PLATINA3
IWT policy platform
- FLEET -

Funding and financing the energy transition of the European IWT fleet
D2.5

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Author	Laure Roux CCNR l.roux@ccr-zkr.org
Co-author(s)	Martin Quispel, SPB/EICB Salih Karaarslan, SPB/EICB Laure Roux, CCNR Secretariat Valérie Laget CCNR Secretariat Ruxandra Matzalik Florescu, PDM Robert Rafael, PDM

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List of abbreviations

AFIF: Alternative Fuels Infrastructure Facility

BATT4EU : Battery Value Chain Partnership

BAU : business-as-usual

BLN: billion

BMKB: Borgstelling MKB-kredieten

CAPEX: capital expenditure

CCNR : Central Commission for the navigation of the Rhine

CCS : carbon capture and storage

CCU : carbon capture and utilisation

CDNI: Convention on the collection, deposit and reception of waste generated during navigation on the Rhine and other inland waterways

CEF: Connecting Europe Facility

CLINSH: Clean Inland Shipping

CNG: compressed natural gas

COSME: EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises

CSR: corporate social responsibility

DC : Donau Commission

DEI+/DIE+: Demonstratie Energie- en Klimaatinnovatie/Demonstration Energy and Climate Innovation

DG CLIMA: Directorate General for Climate Action

DKTI: Demonstratie klimaattechnologie en -innovatie scheme

DPF : diesel particulate filter

DTP: Danube Transnational Programme

EBRD: European Bank for Reconstruction and Development

EBU: European Barge Union

EC: European Commission

EEC: energy saving certificate

EFSD+: European Fund for Sustainable Development

EIB: European Investment Bank

EIBIP: European Inland Barging Innovation Platform

EIC: European Innovation Council

EIF: European Investment Fund

EIT: European Institute of Innovation & Technology

ENI: European Neighbourhood Instrument

ENP: European Neighbourhood Policy

EP: European Parliament

ERA: European Research Area

ERDF: European Regional Development Fund

ESO: European Skippers' Organisation

ETD: Energy Taxation Directive

ETS: EU Emissions Trading System

EU: European Union

EVdB: Europäische Vereinigung der Binnenschiffer

FC: fuel cell

FCH JU: Fuel Cells and Hydrogen Joint Undertaking

FI: financial intermediary

FR: financial regulation

GHG: greenhouse gas

GNI: gross national income

GRENDEL: Green and Efficient Danube Fleet

HEU: Horizon Europe

IF : Innovation Fund

IPA: Instrument for Pre-Accession Assistance

IPCC: Intergovernmental Panel on Climate Change

IWT: inland waterway transport

KIC: Knowledge and Innovation Community

LGF: Loan Guarantee Facility

LNG: liquefied natural gas

LOHC: liquid organic hydrogen carriers

MA: Mannheim Act

MFF: Multiannual Financial Framework

MIA : Milieu-investeringsaftrek

MIT: Mkb-innovatiestimulering Regio en Topsectoren

MoU: Memorandum of Understanding

MS: Member States

MSCA: Marie Skłodowska-Curie actions

NDICI: Neighbourhood, Development and International Cooperation Instrument

NGEU: Next Generation EU

NIP: Neighbourhood Investment Platform

NPBI: National Promotional Banks and Institutions

NRMM: Non-Road Mobile Machinery

OECD: Organisation for Economic Co-operation and Development

OPEX: operational expenditure

PAMI: Programme d'Aide à la Modernisation et à l'Innovation

PARM: Plan d'Aide au Report Modal

RED: Renewable Energy Directive

RQ: research question

RRF: Recovery and Resilience Facility

SCF: Social Climate Fund

SCR: selective catalytic reduction

SME: small and medium-sized enterprises

SRIA: Strategic Research and Innovation Agenda

SRVB: Subsidieregeling Verduurzaming Binnenvaartschepen

STEERER: Structuring Towards Zero Emission Waterborne Transport

TCO: total cost of ownership

TEN-T: Trans-European Transport Network

TFEU: Treaty on the Functioning of the European Union

TRL: technological readiness level

TTS: Transport Trade Services

TTW: tank-to-wake

VAMIL: Willekeurige afschrijving milieu-investeringen

VNF: Voies navigables de France

WATERBONE TP: Waterborne Technology Platform

ZES: zero emission service

ZEWT: European Partnership on Zero-Emission Waterborne Transport Partnership

ZEWT cPP: Co-Programmed Partnership on Zero-Emission Waterborne Transport

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Executive Summary

Description of the PLATINA3 project

The Horizon 2020 PLATINA3 project[4] provides a platform for the implementation of the NAIADES III action programme. PLATINA3 is structured around four fields (Market, Fleet, Jobs & Skills, Infrastructure) of which work package 2 (WP 2) deals with various aspects of the fleet such as 1) zero-emission fleet; 2) climate resilient fleet; 3) digital and automated vessels; 4) technical regulations and standards for the fleet and fuels; and 5) accurate fleet data.

This report presents the conclusions from Task 2.5 of PLATINA3 which focusses on further coordinating, developing and providing support to improve the funding and financing conditions for vessel owners in Europe to invest in powertrain solutions which match the transition towards zero-emission transport. This task builds on the outcome of existing studies[1] and analyses of available funding and financing opportunities to suggest a preliminary roadmap towards improving the funding conditions and a new European instrument.

While a more detailed summary is provided below, the key takeaways are as follows:

- Enabling the energy transition requires addressing economic, financial, technical and regulatory obstacles to the deployment of relevant technologies.

- Many funding and financing opportunities are available but are not all considered adequate to support the energy transition of the inland waterway transport (IWT) sector. There is room to make best use of existing funding and financing opportunities.

- The setting-up of a European financial instrument can be an appropriate solution to finance the energy transition of the inland navigation sector. The implementation of such an instrument can follow a two-phase approach, following the rhythm of the Multiannual financial framework.

- In order to move on with the implementation of such an instrument, all actors need to come forward with their intentions

- One centralised instrument combining, EU, national and sectoral contributions as part of a common pool of money would not be realistic.
  A more realistic concept for a European instrument would therefore be decentralised with:

    - national contact points and national co-funding
    - in addition to resources managed at European level coming from the EU budget (i.e. new or adapted funding programmes) and a sector contribution.

- The current framework does not enable to trigger the energy transition at the level of the individual vessel owner and the vessel owners do not have the financial capacity to finance the transition by their own means. In addition, no mechanism currently exists to ensure that those who invest today

[1] In particular, it builds upon the outcome of the CCNR study on the energy transition of the inland navigation section towards zero emission and its financing. CCNR study on energy transition towards a zero-emission inland navigation sector, executed by SPB/EICB, DST, REBEL, Ecorys, ProDanube and Panteia, see https://www.ccr-zkr.org/12080000-en.html

in expensive emission reduction technologies and take a financial burden and risk in doing so are not put at competitive disadvantage compared to those who decide to invest at a later stage (and still use relatively low cost fossil gasoil and continue to use old diesel engines). The setting-up of a sector contribution is therefore not seen as a goal in itself but mainly as a tool to address those two issues. Different options for a sector contribution remain available. Should support for the setting-up of such a contribution be lacking, it is likely that more aggressive regulatory evolutions will need to take place to force the switch on the side of vessel owners.

- Even if a decentralised approach is promoted, the energy transition remains a European challenge that requires a European solution and proper European coordination:
    - to ensure sufficient financial resources are available to enable the transition and at same conditions
    - the assess whether the burden set on different actors is fairly distributed
    - to mitigate risk of different national co-funding schemes in parallel which may disturb level playing field
    - to avoid that some vessel owners are side-lined

- A clear European strategy between the EU, national governments and IWT sector representatives regarding the funding and financing of the energy transition towards 2050 is therefore required, as well as a clear action plan to overcome the financial the related financial challenge.

