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LASTING
POWERED BY WATERBORNE

D 1.3 Report on opportunities for both public and private entities to engage in RD&I activities, as well as the deployment of their results, to identify gaps and to draw measures to be taken to address these gaps

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List of Acronyms

AGN	European Agreement on Main Inland Waterways of International Importance
BATT4EU	Industrial Battery Value Chain Partnership
CAPEX	Capital Expenditures
CDTI	Center for Industrial Technological Development (Centro para el desarrollo tecnológico industrial), Spain
CEF	Connecting Europe Facility
CEMT	European Conference of Ministers of Transport
CESNI	Standards of the European Committee for drawing up standards in the field of inland navigation
DG	Directorate-General
DR	Danube Region
EC	European Commission
EIC	European Innovation Council
EIG	Economic Interest Grouping
EIS	European Innovation Scoreboard
EIT	The European Institute of Innovation & Technology
ESA	European Space Agency
ETS	EU Emissions Trading System
EU	European Union
EUSDR	European Union Strategy for the Danube Region
FCH JU	Fuel Cells and Hydrogen Joint Undertaking
GHG	Greenhouse gas
H2020	Horizon 2020 (European dedicated funding programme supporting RD&I covering the financial period of 2014-2020)
HEU	Horizon Europe (European dedicated funding programme supporting RD&I covering the financial period of 2021-2027)
Interreg	Interregional and cross-border cooperation, or European Territorial Cooperation (ETC) programme
IWT	Inland Waterways Transport
KIC	Knowledge and Innovation Communities (of the EIT)
KPI	Key Performance Indicator
LIFE	L'Instrument Financier pour l'Environnement (FR)
MFF	Multi-annual Financial Framework
MSCA	Marie Skłodowska-Curie Actions
NGO	Non-governmental organisation
NOx	Nitrogen Oxides Emissions
NRMM	The European regulation 2016/1628 for the 'Non-Road Mobile Machinery'
NST (2007)	Standard goods classification for transport statistics
OECD	Organisation for Economic Co-operation and Development
OPEX	Operating Expenditures
RD&I	Research, Development & Innovation of new or substantially improved products, services or processes
rkm	River Kilometre
rpm	Rotations per minute

SCR	Selective Catalytic Reduction
TRL	Technology Readiness Levels
UNECE	Inland Transport Committee of the United Nations Economic Commission for Europe
ZEWT cPP	Zero Emission Waterborne Transport co-programmed Partnership

Table 1: List of acronyms

Disclaimer

The present disclaimer has been elaborated jointly by Pro Danube Management, Fundación Valenciaport and Stichting Projecten Binnenvaart.

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This deliverable has collected first-hand information from representatives of the European waterborne transport sector via two main instruments, i.e. a questionnaire as well via bilateral interviews. In this respect, with respect to the data collected, the following clarifications shall be considered:

- The lists of findings are non-exhaustive lists, therefore the input presented might not reflect the entire actual status of the entire European waterborne transport sector.
- There are diverse personal opinions leading to sometimes contradicting findings.
- The conclusions reflect the views of the industry representatives as they have been expressed via the questionnaire & during the bilateral interviews.
- Few content related mistakes have been identified in the answers received, which had to be corrected/eliminated.
- Data clearing for the present report has been processed by the LASTING project team.

As regards the developed EU project database, the following clarifications shall be considered:

- The EU project database generated in the framework of the LASTING project has been generated in a complex process of compiling data available from various official and non-official sources. In terms of content there may be unintentional omissions or missing information for some projects that may be framed in the waterborne sector. Inaccuracies in the information may be due to the availability of information from the sources as well as in the processing and treatment of the information. In addition, information not included in the sources at the time of data extraction has been completed where feasible.
- The database includes additional information useful for the project in relation to the maturity of technologies, innovation trends sorted out according to a format understandable by the Waterborne sector. The exercise of filling in this information has been guided by criteria of transparency, availability of the information, analyst's perception

of the information, etc. The interpretation of the data by different analysts may differ in whole or in part depending on the pre-established objectives in compiling the database and may not accurately reflect the reality of the waterborne sector as a whole.

Executive Summary

Research, Development and Innovation (RD&I) are the key drivers of productivity and hence of prosperity and growth. Two-thirds of the EU economic growth derives from RD&I, accounting for 15% of all productivity gain in Europe[1].

On 21 June 2021, the European Commission released the European Innovation Scoreboard (EIS) 2021, which shows that Europe's innovation performance continues to improve across the EU. According to the EIS, innovation performance has increased by 12.5% on average since 2014.

The present report aims to **present first-hand information on RD&I activities collected from waterborne transport sector representatives** by means of a dedicated survey and bilateral interviews, as well as reflects on the effectiveness of RD&I facilitation mechanism by the previous financial frameworks in the timespan of 2010-2020.

Also, a significant part of this report reflects on the **new EU financial framework (2021-2027)** with its funding & financing opportunities dedicated to supporting RD&I activities in the waterborne transport sector, as well as **national schemes** of Austria, Netherland, Belgium and Spain (4 countries represented in the project consortium).

Moreover, to collect feedback from previous experiences of relevant industry representatives having used/using EU funding & financing opportunities, **a survey** has been prepared by the LASTING project consortium partners which has been circulated within the community of more than 3.000 stakeholders (ports, shipping companies, technology companies, research organisations, education & training institutions, consultancies, NGOs, etc.), that have been selected by the project partners due to their relevancy & involvement in the waterborne transport sector. Specific questions (see **Annex 1**) in line with the scope of Task 1.3 have been included in this dedicated survey and have returned valuable input which has been reflected in the following chapters of this report (chapters 2,3,4,5). This input has been analysed and presented with the support of visual elements such as charts and graphs, in relation to the topic it precedes, following the red thread of this report. The input has been included in this report under the title of "Findings from the questionnaire", as follows:

- In relation to Europe's main research programmes (chapter 2.5);

[1] EARTO Press Release: Call for the European Parliament to Become the Champion of EU RD&I Investments, https://www.earto.eu/wp-content/uploads/EARTO-Press-Release-Call-for-the-EP-to-Become-the-Champion-of-EU-RDI-Investments-Final.pdf

- In relation to the awareness about other funding opportunities (chapter 2.8);
- In relation to the bottlenecks for participation in RD&I activities (chapter 3.1);
- In relation to the validation of identified bottlenecks (chapter 4.7).

Interviews have been conducted with various stakeholders that have specifically expressed their interest by means of the survey to take part in further feedback giving sessions. Dedicated questions in relation to the needs of the waterborne transport sector in Europe, technology challenges, the use of research management information services/systems, attractive EU funding programmes, participation in H2020/HEU/CEF II projects have been reflected upon. Conclusions arising from these interviews are available in chapter 5.

Together with project partners Fundación Valenciaport and Stichting Projecten Binnenvaart, **a database of more than 500 EU-funded projects** dedicated to waterborne transport and covering a timespan of 10 years has been analysed, measuring their effectiveness based on specific indicators as defined by the project consortium. Main findings can be retrieved in chapter 5.

The topic of **barriers identification** (in the sense of bottlenecks/gaps experienced by the waterborne transport sector to engaging in RD&I activities in Europe) is also presented in detail. Validation of possible measures & recommendations for reducing/eliminating these barriers have been conducted together with the participating industry representatives

This report ends with a chapter dedicated to conclusions, which highlights recommendations for more efficient and supportive procedures for financially supported projects. It is important to consider all phases within the lifecycle of RD&I projects, from project development and application processes, to the execution and the reporting phase. **Overall, easier access to support mechanisms including customised information provision to the sector can engage more companies to participate in research activities in the future.**

1. Introduction

1.1 The LASTING Project

Considering the diversity of the waterborne transport sector, its geographical scope, the international dimension and the challenges and opportunities upfront, LASTING (Let's go for Waterborne Transport Research – Broadening engagement and increasing impact) will broaden engagement of the broader waterborne transport sector in European RD&I activities, by developing a communication strategy, and implementing a long-lasting communication campaign beyond the lifetime of this project, ultimately increasing, stakeholder engagement in the sector and thereby increasing impact of European waterborne transport RD&I.

The communication strategy, and thereby the campaign will be based on clear key performance indicators (KPIs) set at the starting point of LASTING, jointly developed with the relevant European Commission Services and the broader waterborne transport sector. The achievement of the KPI's will be measured at fixed intervals, to ensure that the final communication strategy and the campaign will be fit-for purpose and ready for roll-out. An essential element of the communication strategy will be the development of a plug-and-play system for participation in European, national or regional strategic maritime and/or inland waterway transport events. In the framework of LASTING, the plug-and-play system will be tested at a number of occasions, to ensure the system is fit-for-purpose.

In addition, high quality dissemination materials (such as flyers and banners) and templates will be delivered. There will be a main focus on the use of digital tools for dissemination purposes, to ensure that the communication efforts of the waterborne transport community will easily follow the concept launched in the framework of LASTING. Finally, yet importantly, the Waterborne Technology Platform will take over the communication strategy and campaign after the lifetime of LASTING and will ensure a durable implementation of the concepts and materials developed in the framework of the project.

LASTING is coordinated by SEA Europe, counting with the participation of a total of seven partners from four EU countries.

Figure 1: LASTING Consortium Partners

LASTING is funded by the European Commission research and innovation programme Horizon 2020, with an investment of 1,3 million Euro over the course of 36 months, starting in January 2021.

1.2 Introduction to Task 1.3: Opportunities for participation in research and deployment of their results

At the heart of Europe's development is the need of fostering RD&I to create smart and sustainable growth. Research, development, and innovation activities can offer solutions to overcome the current challenges that Europe is facing as a whole, such as energy security, climate change, environmental protection, demographic developments, etc. With waterborne transport sector being a crucial enabler, which can contribute to reinforcing Europe's global position in fostering innovation, it is of utmost importance to investigate which are the necessary preconditions to create a favourable environment in this sense.

Under the lead of Pro Danube Management, Task 1.3 aims to identify opportunities for public and private entities **to engage in RD&I activities and to deploy their results**, while at the same **reflecting on bottlenecks and proposing solutions** to overcome these.

From a financial perspective, the European Union possesses key funding opportunities to support research and innovation in the field of waterborne transport such as: the European Research & Innovation Framework Programme, the European Strategic Investments Programmes, the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the Cohesion Fund within the Cohesion policy.

This report includes, based on **desk research**, a non-exhaustive up-to-date picture of several sources of EU & national funding & financing programmes for the implementation of RD&I actions in the field of waterborne transport. It includes information on various European programmes such as Horizon Europe, LIFE, Recovery and Resilience Fund, Innovation Fund, CEF as well as on dedicated national programmes and EU backed financing options.

As previously mentioned, the present report has collected first-hand information from representatives of the European waterborne transport sector via two main instruments, i.e. a **questionnaire** as well via **bilateral interviews**.

In terms of **results deployment**, the current report relates this aspect to three indicators which have been used in relation to the projects' database analysis (collection of 565 waterborne transport related projects) – i.e. (i) share of follow-up projects, (ii) project awareness & communication channels used, (iii) technology readiness level above 7.

Technology Readiness Levels (TRLs)

To identify the stage of innovation for different technologies, the concept of Technology Readiness Levels (TRL) can be applied.

Within the European Union and its preceding support programme for research and innovation activities, Horizon 2020, TRL was defined within the "HORIZON 2020 –WORK PROGRAMME 2014-2015" Annex G "Technology readiness levels (TRL)" as following:

- TRL 1: basic principles observed;
- TRL 2: technology concept formulated;
- TRL 3: experimental proof of concept;
- TRL4: technology validated in lab;
- TRL 5: technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies);
- TRL 6: technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies);
- TRL 7: system prototype demonstration in operational environment;
- TRL 8: system complete and qualified;
- TRL 9: actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)[2].

In regards of grants for innovation and research activities, it is stated in the last Horizon 2020 work programme (2018-2020)[3] that funded projects should cover a wide range of activities across the innovation cycle, including different TRL levels. However, it was mentioned that "grants shall not be awarded for actions where activities go above TRL8". The same threshold is also applied within the Horizon Europe regulation.[4]

In addition, there is also a relevant reference towards the Organisation for Economic Co-operation and Development (OECD) definitions regarding Technological Readiness Level within the Horizon Europe draft regulation, which can be seen in detail in the following figure. The OECD description characterises the transition of technologies starting from basic research to development and demonstration and finally the stage of early development.

[2] European Commission, HORIZON 2020 –WORK PROGRAMME 2014-2015" - Annex G: https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf
[3] https://ec.europa.eu/research/participants/data/ref/h2020/wp/2018-2020/main/h2020-wp1820-intro_en.pdf
[4] European Commission, COM/2018/435 final: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018PC0435

Stage	Description of Activity
TRL 1-3 Basic Research	Activity driven by a desire to broaden scientific and technical knowledge, and is not explicitly linked to industrial or commercial objectives. It typically includes investigating the underlying foundations of phenomena and observable facts, and typically takes place almost entirely in the academic community.
TRL 3-5 Development	Research with a more direct commercial application, driven both by scientific enquiry (with a degree of public good in the outcomes) and commercial opportunity (with research areas driven by expertise in spotting market opportunity), and is seen as an opportunity to build and develop links between industry and academia increasing the likely success and pull through of ideas from the academic community.
TRL 6-7 Demonstration	Large-scale pre-commercial demonstration of technologies, designed to test and improve longer term operational reliability, develop and improve full scale designs, establish and reduce operating costs and take the technology to a stage where the technology becomes a potential commercial investment. Work is undertaken by the private sector, typically with some academic involvement.
TRL 8-9 Early deployment	Technologies have been shown to work on a large scale, but are not yet competitive in the market, require a policy and market framework that supports their deployment. Development is undertaken by companies in the private sector.

Source: Frontier Economics (2009), Table 3, p. 10; based on ETF (2008), p. 13.

Figure 2: Description of Technology Readiness Levels (TRL) - OECD[5]

[5] OECD, Environmental and Eco-Innovation: Concepts, Evidence and Policies Joint Meetings of Tax and Environment Experts (COM/ENV/EPOC/CTPA/CFA(2009)40/FINAL): http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?doclanguage=en&cote=com/env/epoc/ctpa/cfa(2009)40/final

2. Opportunities for participation in RD&I activities and deployment of results

Continuous research and development in shipbuilding, ship equipment (e.g. engines, alternative propulsion), innovations in logistics (loading units, transhipment equipment and digitalisation of logistics processes), information services but also infrastructure maintenance is needed to maintain waterborne transport as a competitive transport mode. Funding and financing options play an important role in facilitating these policy objectives and support stakeholders in adopting innovative and green technologies and smart, automated and connected waterborne logistics.

This chapter includes overview information on the most important ~~various~~ European programmes for RD&I activities in waterborne transport, such as Horizon Europe, LIFE, the Recovery and Resilience Fund, the Innovation Fund, CEF as well as on some of the main national programmes; it also presents EU-backed financing options supporting RD&I activities that are potentially applicable for the waterborne transport sector. The desk research rolled out in the LASTING project revealed an information gap, that, apart the specifically-dedicated programmes, it is difficult to comprise a clear indication of what can be funded for the waterborne transport sector overall, and how much funding is, in principle, available for the sector.

2.1 EU dedicated funding programmes for RD&I

The following information shall provide an overview over the funding and financing opportunities for Research, Development & Innovation (RD&I) activities. Most of the programmes are specifically designed in a way that they (their calls for proposals) are correlated to the stage of innovation and deployment in order to implement the applicable European policies. In the following paragraphs an overview of the EU budget for the period 2021 to 2027 is provided and the relevant programmes are highlighted and concisely described.

The Multiannual Financial Framework (MFF) provides a long-term budget of €1 211 bln (€1 074.3 bln in 2018 prices) for the time period 2021-2027. In order to support the recovery from the COVID-19 pandemic, an additional budget of €806,9 bln (€750 bln in 2018 prices) has been decided for the recovery instrument Next Generation EU (NGEU). The package will support the Member States (MS) via grants and loans, based on capital raised on the financial markets.

Both foreseen framework budgets will lead together to €2 018 bln (€1 824.3 bln in 2018 prices), out of which at least 30 % shall support the EU climate objectives. Horizon Europe, the main research and innovation programme, will also benefit from the additional available budget via a significant increase. [6] The following two figures provide an overview over the EU Multiannual Financial Framework and the Next Generation EU budget in current and 2018 price.

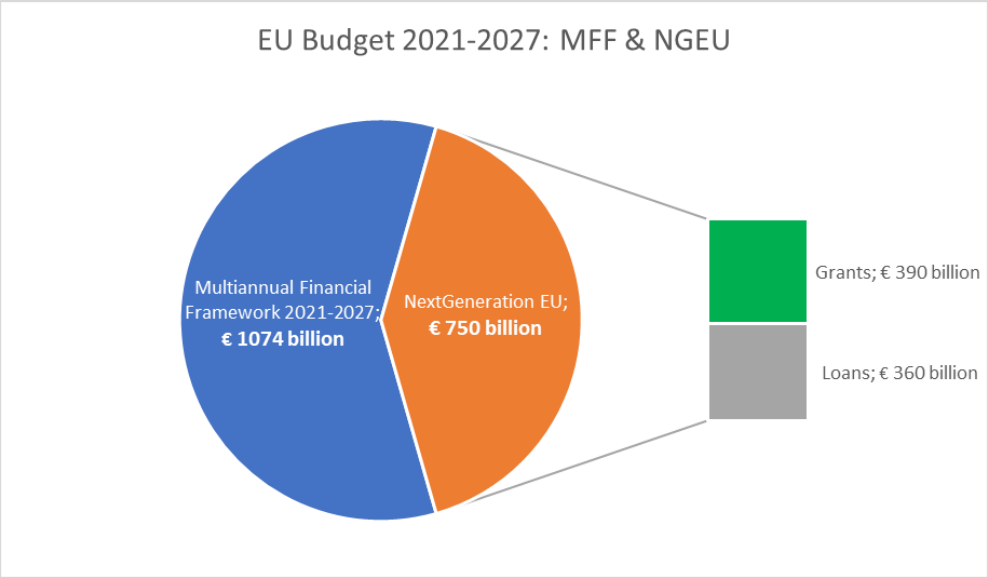


Figure 3: EU Multiannual financial framework 2021-2027 and Next Generation EU; 2018 prices

[6] European Council, Multiannual financial framework for 2021-2027 adopted (Dec 2020): https://www.consilium.europa.eu/en/press/press-releases/2020/12/17/multiannual-financial-framework-for-2021-2027-adopted/

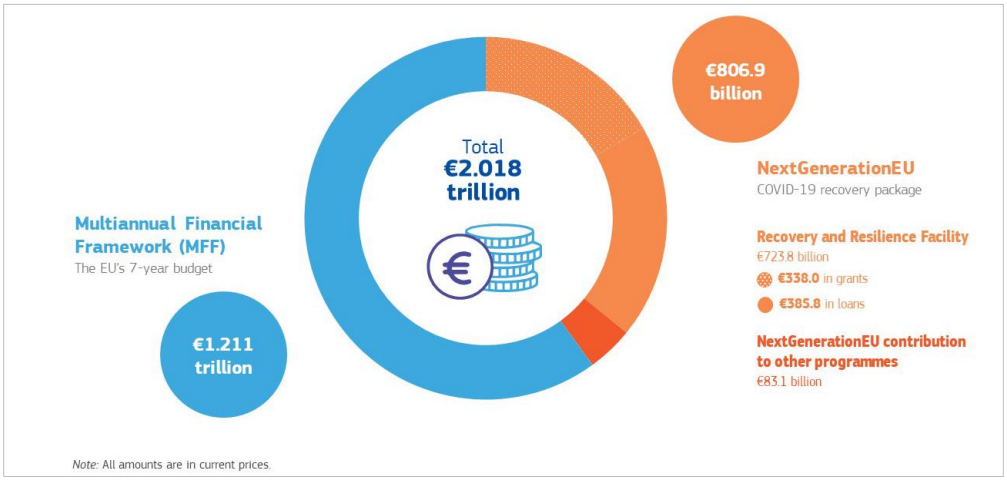


Figure 4: EU Multiannual financial framework 2021-2027 and Next Generation EU; current prices

In the field of digitalisation, several programmes will provide additional resources for the digital transition, which will be complemented by the new Digital Europe Programme, supporting new digital technologies in order to improve Europe's competitiveness and to ensure "a wide use of digital technologies across the economy and society"[7].

In the following chapters the relevant financial support programmes for research and deployment in the fields of green and clean and connected and automated waterborne transport will be analysed. A comprehensive overview over the shares within the Multiannual Financial Framework 2021-2027 and Next Generation EU can be found in detail in Annex 2 (cf.pp 86), under the following link as well as via an overview based on the priorities in the following **Figure 5**:

[7] European Commission, Europe investing in digital: the Digital Europe Programme (Feb 2021): https://ec.europa.eu/digital-single-market/en/europe-investing-digital-digital-europe-programme

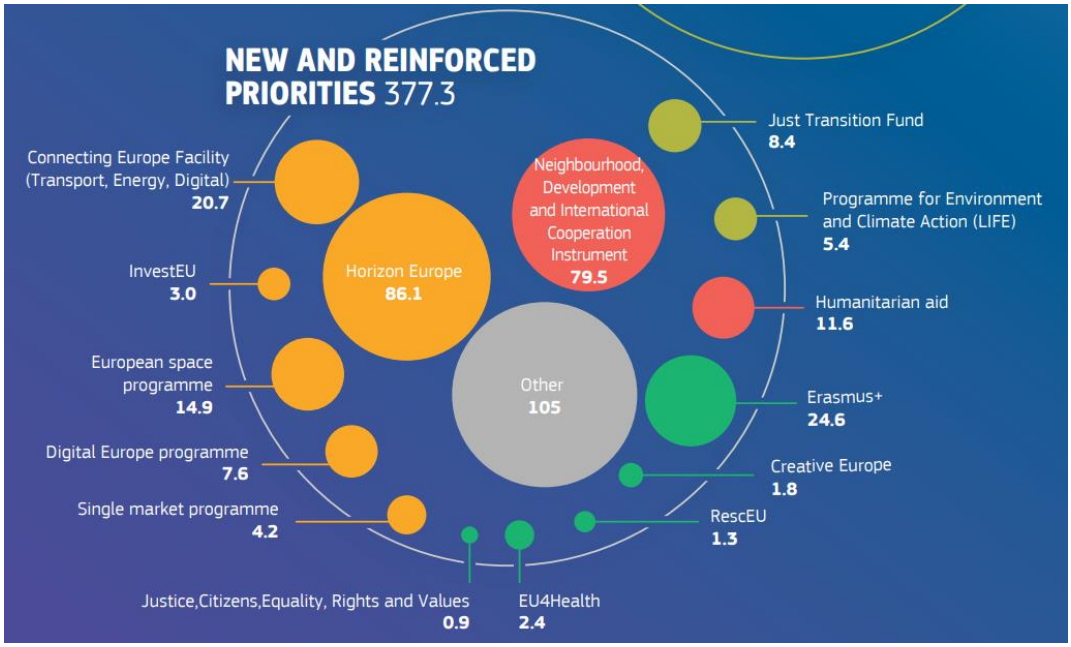


Figure 5: MFF and NextGenEU New and Reinforced Priorities (amounts expressed in billion EUR)[8]

The document is mostly based on the knowledge as of September 2021, as most of the EU funding programmes have been adopted in early 2021 and apply retroactively from the beginning of 2021. All figures within the following elaborations are expressed in current (November 2020) or 2018 prices, represent the same amount in nominal and in real terms. Current prices are calculated by applying annually a fixed deflator of 2% to the amounts in 2018 prices. The 2018 prices are laid down in the proposed regulations and can be used for comparisons.

Considering the relevance of the funding programmes for potential RD&I activities in the transport sector, a communication from the EC on "Europe's moment: Repair and Prepare for the Next Generation" demonstrates its importance: "To help create more jobs, there will also be a focus on accelerating the production and deployment of sustainable vehicles and vessels as well as alternative fuels. The Connecting Europe Facility, InvestEU and other funds will support the financing of the installation of one million charging points, clean fleet renewals by cities and companies, sustainable transport infrastructure and enable the shift to clean urban mobility."[9]

[8] European Union (2021): The EU's 2021-2027 long-term Budget and NextGenerationEU; facts and figures
[9] European Commission, Communication "Europe's moment: Repair and Prepare for the Next Generation": https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590732521013&uri=COM:2020:456:FIN

2.1.1 Horizon Europe

Horizon Europe, the successor of Horizon 2020, is the main research and innovation framework programme running from 2021-2027 (abbreviated as HEU).

The European Union´s key funding programme for research and innovation has the goal to strengthen the EU's scientific and technological bases and the European Research Area (ERA), to boost Europe's innovation capacity, competitiveness and jobs and to deliver on citizens' priorities and sustain our socioeconomic model and values.

