0
SESAR 3	15	108	103	25%	24%	25	78	0
ZEWT	26	334	306	14%	13%	40	266	0

8.3.2. Gender Data on ZEWT

Figure 17: Participations by type of action/instruments and sectors

8.3.3. Partnership calibre analysis - Pre-Horizon Europe track record of ZEWT researchers on dimensions that are enabling factors for project effectiveness

8.3.3.1. ZEWT researchers' track record on team diversity and societal readiness

- A share of 27% of past publications by ZEWT investigators was written as academicprivate co-publications, much above the two relevant benchmarks. The proportion of these publications that were thematically aligned with one or more SDGs was 79%, well above the three benchmarks. The share of these publications that was highly interdisciplinary was slightly below the benchmark range (9% to 11%), at 6%.
- The average share of authors that were women in ZEWT researchers' prior publications was much below the benchmarks at 19%, against 33% in the next closest benchmark (EU27+UK industry).



Figure 18: Pre- Horizon Europe track record of ZEWT researchers on selected dimensions of diversity and societal readiness of research teams (2017-2021).

Note on Figure 18: DDR10%: share of publications amongst the top decile of publications with most disciplinary diversity in references (i.e., most interdisciplinary) in their subfield, year and document type. DDA10%: share of publications amongst the top decile of publications with most disciplinary diversity in authorships (i.e., most multidisciplinary) in their subfield, year and document type. Source: Scopus, NamSor and eCorda databases processed by Science-Metrix

8.3.3.2. ZEWT researchers' track record on citation impact as proxy for scientific excellence and leadership

Past ZEWT researchers' publications recorded citation impact scores well above the LERU and EU27+UK industry levels on the CDI and HCP10% indicators. For instance, 25% of these publications were amongst the most highly cited of their subfield and year, against 18% for LERU publications. Past publications by ZEWT researchers fell on par with the benchmarks on the ARC indicator.



Figure 19: Pre- Horizon Europe track record of ZEWT researchers on citation impact (2017-2021. 20)

8.3.3.3. ZEWT researchers' track record on online dissemination capacity, including OA and online policy-related uptake

- Past research by ZEWT investigators saw citations from online policy-related documents at a level much above the benchmarks. The share of these publications receiving one or more policy-related citations was 4.5 percentage points above the expected level of 2.6%.
- The share of prior publications by ZEWT researchers with mentions on Wikipedia or in trade or journalistic news outlets, however, as roughly on par with the expected levels. This result placed the publications slightly below the benchmark ranges on both indicators.
- ZEWT investigators' track record on OA publication was weak (49%), below the EU27+UK overall level of 65%.

²⁰ Source: Scopus and eCorda databases processed by Science-Metrix



Figure 20: Figure 19: Pre- Horizon Europe track record of ZEWT researchers on selected online dissemination dimensions (2017-2021) ²¹



Figure 21: Pre- Horizon Europe track record of ZEWT researchers on OA publishing (2017-2021 ²²).

²¹ Source: Scopus, PlumX, Overton and eCorda databases processed by Science-Metrix.

²² Source: Scopus, Unpaywall and eCorda databases processed by Science-Metrix.

8.3.3.4. Notes on interpretation of the partnership calibre analysis (previous Annex)

The KIP monitoring framework1 recommends that scientific outputs such as journal publications or citations towards these publications be evaluated no earlier than two years after the supported projects of interest have been completed. On this basis, as of fall 2023, it is not appropriate, nor is even the necessary data even available, to conduct a bibliometrics evaluation exercise of Horizon Europe journal-publication-mediated scientific outputs.

To measure instead enabling factors of Horizon Europe effectiveness, a so-called calibre analysis can be performed on the prior scientific achievements of researchers involved in projects selected for Horizon Europe funding. Cluster 4 researchers' prior publications (from 2017 to 2021) were retrieved to establish their track records on dimensions such as academic-private co-publication, cross-disciplinarity, or scientific excellence (proxied through citation impact), among others. It was hypothesised that Horizon Europe funding competitions should select, for example, researchers with past experience in conducting cross-disciplinary research, as a mechanism to increase the likelihood that societal impacts will be realised from supported projects.

One important limitation of this approach is that past achievements are no guarantee of continued performance; and that successful funding instruments may in fact succeed in greatly changing researchers' past practices towards improved practices. Therefore, the calibre analysis does not obviate the need for future monitoring and evaluation, but it can provide a baseline against which to measure future developments, and help focus future on areas that will might require particular improvement and/or monitoring.

The calibre analysis of researchers now active in Cluster 4 destinations, interventions areas, action types, or partnerships, has been performed using the same set of indicators as used in phase 1 of this evaluation. They have been applied to the set of 2017-2021 publications by researchers identified as now active in Cluster 5 and Cluster 6 projects, including partnership projects.