The energy transition context for IWT and the related challenges

Addressing the issue of climate change is a political priority both nationally and internationally. [2][3][4]In their Declaration signed in Mannheim on 17 October 2018, the transport Ministers of the Member States of the CCNR (Germany, Belgium, France, Netherlands, Switzerland) reasserted the objective of largely eliminating greenhouse gases and other pollutants by 2050[5], a long-term vision which is also shared by the European Union (EU). In addition, it tasked the CCNR to take the initiative in developing new financial instruments to achieve said objectives, since existing funding and financing mechanisms have so far not delivered the expected results. At European Union level, the European Commission's Green deal for Europe of December 2019 and its "Smart and Sustainable Mobility Strategy" of December 2020 lay out priority policy areas, one of these being sustainable mobility, and actions to be realised to achieve climate neutrality by 2050. The European Parliament also called in its report "Towards future-proof inland waterway transport in Europe" to help the sector get access to funding, loans and guarantees and to support it in its pathway towards climate neutrality. This requires that appropriate funding and investment opportunities are available, notably at EU and national levels. It also asked for an EU financing plan, looking at existing funding instruments but also at new opportunities, notably an EU inland waterway fund.

Today, the energy transition must be seen as a crucial challenge for European inland navigation (Rhine, Danube, Sava, etc.) and an immediate start should be made to achieve the emission reduction targets set. Based on today's knowledge, while innovations to reduce emissions from existing and new vessels have increased in recent years, they tend for the time being to be limited to pilot projects, which are however of utmost importance in gaining knowledge of new technologies, and addressing economic, financial, technical and regulatory obstacles to the deployment of relevant technologies.

[2] https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF
[3] https://eur-lex.europa.eu/resource.html?uri=cellar:5e601657-3b06-11eb-b27b-01aa75ed71a1.0001.02/DOC_1&format=PDF
[4] https://www.europarl.europa.eu/doceo/document/TA-9-2021-0367_EN.pdf
[5] https://www.ccr-zkr.org/files/documents/dmannheim/Mannheimer_Erklaerung_en.pdf

Regarding the economic and financial bottlenecks, existing studies point to the limited business case for vessel owners to invest in technologies which fit within the transition pathway to reach zero-emission in 2050. In addition, the costs of the transition are too high to be borne by the private parties in the inland waterway transport sector alone. The financial gap to be bridged (or total cost of ownership ("TCO") gap) to achieve the emission reduction objectives at international level is expected to reach several billion euros (ranging between 2.5 and 10 billion euros depending on transition pathways and price scenario assumptions). This is a major bottleneck for driving the transition towards zero-emission and it is urgent to find solutions to close this TCO gap for the IWT sector to realise its transition. In addition, the relatively small size of the European inland waterway vessel market with specific European regulations (e.g. ES-TRIN and NRMM Stage V) implies that technological solutions designed specifically for the inland navigation sector alone are usually not commercially viable. It is therefore unlikely and exceptional that technological solutions will be developed for the inland waterway transport sector alone. To overcome these economic and financial bottlenecks, as much as possible, synergies should be found with technologies developed for seagoing vessels and for non-marine applications whether in Europe or in other parts of the world.

Even if this report will focus on the financial solutions to enable the transition, it is important to remind that regulatory and technical solutions must also be found to enable the transition. From a regulatory perspective, such measures could for instance play an important role in improving the business case for cleaner technologies, from a technical perspective, uncertainties remain concerning especially the development, the cost, the level of maturity and the availability of the technologies contributing to the transition towards a zero-emission inland navigation sector. For some fleet families, zero tailpipe emission technologies and fuels are not yet widely available for roll-out. This is for instance the case of large push boats with their high energy demand, 24/7 operation and high engine utilisation which are for now expected to continue relying on internal combustion engines (ICE) (according to the latest standards) which can achieve near zero-emission performance from well-to-wake perspective. On the other hand, for some vessels categories such zero tailpipe emission solutions exist, this is the case for instance of ferries and daytrip vessels which are expected to often use batteries and on shore power supply (charging the battery with electricity from the grid). In general, vessels operating locally (especially in densely populated areas) with a limited energy demand and a fixed route may benefit from relatively low energy costs for electricity from the grid, to offset the high investment costs for the batteries. In this respect, pay-per-use models are also interesting to the application of containerised and exchangeable battery systems.

To enable this transition, vessel owners and operators also need certainty that their investment in low/zero emission vessels will pay-off and a well-to-wake perspective is essential to remain technology neutral and goal oriented. For this purpose, developing a shared vision of the energy transition, the possible transition pathways for the fleet (new and existing vessels) and the concomitant challenges within the inland navigation sector is essential. The roadmap for reducing inland navigation emission adopted by the CCNR in December 2021 supports developing this shared vision.[6]

Learning from existing funding and financing opportunities

This report starts by making an overview on the existing funding and financing products, as well as other financial tools which can be considered to stimulate the energy transition of the IWT fleet in Europe from a business-as-usual scenario to zero-emission pathways in 2050. With regards to financing products, the list is not exhaustive, but lays focus on the main financing solutions used in the IWT market. In fact, learning from existing funding and financing opportunities is paramount to be able to identify the barriers and gaps and to propose possible new instruments. In addition, given the financial gap to be bridged to achieve the transition, public subsidies are expected to play a crucial role. In this respect, it is important for IWT actors to be aware of the funding opportunities that exist at different levels (EU, national, or regional levels). Key observations regarding how to maximise the use of such funding and financing opportunities are also made. In fact, numerous funding opportunities exist to support the transition but

[6] https://www.ccr-zkr.org/files/documents/Roadmap/Roadmap_en.pdf

are often considered inadequate. For instance, differences in eligibility criteria from one country to another can consist in a barrier and complexify access to such funding opportunities. Working towards better coordination between national programmes and providing transparent information about them would be of added value. At EU level, another bottleneck lies in possible restrictive eligibility criteria and funding priorities. A major bottleneck remains the accessibility of such funding opportunities, hence the need for more technical support available to possible applicants. The visibility of such opportunities could also be improved through for instance an up-to-date funding and financing database. Given the key role played by public funding at national level alongside other EU funding opportunities the possibility for state aid measures to support solutions enabling to reduce emissions should remain intact. It is important to apply a broad scope as regards the solutions, taking into account the air pollutant reductions as well as greenhouse gas reductions from a well-to-wake perspective. The support shall not be biased to zero-emission tailpipe solutions and needs to address also the solutions for existing fleet. For example engine replacement shall be in scope where new clean engines can also use low carbon fuels such as advanced biofuels or synthetic e-fuels made from renewable sources.

Developing a European financial instrument to support the energy transition

Building on existing studies, the need to develop new financial instruments but also the European Parliament's proposal to set up a new inland waterway fund, the report outlines a proposal for a new European financial instrument dedicated to IWT. The proposal is based on mixed sources (public and private and includes a differentiated sector contribution to incentivize vessel owners. Such an instrument should be focused primarily on providing grants to vessel owners. Next to public contributions, a differentiated contribution by the sector is envisaged to support its energy transition, with a higher contribution to be provided by polluting vessels and no contribution to be paid anymore by vessel owners which already achieve the emission target. Indeed, it is unrealistic to expect that the public sector will provide the full volume of resources needed to close the TCO gap by means of providing grants. Specific and detailed proposals for the development of such as sector contribution are presented in the report. Given that the setting up a sector contribution might seem at odds with the conclusion that in general, limited investment capacity is available on the side of the sector to invest in low/zero-emission technologies, the rationale behind the development of such a contribution is also explained in-depth. The current framework does not enable to trigger the energy transition at the level of the individual vessel owner. In addition, no mechanism currently exists to ensure that those who invest today in emission reduction technologies and take a financial burden and risk in doing so are not put at cost-competitive disadvantage compared to those who decide to ignore the societal need to reduce emissions or postpone investments at a later stage. Reflections on the setting up of a sector contribution were driven by the need to create an incentive for vessel owners to invest in emission reduction technologies and to use clean and low/zero carbon fuels (what is currently lacking), but also to ensure that such a contribution be earmarked to support the private sector and be invested in their projects to adapt the fleet of inland vessels for the energy transition of the sector. The setting-up of a sector contribution has therefore never been seen as a goal in itself. At the same time, in anticipation of expected legislative developments that would require the sector to contribute financially to the energy transition in ways which might not be the most appropriate (general tax, integration into Emission Trading Schemes, strict access bans for vessels which do not meet certain emission standards). This idea of a sector contribution also aimed at generating a large-scale discussion on what could be the most appropriate way for the sector to contribute to this transition and being in the driving seat to develop the parameters for such a contribution (bottom-up approach) instead of such parameters being imposed on the sector (top-down approach such as an ETS for IWT) with possibly a very high-cost impact but without having certainty on an earmarked use of the resources. This is why an important implication of the sector is expected, as well as its support, with regards to the further development of a sector contribution. It is also important to mention that the first reflections regarding the need for the sector to contribute to the energy transition challenge in the form of a sector contribution started before the COVID-19 crisis, before the proposals from the European Commission in the context of the "Fit for 55" package and before the Russian war of aggression against Ukraine. The form which such a sector contribution and its viability are related to such developments.