According to the available information, the programme will have a budget of around €95.5 bln for 2021-2027; including €5.4 bln from NextGenerationEU to boost our recovery and make the EU more resilient for the future. The targets will be tackled via the programme's implementation structure, visualised within **Figure 6** and based on three main pillars:

- Pillar 1 "The Excellence Science" **(€25 billion);**
- Pillar 2 "Clusters - Global Challenges & European Industrial Competitiveness" **(€53.5 billion);**
- Pillar 3 "Innovative Europe" **(€13.6 billion).**

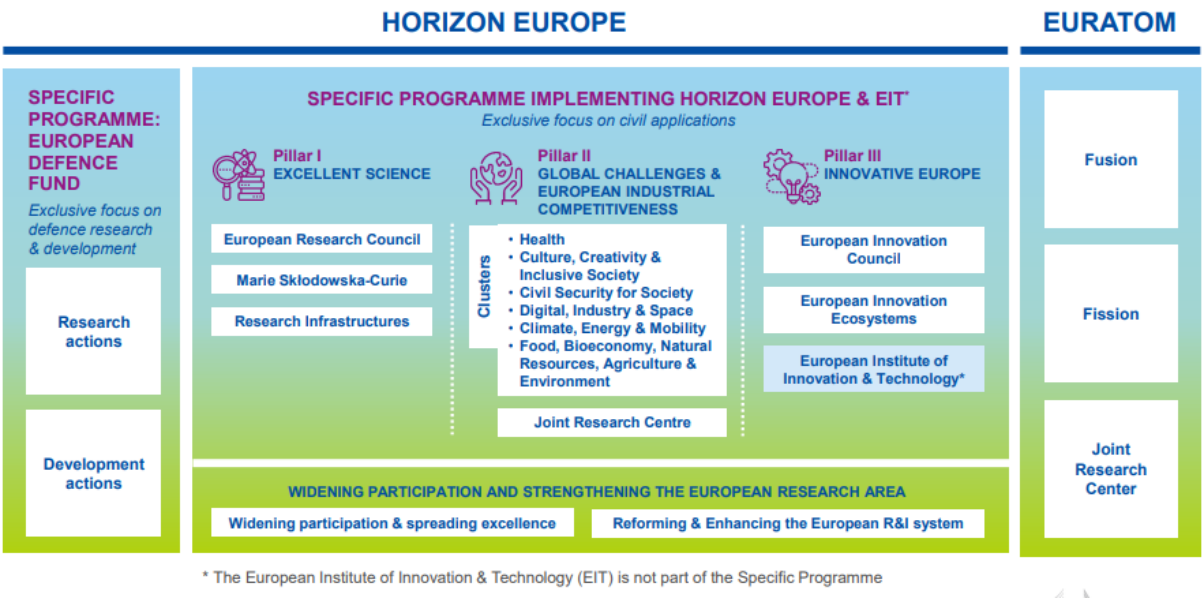


Figure 6: Horizon Europe structure[10]

[10] Horizon Europe, the EU research and innovation programme (2021-27) Factsheet

According to the proposed regulation "establishing Horizon Europe"[11], the Programme may reimburse up to 100% of total eligible costs of an action (project), except for:

a) innovation actions: up to 70% of the total eligible costs, except for non-profit legal entities where the Programme may reimburse up to 100% of the total eligible costs;
b) programme co-fund actions: at least 30% of the total eligible costs, and in identified and duly justified cases up to 70%;

Based on the Horizon Europe Strategic Plan for the first four years (2021-2024), the first work programmes (2021-2022) for Horizon Europe are available to view and download on the Funding and Tenders Portal.[12] The Strategic plan will contain the following points:

- key strategic orientations for research and innovation support and their targeted impact;
- European partnerships (co-funded and co-programmed);
- Missions;
- areas of international cooperation;
- specific issues like social sciences and humanities, gender, and the role of key enabling technologies[13].

Although in Pillar I no dedicated funding for the waterborne transport sector has been identified, part of its components can still be relevant for waterborne-related activities.

The first component that we will look a bit more closely at is the Marie Skłodowska-Curie Actions (MSCA), the EU flagship programme for doctoral and postdoctoral training, equipping researchers with new knowledge and skills through mobility across borders and exposure to different sectors and disciplines. They fund the development of not just doctoral and postdoctoral training programmes, but also staff exchange and collaborative research projects, and are mainly dedicated to universities and research centres[14]. Past MSCA have already funded waterborne-related topics, and this is expected to continue throughout HEU. No specific funding for the waterborne transport sector is allocated out of

[11] European Commission, Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing Horizon Europe – the Framework Programme for Research and Innovation, laying down its rules for participation and dissemination: https://eur-lex.europa.eu/resource.html?uri=cellar:b8518ec6-6a2f-11e8-9483-01aa75ed71a1.0001.03/DOC_1&format=PDF

[12] European Commission, Horizon Europe work programmes: https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/horizon-europe-work-programmes_en

[13] European Commission, Horizon Europe: https://ec.europa.eu/info/horizon-europe_en

[14] Marie Skłodowska-Curie Actions | European Commission (europa.eu)

the total €6.6 bln earmarked for MSCA, consequently the relevant calls and funding support of the MSCA need to be evaluated on a case by case basis.

Pillar II is the key part of HEU in respect to RD&I funding for the waterborne transport sector, as it comprises the most relevant funding opportunities (calls) for the waterborne transport sector, both in terms of content and budget allocation.

Here, the most relevant cluster is Cluster 5 Climate, Energy and Mobility, which has a total allocation of €15.123 bln (including €1.35 bln from NextGenerationEU).

Further, Horizon Europe supports **European Partnerships** in which the EU, national authorities and/or the private sector jointly commit to support the development and implementation of a programme of research and innovation activities. Their goal is to contribute to the achievement of EU priorities, address complex challenges outlined in Horizon Europe and strengthen the European Research Area (ERA).[15] Figure 7 provides an overview of the 49 candidate/approved European Partnerships, out of which some are relevant for the waterborne transport sector.

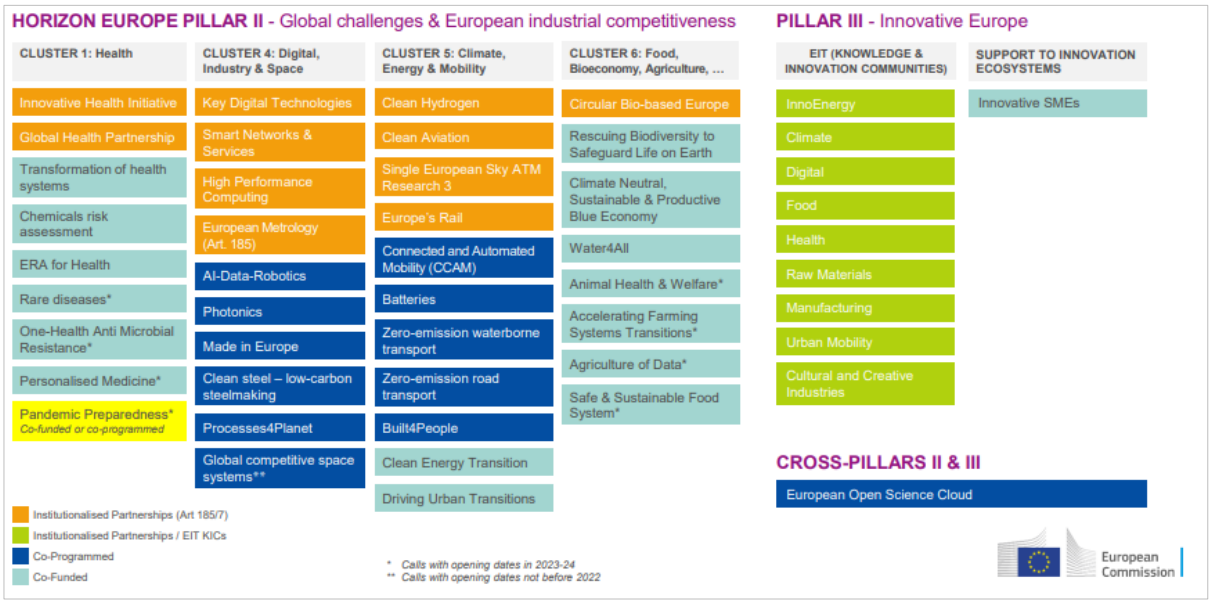


Figure 7: Overview of 49 candidate European Partnerships[16]

[15] European Commission, Horizon Europe: https://ec.europa.eu/info/research-and-innovation/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe_en
[16] European Commission, Horizon Europe - Investing to shape our future: https://ec.europa.eu/info/files/horizon-europe-investing-shape-our-future_en

In regards of the European partnerships **specifically** relevant for the waterborne transport sector, the co-programmed **"European Partnership on Zero-Emission Waterborne Transport (ZEWT)"** is of particular significance and interest.

The ZEWT partnership aims for the EU to lead and accelerate the transformation of maritime and inland waterborne transport to eliminate all harmful environmental emissions (including greenhouse gas, air and water pollutants) through innovative technologies and operation. By 2030 the objective is to develop and demonstrate deployable zero-emission solutions which are applicable for all main ship types and services and will enable achievement of zero-emission waterborne transport by 2050.[17] In addition, the ZEWT will:

- *Develop and demonstrate deployable technological solutions which will be applicable for the decarbonisation and the elimination of other harmful emissions of main ship types and services;*
- *Facilitate 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;*
- *Facilitate the development and implementation 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 by 2030 at the latest;*
- *Facilitate the uptake of innovative zero-emission waterborne transport technologies and solutions within the European waterborne sector, supporting economic growth and European employment.* [18]

The ZEWT Partnership ensures an earmarked EU contribution of €530 mln for the waterborne sector between 2021-2030, complemented by the private contributions of approx. €3.3 bln throughout this period.

Among the other EU partnerships, two of them are of particular importance to the waterborne sector, both placed in Cluster 5 as well.

The first is **the institutional Clean Hydrogen Partnership**, which is a continuation of the Fuel Cells and Hydrogen Joint Undertaking (FCH JU) from H2020. With €1 bl of public funding, complemented by an

[17] European Partnership on zero-emission waterborne transport, Draft partnership proposal: https://ec.europa.eu/info/sites/info/files/research_and_innovation/funding/documents/european_partnership_for_zero-emission_waterborne_transport.pdf
[18] Waterborne, ZERO EMISSION WATERBORNE TRANSPORT: https://www.waterborne.eu/partnership

equal amount from the private sector, this partnership addresses the use of Hydrogen in both the industry and the transport sectors, including waterborne. Some of its future calls are therefore of high importance for the waterborne transport sector. That is why the ZEWT partnership has also signed a Memorandum of Understanding (MoU) with Clean Hydrogen in order to coordinate their actions in the future, in particular for calls that are or can be of relevance for the waterborne sector.

The second is **the co-programmed Industrial Battery Value Chain Partnership (BATT4EU)**. With €925 mln of public funding and an equal amount of private contributions, the partnership will boost research and innovation to develop a variety of differentiated technologies that will result in a competitive, sustainable and circular European battery value chain[19]. Given the importance of electrification and large energy storage capacities in the various segments of the waterborne transport, the cooperation with this partnership is also very important, and some of its call can be of particular interest for the waterborne transport stakeholders. Consequently, at the moment this deliverable is being finalised, the representatives of the ZEWT and BATT4EU partnerships are discussing a MoU in order to coordinate some of their future actions for the benefit of the sectors. Just as in the case of the Hydrogen partnership, one of the main objectives is to ensure that some calls from this partnership are also relevant to the waterborne transport RD&I community.

In addition, waterborne transport-related RD&I topics can also be covered by other calls from Cluster 5. **These calls will cover the topics that are not being dealt with by the aforementioned three partnerships; some of the relevant calls can also be cross-cutting/cross-sectorial**. The relevance and budget of these calls needs to be assessed on a case-by-case basis.

Within Pillar II, relevant calls for the wider waterborne (transport) sector, including the 'blue economy' topic, can also be found within:

- Cluster 3 Civil security for society (€1.596 bln total funding);
- Cluster 4 Digital, Industry and Space (€15.349 bl total funding, including €1.35 bln from NextGenerationEU);
- Cluster 6 Food, Bioeconomy, Natural Resources, Agriculture and Environment (€8.952 bln total funding).

The relevance and funding available will again need to be assessed on a case-by-case basis.

[19] BATT4EU: a new milestone for a more competitive and sustainable eu battery value chain – BATT4EU (bepassociation.eu)

Pillar III, just as Pillar I, also comprises interesting funding opportunities even if no dedicated waterborne section or funding have been identified.

The newly-established **European Innovation Council (EIC)** is of particular importance as it focuses mainly on breakthrough, deeptech and disruptive innovation, targeting especially market-creating innovation. It also pays particular attention through its 'accelerator funding' in supporting SMEs, start-ups and small mid-caps to bridge the financing gap between late stages of research activities and market take-up, to effectively deploy breakthrough, market-creating innovation and scale-up companies where the market does not provide viable financing[20]. With a budget of €10.1 bln for this MFF, the EIC support should leverage other investments of 3-5 times the amount of allocated by the EIC to boost the smaller and newer companies throughout the EU. The relevance and funding of each call should be assessed on a case-by-case basis.

Though it has significant differences in terms of structure and approach, **the European Institute of Innovation and Technology (EIT)** is also a part of HEU. With a total budget allocation of approx. €3 bln, its mission is to bring together organisations from business, education and research, and find innovate solutions to pressing global challenges. The EIT is segmented into seven Knowledge and Innovation Communities (KICs), each comprising leading companies, research labs and higher education stakeholders. A KIC is dedicated to finding solutions to a specific global challenge, and for this it offers a wide range of innovation and entrepreneurship activities: education courses that combine technical and entrepreneurial skills, tailored business creation and acceleration services and innovation driven research projects[21]. The most relevant KICs are in this case the **EIT Climate-KIC** and **EIT InnoEnergy**, though others can also have relevant calls. As for previous HEU funding possibilities, the relevance and funding of the EIT calls need to be assessed on a case-by-case basis.

Applications to the calls for projects from these HEU instruments/sections are subject to the HEU rules. In most cases, the principle of 'minimum three different partners from three countries' applies to form consortia and project proposals; in some cases, the HEU rules allow for project proposals coming from less partners and/or countries, e.g. some calls targeting SMEs. In principle all types of stakeholders can take part in HEU projects, but some call may be restricted to a narrower set of stakeholders (e.g. SMEs).

20 European Innovation Council | European Commission (europa.eu)
21 EIT at a glance | EIT (europa.eu)

In the case of Clean Hydrogen, as with any of the other institutional partnerships, some of the relevant calls may be restricted to members of the partnership alone.

Projects funded within the HEU can support RD&I activities up to TRL 8. The maximum TRL level supported is defined within the text of each call for projects.

As it was the case for H2020 in the previous MFF, HEU is now the main funding instrument for waterborne transport RD&I activities at the EU level, with an unprecedented attention and funding resources dedicated to the sector.

2.1.2 LIFE - Programme for the Environment and Climate Action

The LIFE programme (L'Instrument Financier pour l'Environnement) is setting its targets via funding in the field of environmental and climate actions, based on the objective to "contribute to the shift towards a clean, circular, energy-efficient, low-carbon and climate-resilient economy, including through the transition to clean energy, to the protection and improvement of the quality of the environment and to halting and reversing biodiversity loss, thereby contributing to sustainable development."

The programme **shall close the gap in environmental and climate developments between research activities (Horizon Europe) and large-scale implementation**. Thus, the **LIFE programme is dedicated to TRL 8-9** RD&I and market roll-out, even if calls often do not prescribe TRLs. However**, LIFE funding must not overlap with other EU funding**. Funding will be available via three main types of support elements:

1. Standard Action Projects: develop, demonstrate and exchange innovative methods, integrate best practice solutions and contribute to better environmental governance;
2. (Strategic) Integrated Projects: compliance support tools for catalysing implementation of key environmental plans over large areas;
3. NGO Operating Grants: improving involvement of civil society[22].

The budget of the LIFE programme is implemented through direct management. Funding is disbursed in the form of grants, procurements and prizes.[23] In this MFF, a budget of €5.4 billion will be made available via the following programme structure, into four sub-programmes:

In the field Environment, €3.5 billion will be available:

- Nature and biodiversity: €2.15 billion;
- Circular economy and quality of life: €1.35 billion.

In the field Climate Action, €1.9 billion will be available:

- Climate change mitigation and adaptation: €0.9 billion;
- Clean energy transition: €1 billion.

The co-financing rate will depend on the project type, the standard rate is 55% of the total eligible project costs, which can be enlarged to up to 60%, or 75% in the sub-programme nature and biodiversity. For integrated projects a rate of up to 60% of the eligible costs is foreseen. It is clearly

[22] François Delcueillerie LIFE programme unit, DG ENV, European Commission, "The future LIFE Programme 2021-2027"
[23] European Union (2021): The EU's 2021-2027 long-term Budget and NextGenerationEU; facts and figures

recommended to submit "large ambitious projects" above €500,000. In the case of integrated projects, the project budget is typically around €17 million.[24]

In Q2/2021 the new LIFE Programme´s Calls for Proposals have been opened for:

- Nature and biodiversity;
- Circular economy and quality of life;
- Climate change mitigation and adaptation;
- Clean energy transition;
- Operating Grants for non-profit making entities.

Even if the (sub)programmes mentioned above do not make a specific reference the wider waterborne sector, their general scope is of interest to the sector stakeholders, and the relevance of the calls should be assessed on a case-by-case basis. According to the screening of the **first open grant calls**, the following information has been obtained (non-exhaustive) that is connected to the waterborne sector[25]:

- Circular economy and quality of life: recovery of resources from waste, including end-of-life ships; improve air quality through sustainable mobility other than road transport, including maritime transport, ports, aviation and Non-Road Mobile Machinery (NRMM) mobility; marine and coastal water management;
- Climate Change Mitigation and Adaptation: actions to reduce GHG emissions in sectors not covered by the ETS (zero-emissions mobility & associated infrastructure).

From the descriptions of both the subprogrammes and the first calls, it is clear that LIFE funding is more focused on activities for the wider waterborne sector (e.g. 'blue growth'), for those that are overlapping with other sectors (energy production and infrastructures), or the shore-side activities. However, some calls have or will be addressing the 'core' waterborne transport stakeholders, including on topics that pertain to the ZEWT Partnership. Some past examples: the Zero.Emission.Ships (ZEM/SHIPS) project[26], the LNG Tanker project[27] or the CLean INland Shipping (CLINSH) project. Also, the LIFE calls usually allow proposals from consortia that are below the HEU principle of 'minimum three partners from three different countries'. Even if the LIFE programme is open to basically all types of stakeholders, the topics

[24] European Commission, LIFE Frequently asked questions (FAQs) LIFE; https://ec.europa.eu/easme/en/section/life/frequently-asked-questions-faqs#Q6
[25] LIFE - Calls for proposals (europa.eu) (presentations of the calls).
[26] https://webgate.ec.europa.eu/life/publicWebsite/project/details/2657
[27] https://webgate.ec.europa.eu/life/publicWebsite/project/details/2129

addressed and the often high TRLs required make it more suitable for companies and authorities. Further information can be accessed via the CINEA website[28] and the Funding and tender opportunities portal[29]

[28] https://cinea.ec.europa.eu/life/life-calls-proposals_en
[29] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/life2027

2.1.3 The Recovery and Resilience Facility

The Recovery and Resilience Facility (RRF) is a new instrument to react on the impact of the COVID-19 crisis. It will provide financial support to the Member States and will act as the main pillar of Next Generation EU, with the highest budget share. As mentioned before, the NGEU is based on loans and grants to support the EU countries; RRF provides a total budget of €723.8 bln, comprising the money available for loans (€385.8 bln) and grants (€338 bln).[30]

All member states have developed national recovery and resilience plans, with a focus on the country specific needs and the contributions to the overall EU objectives of the green transition (at least 37 % of the budget shall be allocated for greening activities) and the digital transformation (min. 20 %) as well as to the general EU priorities (boost growth, job creation). "Examples of areas for reforms and investment projects, which can be included in the recovery and resilience plans:

- Digital transformation;
- Smart, sustainable and inclusive growth and jobs;
- Policies for the next generation;
- Health and resilience;
- Social and territorial cohesion;
- Green transition". [31]

The time process and work to be done by the member states and the EC, including a timeline for drafting the plans and implementing the reforms and investments, can be seen in Figure 8.

[30] European Union (2021): The EU's 2021-2027 long-term Budget and NextGenerationEU; facts and figures
[31] European Council, Infographic - Recovery and Resilience Facility (Feb 2021): https://www.consilium.europa.eu/en/infographics/20201006-recovery-resilience-rrf/

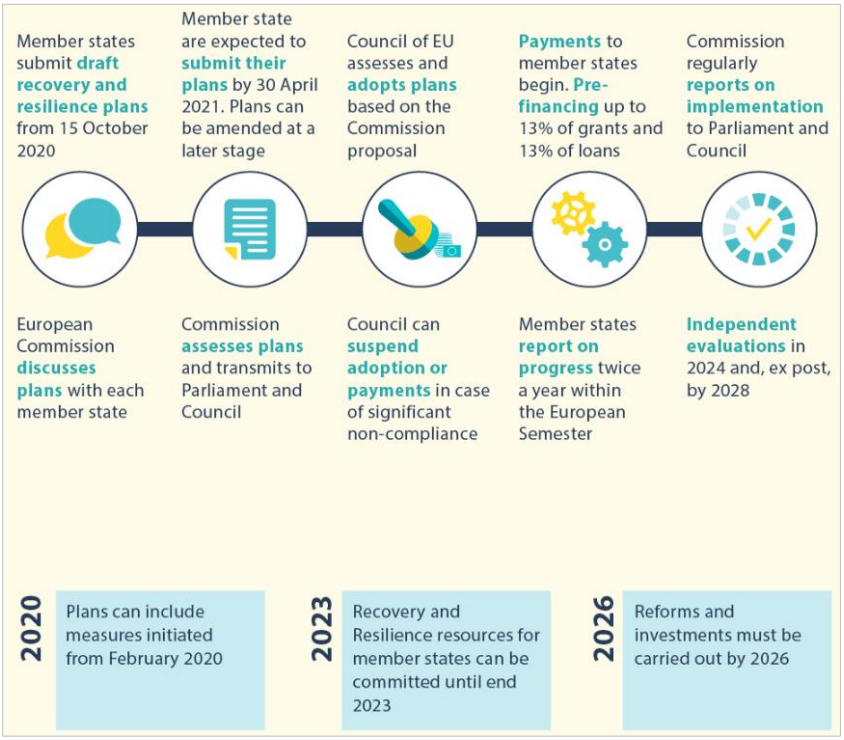


Figure 8: Recovery and Resilience Facility Timeline and work process[32]

The national recovery and resilience plans shall indicate the reforms and investments to be implemented by 2026. Within the following link, there are country specific links from each of the member states, containing the draft or final plans or useful information shared with the stakeholders.

- https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility_en

The majority of this funding will be funnelled via the EU Member-States, and it is therefore at the national level that the spending is decided. It can be used for both investments in mature (infrastructure) projects but also in equipment and facilities that help RD&I activities, including for the waterborne transport sector. **Another direction can be to support the high-TRL investments made with the help of the HEU funds, and bring technologies to the required maturity levels, followed by a potential roll-out at the regional or national level**. Moreover, knowing the directions of funding decided at their national levels in this case, the waterborne transport stakeholders can better plan which RD&I activities funded through internal or other EU sources should be approached in order to: achieve and roll-out relevant solutions quickly, benefit from new technologies and testing facilities.

[32] European Council, Infographic - Recovery and Resilience Facility (Feb 2021): https://www.consilium.europa.eu/en/infographics/20201006-recovery-resilience-rrf/

2.1.4 The Innovation Fund

The Innovation Fund is one of the world's largest funding programmes for the demonstration of innovative low-carbon technologies. The fund shall support innovative technologies on their pathway from concept and pilot status to roll out, via dedicated support in the phase of demonstration. The complementarity (within the development stages) to Horizon Europe, CEF and InvestEU can be seen in the following figure.

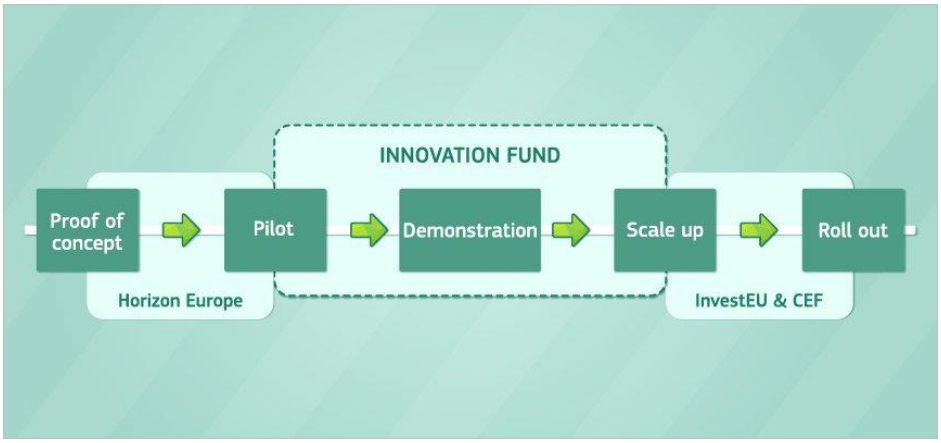


Figure 9: Scope of the Innovation Fund and complementarity to Horizon Europe and CEF / InvestEU[33]

For the time period 2020-2030 around €20 bln (depending on the carbon price) is foreseen to address the commercial demonstration of innovative low-carbon technologies, aiming to bring to the market industrial solutions to decarbonise Europe and support its transition to climate neutrality.

The available budget will strongly depend on the on the carbon price of the EU ETS (EU Emissions Trading System), which is providing the revenues for the fund. In parallel to the Innovation Fund, the EU ETS provides the main long-term incentive for these technologies to be deployed.

The fund will launch calls for small-scale (total CAPEX below €7.5 mln) as well as large-scale projects (above €7.5 mln), focusing on the following thematic fields:

- innovative low-carbon technologies and processes in energy-intensive industries, including products substituting carbon-intensive ones;
- carbon capture and utilisation (CCU);
- construction and operation of carbon capture and storage (CCS);

[33] European Commission, Innovation Fund: https://ec.europa.eu/clima/policies/innovation-fund_en

- innovative renewable energy generation;
- energy storage.