To help differentiate these past achievements by Cluster 5 and Cluster 6 researchers, benchmarks have been assembled as follows:

- EU27+UK overall: all 2017-2021 GT publications with at least one EU27 or UK affiliation, but excluding FP-supported articles
- LERU: all 2017-2021 GT publications with at least one affiliation with an institution that is part of the League of European Research Universities, but excluding FP-supported articles
- EU27+UK industry: all 2017-2021 GT publications with at least one EU27 or UK private sector affiliation, but excluding FP-supported articles

By definition, EU27+UK industry researchers have a strong academic-private co-publication score. Therefore, the benchmark should not be used on this specific indicator.

For the three altmetrics indicators used here (citation from online policy-related documents, Wikipedia mentions, and trade and journalistic news outlets mentions), a new normalisation method is being rolled out as part of Phase 2 work. Indeed, for each altmetrics finding, a custom synthetic world level (often referred to as the "expected") is provided. Synthetic world levels are the average level of publications with one or more altmetrics mentions in equivalent (in terms of disciplinary distribution) global reference sets. This normalisation methods differ from normalisation methods commonly used for citation impact indicators to better control for effects associated with sparser altmetrics signal.

8.3.4. Survey results

Concerning the **location of organisations participating in Horizon Europe**, 15 countries were stated by the survey respondents (N=49) most often. The biggest share could be observed for the Netherlands and Spain (each 14.3%), followed by France and Greece (each 12.2%), as well as Germany (8.2%); the lowest share was registered for Bulgaria, Cyprus, and Denmark (each 2%). The relatively low share of respondents from the UK may be attributed to the uncertainties following Brexit and the gradual finalisation of the agreement between the EU and UK.



Figure 22: In which Horizon Europe country is the organisation that you represent located?

The respondents' (N=49) strongest **agreement** (either *strongly agree* or *rather agree*) with statements relating to **administrative and management processes** in Horizon Europe (see table below) could be registered for the guidance documents related to the project implementation being sufficient and clear (65%), the expenditure eligibility requirements being clear (63%), the rules for the calculation of personnel costs being adequate and clear (61%), and the time of the process leading up to the signature of the grant agreement being adequate (58%).

The survey participants least agreed with the support in case of technical issues with the online platform being useful (37%), the online platform being user-friendly (47%), and the EC being sufficiently flexible with respect to changes in the project consortium (49%). It should be noted, though, that for providing technical support for the online platforms, 33% chose "not applicable", which could be understood as these participants not having experienced technical issues. Considering only those responses that did provide an assessment would mean that 55% agreed, 24% remained neutral, and 21% disagreed with the statement that the technical support was useful.



Figure 23: Would you agree or disagree with the following statements about the administrative and management processes in your Horizon Europe project?

In terms of the participants' (N=49) strongest **agreement** (to a *very large* and *large extent*) with statements concerning the **effort needed to prepare and submit a Horizon Europe proposal** could be observed for the needed effort being proportionate to the complexity of the proposed project (69%), the application costs being proportionate to the voume of the funding requested in the proposal, and the efforts needed being proportionate to the majority of project partners involved. The only item that did not gather the majority of

positive responses was the needed efforts being proportionate to the chances of securing HE funding (45% agreement, 23% neutral, 18% disagreement, 12% do not know/NA).



Figure 24: To what extent do you agree with the following statements about the effort needed to prepare and submit your Horizon Europe project?

Regarding the **percentage share of Horizon Europe project budgets being spent on administrative tasks**, the biggest share of participants (38.8%; N=49) estimated they spent between 6-10%, followed by 24.5% having estimated between 4-5%. 4.1% of respondents estimated a share of 16% and above.



Figure 25: In your estimation, what is the percentage share of your Horizon Europe project budget that is spent on administrative tasks (e.g. project reporting, project financial management, and similar)?

Concerning the participation or coordination of projects in Framework Programmes prior to Horizon Europe, i.e. mainly Horizon 2020, 42.9% of respondents (N=49) answered that they had been involved as participant, 14.3% as coordinator as well as

participant (in separate projects), and 10.2% as coordinator. Still, 32.7% stated that they had not been involved prior to Horizon Europe, which would mean they are newcomers to the Framework Programmes.



Figure 26: Before your current Horizon Europe project, have you personally participated/coordinated previous Framework Programme (Horizon 2020) project(s)?

A large majority of respondents (85%; N=40) did not apply for any **additional funding from other sources for the research idea/activities addressed in their HE project**. 10.0% applied for public national or regional funding, 2.5% applied for support from a co-funding arrangement (third countries only) and another 2.5% applied for private funding.



Figure 27: Have you applied for any additional funding for the research idea/activities addressed in your Horizon Europe project?