Should such support for the setting-up of such a contribution be lacking, it is likely that more aggressive regulatory evolutions are needed to reach the emission reduction goals, with a possible risk of national and regional governments taking their own intervention measures under the framework of the European "Effort Sharing Regulation" which can cause significant differences and a distortion of the level playing field.

At the level of the EU, it was made clear that financial commitments (public side) to feed a new instrument supporting the IWT fleet and which could come on top of a sector contribution, would not be possible under the current MFF (2021-2027).At the level of national governments, some financial commitments to support the IWT fleet have already been made in some countries, but not in others. Such financial commitments are limited in time. In addition, it is not always possible to dedicate financial means for the coming years “at will”, usually such financial means are negotiated in a law defining the budget and spending on a yearly/pluriannual basis.

Given the ambitious emission reduction objective set at international level, including for the IWT sector, it is now urgent to develop an appropriate financial solution to enable the transition. The need to develop a solution at European level was also highlighted on several occasions to ensure a level playing field. Indeed, should the financial solutions be developed only in parallel (EU, national/regional level) without a proper European coordination or strategy, it is expected that the majority of vessel owners will not obtain the necessary support to make their transition which means that emission reduction goals will not be achieved by the IWT sector.

Timewise, a two-phase approach could be envisaged to develop such an instrument, a phase 1 and 2:

A *phase 1* - under the current MFF (2021-2027): During this period, the use of existing funding and financing opportunities at various levels should be improved and the grounds for the setting up of a European wide instrument should be agreed upon (which investment priorities, which size, which contributors, which administrative costs, etc.). The setting up of a sector contribution could be put in place towards the end of this period, provided that several conditions are reunited. This requires beforehand that this concept is supported by all relevant actors and still requires answering to several questions. During this period, assessing the willingness of all parties to work towards the development of a European financial solution will be at the core.

A *phase 2* - period of the new MFF (2028-2035): linking together EU, national and sector contributions under an instrument supporting the energy transition of the inland waterway fleet. Three options for such an instrument were analysed in the first place.

1. Option 1 - a fully centralised instrument: combining EU, National and Sector contributions as part of the same “pool” of money dedicated to IWT fleet. It could be accompanied by the setting up of a central advisory desk.
2. Option 2 – a decentralised instrument: EU, national and a sector contribution (mandatory) to be made available in parallel. It could be accompanied by the setting up of a central advisory desk.
3. Option 3 – a decentralised instrument: EU, national and a sector contribution (voluntary) to be made available in parallel. It could be accompanied by the setting up of a central advisory desk.

The work performed in the context of PLATINA3 made it clear that the option of a fully centralised instrument (option 1) would be less realistic, seen as a too complex framework. The legal feasibility of such an option was also put into question. The option of a decentralised instrument, where EU, national and sector contributions could be made available in parallel could be more appropriate. In this case, an instrument would need to be set up at European level for the collection of a sector contribution, as well to manage and spend its revenues. National/regional funding as well as EU funding would then be available in parallel. However, at EU level, the setting-up of a new funding programme or the adaptation of existing funding programmes (such as CEF) to better capture the specificities of inland navigation would be recommended. Contributions from non-EU member States should also be allowed to ensure that vessel-owners from all countries in Europe, which are relevant for IWT transport can benefit from it. The

new or adapted funding programme should therefore be structured in a way that not only funding to vessel owners in the EU but also outside may be made available.

Given the size of the financial challenge to enable the energy transition of the sector as well as its European dimension, making an agreement on a clear European strategy (or at least at corridor level) plays a paramount role. This is needed to ensure that the different funding sources (from the sector, EU, regional/national level) are complementary, sufficient and appropriate to enable the transition. In addition, it can be a way of ensuring that the burden set on the different actors is fair and proportional. It needs to be taken into account to which extent different funding priorities can be identified depending on the source of the contributions. To match the European ambition towards a zero-emission inland navigation sector, it is clear that financial commitments at all levels needs to increase.

To be successful, this decentralised approach is however conditioned to a coordination of all actors and requires the support from all actors involved. At this stage, the willingness and commitment from all involved actors to move forward toward in the development of a European solution for financially supporting the energy transition is considered as a turning point.

Developing a roadmap to financially support the IWT sector in realising its energy transition

Finally, the report describes a preliminary roadmap to improve the funding and financing of the energy transition and to develop a European financial instrument. It is important to remind that the reflections regarding the development of such a new instrument started before the COVID-19 crisis, the latest proposals from the EC in the context of the "Fit for 55" package and the Russian invasion in Ukraine. These are factors which can influence the decision making on the sector contribution and the development of a European instrument. Despite that it is unclear how Fit for 55 proposals will unfold into legislation, the PLATINA3 consortium is convinced that there are already clear actions to be done to improve the overall financing framework. In parallel the preparation of a dedicated European funding instrument (or at least at corridor level) to support the energy transition of the IWT sector needs to continue. An important role is foreseen for the IWT sector itself. In fact, it was made clear that without sufficient support from the IWT sector, the steps towards the setting up of a sector contribution will probably not be taken . In the context of such reflections, keeping the momentum and involving all possible parties involved in the setting up of the envisaged public-private instrument is recommended. As a clear next steps, and on the basis of the work undertaken in the context of PLATINA3, it is important that all possible contributing parties to a European instrument indicate their position as regards the conclusions and next steps as presented in the report. This is important for the further elaboration of the practical elements of the envisaged European financial instrument.

The different actions outlined in the action plan are classified according to priority I and priority II actions. The actions are described in detail. The date by when such actions should be performed as well as by whom is presented in the action plan. The actions relate in particular to the following four topics:

1. **Making best use of the existing funding and financing programmes at national and European level.** This requires for instance that:
    - state-aid measures to support solution enabling to reduce emissions are possible, even if they are not zero emission tailpipe solutions.
    - best practices and drawbacks regarding existing funding and financing programmes are more clearly identified.
    - a centralised "advisory desk" is being set up which is free for vessel owners/operators.

2. **The role of customers and intermediaries in the greening challenge**. Indeed, while their role is not addressed to a great extent in this report (see Annex 5), they are key players to enable the energy transition. The demand for low-zero emission vessels and transport services from customers (i.e. shippers and brokers or tourists) can be a huge push factor for ship owners/operators to invest in greening technologies and to use sustainable alternative fuels.

Strengthening the demand side of low/zero-emission services by inland vessels should be an additional topic in future work. A key action in that regard relates to enquiring about the willingness, barriers and opportunities of cargo owners to contract low/zero-emission vessels, even if this implies additional costs. It is valuable to investigate whether arrangements, standards and commitments could be made in that regard, taking into account level playing field issues as well as competition law.

3. **The setting up of a European financial instrument**. This will require addressing questions of political nature the latest by 2024 taking into account the impact of Fit-for-55 implementation. This in view of reaching a common understanding on the meaning and the goals of a European financial instrument to support the inland navigation energy transition as well as evaluating the willingness of public and private parties to contribute to the European instrument dedicated to inland vessels. Further analyses and discussions regarding the setting up of a sector contribution should also be dealt with as a matter of priority. Other actions regarding the parameters of a European instrument or its governance can be dealt with as a subsequent matter and therefore second priority as such actions are relevant only if the willingness to develop a European instrument is confirmed.