The co-funding rate is up to 60% of the additional capital and operational costs of large-scale projects and up to 60% of the capital costs of small-scale projects. In both categories first calls have been already opened.[34]

Though the waterborne transport sector is not directly nominated among the (main) thematic fields, their description provides the opportunity for the waterborne stakeholders to be included in the targeted activities. Furthermore, in a workshop (June 2019) between WATERBORNE TP and EC DG CLIMA representatives, the latter underlined the fact that **for waterborne transport, co-financing of the use of any carrier of renewable energy will be eligible (e.g. wind energy, renewable hydrogen, renewable ammonia, renewable electricity)**. The description of the calls will provide a clearer idea on which are the opportunities for the waterborne transport segments and their funding allocation.

Consequently, on the 27th of July, the European Commission published the first set of projects (pre-)selected in the framework of the EU Innovation Fund. Out of these, there are four projects that are relevant to the ZEWT cPP and the waterborne transport sector as a whole:

- two smaller-scale projects for a grant: FirstBio2Shipping (First Bio-LNG to marine shipping) and E-PROOF (Integrated Battery Power for MS Piret – E-PROOF – Electric Propulsion for Ferry);
- two larger projects for project development assistance: HYDROGEN EU-ROPAX (Zero-emission vessel powered by a large-scale fuel cell system and green hydrogen) and WAVE (Large sailing cruise ship featuring an innovating wind propulsion technology).[35]

The Innovation Fund is an instrument conceived **to achieve firstly the implementation and market roll-out for the results coming out of HEU, but also from other RD&I activities that have benefitted or not from previous EU funding**. Even if various types of stakeholders could in principle be part of consortia applying to these calls, **the Fund is first of all meant to support companies' investments**.

In the coming years it is expected that waterborne transport will not only continue to benefit from funding possibilities from the Innovation Fund, but that they will increase, given the sector's needs in terms of GHG abatement as well as the inclusion of maritime in the ETS.

[34] European Commission, Innovation Fund: https://ec.europa.eu/clima/policies/innovation-fund_en
[35] EU invests €122 million to decarbonise the economy (europa.eu)

2.1.5 The CEF - Connecting Europe Facility

As a next step after RD&I, the Connecting Europe Facility (CEF) is the main funding programme for infrastructure investments, supporting investments in the trans-European network infrastructure (TEN). The programme is focusing on three sectors: transport, energy and digital services. Based on the overall objectives of the Green Deal, 60% of the CEF envelope shall contribute to climate objectives.

The budget for CEF Transport, relevant for the waterborne sector, is €25.81 bl (including €11.29 bln for cohesion countries). The facility aims to support investments in projects implementing new upgrading existing transport infrastructure in Europe.

CEF has dedicated rules for co-financing rates; the amounts can be increased under special conditions as in the case of applicability to the Cohesion Fund or in the case of cross-border links (the rates may be increased to a maximum of 85% for actions relating to cross-border links). For works and studies in the transport sector the following rates apply:

- For studies, the amount of EU financial assistance shall not exceed 50% of the total eligible cost.
    - *"studies" means activities needed to prepare project implementation, such as preparatory, mapping, feasibility, evaluation, testing and validation studies, including in the form of software, and any other technical support measure, including prior action to define and develop a project and decide on its financing, such as reconnaissance of the sites concerned and preparation of the financial package*
- For works in the transport sector, the co-financing rate shall not exceed 30% of the total eligible cost; may be increased to a maximum of 50%.

The programme and its role within the technology development stage is clearly defined in its proposed regulation: "[…] the Connecting Europe Facility supports large-scale roll-out and deployment of innovative technologies and solutions in the fields of transport, energy and digital infrastructure, in particular those resulting from Horizon Europe; […]"[36]

The main objective of CEF Transport is to facilitate:

> "[…] the completion of both layers of the trans-European transport network: the TEN-T core network by 2030 and the TEN-T comprehensive network by 2050. […] It shall also support the deployment of European traffic management systems for all traffic modes, in particular for air transport and railways, and helps the EU transition towards smart, sustainable, inclusive, safe

[36] Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL establishing the Connecting Europe Facility and repealing Regulations (EU) No 1316/2013 and (EU) No 283/2014; COM/2018/438 final

and secure mobility (for example by establishing a European network of charging infrastructure for alternative fuels). Part of the budget would be reserved for Member States eligible for the Cohesion Fund."[37]

Details on the TEN-T network approach are laid down in the "EU guidelines for the development of the trans-European transport network" (Regulation (EU) No 1315/2013).

The importance of the CEF funding for RD&I comes mainly from the fact that **it is supporting first-of-a-kind innovative deployments, thus helping to ensure a secure (and sizeable) funding** and proof of maturity for these solutions. Thus, the CEF ensures a critical link between the market and the successful results from advanced RD&I actions, with or without previous EU funding support. This also makes it **a funding instrument which is mostly dedicated to authorities and then companies**.

There is no budget specifically earmarked for the waterborne transport sector in this MFF (or later), as this depends on the political decisions at the national levels and the approved projects, together with their technical and financial details. However, given the fact that the CEF planning is overall known and agreed upon, including part of their technical and/or operational specifications, the potentially available budget for the waterborne transport stakeholders can be inferred to an extent.

Given the types of investments in the TEN-T corridors, which include maritime and inland waterways ports, other relevant infrastructures and routes, the CEF has a very high importance for the waterborne transport community involved in RD&I activities, with high relevance for public bodies and also applicable for private entities. Another advantage is the amount of funding earmarked within CEF, which ensures a sizeable and stable budget, critical factors when planning high TRL investments and their roll-out. Last but not least, another key advantage is the long-term planning of these investments, with the TEN-T Core network being scheduled for completion in 2030, and the Comprehensive Network for 2050. All these factors make the CEF one of the main tools to support important segments of the RD&I completion and roll-out for the waterborne transport sector.

[37] Legislative Observatory – European Parliament, Connecting Europe facility 2021–2027: https://oeil.secure.europarl.europa.eu/oeil/popups/summary.do?id=1538312&t=e&l=en

2.1.6 Interreg - Interregional and cross-border cooperation

Interreg (European Territorial Cooperation - ETC) is one of the main goals of the cohesion policy of the European Union. The programme aims to support joint actions and policy exchanges between national, regional and local actors from different Member States. The objective of ETC is to promote a harmonious economic, social and territorial development of the EU as a whole. [38]

The available budget for Interreg projects in the MFF period 2021-2027 will be approximately €8 bln, supported mainly by the European Regional Development Fund (ERDF), which will have a budget of €226 bln. (The ERDF finances programmes in shared responsibility between the EC and national and regional authorities in Member States, with the goal to correct the imbalances between its regions.)[39]

In the case of Interreg, more emphasis is being placed on climate and social issues, aligned with the overall goals of the European Green Deal initiative, in the new period. The programme will support actions in the following strands:

- Cross-border cooperation between adjacent regions to promote integrated and harmonious regional development between neighbouring land and maritime border regions (currently 60 programmes; 72.2% of total resources);
- Transnational cooperation over larger transnational territories or around sea-basins (currently 15 programmes; 18.2% of total resources);
- Interregional cooperation to reinforce the effectiveness of cohesion policy (currently 4 programmes, 6.1% of total resources). The only Interreg part that fully covers the EU;
- Outermost regions' cooperation (3,5%)[40].

As a rule, calls from the Interreg cross-border and transnational cooperation programmes can be accessed only by entities from those regions and countries that are covered by these programmes, whereas the interregional cooperation programmes are open to entities from all over the EU. Unlike the previously scrutinized funding instruments, Interreg is focused on three types of beneficiaries[41]:

- Public authorities – local, regional and national;

[38] European Commission, EU regional and urban development: https://ec.europa.eu/info/eu-regional-and-urban-development
[39] European Commission, European Regional Development Fund: https://ec.europa.eu/regional_policy/en/funding/erdf/#2
[40] European Commission, Interreg, New Interreg budget set to be 8 billion euros: https://interreg.eu/news/interreg-budget-in-new-period-set-to-8-billion-euros/
[41] What is Interreg Europe? | Interreg Europe

- Managing authorities/intermediate bodies – in charge of the Investment for Growth and Jobs programmes or European Territorial Cooperation;
- Agencies, research institutes, thematic and non-profit organisations.

The funding rate at each Interreg programme level is set at a maximum of 80%[42] of the funds to be provided by the EU, with up to 85% for outermost regions.

Details are laid down in the Common Provisions Regulation[43], in which the following five policy objectives are identified:

1. a more competitive and smarter Europe;
2. a greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe;
3. a more connected Europe;
4. a more social and inclusive Europe;
5. a Europe closer to its citizens.

The 'unified' part of Interreg is a fraction of the total budget and plan, has no dedicated waterborne programme and budget, and each regional programme has its own agenda. Hence, stakeholders need to evaluate each programme where they are present and thus eligible to apply. The full list of Interreg programme can be found on the Interreg main website[44]. There are programmes covering major maritime (Black Sea Basin, Adriatic-Ionian, Atlantic Area, etc.) or riverine (e.g. the Danube Transnational Programme) regions, including parts of neighbouring non-EU countries. Such programmes are certain to offer interesting opportunities for the wider waterborne transport sector. The Interregional cooperation, covering the entire EU, can also offer relevant opportunities: e.g. the CLIPPER project[45].

Interreg calls are much smaller, the EU funding rarely going above €2 – 2,5 mln. Many calls are not TRL-focused, that is why TRL levels are generally not mentioned. However, Interreg can *de facto* support a wide array of TRL levels. The relevance – topics, TRL level or equivalent, funding – needs to be assessed on a case-by-case basis. Besides the aforementioned types of stakeholders that are targeted for Interreg funding, SMEs also benefit from increased attention and opportunities in Interreg.

[42] The maximum co-financing rate for Interreg programmes was raised from 70% to 80% compared with the original EC proposal, according to the final compromise text.
[43] European Commission 2018/0196(COD); Common provisions on ERDF, European Social Fund Plus, Cohesion Fund, and European Maritime and Fisheries Fund and financial rules for those and for Asylum and Migration Fund, Internal Security Fund and Border Management and Visa Instrument 2021–2027
[44] https://interreg.eu/
[45] CLIPPER | Interreg Europe

2.2 EU backed financing options / InvestEU

The objective of the new InvestEU Programme is to mobilise public and private investment using guarantees of €26.2 billion (to be provisioned at the rate of 40% from the EU budget), to back investment projects and to address market failures and sub-optimal investment situations.

InvestEU is built on the structure and experiences of the European fund for strategic investments (EFSI), having the European Investment Bank Group (EIB) as main investment partner for the implementation of the programme, including national promotional banks and international financial institutions.

The guarantees shall leverage the committed budget in the defined policy windows in the member states. Therefore, the InvestEU Programme is built up via four windows, **with a focus on the green and digital transition in Europe, including waterborne transport sector topics**.

InvestEU has a budget guarantee of €26.2 billion (in current prices), which will be indicatively divided between its four policy windows as follows:[46]:

- Sustainable infrastructure window: 37.8% (€9.9 billion);
- Research, innovation and digitisation window: 25.1% (€6.6 billion);
- SME window: 26.4% (€6.9 billion);
- Social investment and skills window: 10.6% (€2.8 billion).

The programme is compiled to support financing and investment operations, that comply with the goals to address "market failures and sub-optimal investment situations or for support for operations, which contribute to the Union policy objectives and fall under the scope of the areas eligible for financing and investment operations under the appropriate window."

According to Regulation (EU) 2021/523 of the European Parliament and of the Council of 24 March 2021 establishing the InvestEU Programme, the applied risk coverage can be provided by the implementing partner (national promotional banks or institutions) via the types of financing listed in the following:

- *loans, guarantees, counter-guarantees, capital market instruments, any other form of funding or credit enhancement, including subordinated debt, or equity or quasi-equity investments,*

[46] European Council, InvestEU: Council greenlights provisional agreement reached with the Parliament: https://www.consilium.europa.eu/en/press/press-releases/2020/12/16/investeu-council-greenlights-provisional-agreement-reached-with-the-parliament/

provided directly or indirectly through financial intermediaries, funds, investment platforms or other vehicles to be channelled to final recipients;

- *funding or guarantees by an implementing partner to another financial institution enabling the latter to undertake financing* [47].

European Investment Bank (EIB)

The European Investment Bank (EIB) is the lending arm of the European Union, to the public and private sectors alike. If projects to be financed are complying with the high technical, environmental and social standards, the bank supports within four priority areas: Innovation and skills, Small businesses, Infrastructure and Climate and environment. As a basic principle the EIB is financially autonomous (raising money on international capital markets).

The excellent credit rating is leading to good rates, which can be passed further to the clients. However, the maximum financial support is limited to 50 % (with some exceptions to this general rule) on the respective investment, in order to provide the benefits to a broader spectrum of projects.

In order to provide support also towards small businesses and mid-caps, the "EIB Group" is also consisting of a second entity next to the EIB itself, the European Investment Fund (EIF). By offering an "Integrated Risk Finance Product Range" of SME finance to the intermediaries, the European Investment Fund is complementing the products offered by the EIB via partner organisations acting as financial intermediaries (banks, guarantee, leasing and microfinance institutions, private equity and venture capital funds, among others).

The provided products are mainly inclusive finance (venture capital, etc.) equity products (guarantees, etc.) and debt products (Credit enhancement / Securitisation, etc.).[48]

In most cases, there is no dedicated waterborne transport funding from the EIB, regardless of the TRL levels, the waterborne segment or types of stakeholders; also, the bank does not fund low-TRL activities, focusing on mature or near-market products, since it operates on the same principles as every commercial bank. However, there are a couple of exceptions, as outlined below.

[47] Regulation (EU) 2021/523 of the European Parliament and of the Council of 24 March 2021 establishing the InvestEU Programme
[48] CCNR, Study on Financing the energy transition towards a zero-emission European IWT sector; Deliverable – Research Question F

Under the 'Innovation and skills' priority area, the EIB support for research and innovation and the digital economy is split into three main directions[49]:

- Innovation and skills;
- The InnovFin – EU finance for innovators;
- The digital economy sector.

Under '**Innovation and skills**', the following areas of eligibility exist: fundamental research, education, digital economy, health and industry. While waterborne transport is not specifically mentioned, it can still obtain funding for subjects that fall (also) within the scope of these areas of eligibility, in particular the 'industry' one, especially since the declared goal in this case is to "help reignite Europe's traditional industries, such as the automotive, printing, manufacturing and computing domains, while supporting the transition to the green economy"[50]. Furthermore, the 'greening' and digitalization aspects are cross-cutting topics when it comes to EIB support.

The EIB funding for Innovation and Skills is translated into:

- Support of development and commercialisation of new products, processes and business models;
- Promote investment in research and development, education, upskilling and training;
- Improving connectivity and access by investing in broadband and mobile networks;
- Adoption and diffusion of digital and other emerging technologies.

This is achieved through both direct loans and more sophisticated financial instruments such as venture debt, that combines the advantages of a long-term loan with a remuneration model based on a company's performance.

"**InnovFin – EU Finance for Innovators**" is an initiative launched by the EIB in cooperation with the EC under H2020. It aims to facilitate and accelerate access to finance for innovative businesses and entities in Europe. InnovFin supports projects, which by their nature are riskier and harder to assess than traditional investments, and therefore often face difficulties accessing finance. In order to overcome these difficulties, the EU and the EIB Group joined forces to provide finance to support research and innovation of small and early-stage enterprises – from small tech start-ups to large research facilities and circular economy companies. More specifically, InnovFin provides loans, guarantees and equity-type funding, tailored to innovators' needs. Financing is either provided directly or via a financial

49 Launch of Horizon Europe (eib.org)
50 Innovation and skills (eib.org)

intermediary, usually a bank or a fund. InnovFin is available across all eligible sectors in EU Member States and Associated Countries[51], and thus relevant also for the waterborne transport stakeholders.

While this programme was created in connection to H2020, it is expected that it will continue, with some changes, for HEU as well. While the new overall form of the programme is yet to be finalized, the EIB can approve new operations only under InnovFin Thematic Financing, targeting key policy sectors facing particularly significant financing gaps. Financing is available for small companies, large caps and special purpose vehicles under the following products, two of them relevant for the wider waterborne sector:

- InnovFin Energy Demonstration Projects (EDP), which provides loans, loan guarantees or equity-type financing typically between €7.5 million and €75 million to innovative demonstration projects in the fields of energy system transformation, including but not limited to renewable energy technologies, smart energy systems, energy storage, and carbon capture utilisation and storage. The product is deployed directly by the European Investment Bank and will continue to support innovative projects until the end of 2022[52];
- InnovFin Thematic Investment Platforms will catalyse third-party financing for thematic areas, such as the circular bioeconomy. The platforms will provide access to finance via debt or equity-type products to innovative projects in specific thematic areas and will be managed by financial intermediaries and fund managers[53].

Lastly, the EIB offers support for the digital economy. Even if the waterborne sector is now particularly targeted in this case, it can still find relevant funding here due to the ever growing digitalization of all sectors. Some of the topics funded by the EIB in this case and that are relevant for the waterborne sector are: software development, cyber security and innovative digital technologies (e.g. artificial intelligence and blockchain), smart use of green digital technologies, etc.

Consequently, while the EIB does not offer a dedicated envelope in terms of budget or specific waterborne-related topics, it does provide a wealth of opportunities for the sector stakeholders. Moreover, its support is crucial in providing financial backing for projects that would otherwise be hardly bankable with a regular commercial bank, as well as in supporting the completion and market roll-out of products and services that had been developed with H2020 (and from now on HEU) funding.

51 InnovFin EU Finance for innovators (eib.org)
52 InnovFin Energy Demo Projects (eib.org)
53 InnovFin Thematic Investment Platforms (eib.org)

EEA Grants

The objective of the Financial Mechanism of the European Economic Area 2009-2014 (hereinafter referred as EEA-Grants) is to finance several programmes, in order to contribute to the reduction of the economic and social disparities in the European Economic Environment (EEA - European Economic Area), and to strengthen the bilateral relations between the EFTA countries (Norway, Iceland and Liechtenstein) and the EU 16 countries eligible for this aid. EEA do not directly aim waterborne RD&I activities, however, it is important to follow the open calls in order to have all potential possibilities monitored by the waterborne transport sector stakeholders in the eligible countries.

2.3 EU funding and financing overview based on the focus and scope

In the figure below, the main scopes of the aforementioned funding instruments are highlighted in consideration of relevance for the transport sector. Depending on the areas of activity, different support programmes have to be taken into account; for example, CEF is focusing on infrastructure programmes, whereas the Innovation Fund will rather support the developments and deployment in regards to the clean fuels and fleets in the (waterborne) transport sector. However, it must be noted that the boundaries of these funding programmes have some overlaps, with financing also applicable for topics beyond these main scopes – e.g. the Innovation Fund, as stated above, will be financing aspects that relate to fleet (and operations) for the waterborne transport sector.

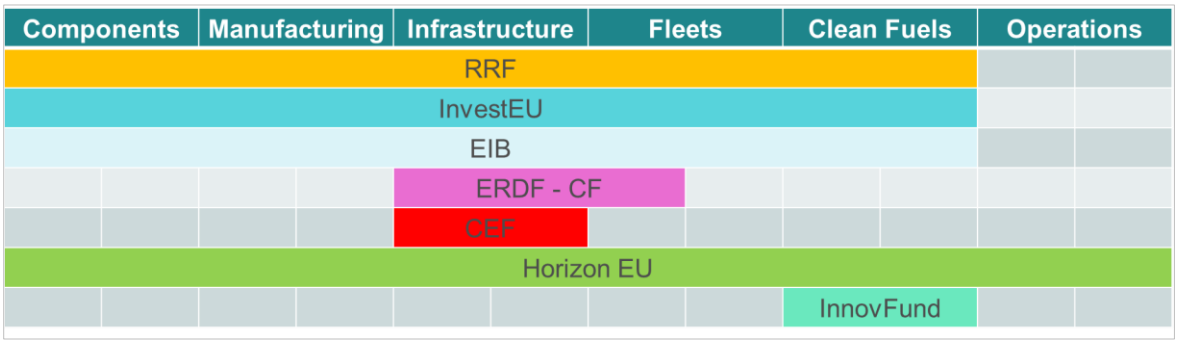


Figure 10: EU funding to support EU funding to support the Smart and Sustainable Mobility Strategy[54]

IWT and its importance is highlighted within the Smart and Sustainable Mobility Strategy of the European Union and the European Green Deal, e.g. via the following goal "substantial part of the 75% of inland freight carried today by road to shift to rail and inland waterways."[55], thus giving it a higher prominence, alongside the maritime sector. Even though the majority of relevant key priorities in the transport sector are within the topics urban mobility / transport, European railway infrastructure development and digitalisation, the current MFF and in particular the HEU have registered a crucial shift regarding the support offered to the waterborne transport sector through the adoption of the ZEWT Partnership. In addition, the other HEU instruments, as highlighted above, will contribute to ensuring a comfortable RD&I budget at the EU level throughout this period.

[54] Olivier Silla – DG MOVE: EU funding to support the Smart and Sustainable Mobility Strategy
[55] https://ec.europa.eu/transport/sites/transport/files/mobility-strategy-memo-qa.pdf

2.4 National Funding Programmes

In the following chapters, you may find a non-exhaustive list of examples from member states represented in the project consortium (AT, BE, NL, ES) which may be relevant for the waterborne sector:

2.4.1 Austria

In Austria, the Austrian Research Promotion Agency (FFG), being also the National Contact Point for H2020 has the goal to support entities through several programmes in the field of RD&I. One of their main tasks is to "manage and finance research projects in the business and science sectors", having several programmes supporting (Austrian based) companies across all industries.

In addition to specific calls for defined research topics and industries, FFG offers also the opportunity to get funding via the "General Programme", open to all research topics incl. mobility in general and eligible to companies and projects of all sizes, with budgets starting from approx. €300,000. The funding rate can be up to 50 % (for Start-ups up to 70 %) of total eligible costs.[56]

2.2.2 Belgium

Waterborne plays an important part in the economy of Belgium. The presence of the Port of Antwerp plays an important part in this. It´s the second largest harbour in Europe and a big part of the goods that arrive in the port are transported through inland shipping to the rest of Europe. It is also seen as a greener and less sensitive to traffic jams than transport on the road. The NRMM European regulation 2016/1628 is a great stimulant. Greening is also seen as an economic opportunity, making waterborne transport a cheaper way of transporting goods than moving them over the already busy road system.

What makes Belgium stand out is it´s complex institutional organization, based on regions and linguistic grounds. There are three distinct regions: Flanders, Wallonia and Brussels, all of these regions have a large amount of autonomy and are responsible for, amongst many others, economic affairs. Within the context of the greening of inland shipping, Flanders and Wallonia play an important part. Both regions have created schemes to promote this.

Flanders

The organization Vlaamse Waterweg is responsible for maintenance and exploitation of the waterways in the Flanders region. There is one funding scheme available specifically designed to reduce pollutant

[56] FFG, Objectives and Mission: https://www.ffg.at/en/FFG/objectives-and-mission; General Programme: https://www.ffg.at/en/programme/general-programme

emissions from inland vessels. This scheme is called 'Nabehandelingstechnieken'. Here the purchase and installation costs of an after-treatment system will be compensated. This scheme is available for larger ships that are able to navigate all European Conference of Ministers of Transport (CEMT) classes. The system has to be part of the ship and improve the ecological performance of the ship. 80% of the investment costs can be compensated with a maximum of €50,000 per ship.[57]

Wallonia

The Operational Directorate General for Mobility and Waterways is responsible for the managing of the Walloon waterways, amongst many other responsibilities. In this role they offer a relevant funding scheme to make the inland shipping industry more sustainable. The goals is to let ships comply with the emission norms for pollution set out by the Central Commission for the Navigation of the Rhine.

The scheme is called 'Prime à l'acquisition d'un bateau de navigation intérieure d'occasion' (Bonus for the acquisition of a used inland navigation vessel). The scheme promotes the purchase of a second-hand ship that will be retrofitted with an engine that complies with the emission norms mentioned before. This has to be done within 6 months after purchase. The applicant has to be a master captain for less than two years and 30% of the investment cost are available for reimbursement. The minimum investment should be €12,500. The maximum amount funded is €200,000 over 3 years.[58]

2.4.3 Netherlands

Waterborne transport plays an important role for distribution and logistics in the Netherlands, partly because of the closely branched waterway network. Particularly the presence of the port of Rotterdam, which plays a major and important role in the supply and distribution of goods to the hinterland in Western Europe have made the inland shipping sector in the Netherlands one of the largest in Europe.

Based on the objectives of the Dutch government aimed at improving air quality and energy sustainability and energy efficiency, the range of schemes for sustainability in waterborne transport is relatively large. The Dutch national government currently offers support for investments in the waterborne transport sector.