When it comes to activities planned in a project that are implemented in collaboration with projects funded under other Horizon Europe programmes or clusters, 51.9% of respondents (N=27) stated as answer of this multiple-choice question that they did not have any planned. That said, Pillar II registered the highest share of respondents who stated to

having planned joint activities, i.e. 48.1% for Cluster 5 and 3.7% for Cluster 4. In Pillar I, Research Infrastructure, Marie Sklodowska-Curie and the European Research Council were each mentioned by 3.7% of respondents.



Figure 28: Are there any activities planned in your project that are implemented in collaboration with projects funded under other Horizon Europe programmes or clusters (this could include mutual conferences, joint dissemination activities, workshops, joint public Regarding the question if the respondents' (N=43) project was a **continuation of research activities carried out under previous Framework Programmes or other funding schemes**, 65.1% answered no, that their project was not a follow-up or continuation; followed by 14% who stated that they did not know, perhaps indicating that they had not been personally involved in prior efforts. 32.6% of responses stated that their HE project was a continuation of research, i.e. either under Horizon 2020 (14%), under a national/regional funding scheme (11.6%), under FP7 grants (4.7%), or under other European funding schemes (2.3%).



Figure 29: Is your Horizon Europe project a continuation of research activities carried out under previous Framework programmes/other funding schemes? (in terms of being based on the work carried out in the past research project). If yes, please specify which programme

Regarding the **extent to which their HE project responded to the needs of the survey participants' organisation**, the majority (66%; N=49) agreed that it helped to develop sustainable solutions contributing to a green transition. Only 45% stated that their project helped reduce the environmental impact of their products, processes, or services; 27% remained neutral; 8% disagreed; 20% either did not know or found the question did not apply.



Figure 30: To what extent does your Horizon Europe project respond to the following needs of your organisation?

In terms of **outputs having been produced by or being the likely result of their HE project**, the biggest share of the respondents (75.6%; N=45) indicated testing, demonstration and piloting as answer to this multiple choice question; followed by research publications (73.3%), and prototypes (66.7%). A somewhat lower share also stated new or improved products, services (46.7%); new large-scale datasets/data produced (46.7% as well); or new or improved tools, methods, or techniques (44.4%). Despite being a horizontal aspiration across HE, social innovation – in terms of tools, guides, or strategies – was mentioned by a mere 11.1% of respondents.



Figure 31: Please indicate which of the following outputs have been produced/are likely to result from your Horizon Europe project (please select all applicable answers):

Concerning **respondents'** (N=45) **HE project having achieved or being likely to achieve specific results** to a very large or large extent, 86% indicated the development of sustainable solutions contributing to a green transition; 63% strengthening relationships with leading partners in Europe; 54% each improving the skills, knowledge, and competencies of researchers and well as improving the career prospects of researchers; another 45% indicated an enhanced capacity to test, demonstrate, and prototype new technological developments, and another 45% mentioned the development of policy-making and standards-setting measures as a result of their project. Only 23% of respondents believe that their project is contributing to emerging areas of science and technology.



Figure 32: To what extent, if at all, has your Horizon Europe project achieved/is likely to achieve the following results:

In terms of **barriers and challenges faced during project implementation** to a very large or large extent, 17% of respondents (N=41) suffered from the Covid-19 pandemic (and another 12% to some extent), 12% from a lack of administrative support within their organisation (and another 22% to some extent), and 10% from having received insufficient funding (and another 22% to some extent). The least concern was registered for the withdrawal of one or more consortium partners (only 6% to a very large, large, or some extent), as well as the emergence of competing solutions outdating the respondent's project (7% to a very large, large, or some extent).



Figure 33: To what extent have the following barriers constituted challenges when carrying out your project?

In terms of **foreseen exploitation activities**, 48.8% of respondents (N=41) indicated developing, creating, manufacturing, and marketing of a product or process, 39% the use of results for academic purposes, and 26.8% creating and providing a service. Notably, 14.6% of respondents did not know whether or not their project had any foreseen exploitation activities, or found that the question did not apply to their project; another 12.2% stated that no such activities were foreseen.



Figure 34: Are there any exploitation activities (e.g., using project results for commercial purposes, to tackle societal problems or in policymaking) foreseen as a part of your project? Please select the relevant types of exploitation activities foreseen:

Comparing Horizon Europe to national and/or regional research funding opportunities, 73% of respondents (N=37) agreed (to a very large or large extent) that the former involved a higher level of competition than the latter. Conversely, only 8% agreed that HE provided no additional benefits compared to the national/regional support. 68% of respondents agreed that HE provided more international mobility opportunities for researchers, and another 68% agreed that it provided a higher amount of funding.



Would you agree or disagree that, compared to the research funding available to you at national and/or regional level, Horizon Europe:

Figure 35: Would you agree or disagree that, compared to the research funding available to you at national and/or regional level, Horizon Europe:

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