4. **Monitor and report on the progress made**. To ensure that the work undertaken in PLATINA3 receives a proper follow-up, it will be essential to keep track on the progress and execution of the actions listed and organise periodic meetings where the overall progress regarding the setting up of a European financial instrument.

The specific actions for these 4 topics are summarised below:

I. Make best use of the existing funding and financing programmes at national and European level		
Priority I		
1	**Ensuring that state aid measures to support solutions enabling to reduce emissions are possible, even if they are not zero emission solutions**	**Regular task**
2	**Identification of best practices and drawbacks of existing funding and financing programmes**	**2023**
3	**Working towards better coordination between national programmes**	**2023-2024**
4	**Agree on a strategy between the EU, national governments and the IWT sector representatives regarding the funding and financing for the energy transition towards 2050**	**2025**
5	**Setting up a networking platform for possible IWT project partners in view of applying to funding programmes**	**2022-2023**
6	**Organisation of a workshop between European countries to share experience on existing funding programmes for IWT**	**2023**
Priority II		

7	Setting up of a centralised and free "advisory desk" available to vessel owners willing to make an investment in a technology contributing to the transition towards zero emission in 2050	2025
8	Reflect on the opportunities and barriers relating to the setting of cooperatives to facilitate access to financing, particular for smaller companies	2025
9	Ensuring that new funding and financing programmes are suitable to overcome the energy transition of the inland waterway transport sector financial challenge – lobbying	Regular task
10	Ensuring that existing funding and financing programmes are suitable to overcome the energy transition of the inland waterway transport sector financial challenge – lobbying	Regular task
11	Increased visibility of existing funding and financing programmes relevant for the energy transition of the IWT sector – up-to-date funding and financing database	2025
12	Active communication regarding innovative projects in IWT - Setting up of a database on innovative vessels	Regular updates
13	Active communication regarding innovative projects in IWT – Innovation award	from 2025 onwards
14	Increased accessibility of existing funding and financing programmes relevant for the energy transition of the IWT sector – a manual for applicants on access to funding and financing	2025

II. Actions related to the role of customers and intermediaries in the greening challenge		
Priority I		
15	Enquire about the willingness of cargo owners to contract with low/zero-emission vessels, even if this implies additional costs, and whether commitments could be made in that regard	2023
Priority II		
16	Improve the transparency between vessel owner and end customers to ensure that the latter make a conscious choice for low/zero-emission transport on inland waterways.	2025
17	Identifying incentives for customers to making contracts with low/zero-emission vessels	2025

III. Actions related to the setting up of a European financial instrument		
	Questions of political nature	
Priority I		
18	**Reaching a common understanding on the meaning and the goals of a European financial instrument to support the inland navigation energy transition.**	**2023**
19	**Evaluating the willingness of public and private parties to contribute to the European financial instrument**	**2024**
20	**In case there is willingness and if the idea of a European instrument is viable, need to investigate whether a pilot instrument could be created at the level of the Rhine**	**2024**

	Specific consideration regarding the setting of a sector contribution	
Priority I		
21	**In case there is willingness and if the idea of a European instrument is viable, finding an agreement on the methodology to be applied to determine the level of a sector contribution (strong link with PLATINA3 Task 2.6)**	**2024**
22	**Examining the compatibility of such a contribution with relevant international conventions**	**2024**
23	**Decide on the use of Reserve Fund to support investments in the greening of the IWT fleet or to support the setting up of an advisory desk**	**2024**
	Specific considerations regarding the parameters of a European instrument (relevant if willingness to develop a European instrument is confirmed)	
Priority II		
24	**Need to determine the share of public and private contribution to this instrument**	**2026**
25	**Need to determine the size of the instrument**	**2026**
26	**Need to consider several elements when it comes to implementing the instrument**	**2026**
	Specific considerations regarding the governance and the legal base of a European instrument (relevant if willingness to develop a European instrument is confirmed)	
Priority II		

27	**Examine the governance structure of the instrument**	**2026**
28	**Examine what would be the most adequate legal base for such an instrument**	**2026**
29	**Examine the administrative costs related to the setting-up of such an instrument**	**2026**
30	**Examine the compatibility of such an instrument with EU state aid law**	**2026**

IV. Monitoring and reporting progress – Priority I		
31	**Keep track on the progress and execution of the actions listed and organise periodic meetings where the overall progress regarding the setting up of a European financial instrument and in view of overcoming the financial challenge. The lead partner(s) for each action could present the main progress and results.**	**From July 2023 (after PLATINA3 ends)**

1. Introduction

The Horizon 2020 PLATINA3 project[4] provides a platform for the implementation of a future inland navigation action programme. PLATINA3 is structured around four fields (Market, Fleet, Jobs & Skills, Infrastructure) of which work package 2 (WP 2) deals with various aspects of the fleet such as 1) zero-emission fleet; 2) climate resilient fleet; 3) digital and automated vessels; 4) technical regulations and standards for the fleet and fuels; and 5) accurate fleet data.

This report presents the conclusions from Task 2.5 of PLATINA3 which focusses on improving the funding and financing conditions for vessel owners to invest in powertrain solutions which matches the transition towards zero-emission transport. This task builds on the outcome of existing studies and analysis of available funding and financing opportunities to suggest a preliminary roadmap towards improving the funding conditions and a new European instrument.

1.1. Objective of the task

Objective: "Further coordination, development and providing support to schemes and measures to be implemented in Europe to improve the funding conditions for vessel owners to invest in powertrain solutions which matches the transition towards zero-emission transport"

Refined objectives following kick-off meeting:

- On the basis of facts and figures from CCNR studies[7], develop a common view between consortium members, create European wide awareness and identify the opportunity of new financing instruments to realize the energy transition of inland navigation fleet (which cannot be financed alone by the sector).

[7] CCNR study on energy transition towards a zero-emission inland navigation sector, executed by SPB/EICB, DST, REBEL, Ecorys, ProDanube and Panteia, see https://www.ccr-zkr.org/12080000-en.html

- Investigate the additional measures targeting/supporting shippers, forwarders and brokers which need to be taken to promote making contracts involving the use of vessels with reduced emissions (i.e. lessons learnt from pilot project to address the issue of lack of business case).
- Taking into account the feedbacks of stakeholders, refine a proposal of international financial instruments and elaborate a preliminary roadmap: list of measures (and main miles stones, questions to be solved), which public and private stakeholders will be involved and what role they should have, identification of the barriers still to be overcome. For example, a labelling or indexing tool for inland vessels as analysed in PLATINA3 task 2.6 can be one of the relevant measures. Additionally, several measures will fall outside the scope of competency of the EU but can be mentioned as a research work as non-EU member states are part of the main IWT corridors (Switzerland, Serbia, Ukraine).
- Develop communications measures using networks of all partners and discussion space of current projects, especially addressing EU decision makers.

1.2. Methodology and activities

Methodology: This task builds further upon the outcome of the CCNR study on financing and CCNR activities regarding the development of a funding/financing scheme towards a zero-emission fleet. Throughout the development of this report, an abroad group of stakeholders in Europe was involved (A dedicated workshop, written consultation and PLATINA Stages events), paving the way for a European-wide decision making and implementation on the scheme to be applied.

Activities:

- Based on existing work/best practices, technical preparation of three workshops in the framework of PLATINA Stage events 1,2 and 4, to present and discuss the possible intervention measures needed to financially support the transition of the inland navigation fleet sector towards zero-emission as well as one parallel expert workshop.
- Report on the additional measures targeting/supporting shippers, forwarders and brokers which need to be taken to promote making contracts involving the use of vessels with reduced emissions (see annex 5)
- Elaboration of an action plan for these identified measures. These should include how such measures will be deployed, which stakeholder will be involved and what role they should have. The findings and the Action Plan were presented and discussed at the 4th Stage Event on 7 June 2022.

1.3. Introduction and policy context

Addressing the issue of climate change is a political priority both nationally and internationally. The 2015 Paris Agreement[8], which aims to slow down the pace of climate change (with i.e. a maximum increase in the global average temperature to well below 2 °C above pre-industrial levels by 2100) by reducing greenhouse gas emissions, is one of its key components.