Green Deal Zeevaart, Binnenvaart en Havens (Green Deal on Maritime and Inland Shipping and Ports)

[57] https://www.vlaamsewaterweg.be/nabehandelingstechnieken
[58] http://mobilite.wallonie.be/home/je-suis/une-entreprise/transport-de-marchandises/bateau/conseils-et-aides/prime-acquisition.html

An important step that has been taken in this context concerns the Green Deal Zeevaart, Binnenvaart en Havens signed in 2019. With this Green Deal the national government, provinces, ports, maritime sector organizations, shippers, carriers, banks and knowledge institutions join forces to make shipping more sustainable. Dozens of actions have been proposed in the Green Deal to significantly reduce the emissions of CO2 and other harmful substances from inland shipping and maritime shipping. Among other things, this should lead to inland shipping emitting at least 40% less CO2 in 2030 and in 2050 being “virtually climate neutral”. €15 mln is being made available for the period 2020-2021 for the inland shipping sector to stimulate innovations and, among other things, the purchase of clean engines with a funding intensity of 40% of the investment for large, 50% for medium and 60% for small enterprises. The funding intensity for the period of 2022-2024 is to be negotiated at a later stage. The ambition is to have 150 zero emission inland waterway vessels in 2030. There will also be a new sustainability label for inland vessels that will allow skippers in the future to receive a discount on port dues and use the label to finance their ship.[59]

Maritiem Masterplan

The Maritime Master Plan was developed by the Dutch maritime sector. The programme should provide stimulus to a more sustainable and digital sector by means of both RD&I and actual deployment. The goal is to have 30 new zero-emission and digital ships and 5 retrofits by 2030. The basis of the Master Plan is a broad R&D programme with 'launching customership’ of the Royal Netherlands Navy, the ‘Rijksrederij’. The exact details will follow in the near future.[60]

Stikstofreductie Binnenvaart (Nitrogen reduction inland waterway transport)

In April 2020 the Dutch Minister of Agriculture, Nature Management and Food Quality announced a number of measures to reduce nitrogen emissions. One of these measures concerns the provision of €79 mln until 2030 for the greening of inland vessels. This measure focuses on the installation of SCR catalytic converters on existing inland vessel engines to reduce engine nitrogen oxides emissions (NOx). A NOx reduction of more than 80% can be achieved per ship. As the measure is only aimed at reducing NOx from the engine, particulate filters are therefore in principle not covered by this measure, just like installing a completely new Stage V engine. The budget that was already available within the Green Deal for Inland Shipping and Ports (€15 mln) can be used for such applications.[61] A large part of the funding

[59] https://www.greendeals.nl/green-deals/green-deal-zeevaart-binnenvaart-en-havens
[60] https://maritiemland.nl/maritieme-sector/projecten/masterplan-voor-een-emissieloze-maritieme-sector/
[61] https://www.eicb.nl/e79-mln-voor-vergroening-van-binnenvaartschepen/

in this programme and the funding of €15 mln in the Green Deal for IWT are currently grouped together in the funding scheme "Subsidieregeling Verduurzaming Binnenvaartschepen" that opened up in early 2021 and makes a total of €76.7 mln available for various measures to make an inland waterway vessel more sustainable.[62]

Subsidieregeling Duurzame Scheepsbouw (Sustainable Shipbuilding Subsidy Scheme)

In addition, there is the Sustainable Shipbuilding Subsidy Scheme (SDS) which is intended for shipyards that want to implement a shipbuilding innovation project that contributes to sustainable development. This is meant to support building inland vessels or sea ships with a gross weight above 100 tons or tugboat with a capacity of more than 365 kW. Fishing vessels are not eligible. In 2021, there are two tenders for the first time. The budget per tender is €2.3 million. The subsidy amounts to 25% of the eligible costs. The maximum subsidy amount per applicant is €1,25 mln.[63]

Demonstratie klimaattechnologie en -innovatie (Climate Technology and Innovation transport scheme)

In order to stimulate innovative and climate-friendly developments and demonstrations in the transport sector, the Dutch government has introduced the Demonstratie klimaattechnologie en -innovatie scheme, for short DKTI (Climate Technology and Innovation transport scheme). DKTI-Transport supports sustainable transport demonstration projects whose innovation is not yet on the market, has a strong business case and is viable. The scheme focuses on transport solutions with low or no CO2 emissions and themes such as electric driving and sailing, efficient ships, driving on hydrogen, biofuels in aviation, shipping and heavy road traffic. The DKTI-Transport focuses on the following 5 types of projects:

- Development of new products;
- Living lab projects where new technologies, ideas and concepts are developed and tested together with users;
- Feasibility studies in which the potential of a project is investigated and analysed;
- Facilitating innovation clusters that promote innovations in sustainable transport by sharing facilities and exchanging knowledge and expertise;
- Co-financing of local infrastructure for alternative fuels.

[62] https://www.eicb.nl/projecten/subsidie-verduurzaming-binnenvaart/
[63] https://www.rvo.nl/subsidie-en-financieringswijzer/subsidie-duurzame-scheepsbouw-sds

The scheme is open during the years 2020 and 2021. Project contributions range from 25% to 100% of the eligible costs, depending on the type of activity (technical feasibility study, experimental development, living lab) and type/size of organisation. The maximum amount of subsidy is €50,000 for technical feasibility studies, €500,000 for experimental developments and €2 mln for living labs. The total available budget for the programme is €36 mln in 2021.[64] Information on 2022 amounts is not available at the moment of elaboration of this report.

Green Award

Finally, it is worthwhile mentioning the Green Award incentive system. Green Award is a quality mark for ships that meet high requirements in the field of safety and the environment. Green Award operates according to a Schedule of Requirements covering engines and issues such as fuel, pollution prevention, safety, technical equipment on board and crew behaviour. A minimum number of points must be achieved on these aspects. Depending on the number of points achieved, a ship will receive a Bronze, Silver, Gold or Platinum certificate. Only ships whose main engines are equal to the emission standard NRMM Stage V are eligible for the "Gold". They must also score on other points. Depending on the score, they receive either "Gold" or "Silver". Ships whose main engines comply with the CCR-2 emission ceiling can qualify for "Bronze" and "Silver". The certificate is valid for 3 years after the inspection date. The Green Award certificate gives a ship access to multiple incentives, including discounts on port dues in the Netherlands (and in Ghent, Belgium), products and services. A list of incentive providers can be found via this link: https://www.greenaward.org/inland-shipping/nl/faq/

2.4.4 Spain

In Spain, the Center for Industrial Technological Development (Centro para el desarrollo tecnológico industrial - CDTI) coordinates technology research funding in Spain, acting on behalf of the Spanish Ministry of Science and Technology. Moreover, this public entity promotes the innovation and the technological development of the Spanish companies through help and support mechanisms of R&D projects at the national and international level. In that sense, the main objective CDTI is to contribute to the improvement of the technological level of the Spanish companies via the development of the following activities:

- Technical-Economical evaluation and granting of public aids for innovation through grants or partially reimbursable aids for RD&I projects developed by companies;

64 https://www.inventivenl.nl/nieuws/dkti-subsidie-voor-innovaties-in-transport-en-logistiek/

- Management and promotion of Spanish participation in international technology cooperation programmes;
- Promotion of international business technology transfer and technological innovation support services;
- Support for the creation and consolidation of technology-based companies.

The CDTI is governed by private law in its relations with third parties. This allows it to offer companies agility and flexibility in its support services for the development of business RD&I projects, the international exploitation of technologies developed by the companies, and the making of offers for technological-industrial supplies to scientific and technological organizations.

Consequently, the CDTI grants companies its own economic aid and facilitates access to third party aid (subsidies from the EU R&D Framework Program, for example) to carry out national and international research and development projects.

It also provides support to companies to develop international cooperation, for which it offers aid for innovation and technology transfer projects, its external network and multilateral cooperation projects (Eureka and Iberoeka) and bilateral cooperation projects with Canada, Japan, China, South Korea, India and South Africa.

In addition, the CDTI has been empowered as the competent body to issue binding reports on the projects to which it has granted aid in any of its lines (Royal Decree 2/2007). These documents provide Spanish companies, which have an approved project with public aid granted by the CDTI with greater legal certainty when it comes to obtaining tax deductions for the expenses incurred in the R&D activities of such projects.

Finally, the CDTI manages and supports Spanish companies in obtaining high-tech industrial contracts generated by different national and European organizations, such as the European Space Agency (ESA), the European Laboratory for Particle Physics (CERN), the European Synchrotron Facility (ESRF), Hispasat and Eumetsat.

CDTI supports Spanish companies in participating in European programs, for example the research framework program of the European Commission, the programs of ESA, ESRF or CERN. In general, the CDTI has grants for R&D addressed to companies and normally does not distinguish between the sectors to which it is addressed, i.e., the programs are suitable for all sectors.

CDTI has different instruments to fund RD&I projects and to create a consolidate technology start-ups.

CDTI has several instruments to fund RD&I projects, among which the main financing programmes are:

- Research and Development project (PID) – The projects may comprise both industrial research activities as well as experimental development, in accordance with the definitions of the General Block Exemption regulation (EC Regulation nº651/2014). The projects are divided into three categories:
  A. Individual R&D projects – Where the beneficiaries are the companies. The length of these projects may be from 12 to 36 months. The fundable budget is around €175,000.
  B. National Cooperation R&D projects – An economic Interest Group (EIG) must be formalised or a consortium governed by a private collaboration agreement comprised of, at least, two independent companies. The maximum participants shall be 6. The length of these projects may be from 12 to 36 months and the minimum fundable budget will be around €500,000, with a minimum budget of €175,000. Any single company cannot hold more than 65% of the total budget.
  C. International technological cooperation projects – The Spanish participation may be funded by means of an individual project or a national cooperation project according to the number and type of participants. These projects are subject to a regulated certification process. The beneficiaries are individual companies or an EIG or a consortium made up of at least two independent companies. The sale approach regarding length and project budget as the other aforementioned.

  The funding modality for the project will be partially reimbursable aid, with financial cover of up to 75% of the total approved budget which, by way of exception, may amount to up to 85%. Such aid may comprise a non-reimbursable tranche (NRT) which shall depend on the characteristics of the project and the beneficiary. Therefore, CDTI aid may be distributed/split in the following way:

PROJECT CHARACTERISTICS	SMEs	BIG COMPANIES
Basic NRT (non-reimbursable tranche	Up to 10%	Up to 5%
Effective participation through the subcontracting of research institutes (at least 10% of the eligible budget	Up to 15%	Up to 10%
Co-funded by the ERDF	Up to 20%	Up to 20%

PROJECT CHARACTERISTICS	SMEs	BIG COMPANIES
International Technology CooperationCo	Up to 33%	Up to 33%

This aid scheme is subject to the Commission Regulation (EC) No 651/2014 of 16th June 2014 declaring certain categories of aid compatible with the common market in application of Articles 87 and 88 of the Treaty (General Block Exemption Regulation).

- INNPRONTA – A programme for the financing of large integrated industrial research projects, of a large-scale and strategic nature, which serve to develop new technologies in forward-looking technological areas with economic and commercial prospects at the international level. The main topics are energy, environment and climate change, biotechnology, health and food, etc.

  The beneficiaries are a consortium of companies or an Economic Interest Grouping, at least 4 different companies, of which at least one has to be large or medium-sized and another has to be a SME. The project duration is 4 years, with a minimum budget of €15 mln euros. A subsidy and loan combination that may amount to a maximum of 75% is compatible. Regarding the eligible expenditure, the equipment and instrument costs (amortization), personnel expenses, external services and subcontracting costs, general additional expenses and other running costs are included.

- INNODEMANDA – The INNODEMANDA programme is a financing instrument which supports technology bids taking part in the public purchase of innovation processes. Funds will be given to companies to cover innovation costs so that the public body pays the same amount as if it bought the already developed technology, in this way, affording greater exposure of these companies' products and services in the Administration.

  This instrument will be financed and managed by the Ministry of Science and Innovation through the Centre for the Development of Industrial Technology (CDTI). Furthermore, the Ministry of Science and Innovation will support public bodies in the verification of the running of the pilot tests and the quality of the innovation proposals.

- EEA GRANTS

  Spain receives a total budget of over €42 mln, of which €18,215,000 have been allocated to the Programme "Environmental and Climate Change-related Research and Technology". The budget of this programme is completed with a contribution from CDTI in the form of soft loans.

- TECHNOLOGY FUND – The Technology Fund is a special item in European Union FEDER funds allocated to promoting business R&D&I in Spain. The CDTI has been appointed to manage part of them for which different instruments with FEDER/CDTI joint financing have been designed in accordance with community requirements.

The Technology Fund is targeted at all regions of Spain but in their distribution, priority has been given to former Objective 1 regions which, as a whole, are recipients of 90% of their budget:

1. Andalucía, Extremadura, Castilla la Mancha and Galicia are recipients of 70% of the technology fund;
2. Valencia, Castilla y Leon and the Canary Islands are recipients of 15%;
3. Murcia, Asturias, Ceuta y Melilla are recipients of 5%;
4. The other Spanish regions are recipients of the remaining 10%.

The Technology Fund is mobilised through the financial instruments of the Centre and is assigned to the proposals submitted according to the availability of funds in the Autonomous Region where the project is to be developed.

In Research and Development Projects (PID), joint financing with the Technology Fund gives the company an increase of 10 percentage points with respect to the non-refundable section of its proposal.

The Technology Fund is also executed through a specific programme of subsidies via a call for applications (FEDER-Innterconecta) which support integrated experimental development projects, of a large-scale, strategic nature, and whose objective is the development of new technologies in forward-looking technological areas with economic and commercial prospects at the international level.

- FUNDING FROM THE EIB – The European Investment Bank (EIB) has given Spain a loan to support investment projects undertaken by small and medium enterprises (SMEs) and small and mid-cap companies (companies with less than 3,000 employees). CDTI will allocate the amount of this loan to co-finance part of the R&D projects that it manages.

EIB funding is intended for loans granted by CDTI for R&D projects with a minimum duration of 2 years. It may be used to finance from small projects to investments up to a maximum estimated cost of €25 mln (EIB contribution will not exceed €12.5 ml).

A project's eligibility to receive loans is subject to the following criteria:

1. Independent SMEs, with less than 250 employees before the investment, and established in one of the 28 Member states of the European Union;
2. Independent mid-cap companies with less than 3,000 employees before the investment and established in one of the 28 Member States of the European Union;
3. Almost all economic sectors are eligible except for some exceptions, which include the production of weapons, arms or ammunition; military or police infrastructures and equipment or facilities intended to limit individual rights and freedom of people; gambling; industries related to tobacco; activities involving the use of live animals with experimental or scientific purposes – to the extent that they violate the "European Convention for the protection of vertebrate animals used for experimental and other scientific purposes" of the Council of Europe; activities whose environmental impact can't be mitigated or compensated; controversial activities for moral or ethical reasons (ex. research in the field of human cloning); activities whose sole purpose is real estate speculation.

- FEDER (ERDF) – INTERCONNECTA - Integrated experimental development projects, of a large-scale, strategic nature, and whose aim is the development of new technologies in forward-looking technological areas with economic and commercial prospects at the international level, representing, at the same time, an important technological and industrial advance for the regions receiving funding from the "R&D&I by and for the benefit of Companies - Technology Fund" Operating Programme.

  Support may also be given to Industrial Research projects if, during the course of their assessment, the objectives of the project are considered to fulfil the definition of Industrial Research according to the General Exemption by Categories Regulation.

  Projects may deal with any subject area provided that they have a high technology level, enable the participants to increase the added value of their activities and boost the creation of skilled employment.

1. **Beneficiaries:** The formalisation is required of an Economic Interest Grouping (EIG) or a consortium governed by a private cooperation agreement, formed of at least 3 companies that are independent from each other, of which one has to be large or medium-sized and another has to be an SME, according to the definition of the European Commission. In the event that in the grouping there is no small company, at least one shall participate under the modality of

subcontracting by any of the companies in such grouping. Maximum number of companies: 10. Furthermore, the relevant participation of, at least, one research body under the modality of subcontracting by one or several member companies is necessary. The participation of the research bodies as a whole shall be significant, with a minimum share which will be set in the relevant call for applications.

2. **Project duration:** The duration of the Project is three calendar years.
3. **Project budget:** It will be set in each call for applications. The budget shall be distributed equally over the years the project lasts.
4. **Eligible expenditure:** Equipment and instrument costs (amortization), personnel expenses, external services and subcontracting costs, general additional expenses and other running costs
5. **Modality, funding amount and compatibility**: The project funding modality will be awarded under the subsidies modality and will be jointly financed on account of the Technology Fund - FEDER funds (*R&D&I Operating Programme by and for the benefit of companies (Technology Fund*)). Further information on the Technology Fund.

- **R&D PROJECT – CERVERA TRANSFER** – Grants to individual R&D projects developed by companies in collaboration with Technology Centres at national level in the priority technology areas of Cervera Scheme. The beneficiaries are SMEs. The calls are open all the year and there is no deadline to submit proposals. The grant is partially reimbursed. The minimum budget is €175,000 with 10% of the budget for those Technology centres. The duration is between 12 to 36 months for individual projects. The loan is over 85% of the total budget with blend conditions. It allows co-financing of FEDER.
- **R&D STRATEGIC PROJECT – CIEN** - The CIEN Strategic Program is competitive and its objective is the financing of large industrial research projects developed in effective collaboration by business groups and oriented towards carrying out planned research in future strategic areas with potential international projection. The projects will be aimed at carrying out industrial research activities in **which knowledge and** techniques are acquired that may be useful for the creation of new products, processes or services, or contribute to the significant improvement of existing products, processes or services, provided that they incorporate relevant specific developments. These projects may include the creation of components of complex systems that are necessary for industrial research, especially the validation of generic technology, except for prototypes.

The beneficiaries will be consortia formed by groups of companies, formalized by means of a private collaboration agreement. All the member companies of the consortium will be considered as beneficiaries. Each consortium must be made up of a minimum of three and a maximum of eight companies; at least two of them must be separate legal entities and at least one must be considered an SME. Each consortium will identify the company that will act as "project coordinator". The "project coordinator" company must be one of the medium or large companies in the consortium. In no case may a small company of the consortium act as "project coordinator". The "project coordinator" will be the interlocutor of the CDTI from the application for aid until the approval, if any, by the Board of Directors of the Center; all this without prejudice that the CDTI, during this phase, may contact directly any of the companies that make up the consortium to request clarifications regarding the project.

The program's budget is €100 mln. Projects submitted to the CIEN Program must have a minimum total budget of €5 mln and a maximum budget of €20 mln. The minimum budget that can be financed per project will be at least €4,5 mln, and for each company in the consortium, minimum €175,000. Projects will have a minimum duration of 36 months and a maximum duration of 48 months, with milestones lasting between 9 and 18 months.

2.5 Findings from the questionnaire in relation to Europe´s main research programmes

In relation to the information on Europe's research programmes – FP7, H2020 and HEU, more than 60% of the replies mentioned that they are familiar with these programmes as they have been involved either as a participant or as coordinator. Less than 10% indicated that they are not aware of these programmes.

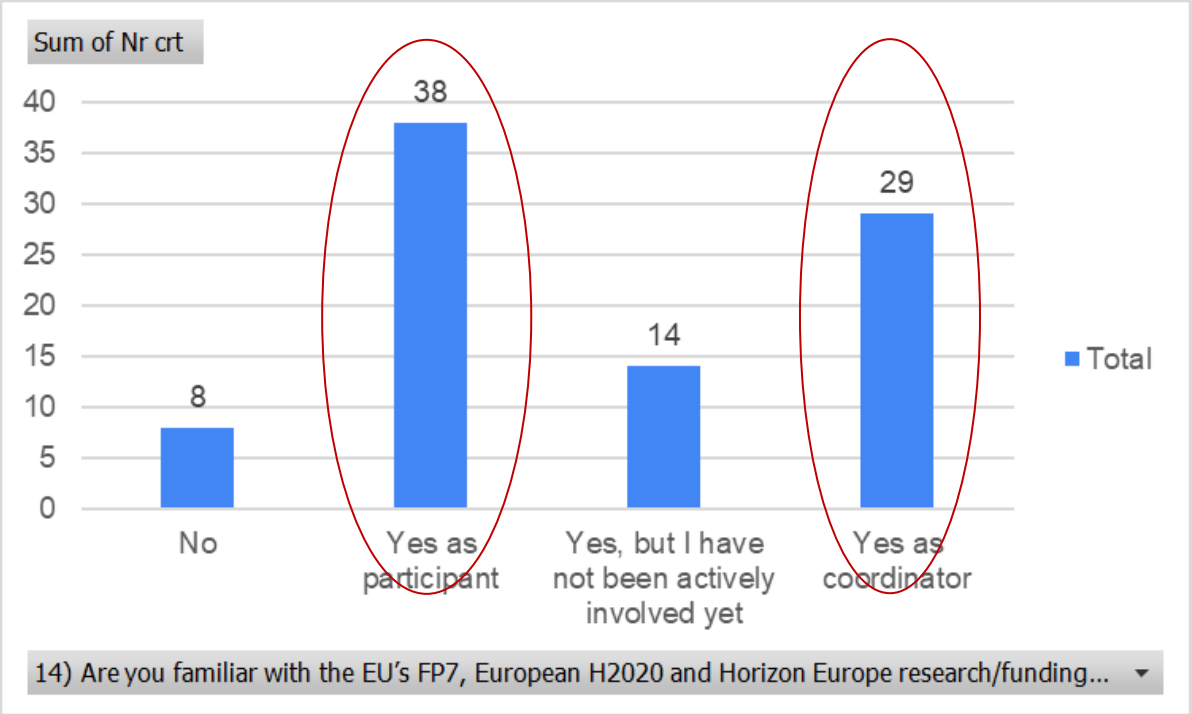


Figure 11: Information and involvement in EU's research programmes - FP7, H2020, HEU

Adding to the existing analysis a new element, **namely the company headquarters**, it can be noticed that the country with the highest participation as project coordinator in FP7 and H2020 is Belgium, followed by the Netherlands.

However, as it can be seen in the next figure, regarding the participation in projects funded by FP7 and H2020, the first places are taken by the Netherlands, Austria, Romania and Bulgaria.

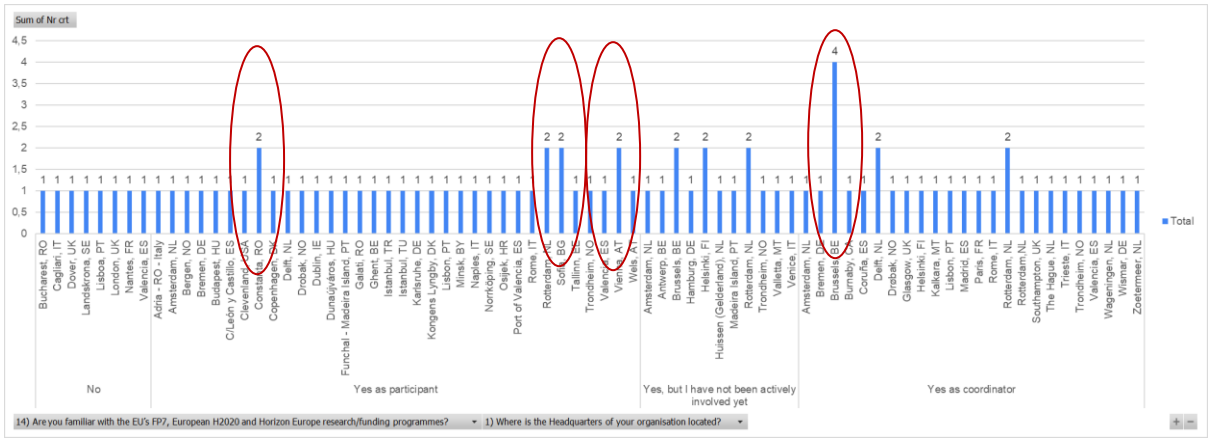


Figure 12: Involvement in FP7, H2020 funded projects according to country of origin

In terms of involvement in other EU funded programmes, 20% of the stakeholders did not indicate any other programme, whereas the majority selected CEF and Interreg.

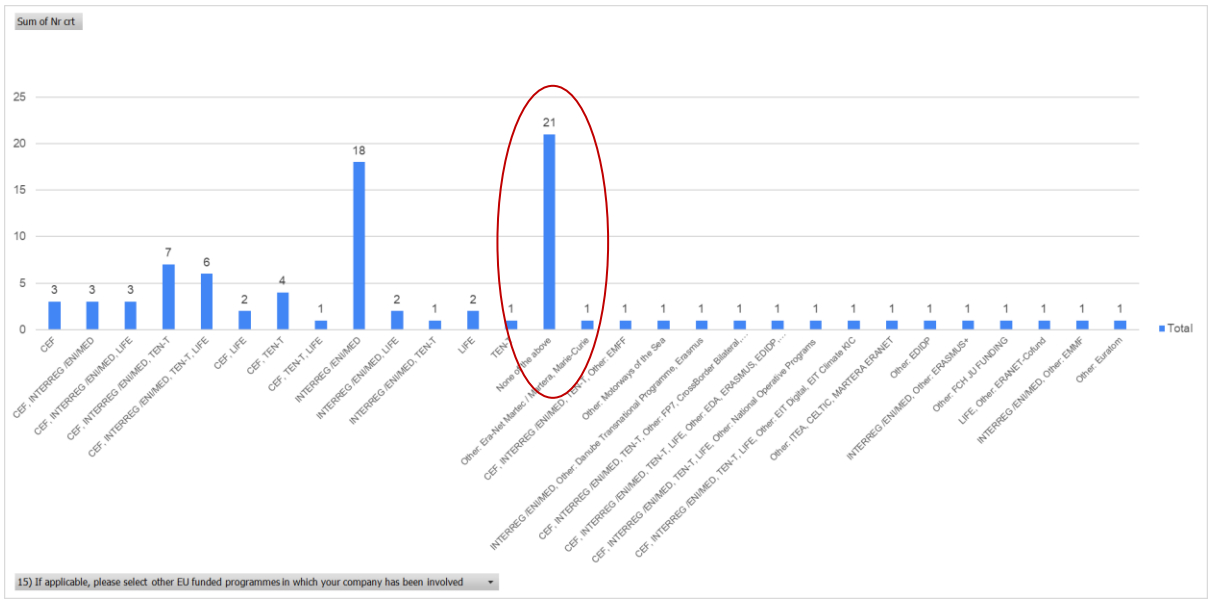


Figure 13: Involvement in other EU funded programmes[65]

[65] Chart based on non-filtered answers from respondents; mistakes might occur, liability of the project partners is excluded.

Introducing a new element in the analysis – company headquarters location – reveals a detailed overview of programme preference based on headquarters location as it can be noticed in the following table. Therefore, from the 89 replies received a clear indication for CEF and TEN-T was chosen by organisations located in Norway, the Netherlands, Germany, Portugal and Malta.