In their Declaration signed in Mannheim on 17 October 2018, the transport Ministers of the Member States of the CCNR (Germany, Belgium, France, Netherlands, Switzerland) reasserted the objective of largely eliminating greenhouse gases and other pollutants by 2050[9] and tasked the CCNR to develop a roadmap to:

- reduce greenhouse gas emissions by 35% compared with 2015 by 2035,
- reduce pollutant emissions by at least 35% compared with 2015 by 2035, and
- largely eliminate greenhouse gases and other pollutants by 2050.

The aforementioned Declaration also tasked the CCNR to take the initiative in developing new financial instruments to achieve said objectives, since existing funding and financing mechanisms have so far not delivered the expected results.

[8] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
[9] https://www.ccr-zkr.org/files/documents/dmannheim/Mannheimer_Erklaerung_en.pdf

The European Commission's Green deal for Europe of December 2019[10] and its "Smart and Sustainable Mobility Strategy" of December 2020[11] lay out priority policy areas, one of these being sustainable mobility, and actions to be realised to achieve climate neutrality by 2050. In particular, it sets:

- a greenhouse gas reduction target of at least 50% and close to 55% by 2030 compared with 1990 (for all sectors),
- a greenhouse gas reduction target of 90% in the transport sector by 2050 (to achieve climate neutrality) compared to the emissions estimated for the year 1990.

Thus, the CCNR and EU share the same long-term vision with "a zero greenhouse gas emissions inland navigation sector by 2050". Regarding the reduction of air pollutants, CCNR also defined targets by 2035 and by 2050.

In 2019, **CCNR launched a study project on financing the energy transition towards a zero-emission IWT** aiming to:

- assess the financing needs for the energy transition of the IWT sector,
- secure support and acceptance of such results in close cooperation with relevant stakeholders,
- formulate recommendations for the development of a European financing and subsidy scheme to support this transition,
- provide inputs to the discussions at the Rhine, European and international levels, and
- pave the way for a political decision.

In the framework of this study, the most promising technologies were assessed with regards to their suitability for inland navigation and more precisely for each of the 12 main fleet families (as defined in the PROMINENT project[12] mainly and slightly extended based on the IVR database).

The choice of technologies reflects the current state of knowledge. It was decided to focus on a set of technologies with a technological readiness level ("TRL") of 5 and above. For instance, other technological options like lithium-air batteries, LOHC, formic acid or green ammonia in combination with fuel cells or internal combustion engines might play roles in later stages of the energy transition. Regarding ammonia for instance, it is a serious candidate as an energy carrier for seagoing vessels but still presents important external safety issues to be investigated in inland navigation.

These selected technologies are either based on combustion engines with alternative fuels/technologies, or electric engines:

Combustion engines:

- aftertreatment systems on combustion engines with fossil fuels (e.g. SCR, DPF refit or new Stage V / NRE or Euro VI engine)
- drop-in biofuels (including e-fuels), such as HVO and in future e-diesel
- bio/e-methane or bio-LNG
- bio/e-methanol
- green hydrogen

Electric engines:

[10] https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF
[11] https://eur-lex.europa.eu/resource.html?uri=cellar:5e601657-3b06-11eb-b27b-01aa75ed71a1.0001.02/DOC_1&format=PDF
[12] https://www.prominent-iwt.eu/wp-content/uploads/2015/06/2015_09_23_PROMINENT_D1.1-List-of-operational-profiles-and-fleet-families-V2.pdf

- full battery-electric power, with fixed or exchangeable battery systems
- fuel cells (with hydrogen or methanol as an energy carrier)

Two scenarios were defined, with a "conservative" pathway using a higher share of more mature, easy to implement and available technologies (higher percentage of combustion engines with alternative fuels) and an "innovative" pathway with more expensive and innovative technologies, however still in their infancy stage, but with real zero emission tailpipe features (higher percentage of electric technologies). Following the IPCC calculation approach[13], both scenarios achieve the European and CCNR objectives in terms of greenhouse gases and air pollutant emissions. Those two scenarios were compared to a "business-as-usual" scenario (BAU), meaning how much emission reduction can already be expected towards 2050 based on the current regulatory framework and assumptions on factors that determine the emission levels (such as transport demand, development of the fleet, the energy consumption of a vessel, the transport and logistic efficiency, emission profile of a vessel).

In this study, the cost of the energy transition was calculated for each of the 12 fleet families, for each scenario and with minimum, average and maximum cost hypothesis. It includes:

- CAPEX, consisting of initial investment costs for equipment (e.g. Stage V diesel engine, batteries, etc.) and installation costs (e.g. installation of an engine, electrification of a vessel for FC and battery applications, etc.).
- OPEX, consisting of energy/fuel and maintenance costs

Total Cost of Ownership (TCO), consisting of average annual OPEX and capital costs (the average annual interest and depreciation costs for capital expenditure).

All these calculations required making hypotheses on costs up to 2050, with uncertainty regarding the development of the technologies and the availability of the energy source/fuels, both having an impact on such cost estimations. Hence, it was decided to propose minimum, average and maximum cost estimations in this CCNR study.

The calculation was made based on the evolution (size and technical evolution) of the total inland shipping fleet (excluding floating equipment) from all connected waterways in Europe, with the hypothesis of a steady market demand for freight and slightly growing for passenger transport, and an overall reduction of energy consumption of 15% for the BAU scenario and 30% for the two transition pathways, due to efficiency increase, caused by higher energy prices in the pathways as well as more awareness and accompanying measures assumed in the two pathways.

This extensive study led to the calculation of CAPEX and TCO gap between transition pathways and business-as-usual evolution in a very refined way. Figures are summarised in the next table:

		OPEX		**CAPEX**		**TCO**	
		Total	**gap vs. BAU**	**Total**	**gap vs. BAU**	**Total**	**gap vs. BAU**
BAU	**Minimum**	26.75	-	2.55	-	30.44	-

[13] Application of this TTW approach implies making assumptions concerning the upstream chains. The estimation of emissions produced is therefore simplified and fuel availability idealised at this stage (for all technologies). In this approach, advanced biofuels are considered as carbon neutral, meaning that emissions resulting from their burning are already captured in the upstream chain (IPCC methodology).

	Average	30.24	-	2.62	-	34.03	-
	Maximum	34.63	-	2.65	-	38.46	-
Conservative Pathway	**Minimum**	26.14	-0.62	5.97	3.42	32.87	2.43
	Average	29.24	-1.00	6.70	4.03	36.67	2.65
	Maximum	37.04	2.41	7.20	4.51	44.85	6.38
Innovative Pathway	**Minimum**	25.53	-1.23	7.88	5.34	35.70	5.26
	Average	30.123	-0.11	9.34	6.72	41.83	7.80
	Maximum	36.13	1.51	10.44	7.80	48.65	10.19

Table 1: OPEX, CAPEX and TCO for the pathways versus BAU scenario (in billion € from 2020 to 2050)

These figures correspond to the amount to finance over 30 years, from 2020 to 2050, depending on the two pathway scenarios, and for which financing, and funding solutions must be developed. Indeed, the CCNR study also concluded that there is currently a limited business case for vessel owners to invest in technologies which fit within the transition pathway to reach zero-emission in 2050 and the study concluded that the costs of the transition are too high to be borne by the private parties in the inland waterway transport sector alone. This is the major bottleneck for driving the transition towards zero-emission and solutions to close the TCO gap towards a zero-emission inland navigation section by 2050 must be found.

To address this barrier, one option could be to develop a new European instrument to financially support the vessel owners willing to spend money on low/zero-emission technologies, based on mixed sources (public and private), including a sector contribution. PLATINA3 task 2.5 aims to support the development of such a new European instrument.

Between the finalisation of the CCNR study process by the CCNR and the drafting of this report new opportunities and new legislative proposals have arisen which must be taken into account.

In 2019, Priority Area 1a of the **EU Strategy for the Danube Region[14] (details available in Annex I)** presented "Strategy on fleet modernisation" containing an overview of the state-of-play of the Danube fleet, instruments for fleet modernisation and recommendations for facilitating a process of energy transition. The subsequent document - "Policy recommendations on fleet modernisation: Discussion paper" focuses on the issues related to funding and financing of energy transition of the Danube fleet. This document discusses and evaluates the outcomes of the GRENDEL project, the Strategic Research and Innovation Agenda (SRIA) for the Partnership on Zero-Emission Waterborne Transport and CCNR study regarding new financial instruments for "green" vessels. The study comes up with two policy recommendations for:

- the creation of national aid schemes;
- the development of a strategic research agenda including technology pathways.

[14] https://danube-region.eu/

The **European Commission's NAIADES III Action plan**[15] was released in June 2021, with the core objectives of 1) shifting more cargo over Europe's rivers and canals and 2) facilitating the transition to zero-emission vessels by 2050. Some flagship measures relating for instance to the speeding up of the certification process for innovative and low emissions vessels, the development of multimodal alternative fuel infrastructure hubs or the need to support the sector and Member States in the transition towards zero-emission, particularly regarding funding and financing, are key to meeting the energy transition challenge. To meet this challenge, support for the initial deployment of zero-emission vessels and the related recharging/refuelling infrastructure is now proposed through the Alternative Fuels Infrastructure Facility under the 2021-2023 work programme of the Connecting Europe Facility 2. Where possible, funding under the CEF 2 could be combined with other sources of funding to achieve greater impact. Such a new instrument will partially contribute to closing the TCO gap and should be taken into account in the context of this report. In addition, this action plan indicates that the European Commission will facilitate the efforts by stakeholders and Member States to create a fund to complement EU and national financial instruments for the deployment of zero-emissions vessels. This confirms that the time is ripe to develop an instrument dedicated to IWT.

On 14 July 2021, **the European Commission proposed its "Fit for 55" package**[16] from which new financing and funding opportunities for the energy transition of the inland waterway transport sector might arise, such as the Modernisation, the Innovation or the Social and Climate Fund. In addition, some regulatory solutions might also contribute to closing the TCO gap, particularly the OPEX costs, such as on the proposal in this package to revise the Renewable Energy Directive 2018/2001 II (RED II) and Directive 98/70 on the quality of petrol and diesel fuel, both currently in force. This new proposal for a RED III may provide the legal framework to implement a regulatory solution to make sure that a certain share of the energy provided to inland waterway vessels will be from renewable sources, thereby contributing to eliminating the operational advantage of conventional fossil fuels over renewable fuels and stimulating the uptake of alternative energy sources for IWT. As part of its "Fit for 55" Package, the European Commission also presented a proposal for a revision of the Energy Taxation Directive (ETD).[17] One of the main reasons for such a revision was to ensure the ETD supports the green transition by setting the right fiscal incentives. While it is proposed on the one hand to use fiscal tools in view of supporting the deployment of sustainable alternative fuels, it is also proposed to end the fuel tax exemptions for aviation, sea shipping, fishery and also for inland navigation in Europe by introducing a mandatory minimum level of tax to be implemented by all EU Member States. While negotiations still have to take place regarding this specific legislative proposal, it seems important to anticipate its possible impact on the development of a European Instrument for the funding and financing of the IWT energy transition.

Last but not least, on 14 September 2021, **the European Parliament adopted by a large majority a report entitled "Towards future-proof inland waterway transport in Europe"[18],** which notably calls for the establishment of "*a dedicated EU inland waterway fund, including a one-stop-shop system that is easily accessible for help and assistance"*. In particular, to justify setting up such a Fund, the European Parliament acknowledges that the funding gap to be bridged to realise the energy transition cannot be supported by the private sector alone, highlights the lack of a business case for private vessel owners to invest in propulsion technologies that play a role in the transition of the sector towards zero emission by 2050 and stresses the need to mobilise public support and private investments to this end. In particular, given the structure of the sector, mostly consisting of SMEs and family businesses, the Parliament recommends improving the scalability of the investments, to enhance access to funding, including via the reduction of

[15] https://transport.ec.europa.eu/transport-modes/inland-waterways/promotion-inland-waterway-transport/naiades-iii-action-plan_en

[16] https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en

[17] https://ec.europa.eu/info/sites/default/files/revision_of_the_energy_tax_directive_0.pdf

[18] https://www.europarl.europa.eu/doceo/document/TA-9-2021-0367_EN.pdf

the related administrative burden. The possibility to combine projects into a single application is also referred to in view of the chances of vessel owners to obtain funding. Indeed, in order to have access to funding at European level, often a minimum project size is required which is not always met by individual projects to upgrade existing inland vessels or newbuild inland vessels. It is important to highlight, that in view of setting up a dedicated EU inland waterway fund, the European Parliament calls for such a fund to complement the reserve fund (under Regulation (EU) No 546/20142), with "*significant additional financial contributions from EU and national financing instruments as well as from other private and public investments, in order to leverage further investments from the industry and to address the current investment gap in financing the sustainable transition".* It also "*calls on the Commission to assess the viability of including a new European scrapping scheme and fleet renewal as part of the fund".* Indeed, incentives could be provided for scrapping old vessels, to be used when investing in new vessels. However, the setting up of incentives for the scrapping of older and most polluting vessels, in the form of a scrapping fund is not supported by some Member States making it unlikely that such a scheme will be implemented in the near future[19]. This option will therefore not be further explored in this report. The Parliament also highlights that blending opportunities with existing instruments such as CEF, the European Structural and Investment Funds, including the Cohesion Fund, and financing instruments from the European Investment Bank should be available. Both newbuilt and retrofitting of existing vessels should be covered in view of improving their energy efficiency and support investments into new technologies. The EP report also tackles the need for the European Investment Bank (EIB) to provide "funding for attractive capital loans". A new instrument is currently under development which will be addressed in this deliverable.

1.4. Structure of the report

As defined in the Grant Agreement for PLATINA3, this task intends to lead to "further coordination, development and providing support to schemes and measures to be implemented in Europe to improve the funding conditions for vessel owners to invest in powertrain solutions which matches the transition towards zero-emission transport".

In this report, **Chapter 2** will present an overview of existing funding, financing and other financial tools available for vessel owners to invest in technologies fitting within the transition pathways towards zero-emissions. **Chapter 3** will outline some key observations regarding how to maximise the use of such funding and financing opportunities. **Chapter 4** will outline a possible proposal for a European financial instrument dedicated to IWT. Finally, **Chapter 5,** will describe a preliminary roadmap to identify the actions/barriers which still must be taken/overcome to improve the funding and financing opportunities for the IWT sector to make its energy transition as well as to develop a European financial instrument.

This report will not deal with all the European or national policy incentives such as engine ban or other regulations. However, it is important to note that, in addition to financial support, regulatory measures would play an important role in improving the business case for cleaner technologies and stimulate market uptake, for instance, by decreasing the operational use and advantage of conventional fossil fuels over renewable fuels/energy (fiscal incentives, stricter emission limits…). The report will also not deal with the financing of new infrastructures that will be treated in WP4.

[19] Informal discussion among CCNR member States

2. Overview of main funding and financing products as well as other financial tools to support the energy transition

The objective of this section is to provide an overview on the existing funding and financing products, as well as other financial tools which can be considered to stimulate the energy transition of the IWT fleet in Europe from a business-as-usual scenario to zero-emission pathways in 2050.With regards to financing products, the list is not exhaustive but lay focus on the main financing solutions used in the IWT market.

In the context of this report, the focus is set on the financial measures which could play a role, according to different degrees, in closing the TCO gap towards a zero-emission inland navigation by 2050, to a different degree. In all cases, the accompanying legal and regulatory framework to enable the above-mentioned measures must be defined.

Other legislative evolutions are not in the scope of the report but are needed to enable the energy transition (link with task 2.7). Example of measures: imposing a mandatory reduction rate of greenhouse gas intensity in the fuel supplied to inland navigation, setting up a regulatory framework enabling the possible phasing out of the most polluting technologies failing to achieve the CCNR and EU long term emission reduction ambition, targeting existing vessels, addressing both GHG and pollutant emissions (successor of Stage V standard? Evolution of the NRMM scope to apply to existing engines?), mandatory emissions limits, appropriate regulatory framework for the use of alternative fuels and batteries.