Row Labels	Sum of Nr crt
CEF	**3**
Drøbak, NO	1
Huissen (Gelderland), NL	1
Rotterdam, NL	1
CEF, INTERREG /ENI/MED	**3**
Burnaby, CA	1
Drobak, NO	1
Dunaújváros, HU	1
CEF, INTERREG /ENI/MED, LIFE	**3**
Coruña, ES	1
Rotterdam, NL	1
Valencia, ES	1
CEF, INTERREG /ENI/MED, TEN-T	**7**
Amsterdam, NL	2
Hamburg, DE	1
Helsinki, FI	1
Norrköping, SE	1
Rotterdam, NL	1
Zoetermeer, NL	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE	**6**
Brussels, BE	1
Rome, IT	1
Rotterdam, NL	2
Sofia, BG	1
Venice, IT	1
CEF, LIFE	**2**
Antwerp, BE	1
Port of Valencia, ES	1
CEF, TEN-T	**4**
Bremen, DE	1
Funchal - Madeira Island, PT	1
Madeira Island, PT	1
Valletta, MT	1

(to be continued on the next page)

CEF, TEN-T, LIFE	**1**
Naples, IT	1
INTERREG /ENI/MED	**18**
Bremen, DE	1
Bucharest, RO	1
Cagliari, IT	1
Constanta, RO	1
Delft, NL	1
Galati, RO	1
Ghent, BE	1
Helsinki, FI	1
Kongens Lyngby, DK	1
Lisbon, PT	2
Nantes, FR	1
Paris, FR	1
Rotterdam,NL	1
The Hague, NL	1
Vienna, AT	1
Wageningen, NL	1
Wismar, DE	1
INTERREG /ENI/MED, LIFE	**2**
Helsinki, FI	1
Osijek, HR	1
INTERREG /ENI/MED, TEN-T	**1**
Wels, AT	1
LIFE	**2**
Brussels, BE	1
Glasgow, UK	1
TEN-T	**1**
Delft, NL	1

(to be continued on the next page)

None of the above	**21**
Adria - RO - Italy	1
Amsterdam, NL	1
Bergen, NO	1
Brussels, BE	4
Copenhagen, DK	1
Istanbul, TR	1
Karlsruhe, DE	1
Landskrona, SE	1
Lisboa, PT	1
London, UK	1
Minsk, BY	1
Rotterdam, NL	1
Southampton, UK	1
Tallinn, EE	1
Trondheim, NO	2
Valencia, ES	1
Vienna, AT	1
Other: Era-Net Martec / Martera, Marie-Curie	**1**
Trondheim, NO	1
CEF, INTERREG /ENI/MED, TEN-T, Other: EMFF	**1**
Dublin, IE	1
Other: Motorways of the Sea	**1**
Dover, UK	1
INTERREG /ENI/MED, Other: Danube Transnational Programme, Erasmus	**1**
Constanta, RO	1
CEF, INTERREG /ENI/MED, TEN-T, Other: FP7, CrossBorder Bilateral, GJU/GSA	**1**
Budapest, HU	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: EDA, ERASMUS, EDIDP, French-Italian initiative,	**1**
Trieste, IT	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: National Operative Programs	**1**
Sofia, BG	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: EIT Digital, EIT Climate KIC	**1**
Valencia, ES	1
Other: ITEA, CELTIC, MARTERA ERANET	**1**
Istanbul, TU	1
Other: EDIDP	**1**
Madrid, ES	1
INTERREG /ENI/MED, Other: ERASMUS+	**1**
Delft, NL	1
Other: FCH JU FUNDING	**1**
Clevenland, USA	1
LIFE, Other: ERANET-Cofund	**1**
Rome, IT	1
INTERREG /ENI/MED, Other: EMMF	**1**
C/León y Castillo, ES	1
Other: Euratom	**1**
Kalkara, MT	1
Grand Total	**89**

Table 2: Involvement in other EU funded programmes according to headquarters location

Introducing a new element in the analysis – company size – reveals the choices of large, medium and small enterprises for particular funding programmes, as it can be noticed in the following table. It can be summarized that there is an even involvement in the different funding programmes, therefore the size of the company is not necessarily a decisive factor.

Row Labels	Sum of Nr crt
Large enterprise (>250 workers)	**40**
CEF, INTERREG /ENI/MED	1
CEF, INTERREG /ENI/MED, LIFE	2
CEF, INTERREG /ENI/MED, TEN-T	4
CEF, INTERREG /ENI/MED, TEN-T, LIFE	4
CEF, LIFE	1
CEF, TEN-T	2
CEF, TEN-T, LIFE	1
INTERREG /ENI/MED	9
INTERREG /ENI/MED, TEN-T	1
LIFE	1
TEN-T	1
None of the above	7
Other: Era-Net Martec / Martera, Marie-Curie	1
CEF, INTERREG /ENI/MED, TEN-T, Other: EMFF	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: National Operative Programs	1
Other: ITEA, CELTIC, MARTERA ERANET	1
Other: FCH JU FUNDING	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: EDA, ERASMUS, EDIDP, French-Italian initiative	1
Medium enterprise (51-250 workers)	**16**
CEF, INTERREG /ENI/MED, TEN-T	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE	1
CEF, LIFE	1
CEF, TEN-T	1
INTERREG /ENI/MED	4
None of the above	3
INTERREG /ENI/MED, Other: Danube Transnational Programme, Erasmus	1
CEF, INTERREG /ENI/MED, TEN-T, Other: FP7, CrossBorder Bilateral, GJU/GSA	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: EIT Digital, EIT Climate KIC	1
LIFE, Other: ERANET-Cofund	1
Other: Euratom	1
Small enterprise (1-50 workers)	**33**
CEF	3
CEF, INTERREG /ENI/MED	2
CEF, INTERREG /ENI/MED, LIFE	1
CEF, INTERREG /ENI/MED, TEN-T	2
CEF, INTERREG /ENI/MED, TEN-T, LIFE	1
CEF, TEN-T	1
INTERREG /ENI/MED	5
INTERREG /ENI/MED, LIFE	2
LIFE	1
None of the above	11
Other: Motorways of the Sea	1
Other: EDIDP	1
INTERREG /ENI/MED, Other: ERASMUS+	1
INTERREG /ENI/MED, Other: EMMF	1
Grand Total	**89**

Table 3: Involvement in EU funded programmes according to company size

The next table displays the involvement based on the organisationtype in the different EU funded programmes. As it can be noticed, the highest "variety" of organisations profile was reported in relation to Interreg+ENI+MED.

Row Labels	Sum of Nr crt
CEF	**3**
Maritime solutions/manufacturers and technology provider	2
Shipping company/operator	1
CEF, INTERREG /ENI/MED	**3**
Maritime solutions/manufacturers and technology provider	2
Port association/working group	1
CEF, INTERREG /ENI/MED, LIFE	**3**
Port Authority /Municipality	1
Research organisation/research centre	1
University	1
CEF, INTERREG /ENI/MED, TEN-T	**7**
location marketing, port/shipping/logistics association, public association	1
Maritime solutions/manufacturers and technology provider	1
Port Authority /Municipality	2
Public body – Administration	1
Research organisation/research centre	1
Trade Association	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE	**6**
Innovation Consultancy	1
Port Authority /Municipality	4
Shipping association/working group	1
CEF, LIFE	**2**
Port Authority /Municipality	1
Port services provider	1
CEF, TEN-T	**4**
Maritime solutions/manufacturers and technology provider	1
Port Authority /Municipality	1
Shipping association/working group	1
Shipping company/operator	1
CEF, TEN-T, LIFE	**1**
Shipping company/operator	1
INTERREG /ENI/MED	**18**
Classification society/insurance company	1
Maritime solutions/manufacturers and technology provider	1
R&D, Ship design and consulting	1
Research organisation/research centre	3
Shipping company/operator	2
Shipyard	1
Trade Association	2
University	7

(to be continued on the next page)

INTERREG /ENI/MED, LIFE	**2**
intergovernmental organization (IGO)	1
IWT consultant	1
INTERREG /ENI/MED, TEN-T	**1**
Research organisation/research centre	1
LIFE	**2**
European Technology Platform	1
University	1
TEN-T	**1**
University	1
None of the above	**21**
Consulting Engineers for Naval Architecture	1
Engineering company	1
expedition services	1
Maritime solutions/manufacturers and technology provider	4
NGO	1
Public body – Administration	1
refer to our webvsite for our business concept	1
Research organisation/research centre	3
Shipping association/working group	2
Shipping company/operator	1
Shipyard	1
Trade Association	1
University	3
Other: Era-Net Martec / Martera, Marie-Curie	**1**
University	1
CEF, INTERREG /ENI/MED, TEN-T, Other: EMFF	**1**
Government agency	1
Other: Motorways of the Sea	**1**
Shipping company/operator	1
INTERREG /ENI/MED, Other: Danube Transnational Programme, Erasmus	**1**
Trainiing instutution	1
CEF, INTERREG /ENI/MED, TEN-T, Other: FP7, CrossBorder Bilateral, GJU/GSA	**1**
Public association	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: EDA, ERASMUS, EDIDP, French-Italian initiative,	**1**
Integrated shipdesign and shipbuilding company	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: National Operative Programs	**1**
Port Authority /Municipality	1
CEF, INTERREG /ENI/MED, TEN-T, LIFE, Other: EIT Digital, EIT Climate KIC	**1**
Research organisation/research centre	1
Other: ITEA, CELTIC, MARTERA ERANET	**1**
Maritime solutions/manufacturers and technology provider	1
Other: EDIDP	**1**
Maritime solutions/manufacturers and technology provider	1
INTERREG /ENI/MED, Other: ERASMUS+	**1**
Academic Association	1
Other: FCH JU FUNDING	**1**
Material Handling Equipment Manufacturer	1
LIFE, Other: ERANET-Cofund	**1**
Research organisation/research centre	1
INTERREG /ENI/MED, Other: EMMF	**1**
Cluster	1
Other: Euratom	**1**
Public body – Administration	1
Grand Total	**89**

Table 4: Involvement in EU funded programmes according to organisation type

With regards to the **satisfaction level** experienced by the stakeholders concerning their needs being met by the existing funding programmes, slightly more than 50% of the replies indicated a positive answer as it can be seen in the next figure.

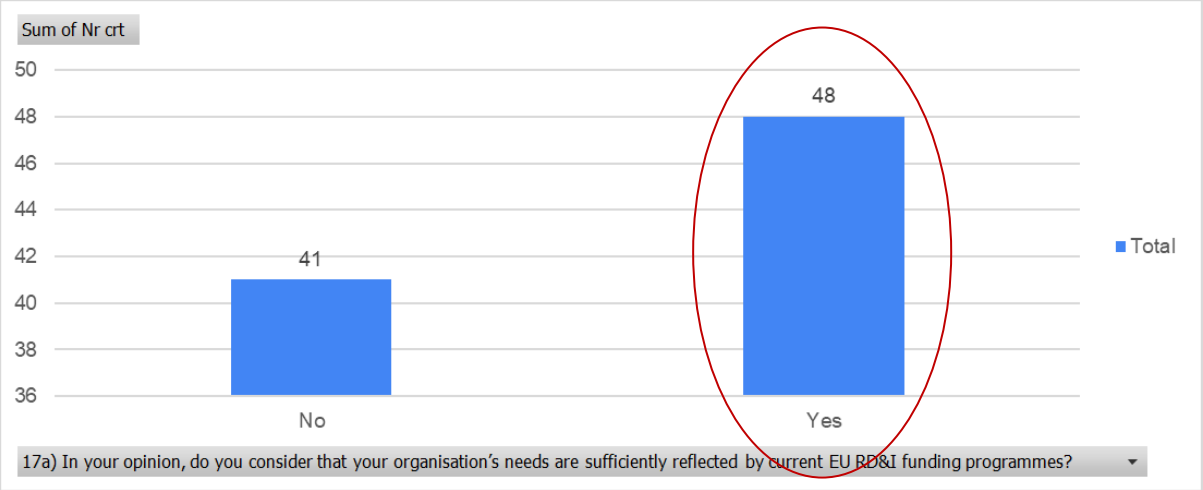


Figure 14: Reflection of needs in the EU RD&I funding programmes

The next chart displays the positive/negative considerations per headquarters location. As it can be seen in the figure below, the highest number of entities which consider that their needs are not sufficiently reflected by the current RD&I funding programmes are located in Rotterdam and Brussels. At the same time, companies located in Delft, Brussels, Bremen, Amsterdam, Lisbon have returned a positive answer. Due to the fact that a significant part of the replies have been collected from organisations located in Brussels, there is a tie between the in the distribution of the negative and positive answers.

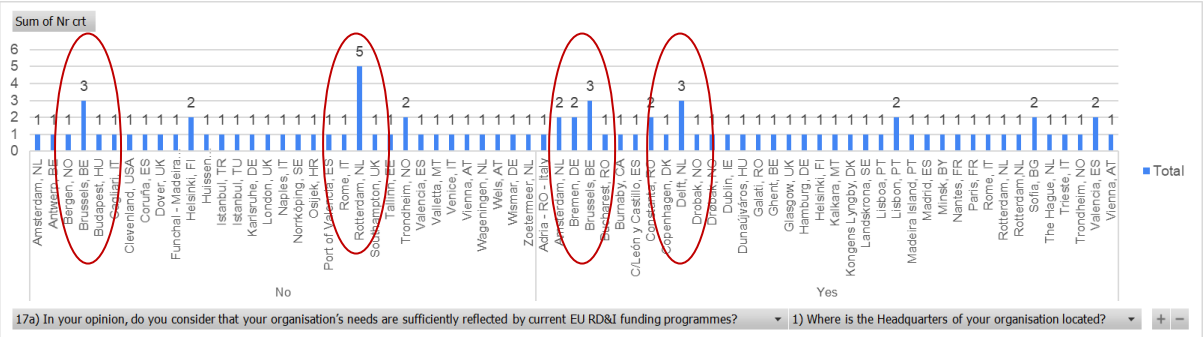


Figure 15: Satisfaction level per organisation headquarters

Last but not least, we can notice the satisfaction level depending on the organisation profile.

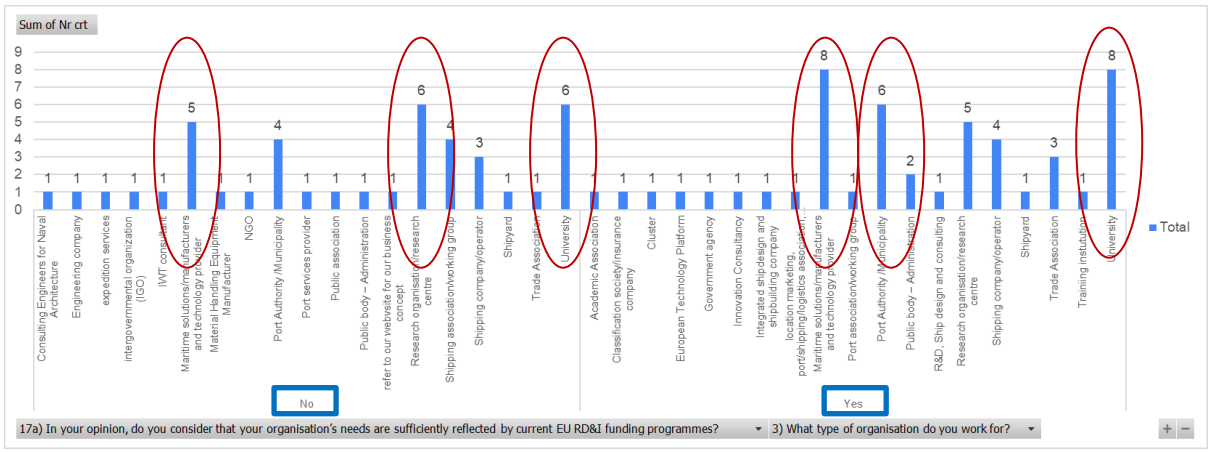


Figure 16: Satisfaction level based on organisation profile

The replies which returned a negative satisfaction level (choosing "No" as answer to question 17a, around 50%) have been further checked in detail. Figure 17 presents the main findings, among which:

- Scope does not match the company's interest or field of expertise;
- TRL is too high;
- Financially not attractive.

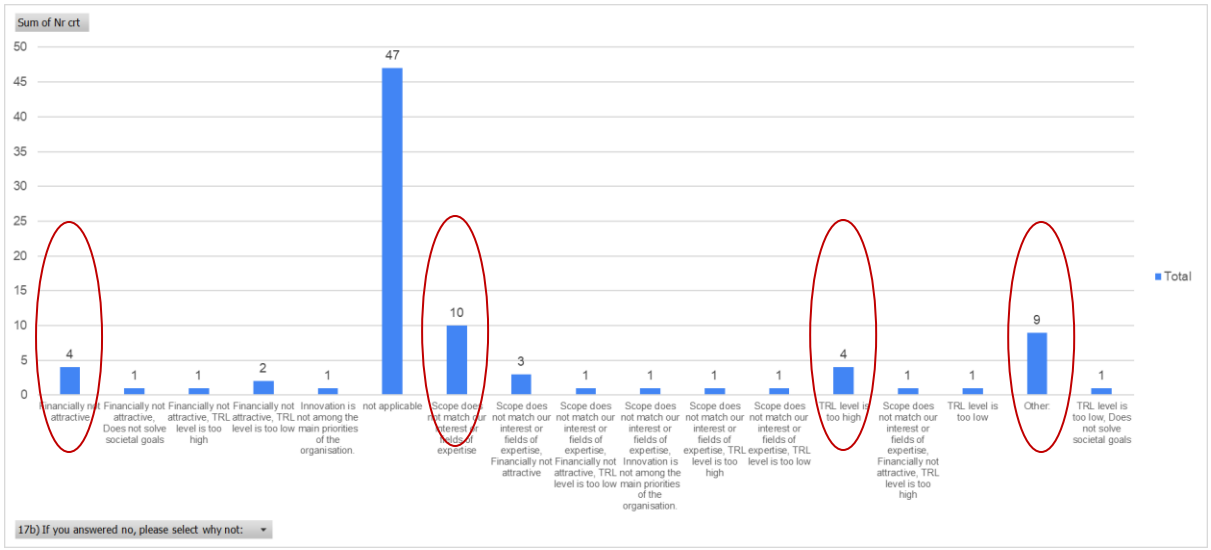


Figure 17: Reasons leading to a low satisfaction level from the possible applicants' perspective

More than 10% of all replies indicated there are other reasons than the options mentioned in the survey. Among these reasons are (inputs quoted as collected from the respondents):

- Difficulty to connect to daily practice;

- The work program is sometimes too "hype-driven", the sector needs to not only create new technologies, but also to keep a leading position in Europe related to improving existing technologies in shipbuilding, equipment manufacture, etc.;
- Geographical limitations of INTERREG programmes mean that some interested companies cannot participate in projects for other regions, e.g. the North Sea region;
- The administrative burden is too high and the risk of not being accepted is too high for IWT entrepreneurs;
- Very hard to enter/comply with the funding conditions.
- EU Maritime research is too focused on ship development (old business model) and misses the opportunities with a transport system perspective and alternative business models;
- Calls are adequate, but it is difficult to get the right partners together;
- Interesting topics for the port cluster are not sufficiently reflected;
- More focus should be dedicated to solving infrastructural problems;
- Too general Calls for Proposals.

Below you may find an overview of these reasons grouped per company size – large, medium or small enterprise.

Row Labels	Sum of Nr crt
Financially not attractive	**4**
Large enterprise (>250 workers)	1
Medium enterprise (51-250 workers)	1
Small enterprise (1-50 workers)	2
Financially not attractive, Does not solve societal goals	**1**
Medium enterprise (51-250 workers)	1
Financially not attractive, TRL level is too high	**1**
Large enterprise (>250 workers)	1
Financially not attractive, TRL level is too low	**2**
Large enterprise (>250 workers)	1
Small enterprise (1-50 workers)	1
Innovation is not among the main priorities of the organisation.	**1**
Small enterprise (1-50 workers)	1
not applicable	**47**
Large enterprise (>250 workers)	22
Medium enterprise (51-250 workers)	7
Small enterprise (1-50 workers)	18
Scope does not match our interest or fields of expertise	**10**
Large enterprise (>250 workers)	5
Medium enterprise (51-250 workers)	2
Small enterprise (1-50 workers)	3
Scope does not match our interest or fields of expertise, Financially not attractive	**3**
Large enterprise (>250 workers)	1
Medium enterprise (51-250 workers)	1
Small enterprise (1-50 workers)	1
Scope does not match our interest or fields of expertise, Financially not attractive, TRL level is too low	**1**
Small enterprise (1-50 workers)	1
Scope does not match our interest or fields of expertise, Innovation is not among the main priorities of the organisation.	**1**
Small enterprise (1-50 workers)	1
Scope does not match our interest or fields of expertise, TRL level is too high	**1**
Small enterprise (1-50 workers)	1
Scope does not match our interest or fields of expertise, TRL level is too low	**1**
Large enterprise (>250 workers)	1
TRL level is too high	**4**
Large enterprise (>250 workers)	3
Medium enterprise (51-250 workers)	1
Scope does not match our interest or fields of expertise, Financially not attractive, TRL level is too high	**1**
Small enterprise (1-50 workers)	1
TRL level is too low	**1**
Large enterprise (>250 workers)	1
Other:	**9**
Large enterprise (>250 workers)	4
Medium enterprise (51-250 workers)	3
Small enterprise (1-50 workers)	2
TRL level is too low, Does not solve societal goals	**1**
Small enterprise (1-50 workers)	1
Grand Total	**89**

Table 5: Other reasons for a low satisfaction level of possible applicants grouped by company size

2.6 Waterborne research projects implemented during the period of 2010 – 2020

Together with project partners Fundación Valenciaport and Stichting Projecten Binnenvaart, Pro Danube Management analysed a database of more than 500 projects EU funded projects dedicated to waterborne transport, covering a time span of 10 years. In relation to Task 1.3 the analysis supported the project team in determining which funding programme were mostly used by the applicants, which innovation topics were mostly selected, indication of the TRL level, etc.

The analysis returned the following findings out of the 565 analysed projects:

- 144 projects received funding from the INTERREG+ENI+MED programmes;
- 103 projects received funding from the FP7 programme;
- 273 projects received funding from the H2020 programme;
- 45 projects received funding from the CEF programme.

The following lists display the **preference for certain innovation topics** by each funding programme:

Innovation topics addressed by at least one project (funded by CEF - 45 projects)

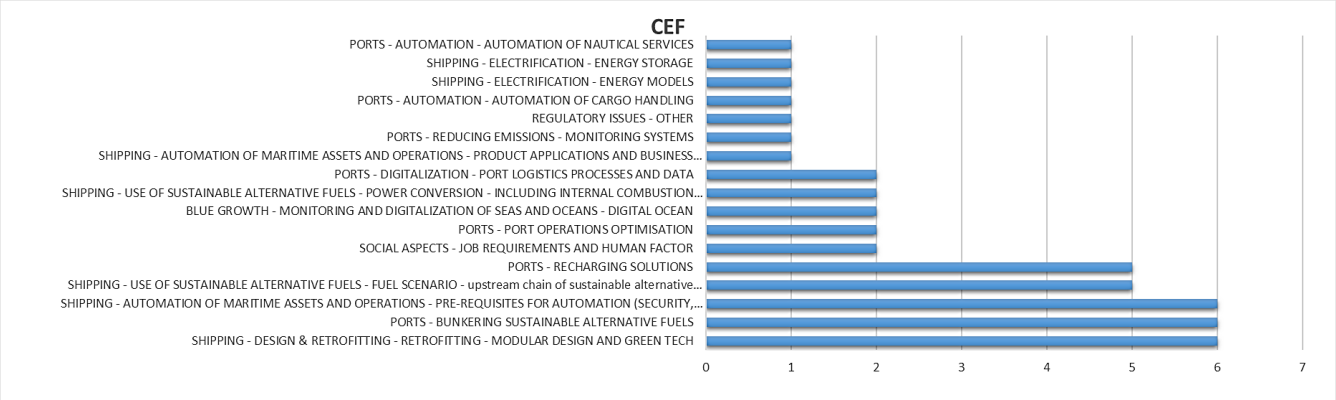


Figure 18: Number of CEF projects per innovation topic; Source: Fundación Valenciaport

As it can be seen from Figure 18, out of the 45 projects funded by CEF, a high number of projects were attributed to shipping, both to automation as we well as to retrofitting with green technologies, but also to ports in terms of deployment of alternative fuels infrastructure. Few projects were dedicated to electrification, digitalisation, capacity building (human factor, education & training). Not all innovation topics were addressed by CEF projects.