2.1. Funding

Given the funding gap to be bridged to achieve the transition, **public subsidies are expected to play an important role.** In this respect, it is important for IWT actors to be aware of the funding opportunities that exist at different levels (EU, national, or regional levels).

This chapter takes into account the extensive work that has already been performed in the context of the CCNR study (RQ F)[20] and the LASTING[21] project. Some of the information made available in the context of the CCNR study are already outdated, particularly when it comes to national funding programmes.

2.1.1. EU budget 2021-2027 and proposals made under the Fit for 55 Package

The Multiannual Financial Framework (MFF) provides a long-term budget of €1 211 billion (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.[22] The following two figures provide an overview over the EU Multiannual Financial Framework and the Next Generation EU budget in current and 2018 prices.

[20] https://ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_F.pdf
[21] https://www.waterborne.eu/projects/coordination-projects/lasting/about-lasting
[22] 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/

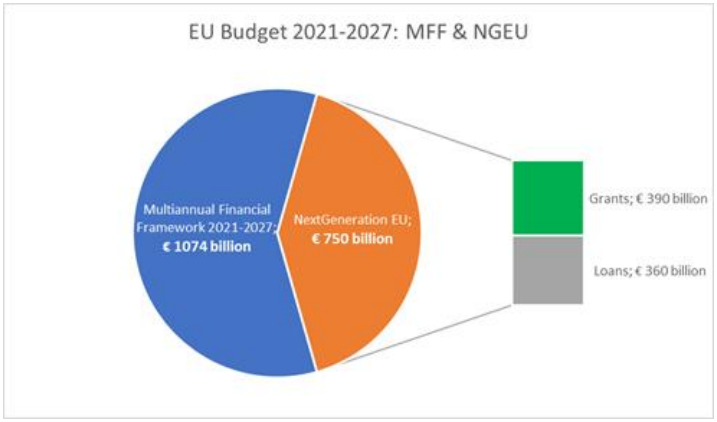

Figure 1: EU Multiannual financial framework 2021-2027 and Next Generation EU; 2018 prices

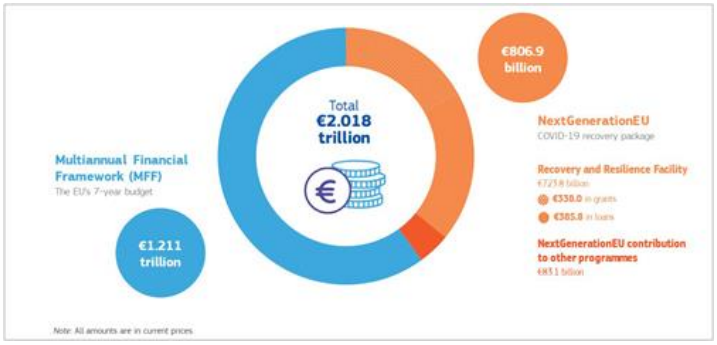

Figure 2: EU Multiannual financial framework 2021-2027 and Next Generation EU; 2021 prices

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".[23]In fact, digitalisation can also contribute to reducing emissions.

In the following chapters the relevant financial support programmes for research and deployment in the fields of green, clean, connected, and automated IWT are analysed. A comprehensive overview over the shares within the Multiannual Financial Framework 2021-2027 and Next Generation EU can be found in under the following link as well as via an overview based on the priorities in the following Figure:

[23] 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

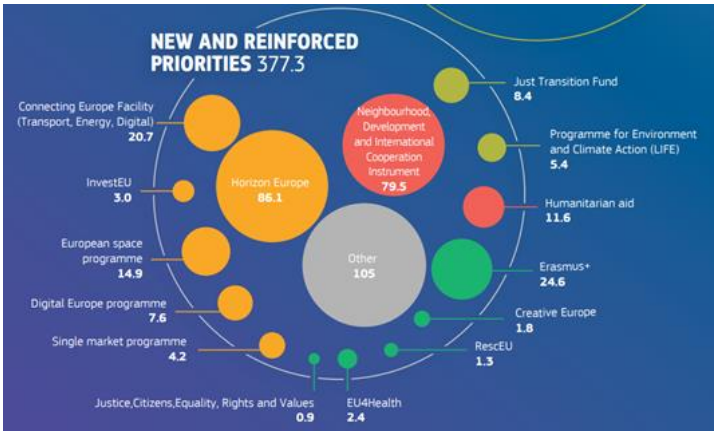

Figure 3: MFF and NextGenEU New and Reinforced Priorities (amounts expressed in billion EUR)[24]

[24] European Union (2021): The EU's 2021-2027 long-term Budget and NextGenerationEU; facts and figures

A snapshot from an overview of funding and financing opportunities is provided in figure 4. It is also available in an Excel format via the following link.

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Matrix-funding oppor

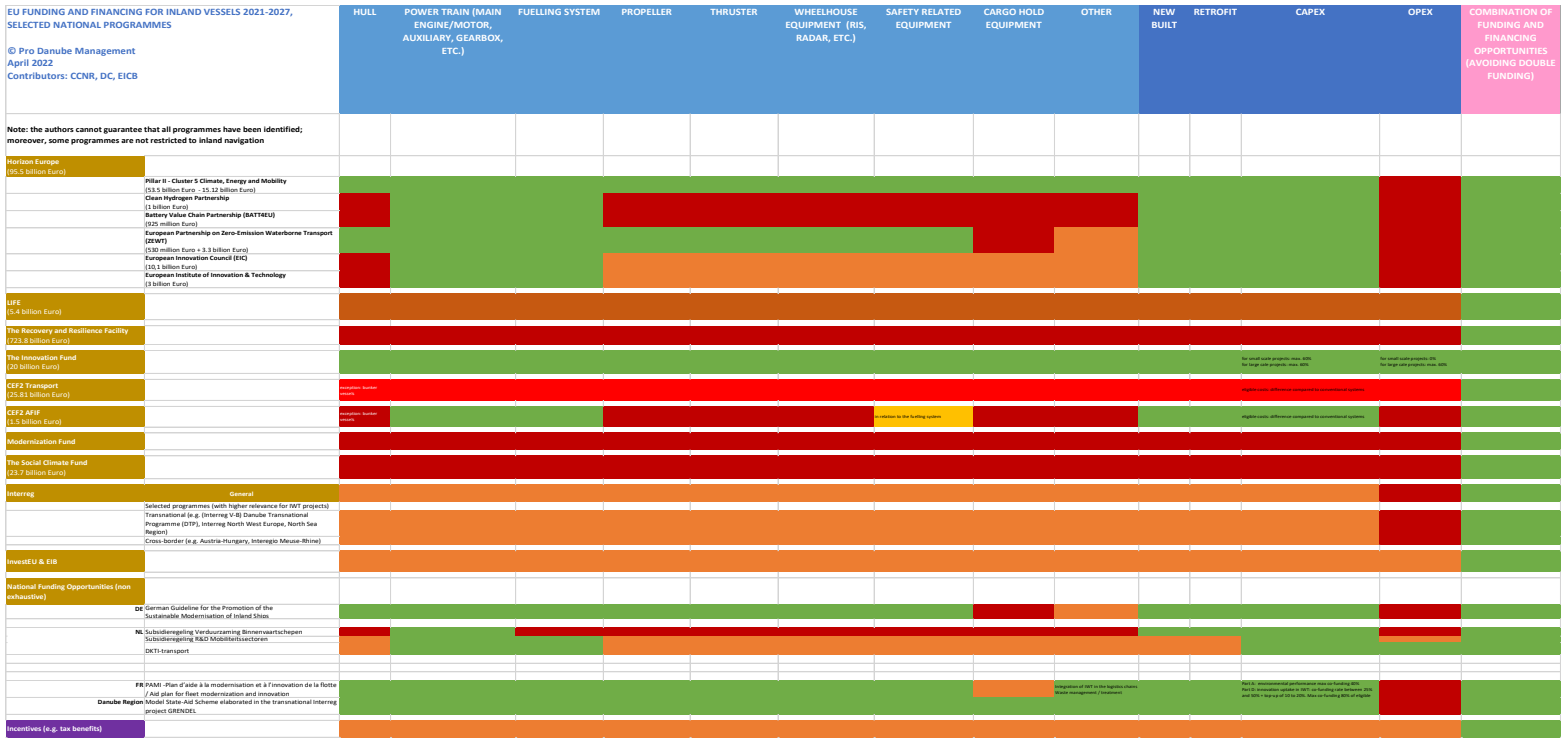

Figure 4 : overwide of funding and financing opportunities at EU level for inland navigation 2021-2027. Note: This overview takes account of the latest information available in January 2022. The authors cannot guarantee that all programmes have been identified; moreover, some programmes are not restricted to inland navigation.