Innovation topics addressed by at least one project (funded by FP7 - 103 projects)

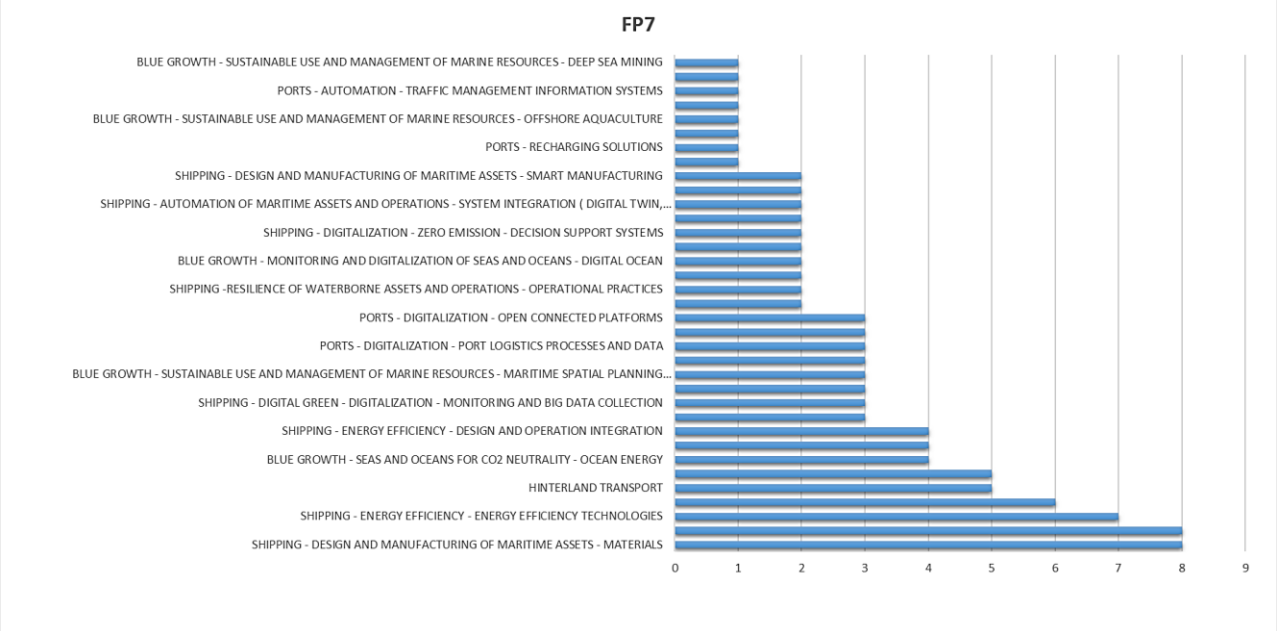


Figure 19: Number of FP7 projects per innovation topic; Source: Fundación Valenciaport

In terms of the innovation topics investigated as part of FP7 projects, the most chosen topics were blue growth – CO2 neutrality for seas and oceans, hinterland transport, energy efficiency technologies and design & manufacturing of maritime assets – materials. From the least investigated topics were ports (recharging solutions, traffic management information systems) and blue growth (deep sea mining, sustainable use and management of marine resources, offshore aquaculture). Not all innovation topics were addressed by FP7 projects.

Innovation topics addressed by at least one project (funded by H2020 - 273 projects)

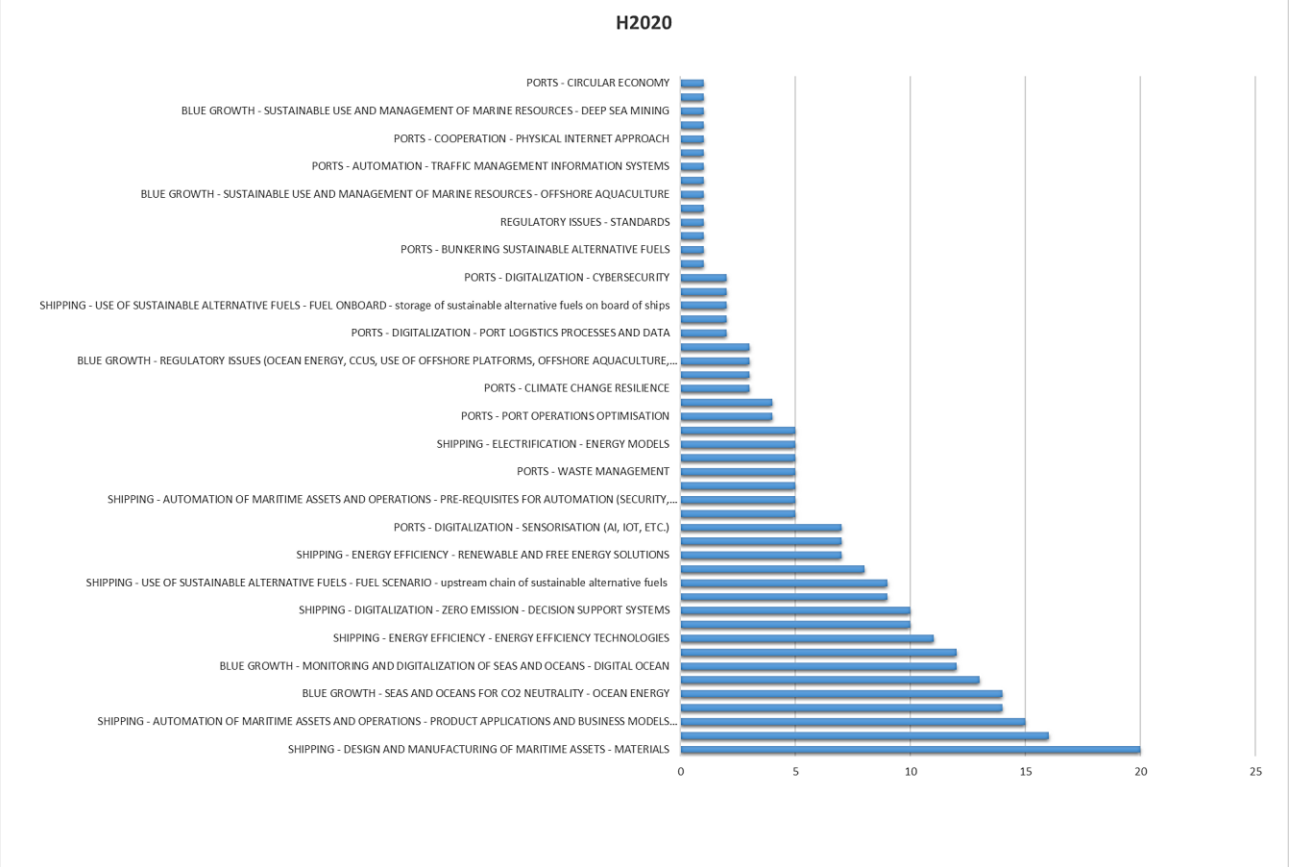


Figure 20: Number of H2020 projects per innovation topic; Source: Fundación Valenciaport

The innovation topic with the highest number of projects receiving funding from the H2020 programme falls in the category of shipping (automation of maritime assets and operations – product applications and business models, design and manufacturing of maritime assets, energy efficiency technologies, use of sustainable alternative fuels, digitalisation) and also blue growth (CO2 neutrality for seas and oceans). From the least investigated topics were ports (circular economy, physical internet approach, bunkering alternative fuels, digitalisation – cybersecurity). Not all innovation topics were addressed by H2020 projects.

Innovation topics addressed by at least one project (funded by INTERREG + ENI + MED - 144 projects)

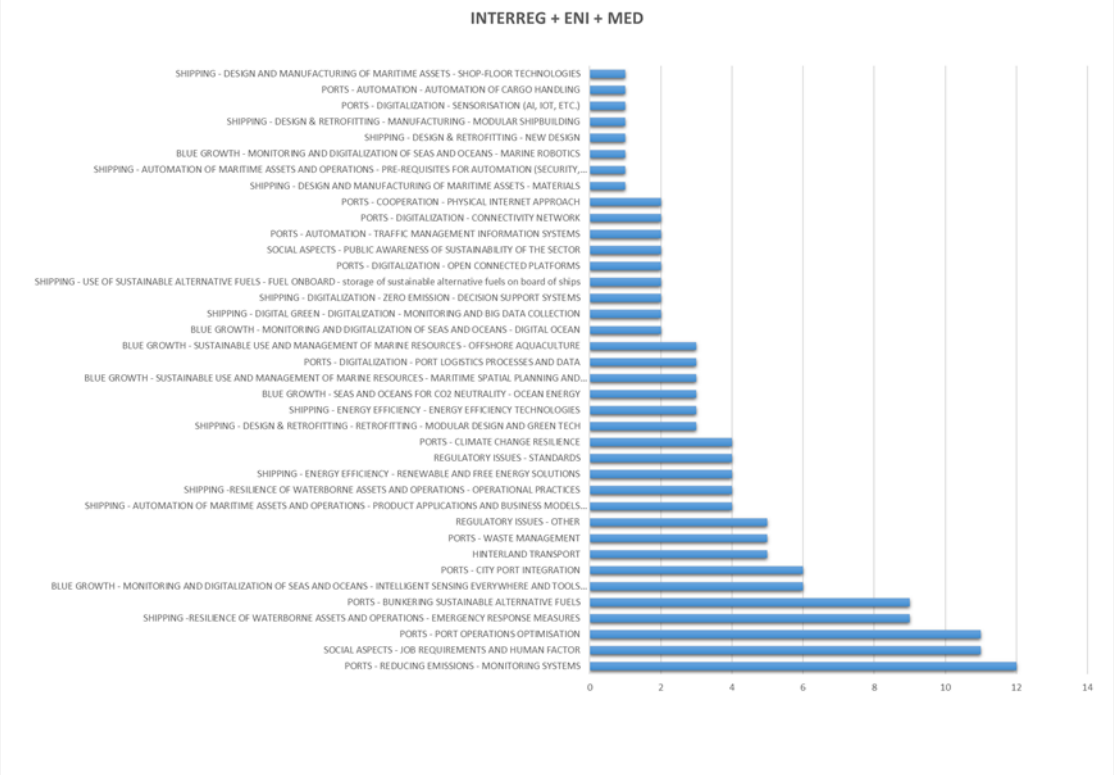


Figure 21: Number of H2020 projects per innovation topic; Source: Fundación Valenciaport

For Interreg+ENI+MED – the innovation topics which were mostly investigated are shipping (design and manufacturing of maritime assets, automation of maritime assets and operations, energy efficiency technologies) and blue growth (CO2 neutrality, monitoring and digitalisation of seas and oceans). From the least investigated topics were ports (circular economy, physical internet approach, traffic management information systems). Not all innovation topics were addressed by Interreg+ENI+MED projects.

2.7 Deployment of results

The following three aspects have been referred to for this purpose, namely:

- Number of follow-up projects (if the analysed project is a continuation of a previous one);
- Number of projects with TRL above 7;
- In terms of project awareness and dissemination & communication channels used.

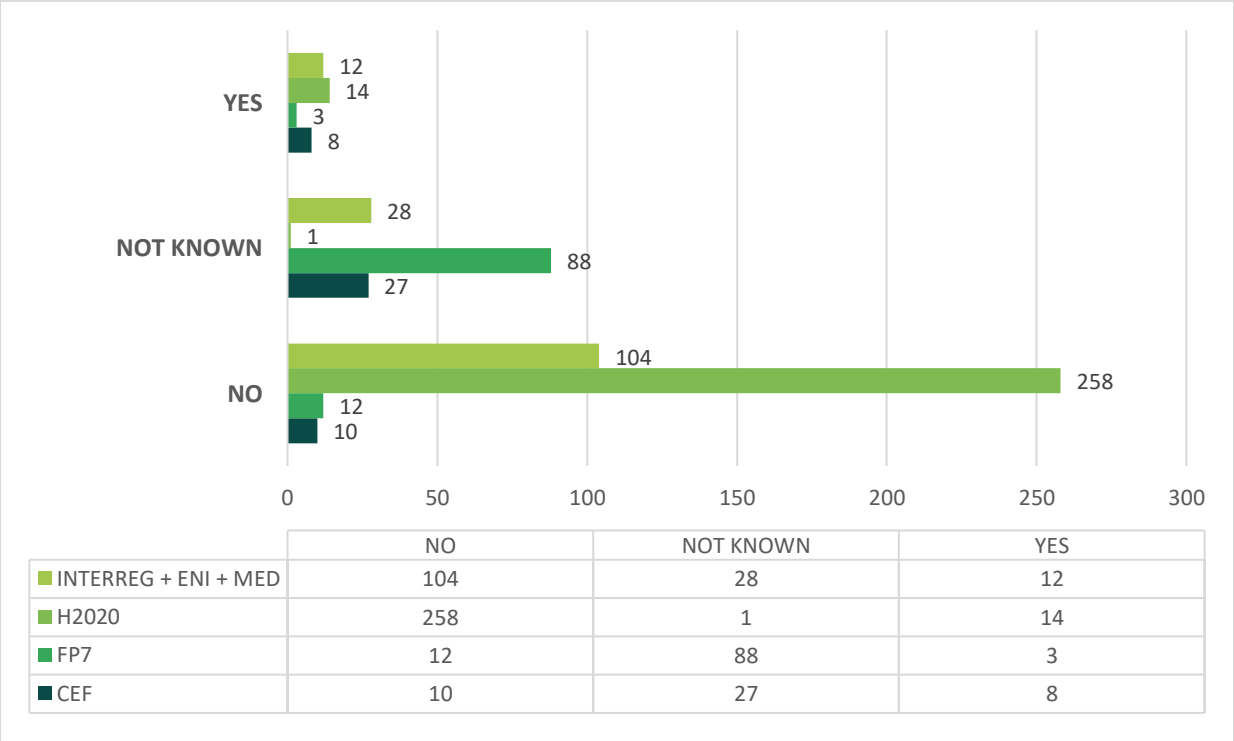
As it can be seen, based on the numbers included in Figure 22, only 6,5% (37 out of 565 projects) of the projects were a continuation of a previous one, which indicated a relatively low amount. In terms of deployment planning, in the case of follow-up projects, planning for what needs to happen after the first project is finalised, is ensured.

For the current analysis, it is also worth mentioning the number of projects with TRL level above 7.

As it can be noticed from Table 6, 5% of the projects analysed have returned a complete, qualified system, the majority being proven in an operational environment.

TECHNOLOGY READINESS LEVEL (TRL)	CEF	FP7	H2020	INTERREG + ENI + MED
TRL 8 - SYSTEM COMPLETE AND QUALIFIED	28	1	70	
TRL 9 - ACTUAL SYSTEM PROVEN IN OPERATIONAL ENVIRONMENT (MARKET)	7	1	18	4

Table 6: Number of projects with TRL above 7



	NO	NOT KNOWN	YES
INTERREG + ENI + MED	104	28	12
H2020	258	1	14
FP7	12	88	3
CEF	10	27	8

Figure 22: Number of follow-up projects

Regarding project awareness and communication channels used, there has been a general preference for digital tools, such as websites, as well as for publications (press releases, leaflets, etc.)

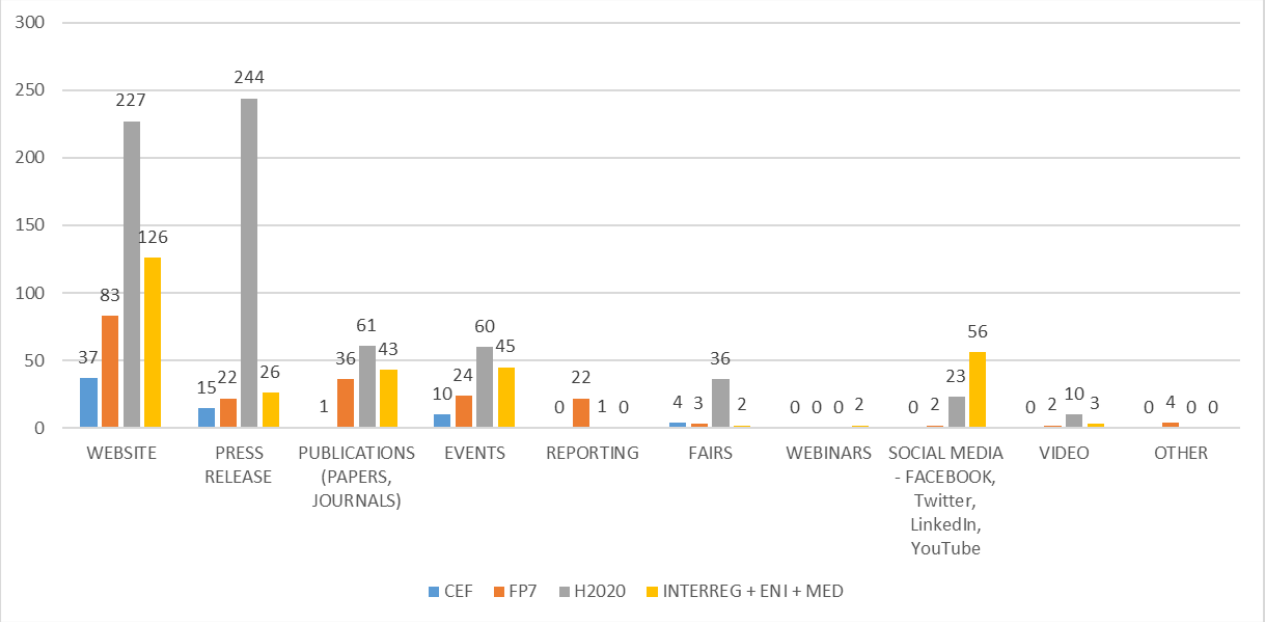


Figure 23: Share of communication channels used for awareness creation

2.8 Other opportunities to engage in RD&I activities

In order to maximise the possibilities to stimulate RD&I activities, there are several methodologies worth to be studied by the respective organisations. For example, according to the **European Association of Research and Technology Organisation (EARTO),** there are different funding sources which depend on the subject matter, the respective target groups, the needed time frame, the TRL of the activity, etc. and, therefore, should be aligned to the needs of the respective RD&I projects along all the different steps of the innovation processes.

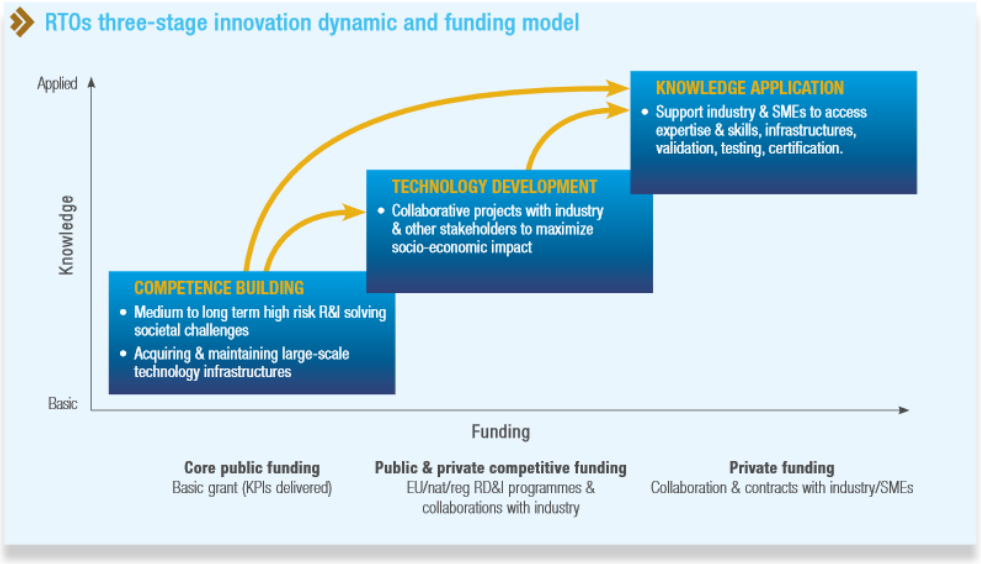


Figure 24: Three-stage funding scheme [66]

In order to foster private investments in Europe, the use of new financial instruments such as loans, equity-based public funding and other credit-based funds increased in recent years. Such financial instruments might be interesting complements **for very high TRL activities only**. Regarding equity-based funding for instance, RTOs welcome the set-up of investment platforms to support RTOs' efforts. High-risk RD&I activities cannot be financed through loans. EARTO members support the EU Competitiveness Council conclusions of 1st December 2017, stressing that "**grants should continue to be the main form of funding**". Besides, the wide majority of RTOs are prohibited by law/statutes from using credit based financial instruments. RTOs' financial model heavily rely on grant-based programmes. Therefore, if funds for credit-based financial instruments happen to be diverted from grant-based programmes, this would have a detrimental impact on RTOs' business models and accountability, as well as on the public sector's capacity to alleviate market failures. Grant-funded programmes are essential to reduce the risks and stimulate private sector's investments. Such instruments should therefore **be limited to private companies and to very high TRL projects**.

[66] EARTO, EARTO Recommendations For European RD&I Policy Post-2020, p.10-11: https://www.earto.eu/wp-content/uploads/EARTO-Recommendations-for-European-RDI-Policy-Post-2020.pdf

2.9 Findings from the questionnaire in relation to awareness about other funding opportunities

By means of the questionnaire around 70% of the participants reported that they are aware of other funding opportunities for RD&I activities applicable for waterborne transport, other than the ones available at EU level.

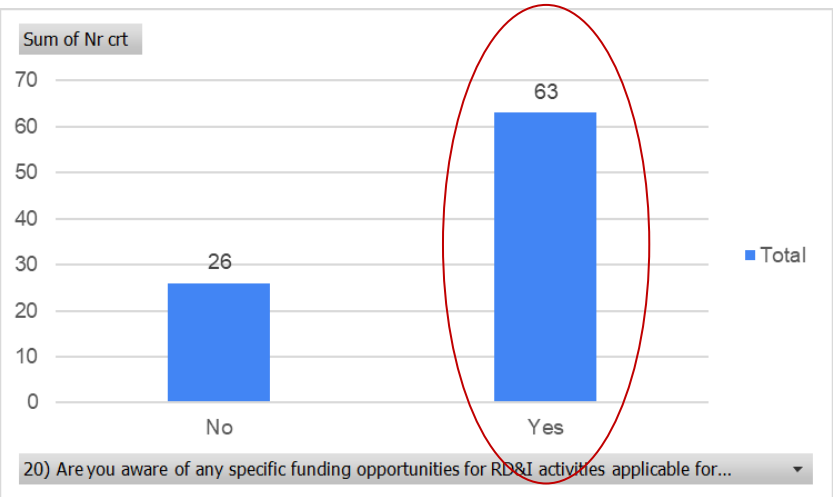


Figure 25: Awareness of other funding opportunities for RD&I activities applicable for waterborne transport

From these 70% replies, 60% made a reference to national schemes, 30% to regional schemes and 10% to local schemes.

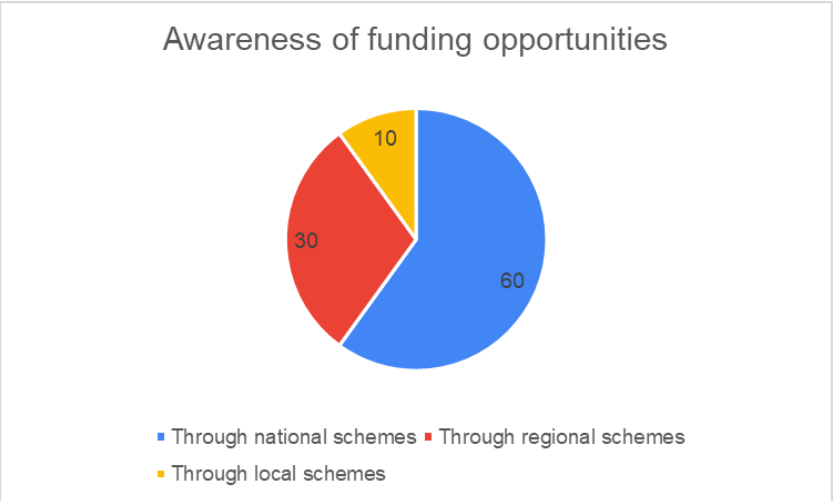


Figure 26: Awareness of other funding opportunities (figures displayed in %)

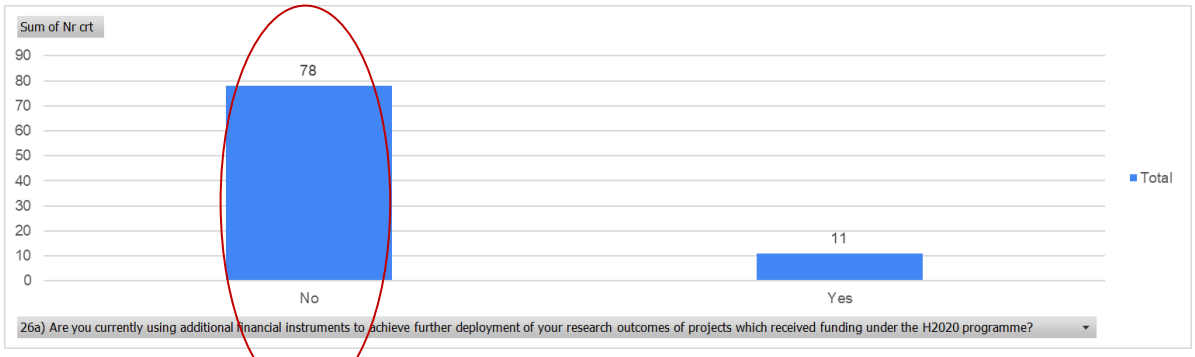


Figure 27: Proportion of stakeholders using additional financial instruments

Below there is an indication of the additional financial instruments used by the respondents. 4/11 replies indicated that own resources are standing for the non-funded parts.

Table 7: Examples of additional financial instruments

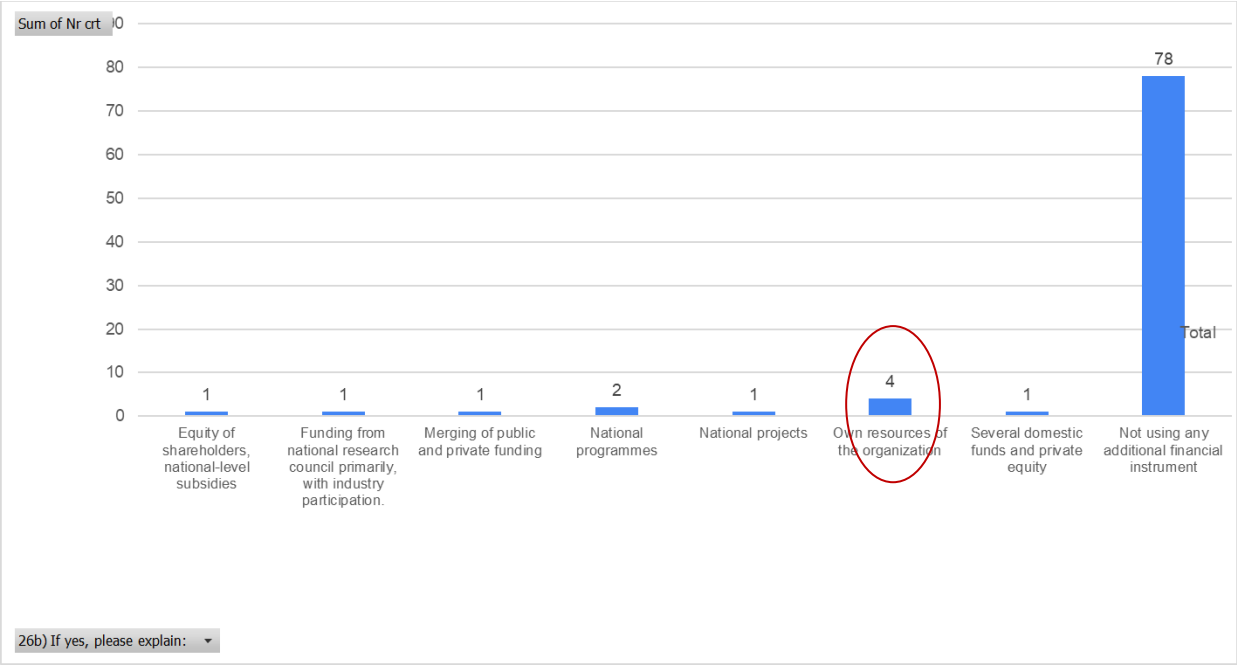


Figure 28: Use of additional financial instruments

3. Identification of bottlenecks/gaps for participation in RD&I activities

Based on the previous participation and manifold experience of the project partners in waterborne transport related EU-funded projects, several barriers have been identified, among which:

- Application procedures are unclear;
- Difficult to find complementary stakeholders for consortium;
- Lack of a relevant area/topic for the needs of the sector;
- Lack of adequate type of financial support;
- Limited internal financial resources to prepare & implement a project;
- Limited internal human resources (technical capacity) to prepare & implement a project;
- Project preparation and implementation rules are cumbersome;
- Success rates are too low to be worth applying for funding;
- Too long lead times between project initiation and implementation;
- Too strict timeframe & deadlines for project preparation;
- Unwillingness to share internal know-how with potential competitors.

These barriers have been included in the dedicated survey and been assessed by the responders based on their own experience with EU funded RD&I projects.

3.1 Findings from the questionnaire in relation to the bottlenecks for participation in RD&I activities

In relation to the main barriers experienced by the waterborne stakeholders when engaging in EU and/or national RD&I funding programmes, based on the 89 replies under analysis, as it can be seen in the chart below, most first[67] replies related to the difficulty to find complementary stakeholders for setting up the project consortium, whereas the second most selected barrier refers to the long lead times between project initiation and actual implementation. From the least chosen options are:

- limited internal financial resources;
- unwillingness to share internal know-how with potential partners;
- limited internal human capacity.

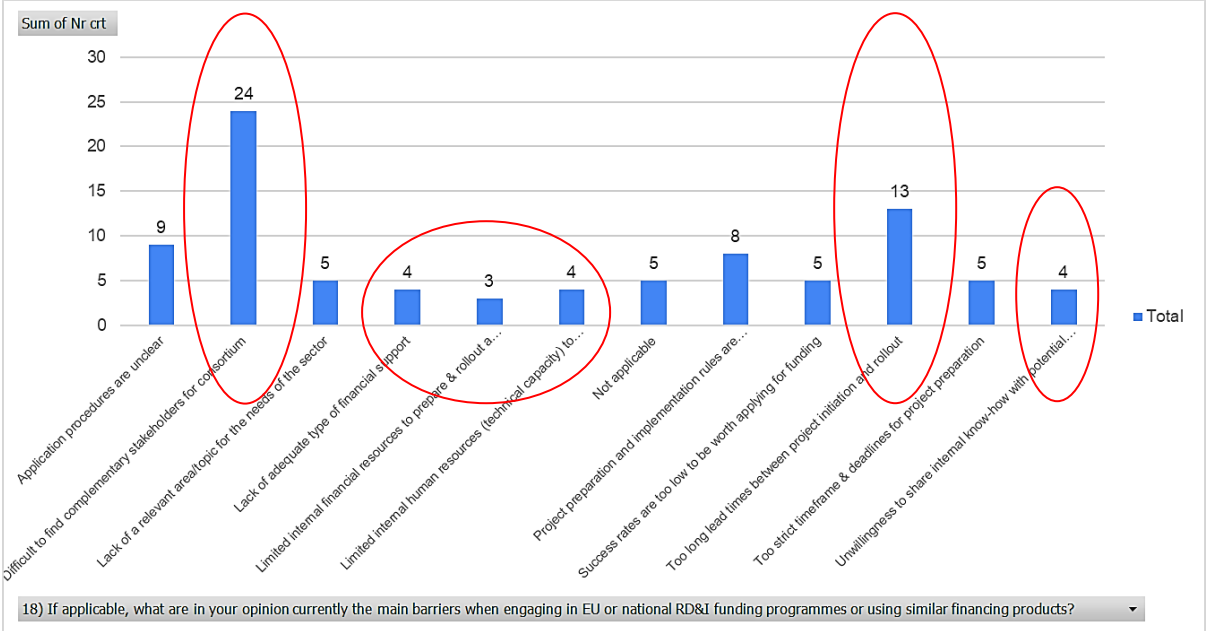


Figure 29: Assessment of main barriers when engaging in EU and/or national RD&I funding programmes

[67] First reply – the question under analysis is a multiple-choice question, with 14 answer possibilities; therefore, due to the manifold combinations of answers, for the sake of this report, the team involved in the data analysis has decided to consider the first answer option which has been selected by the participants.

4. List of measures to address and mitigate the identified bottlenecks

The following measures have been identified by the project team based on its extensive involvement in EU funded projects (both as coordinator and as funded partner) in order to mitigate the previously identified bottlenecks.

4.1 Simplification of the application process leading to elimination of unnecessary bureaucracy (from a complex and time-consuming process to a lean and faster one)

The simplification of application processes is an important step to increase the accessibility and boost the attractiveness of RD&I activities within the private sector (especially in the case of small and medium sized companies).

A harmonized application system throughout all European financial support programmes can be beneficial for the applicants as well as for the authorities. The administrative burden is not only demanding time resources of all involved partners but is also accompanied by financial efforts to be considered already before the start of the actual project.

In order to prepare proper project applications, either internal resources have to be dedicated for the application process or external consultancy companies have to be appointed. To overcome the bureaucratic barriers in the application phase, several recommendations – based on feedback from the involved stakeholders – have been identified also within the framework of the CCNR studies on energy transition towards a zero-emission inland navigation sector[68].

In order to ease the application process, it is recommended to have an open call procedure with a simplified one-stage process with constant support from the national contact point / responsible bodies for the programme. In the best-case scenario, the support should be a free of charge consultancy service, providing advice to interested stakeholder already in the definition of the overall project as well as guiding them along the application process and the completion of the necessary forms.

[68] CCNR - Central Commission for the Navigation of the Rhine, Studies on energy transition towards a zero-emission inland navigation sector: https://www.ccr-zkr.org/12080000-en.html

4.2 Shorter lead times between project initiation, project awarding and implementation

The lead times between project initiation, project awarding and implementation often lead to unnecessary standby time within RD&I projects, especially in case the continuation of a specific project or activity depends on the authority's decision.

Shorter lead times can be achieved through more cut-off dates, better quality and predictable quantity of applications, through the consultancy services of the authorities and also via faster decisions making processes, reached through a harmonization and simplification within all administrative processes.

4.3 Harmonization of procedures regarding required documentations in case of national and European funding / financing

Harmonised application forms for all programmes will make the application process easier for the applicant as well as for the authorities. The forms can be adaptable on specific needs of the programmes, e.g. technical concepts; however, the framework shall be aligned within all European programmes as well as linked to national support programmes. Digital profiles of companies, having certain administrative information in the background and available / usable for all types of applications, can lower the administrative work for multiple applications on both sides.

4.4 Lowering administration requirements during project implementation

The administration requirements during the implementation of RD&I activities shall be limited & reasonable, however the documentation (both technical and commercial) of the project shall be available throughout the entire project lifetime for potential reviews from the authorities.

4.5 Targeted promotion and awareness creation campaigns

The aim of targeted promotion and awareness raising campaigns is to maximize the impact, visibility and ensure that the main message of the EU funding programmes dedicated to RD&I reach in the most efficient way their target groups.

4.6 Incentives to participate in RD&I activities (e.g. tax benefits for the organisation involved)

Member States can support companies involved in RD&I activities not only via conventional financial support directly (funding and financing of the planned activities), but also via further benefits on their way towards an innovative product/idea. This can happen via a mix of tax measures during the phase of research as it is common practice in many countries (e.g. Austria, Netherlands, etc.); nevertheless, innovation and the further role out of technologies, can be supported in addition via special rules in public procurement processes to earn back the research costs retrospectively and boost the market uptake.

4.7 Consultations with experts on the validity of the identified measures (findings from the questionnaire) to overcome barriers

The above mitigation measures have been submitted for validation via the survey, with the below results.

Simplification of the application process leading to elimination of unnecessary red tape (from a complex and time-consuming process to a lean and faster one);

1 - Most relevant/applicable; 5 - Least relevant/applicable

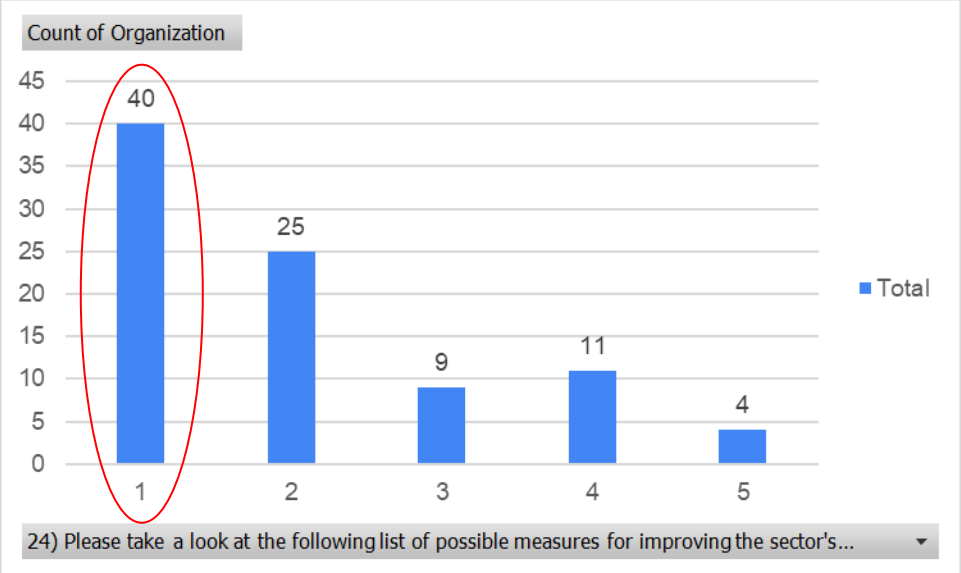


Figure 30: Simplification of the application process

Targeted promotion and awareness creation campaigns for improved access to information & benchmarking

1 - Most relevant/applicable; 5 - Least relevant/applicable

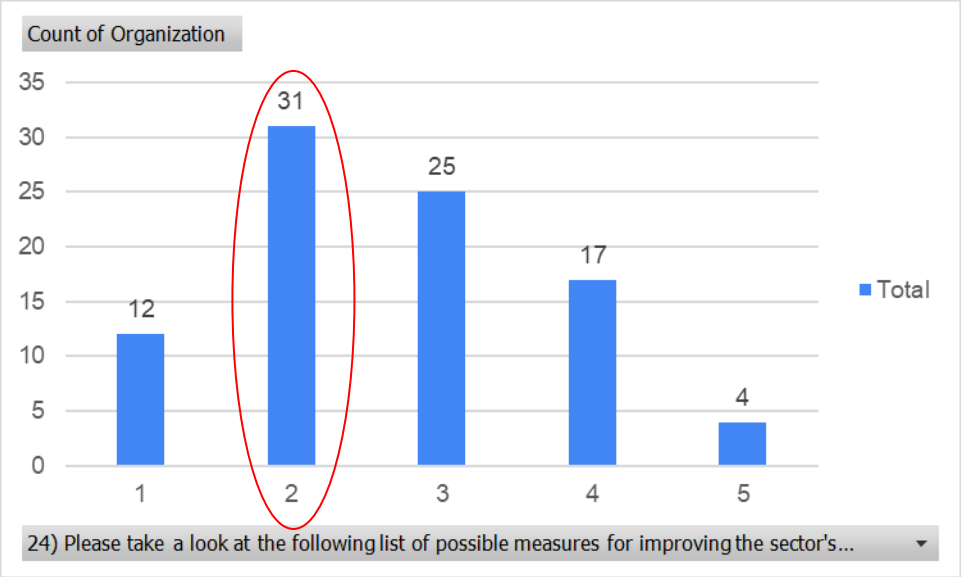


Figure 31: Targeted promotion and awareness campaign for improved access to information & benchmarking

Free of charge application support by the National Contact Points /Responsible bodies

1 - Most relevant/applicable; 5 - Least relevant/applicable

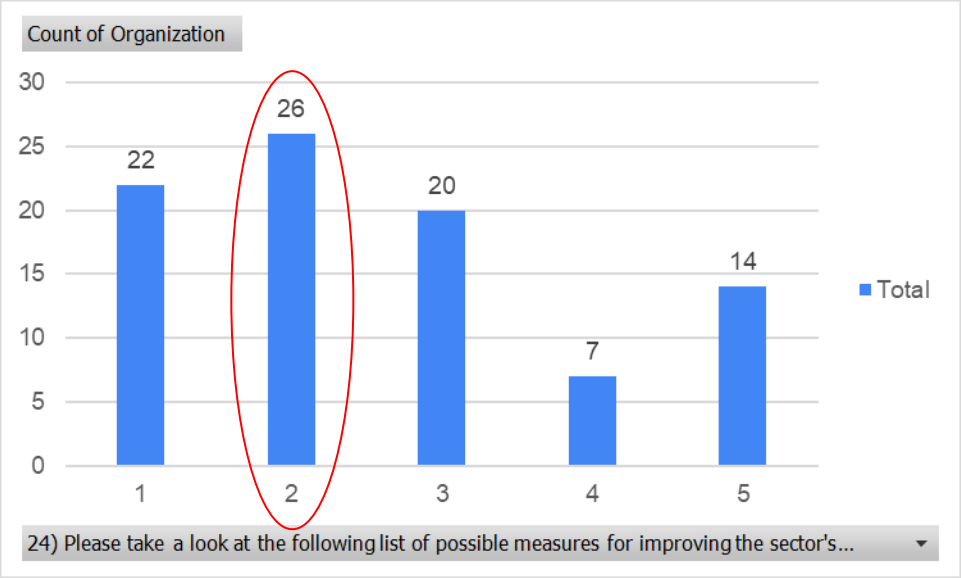


Figure 32: Free of charge application support by the National Contact Points /Responsible bodies

Lowering administration requirements during project implementation

1 - Most relevant/applicable; 5 - Least relevant/applicable

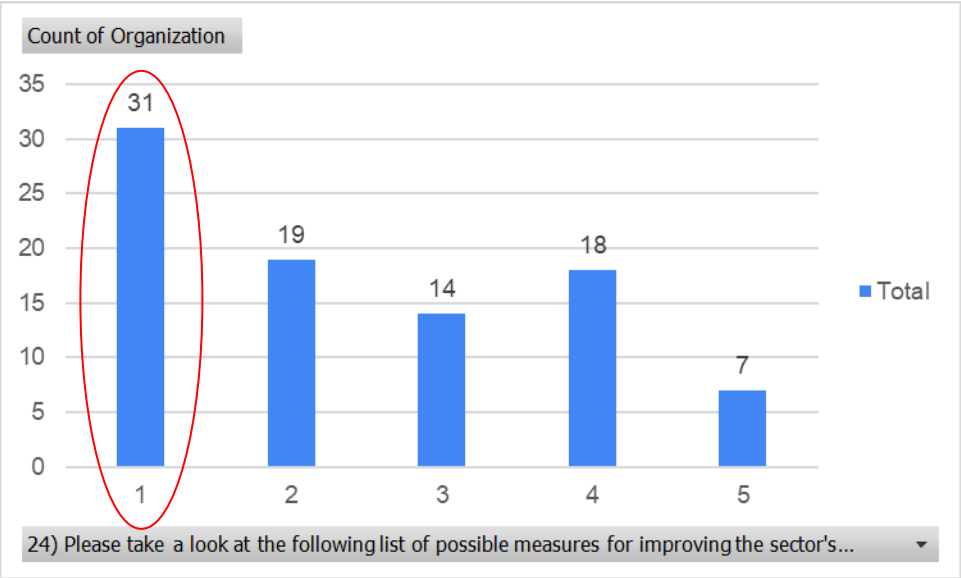


Figure 33: Lowering administration requirements during project implementation

Shorter lead times between project initiation, project awarding and implementation

1 - Most relevant/applicable; 5 - Least relevant/applicable

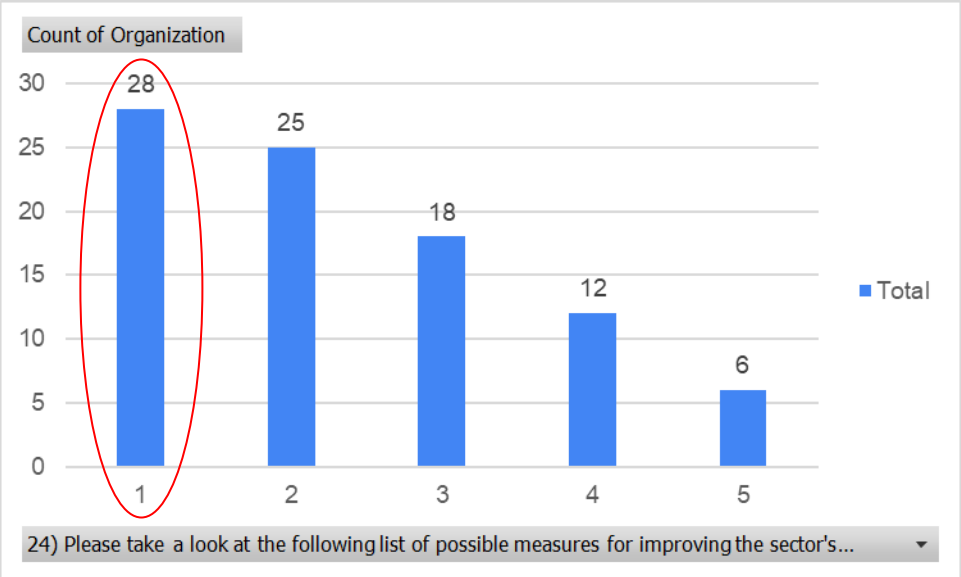


Figure 34: Shorter lead times between project initiation, project awarding and rollout

Harmonisation of procedures regarding required documentation in the case of national funding /financing

1 - Most relevant/applicable; 5 - Least relevant/applicable

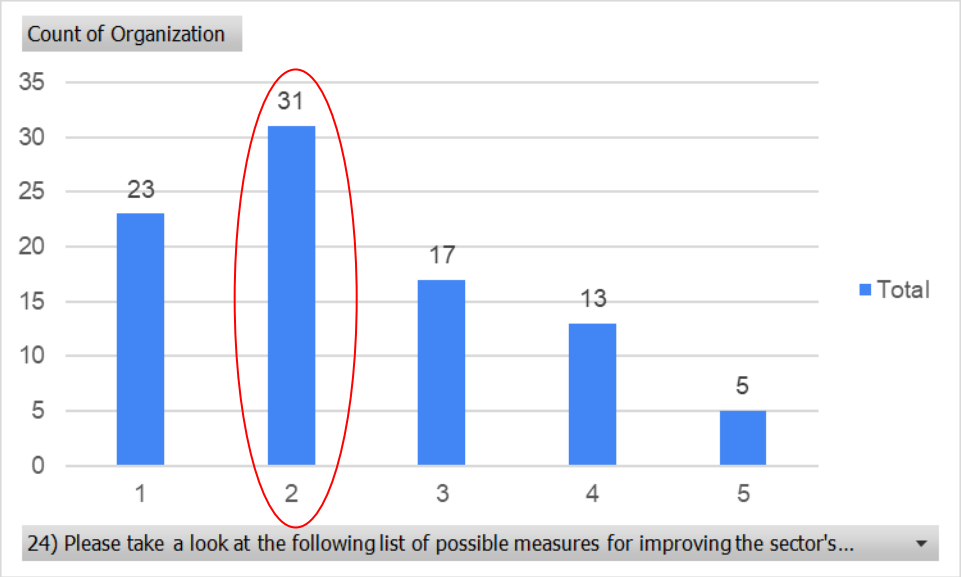


Figure 35: Harmonisation of procedures regarding required documentation in the case of national funding /financing

Incentives to participate in RD&I activities (e.g. tax benefits for the organisations involved)

1 - Most relevant/applicable; 5 - Least relevant/applicable

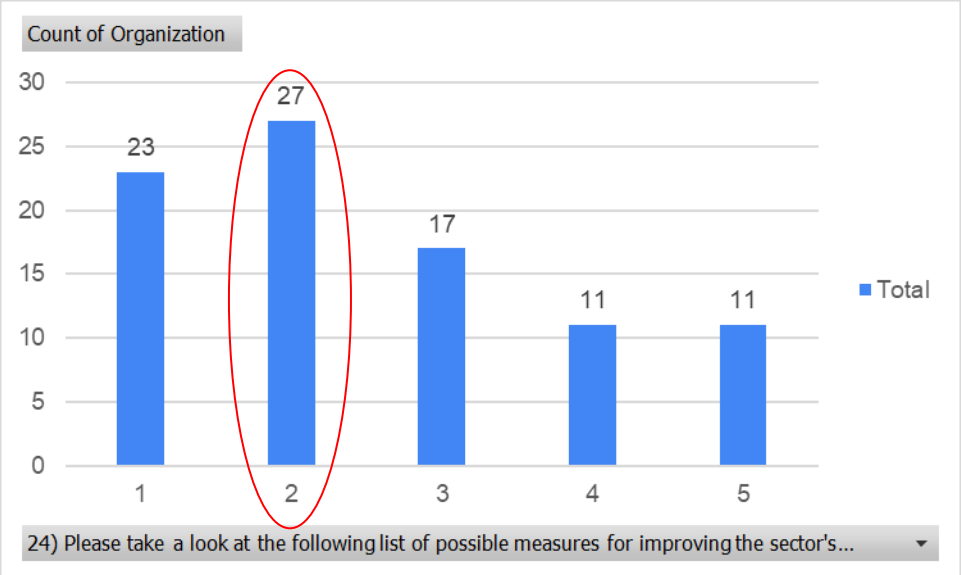


Figure 36: Incentives to participate in RD&I activities (e.g. tax benefits for the organisations involved)

Other measures deemed necessary and requested by the sector (presented as they have been collected from the survey respondents)

- More holistic overview and support to participate in all relevant priorities (Clusters) and measures, including e.g. training, mobility or researchers, trans-European networks;
- Require societal integration and governance as a necessary part of RD&I projects. Alternatively, initiate RD&I calls from a societal perspective instead of a (mostly) technical one;
- Resources for an administrative support team are needed (especially in the case of SMEs);
- Funding for longer term projects analysing system transformation is needed;
- Higher success rate for funding award;
- Dedicated measures per industry:
    - Keep production in Europe.
    - In the case that an innovative (high-power) system is to be integrated in a large ship, the only possibility is to have it integrated onboard an existing ship which will be sold and delivered to the customer. It is impossible that a MEUR 500-1,000 ship is built as a test case to accommodate a MEUR 5-20M system. Therefore, specific instruments have to be deployed to facilitate the development and integration of new systems/components;
    - Port companies: there should be very clear and specific measures to stimulate port companies to introduce emission reduction initiatives/prototypes/measures together with the manufacturers of port equipment and to ensure, that the infrastructure is prepared for zero emission port industry and also for connecting the ships to the electricity grid.
    - More funds dedicated to shipping companies.

5. Interviews with industry representatives

In order to collect further input and in some case to clarify some statements collected via the questionnaire, bilateral discussions have been organised by project partners Pro Danube Management, Fundación Valenciaport and Stichting Projecten Binnenvaart with respective sector representatives that have expressed their interest and availability for such a discussion.

5.1 Proposed questions for discussion

The following questions have been included in the interview template which was used during the interview sessions conducted with selected industry representatives, following their interest as mentioned in the questionnaire.

- You may know that there are various EU, national, regional funds to cover waterborne research. According to your experience - H2020, CEF, LIFE, INTERREG, etc. what is the most attractive one and why? What makes it particularly interesting for your company?
- We see several EU funding programmes with the aim to meet the needs of the sector and overcome technological challenges, but not all the mechanisms get the attraction of the industry. Could you point out the possible reasons behind this issue?
- What is your experience with H2020 projects?
- How do you reflect on your participation or level of involvement in those projects? Could you provide some relevant benefits/take-aways?
- In case of experience with any other RD&I funding programmes (e.g. LIFE, INTERREG, etc.) how do you assess your participation in those projects? Please mention a few benefits/take-aways.
- Are you considering the participation of your company in next Horizon Europe/CEF II/Next Generation funding programmes? Why? How would you better make use of future project opportunities?
- To further support the EU ambitions for the sector, what would be a good approach to raise the attraction of EU programmes for the companies in the sector? How to align the programmes according to the needs of the potential applicants fostering RD&I cooperation in the waterborne transport?

5.2 Entities addressed

The following companies provided their feedback to the above-mentioned aspects:

Interviews conducted by Pro Danube

- Hungarian Federation of Danube Ports / Centroport Ltd. / Plimsoll Ltd.;
- Fluvius Ltd;
- Logistikum – Department of Logistics at the University of Applied Sciences Upper Austria (FH OÖ Forschungs & Entwicklungs GmbH);
- TTS (Transport Trade Services) GmbH;

- Ship Design Group.

Interviews conducted by SPB/ EICB

- Royal Association of Netherlands Shipowners (KVNR);
- CCNR;
- DANSER;
- Fincantieri;
- NPRC;
- Hugues Van Honacker / DG MOVE / EC;
- Khalid Tachi / EICB.

Interviews conducted by FVP

- Port of Amsterdam;
- MARIN;
- Port of Valencia;
- TNO;
- Fundacion Valenciaport;
- Fraunhofer;
- Swedish Maritime Administration;
- CNR;
- SINTEF;
- Corvus Energy;
- Bureau Veritas;
- DNV;
- ABB;
- Wärtsila;
- Grimaldi;
- Royal Belgium Shipowners Association.

5.3 Main findings based on the industry consultations

The findings collected from the bilateral discussions with the above indicated organisations have been summarized below in the following categories.

- From the communication/information availability perspective

  More than half of the feedback received reported a high satisfaction level concerning the availability of information with regard to the RD&I funding opportunities available (H2020, HEU, Interreg). However, there have been several opinions concerning the existence of an information dissemination gap in the sense that information does not reach the right people at the right time, therefore there is a strong request towards a better knowledge and information sharing management (especially in case of funding programmes with a limited duration of the Calls for Proposals).

- From the funding perspective

  From a funding perspective, the funding rates are in most cases considered appropriate, indeed there is a preference for higher funding rates deriving especially from the SMEs needs and in particular for the companies that are developing new specialist technologies (mostly it's 50%, but it's necessary to have around 80%) – especially in case of CEF and H2020.

- From the content perspective

  Dedicated and more focused Calls for Proposals instead of generic ones are preferred (e.g. for fleet owners/operators) – in case of H2020.

- From the administrative perspective

  There has been a unanimous agreement that administrative requirements during the application phase, but even more necessary during the project implementation phase should be kept at a minimum level (**Interreg**). Indeed, large companies have the necessary resources "to cope" with these aspects, whereas SMEs need to assign (in most of the cases) the same persons involved in the research work to deal also with the administrative requirements. Many vessel owners/operators fall short when it comes to mobilizing in-house resources to put together a new project application. Some decide to work together with consultants, but others prefer to get advice directly from regional promotional entities, branch organizations or associations, chambers of commerce, etc., supporting them in obtaining the proper investment for their projects.

  Rejection rate is very high in case of EU funding programmes (e.g. H2020) in comparison to national or regional funding programmes, whereas the efforts for raising a project are considerably much higher

  There is clear indication towards having (a) a single stage application process, requiring applicants to submit a full project documentation by a given deadline than for (b) a two-stage

process consisting of expression of interest (based e.g. on a less than 10-page concept note) followed by the screening of pre-selected applications (based on complete project proposals).

- Positive aspects

  In general, companies are highly interested in collaborating with adequate partners (both with large ones as well as with SMEs). Private companies appreciate also the opportunity to work together with academia and public entities in the frame of EU funded RD&I projects (Interreg, H2020).

  Another aspect mentioned relates to the fact that usually the higher funding rates (above 85%) translate also into the opportunity to take additional risk in the development of a certain product/concept.

- Aspects for improvement

  Most companies involved in IWT (usually SMEs) define the application process in the frame of most EU funding programmes as very complex, time-consuming and even complicated (H2020).

  Timing and the timeline of innovation funds: usually don't fit with the new technology implementation timeline (timing gap). Therefore, there is a preference towards yearly Calls for Proposals and a harmonised timing, announced well ahead to allow companies to accordingly prepare for a project application.

  Access of SMEs: the RD&I market of the European waterborne transport sector is to a large extent dominated by larger companies, therefore SMEs require special conditions in order to compensate the lack of resources – not only financial, but also in terms of HR.

  TRL levels – larger companies appreciate also receiving funding for projects with lower TRL levels as they have own resources to further investigate and take the concept to a TRL of 7,8,9, without having to share information/know-how with the other partners, whereas SMEs prefer to receive funding for both lower and higher TRL levels projects (CEF, H2020).

  Shorter and smaller projects would be beneficial for the research partners, not always large projects with higher budget and big consortia return the best results. Few of the organisation interviewed (less than 10%) fear that the focus may be lost in the case of large projects.

6. Conclusions and Recommendations

Several points in relation to the three task pillars ((1) opportunities to engage in RD&I activities, 2) the bottlenecks/gaps associated and 3) ways to tackle the gaps identified) have been dealt with in this report – in principal starting from the needs of the participating waterborne transport sector representatives as derived from their past experience and perception of the several European RD&I funding programmes as well as from their expectations concerning the current financial framework and related funding opportunities and their planned participation in new project consortia.

In terms of funding for RD&I and market roll-out, the project partners have succeeded in presenting a comprehensive picture of opportunities at the EU level, albeit the fact that for some information the boundaries are not clear, while in other cases the targeted information for waterborne transport is not there (yet). Below is a summary of the main points discovered while investigating the relevant funding opportunities.

The HEU is the main funding instrument for RD&I activities for the waterborne transport sector and for the wider waterborne community. It offers funding from the lower TRLs up to TRL8, with EU contributions per project anywhere between approx. €100.000 and over €25 mil. And it is overall open to all types of stakeholders to apply for its calls. There is also dedicated funding for some actors, in particular SMEs and research-oriented entities. In terms of how the HEU funding is structured, there is both dedicated waterborne transport funding and more general funding that can be used by the sector stakeholders under specific circumstances (depending on the details of each calls).

As a more in-depth overview, this deliverable has found that:

- Within Pillar I of HEU, though there is no dedicated waterborne funding, but there are relevant programmes for the waterborne stakeholders. The most important is the MASCA funding, which has financed waterborne-related activities in the past years. A realistic-conservative estimate is that relevant funding under Pillar I would be in the region of tens of millions of € for the waterborne transport. It is possible to go well over the €100 mil mark, especially if looking at the wider waterborne community
- Within Pillar II the most funding relevant has been identified:
    - Within Cluster 5 Climate energy & Mobility, there is a dedicated funding instrument for the waterborne transport sector, the ZEWT Partnership **with an earmarked budget contribution of €530 mil from the EC**.
    - Within the same Cluster 5, there are two other partnerships – Clean Hydrogen and BATT4EU – with a total EU allocation of almost €2 bln. While this funding will be spread across hydrogen- and battery-related activities for different sectors, the transport sector is one of the priorities for both partnership. And given the fact that other transport modes, in particular road, have already received substantial EU funding, the waterborne transport sector should have a fairly good presence in these two partnerships. An estimate of relevant calls with tens of millions of € as EU funding from

both partnerships is realistic; it is difficult to ascertain at this moment whether the €100 mil milestone can be achieved.

  - Other opportunities under Pillar II should offer significant funding for the waterborne transport sector and the wider community on topics that are not covered by the aforementioned partnerships. A significant number of these topics will be cross-cutting/cross-sectorial, including cooperation with other modes of transport or other economic sectors. While it is unclear what the total amount of relevant funding would be, the figures should be well over €100 mil, especially when including blue growth or similar topics.

- Pillar III also does not have dedicated waterborne funding, but the EIC and EIT instruments are well-adapted to support the sector. Given the overall envelope for these projects, the funding that the sector could access should be well over the €100 mil mark.

The LIFE programme, though with a smaller budget and a narrower focus, can offer funding that is either waterborne-relevant or sometimes even waterborne dedicated. With projects between €500.000 and €17 mil and high TRLs, the LIFE project can help the waterborne community bridge certain gaps. A realistic expectation is in the range of several dozens mil € for the sector throughout the LIFE programme.

The Recovery and Resilience Facility (RRF) is implemented by the Member-States. While it is not known the overall allocation for waterborne topics, it is clear that some Member-States have a high interest in this sector, consequently the overall relevant funding could be in the region of billions of €, for both RD&I and implementation projects.

The Innovation Fund is designed for projects covering the highest TRLs, and targets in particular companies, with an attempt to bridge the gap between H2020/HEU funding ,other RD&I funding and the financial necessities for market roll-out. While at the first glance the waterborne transport is not directly included in the scope of the Fund, the calls and the discussions with the EC have proven that the sector's projects can be funded. A more conservative estimate puts the funding that the sector can access in the region of dozens of millions of €, but it should be possible to go well over the €100 mil mark given the size of the Fund and its duration (up to 2030).

Just as in the case of the RRF, the relevant funding within CEF depends on the interests of the Member-States and the approved projects. However, given the size of the overall CEF funding and the waterborne-related components that need to be funded through this programme, it is safe to assume that the allocations will be in the region of hundreds of millions of €, if not over €1 bln. This funding is meant mostly for market roll-out and implementation, but it can also fund RD&I activities with high TRL in order to reach a mature level.

Interreg has a smaller and more fragmented budget among dozens of regional Interreg programmes. It has lower-level of EU funding, rarely exceeding EU contributions of over €2 mil per project; they can sometimes cover high TRLs, but the nature of these projects is less TRL-focused. The projects are

generally restricted to entities within the region covered by the respective Interreg programme. Though there is no dedicated part of Interreg for waterborne, some regions are comprising large riverine or sea basins, consequently funding waterborne-related projects. While Interreg is not so relevant for bigger companies, it is useful for SMEs, authorities and research-oriented entities. The overall funding that can be accessed by the sector can be anywhere from tens of millions of e to well over €100 mil.

Finally, InvestEU and EIB offer interesting funding possibilities for both RD&I and roll-out of products and services. Their focus are companies, especially SMEs, unicorns, start-ups, etc. However, they can also fund other types of stakeholders. There is no dedicated waterborne funding here, and it is up to the stakeholders to present the products and business cases that can be supported through these funding sources. As a consequence, the potentially accessible funding can vary anywhere between tens of millions (conservative figure), over €100 mil (realistic figure) and over €1 bln (a very optimistic estimate) throughout this MFF.

Overall, it can be concluded that there is a high demand for the right mix of elements (in terms of visibility, knowledge management, funding rates, call focus, TRLs, timeline, administrative affairs, project size, etc.), whereas the preference for the right mix of elements is impacted by the local conditions (maritime vs inland, SME vs big size company, location, etc.) of the entities involved in RD&I activities.

At the same time, receiving reliable information on the existence of relevant funding (e.g. grants from CEF, HEU, national operational programmes) and financing options (loans) and dedicated conditions to access, use and blend these means is of utmost importance. Therefore, ensuring a proper visibility among all stakeholders involved (funding/financing source, management body, implementation body/beneficiaries) is a key (vital) element in targeted promotion activities, be it at EU, regional or national level.

Proper visibility is an essential aspect during the entire information process chain managed by the funding / financing bodies, i.e. from initial promotion, during the implementation phases and towards the very end of the program / action. The proper visibility shall ensure that all type of entities – independently from their size, location, staffing etc. – have the same information on all relevant possibilities.

As such, the project LASTING targets exactly the above-mentioned aspects and will develop a communication strategy in order to raise the visibility and impact of European waterborne transport research, making use of all findings deriving from the activities of WP 1 (Information Gap Analysis and Recommendations), including the opportunities for participation in RD&I projects.

7. References

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Annex 1– Questions included in the survey in relation to Task 1.3

The following questions have been included in the LASTING survey in relation to Task 1.3. The numbering below is reflects the original ordering,

14) Are you familiar with the EU's FP7, European H2020 and Horizon Europe research/funding programmes?

15) If applicable, please select other EU funded programmes in which your company has been involved.

17a) In your opinion, do you consider that your organisation's needs are sufficiently reflected by current EU RD&I funding programmes?

17b) If you answered no, please select why not:

18) If applicable, what are in your opinion currently the main barriers when engaging in EU or national RD&I funding programmes or using similar financing products?

20) Are you aware of any specific funding opportunities for RD&I activities applicable for waterborne transport, other than European ones?

21) If applicable please name support programmes promoted by national research organisations/agencies in the field of waterborne transport and the corresponding responsible organisation(s).

23a) Do existing EU funding programmes for RD&I in the waterborne transport sector or similar financing products sufficiently support your organisation in realising its long-term innovation priorities?

23b) If no, please explain:

24) Please take a look at the following list of possible measures for improving the sector's participation in EU RD&I activities. Rate the measures with grades between 1-5 (1 being the most relevant/applicable and 5 the least relevant/applicable)

- Simplification of the application process leading to elimination of unnecessary red tape (from a complex and time-consuming process to a lean and faster one)
- Targeted promotion and awareness creation campaigns for improved access to information & benchmarking
- Free of charge application support by the National Contact Points/Responsible bodies
- Lowering administration requirements during project implementation

- Shorter lead times between project initiation, project awarding and rollout
- Harmonisation of procedures regarding required documentation in the case of national funding / financing
- Incentives to participate in RD&I activities (e.g. tax benefits for the organisation involved)

25a) Are there specific measures you deem necessary for improving your organisation's participation in EU RD&I projects?

25b) If yes, please explain:

26a) Are you currently using additional financial instruments to achieve further deployment of your research outcomes of projects which received funding under the H2020 programme?

26b) If yes, please explain:

Annex 2 – Multiannual FINANCIAL FRAMEWORK 2021-2027 (in commitments) - 2018 prices

MULTIANNUAL FINANCIAL FRAMEWORK 2021-2027 (in commitments) - *2018 prices*

	2021	2022	2023	2024	2025	2026	2027	2021-2027
1. SINGLE MARKET, INNOVATION AND DIGITAL	**19,712**	**19,666**	**19,133**	**18,633**	**18,518**	**18,646**	**18,473**	**132,781**
1. Research and Innovation	**11,908**	**11,749**	**12,017**	**11,934**	**11,820**	**11,950**	**11,781**	**83,159**
Horizon Europe	10,843	10,843	10,843	10,968	10,968	10,968	10,968	76,400
In addition, allocation under NGEU	*1,700*	*1,650*	*1,650*	-	-	-	-	*5,000*
In addition, allocation under MFFR Article 5 (illustrative annual breakdown)	-	*500*	*500*	*500*	*500*	*500*	*500*	*3,000*
In addition, indicative re-use of decommitments under the FR, Article 15(3)	*71.4*	*71.4*	*71.4*	*71.4*	*71.4*	*71.4*	*71.6*	*500*
Euratom Research and Training Programme	250	250	250	250	251	251	255	1,757
International Thermonuclear Experimental Reactor (ITER)	814	656	924	716	601	731	558	5,000
Other	0.3	0.3	0.3	0.3	0.3	0.3	0.3	2
2. European Strategic Investments	**4,837**	**4,951**	**4,150**	**3,856**	**3,858**	**3,857**	**3,857**	**29,367**
InvestEU Fund	969	969	172	172	172	172	172	2,800
In addition, allocation under NGEU	*1,680*	*1,680*	*2,240*	-	-	-	-	*5,600*
In addition, allocation under MFFR Article 5 (illustrative annual breakdown)	-	*167*	*167*	*167*	*167*	*167*	*165*	*1,000*
Connecting Europe Facility - Transport	1,626	1,626	1,626	1,626	1,627	1,627	1,627	11,384
Connecting Europe Facility - Energy	740	740	740	740	740	740	740	5,180
Connecting Europe Facility - Digital	261	261	262	262	262	261	263	1,832
Digital Europe Programme	1,040	1,153	1,149	855	855	854	854	6,761
Other	21	21	21	21	21	21	21	146
Decentralised agencies	180	181	181	181	181	181	181	1,263
3. Single Market	**842**	**841**	**839**	**838**	**836**	**834**	**831**	**5,860**
Single Market Programme (incl. COSME)	542	539	536	534	531	529	524	3,735
EU Anti-Fraud Programme	23	23	23	23	23	23	24	161
Cooperation in the field of taxation (FISCALIS)	34	34	34	34	34	34	34	239
Cooperation in the field of customs (CUSTOMS)	120	121	121	121	121	121	121	843
Other	10	10	10	10	10	10	10	72
Decentralised agencies	114	114	115	117	117	117	118	811
4. Space	**1,918**	**1,917**	**1,919**	**1,922**	**1,922**	**1,923**	**1,923**	**13,443**
European Space Programme	1,884	1,884	1,885	1,888	1,888	1,888	1,887	13,202
Decentralised agencies	34	34	34	34	34	35	36	241
MARGIN	208	208	207	83	83	83	81	952

2. COHESION, RESILIENCE AND VALUES	**49,741**	**51,101**	**52,194**	**53,954**	**55,182**	**56,787**	**58,809**	**377,768**
5. Regional Development and Cohesion	**33,362**	**33,779**	**34,196**	**34,690**	**35,186**	**35,685**	**36,189**	**243,087**
European Regional Development Fund	27,554	27,880	28,206	28,594	28,983	29,374	29,770	200,360
Cohesion Fund	5,784	5,875	5,965	6,072	6,179	6,286	6,395	42,556
Of which contribution to the Connecting Europe Facility - Transport	1,359	1,380	1,402	1,427	1,452	1,477	1,503	10,000
REACT EU								
In addition, allocation under NGEU	*37,500*	*10,000*	-	-	-	-	-	*47,500*
Support to the Turkish-Cypriot Community	24	24	24	24	24	24	24	171
6. Recovery and Resilience	**834**	**1,171**	**1,688**	**2,705**	**3,193**	**4,054**	**4,950**	**18,595**
Recovery and Resilience Facility (incl. Technical Support Instrument)	110	110	110	110	110	110	109	767
In addition, GRANT-allocation under NGEU (indicative annual instalments)	*109,375*	*109,375*	*93,750*	-	-	-	-	*312,500*
In addition, LOAN-allocation under NGEU (inidcative annual instalments)	*180,000*	*180,000*	-	-	-	-	-	*360,000*
Protection of the Euro Against Counterfeiting	0.8	0.8	0.8	0.8	0.8	0.8	0.8	5
Financing and repayment - Next Generation EU	105	425	938	1,841	2,328	3,190	4,087	12,914
Union Civil Protection Mechanism (rescEU)	85	88	92	210	210	210	210	1,106
In addition, allocation under NGEU	*646*	*627*	*627*	-	-	-	-	*1,900*
EU4Health	309	310	310	310	310	310	310	2,170
In addition, allocation under MFFR Article 5 (illustrative annual breakdown)	-	*483*	*483*	*483*	*483*	*483*	*485*	*2,900*
Decentralised agencies	214	227	227	223	223	222	222	1,558
Other	11	11	11	11	11	11	11	75
7. Investing in People, Social Cohesion and Values	**15,599**	**16,099**	**16,257**	**16,506**	**16,751**	**16,996**	**17,618**	**115,825**
European Social Fund+	12,170	12,293	12,418	12,561	12,705	12,850	12,998	87,995
Of which employment and social innovation	97	97	97	97	97	97	97	676
Erasmus+	2,509	2,878	2,982	3,086	3,189	3,293	3,771	21,708
In addition, allocation under MFFR Article 5 (illustrative annual breakdown)		*283*	*283*	*283*	*283*	*283*	*285*	*1,700*
European Solidarity Corps	128	128	128	128	128	128	128	895
Creative Europe	289	289	213	213	213	213	213	1,642
In addition, allocation under MFFR Article 5 (illustrative annual breakdown)		*100*	*100*	*100*	*100*	*100*	*100*	600
Justice, Rights and Values	127	125	123	121	118	116	113	841
In addition, allocation under MFFR Article 5 for Rights and Values (illustrative annual breakdown)		*133*	*133*	*133*	*133*	*133*	*135*	*800*
Other	176	175	173	171	169	167	165	1,196
Decentralised agencies	200	211	221	227	228	229	231	1,547
MARGIN	-54	53	53	53	53	52	52	261

	2021	2022	2023	2024	2025	2026	2027	2021-2027
3. NATURAL RESOURCES AND ENVIRONMENT	**55,242**	**52,214**	**51,489**	**50,617**	**49,719**	**48,932**	**48,161**	**356,374**
8. Agriculture and Maritime Policy	**53,371**	**50,344**	**49,568**	**48,686**	**47,773**	**46,965**	**46,169**	**342,876**
European Agricultural Guarantee Fund (EAGF)	38,564	38,115	37,604	36,983	36,373	35,772	35,183	258,594
European Agricultural Fund for Rural Development (EAFRD)	13,935	11,187	10,967	10,752	10,542	10,335	10,132	77,850
In addition, allocation under NGEU	*2,250*	*5,250*	-	-	-	-	-	*7,500*
European Maritime, Fisheries and Aquaculture Fund	717	902	855	809	717	717	713	5,430
Other	140	125	125	125	125	125	125	890
Decentralised agencies	16	16	16	16	16	16	16	112
9. Environment and Climate Action	**1,776**	**1,776**	**1,827**	**1,836**	**1,852**	**1,873**	**1,897**	**12,838**
Programme for Environment and Climate Action (LIFE)	660	661	667	677	693	715	740	4,812
Just Transition Fund	1,071	1,071	1,071	1,071	1,071	1,071	1,071	7,500
In addition, allocation under NGEU	*2,000*	*4,000*	*4,000*	-	-	-	-	*10,000*
Other	-	-	45	44	44	43	42	218
Decentralised agencies	45	44	44	43	44	44	44	308
MARGIN	95	93	94	95	94	94	95	660
4. MIGRATION AND BORDER MANAGEMENT	**2,324**	**2,811**	**3,164**	**3,282**	**3,672**	**3,682**	**3,736**	**22,671**
10. Migration	**957**	**1,174**	**1,353**	**1,403**	**1,626**	**1,614**	**1,662**	**9,789**
Asylum, Migration and Integration Fund	823	1,016	1,194	1,244	1,468	1,456	1,504	8,705
Decentralised agencies	134	158	158	158	158	158	158	1,084
11. Border Management	**1,268**	**1,621**	**1,794**	**1,862**	**2,028**	**2,050**	**2,058**	**12,680**
Integrated Border Management Fund	503	604	807	834	940	914	903	5,505
In addition, allocation under MFFR Article 5 for the Instrument for financial support for border management and visa (illustrative annual breakdown)	-	*167*	*167*	*167*	*167*	*167*	*165*	*1,000*
Decentralised agencies	765	1,017	987	1,028	1,088	1,136	1,154	7,175
MARGIN	99	16	17	17	18	18	16	202

5. SECURITY AND DEFENCE	**1,700**	**1,725**	**1,737**	**1,754**	**1,928**	**2,078**	**2,263**	**13,185**
12. Security	**508**	**551**	**579**	**588**	**615**	**623**	**607**	**4,070**
Internal Security Fund	166	210	256	257	279	283	254	1,705
Nuclear Decommissioning (Lithuania)	68	66	71	74	73	68	69	490
Nuclear safety and decommissioning (incl. for Bulgaria and Slovakia)	85	86	64	68	74	83	95	555
Decentralised agencies	189	189	189	189	189	189	188	1,320
13. Defence	**1,105**	**1,088**	**1,071**	**1,079**	**1,227**	**1,369**	**1,575**	**8,514**
European Defence Fund	891	874	857	865	1,013	1,154	1,361	7,014
Military Mobility	214	214	214	214	214	214	214	1,500
MARGIN	87	87	87	87	86	87	81	601
6. NEIGHBOURHOOD AND THE WORLD	**15,309**	**15,522**	**14,789**	**14,056**	**13,323**	**12,592**	**12,828**	**98,419**
14. External Action	**13,358**	**13,653**	**12,919**	**12,186**	**11,453**	**10,722**	**10,956**	**85,245**
Neighbourhood, Development and International Cooperation Instrument	11,380	11,588	10,849	10,111	9,373	8,636	8,862	70,800
In addition, indicative use of reflows from the European Development Fund	*142.9*	*142.9*	*142.9*	*142.9*	*142.9*	*142.9*	*142.6*	*1,000*
Humanitarian Aid	1,393	1,477	1,477	1,478	1,478	1,478	1,478	10,260
Common Foreign and Security Policy (CFSP)	332	334	337	339	342	344	347	2,375
Overseas Countries and Territories (including Greenland)	63	63	63	63	63	63	63	444
Other	189	190	192	194	196	200	206	1,366
Decentralised agencies	-	-	-	-	-	-	-	-
15. Pre-accession assistance	**1,794**	**1,795**	**1,795**	**1,795**	**1,795**	**1,796**	**1,796**	**12,565**
Pre-Accession Assistance	1,794	1,795	1,795	1,795	1,795	1,796	1,796	12,565
MARGIN	158	75	76	75	75	75	76	609
7. EUROPEAN PUBLIC ADMINISTRATION	**10,021**	**10,215**	**10,342**	**10,454**	**10,554**	**10,673**	**10,843**	**73,102**
European Schools and Pensions	2,279	2,337	2,397	2,457	2,529	2,596	2,655	17,250
Administrative expenditure of the institutions	7,742	7,878	7,945	7,997	8,025	8,077	8,188	55,852
TOTAL	**154,049**	**153,254**	**152,848**	**152,750**	**152,896**	**153,390**	**155,113**	**1,074,300**
In addition, allocation under NGEU	*335,151*	*312,582*	*102,267*	-	-	-	-	*750,000*
In addition, allocation under MFFR Article 5 (illustrative annual breakdown)	-	*1,833*	*1,833*	*1,833*	*1,833*	*1,833*	*1,835*	*11,000*
Of which:								
Cohesion (ERDF, CF, ESF, REACT EU)	45,411	45,951	46,493	47,130	47,770	48,414	49,066	330,235
Common Agricultural Policy	52,499	49,302	48,571	47,735	46,915	46,107	45,315	336,444

Source: https://ec.europa.eu/info/sites/default/files/about_the_european_commission/eu_budget/mff_2021-2027_breakdown_2018_prices.pdf
Current prices are calculated by applying annually a fixed deflator of 2% to the amounts in 2018 prices. Totals do not tally due to rounding.
Allocations for 2021 do not take into account the Amending Letter and the outcome of the 2021 Draft Budget negotiations.
As the annual distribution of amounts under the MFFR Article 5 cannot be established in advance, an equal annual split in 2018 prices is applied for illustrative purposes.