The **HEU (Horizon Europe)** is the main funding instrument for RD&I activities for the waterborne transport sector (maritime and inland) 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, being 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 IWT funding and more general funding that can be used by the sector stakeholders under specific circumstances (depending on the details of each call).

Within Pillar I of HEU, though there is no dedicated waterborne (neither for maritime, nor for inland) funding, but there are relevant programmes to be taken into account by the waterborne stakeholders. The most important is the MASCA (Marie Skłodowska-Curie actions) 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. Based on the information received from the Waterborne TP in the frame of the LASTING CSA project, 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 (maritime and inland) transport sector, the European Partnership on Zero-Emission Waterborne Transport Partnership (ZEWT) 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 partnerships. And given the fact that other transport modes, in particular road, have already received substantial EU funding, the waterborne (maritime and inland) transport sector should have a fairly good presence in these two partnerships. As an example, since 31st of March there is a dedicated 15 million euros IWT call for hydrogen demonstrators (at least 5 inland vessels), with exceptionally high funding rates for capital investments (up to 100% eligible costs, in contrast to the general low coverage of CAPEX as it normally only concerns the depreciation costs during the project period) - TOPIC ID: HORIZON-JTI-CLEANH2-2022-03-05. 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 (maritime and inland) 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 (maritime and inland) 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 (covering both maritime & inland). 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 dozen mil € for the sector throughout the LIFE programme. A typical example of relevant projects for inland navigation co-funded by LIFE can consist in the CLINSH project, seeking to reduce air pollutant emission in IWT. A follow-up of the CLINSH project could also be funded by LIFE.

The **Recovery and Resilience Facility (RRF)** is implemented by the Member States. While it is not known the overall allocation for IWT 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 IWT 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 waterborne 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 (both maritime and inland) 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 focuses on infrastructure investment and 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. With a total budget of €1.5 billion, the Alternative Fuels Infrastructure Facility **(AFIF)** will fund actions by the combination of CEF grants with financial support from financial institutions to achieve a higher impact of the investment. It is a relevant instrument for inland vessels, as zero-emission electric vessels, vessels propelled by hydrogen or hydrogen carrier fuels can be eligible for co-funding if it is demonstrated that an initial number of vessels is needed to kick-start the use of the supporting recharging or refuelling infrastructure. The minimum grant level to be provided under the AFIF is 1 million euros and the project financing (loans, equity or bonds) must be approved for at least 10% of the total project costs. The deployment of hydrogen/fuel-cell or electric powered vessels for waterborne transport can be for use in private fleets of vessels, however excluding cruises and exclusive day-trip tourism vessels.

The **Modernisation Fund** is a programme from the EU to support 10 Member States (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia) to meet 2030 energy targets by helping **to modernise energy systems and improve energy efficiency, therefore not having transport in its primary scope**. The Modernisation Fund operates under the responsibility of its beneficiary countries in close cooperation with the European Commission and the European Investment Bank.

To obtain financing, the beneficiary Member State has to:

- demonstrate that the investment complies with the Modernisation Fund requirements set in the ETS Directive and the Implementing Regulation
- have sufficient funds available on its Modernisation Fund account
- provide evidence that the investment proposal **is in line with the State aid rules**
- confirm that the investment complies with any other applicable requirements of Union and national law
- confirm that there is no double funding of the same costs with another Union or national instrument.

The Modernisation Fund is a key part of the European Green Deal Investment Plan and targets investments in: renewable energy, energy efficiency, storage, networks, just-transition in carbon dependent regions.

All investments qualifying for the Modernisation Fund but falling outside the priority areas are considered as "non-priority investments". The Modernisation Fund can cover up to 70% of the relevant costs of non-priority investments, as long as the remaining costs are financed by private legal entities.

The **Social Climate Fund** (SCF), which is currently under negotiations[25] has been proposed to mitigate the effects of a newly proposed ETS (Emissions Trading System) for "buildings, decarbonisation of heating and cooling of buildings, including the integration of energy from renewable sources, and granting improved access to zero- and low-emission mobility and **transport** to the benefit of vulnerable households, vulnerable micro-enterprises and **vulnerable transport users**" (transport users' means households or micro-enterprises that use various transport and mobility options; vulnerable transport users' means transport users, including from lower middle-income households, that are significantly affected by the price impacts of the inclusion of **road transport** into the scope of Directive 2003/87/EC and lack the means to purchase zero- and low-emission vehicles or to switch to alternative sustainable modes of transport, including public transport, particularly in rural and remote areas). The SCF is implemented under the direct management of the Commission, responsible for all steps in implementing the SCF. The SCF provides a total of 72.2 billion euros, and the proposal distinguishes between two periods: 23.7 billion euros from 2025 to 2027 and 48.5 billion euros from 2028 to 2032 in current prices. The latter is subject to availability under the annual ceiling of the Multiannual Financial Framework (MFF). The share that member states can receive is limited to their maximum allocation share. This is based on gross national income (GNI) per capita, population size, the population at risk of poverty living in rural areas, CO2 emissions from fuel combustion by households and percentage of households at risk of poverty with arrears on utility bills.

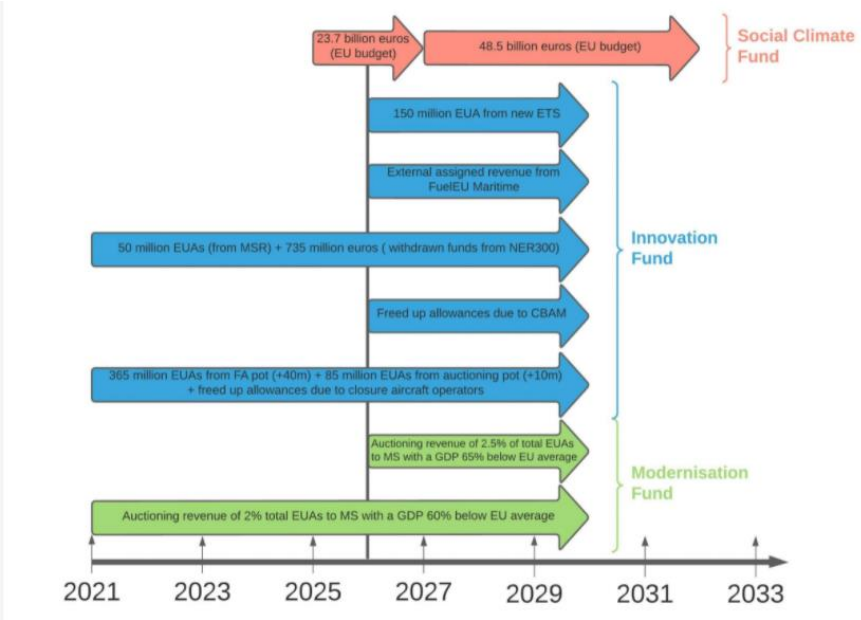

Figure 5 Timeline showing the available funding sources for the Social Climate Fund, Innovation Fund, and Modernisation Fund (Source: Bellona.org)

Additional information regarding the specifics of each programme is available in Annex 2.

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

[25] This means that the final design is not yet agreed upon.

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 river 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 euros to well over €100 mil. An example of a relevant Interreg programme for the Danube fleet modernisation is for instance: **(Interreg V-B) Danube Transnational Programme (DTP).** This cooperation programme is covering five axes: *(1) Innovative and socially responsible Danube region; (2) Environment and culture responsible Danube region; (3) Better connected and energy responsible Danube region; (4) Well governed Danube region; (5) Technical Assistance.* The total programme`s budget is 274 578 077 euros, including the EU support (231 924 597 €) and the national co-financing (42 653 480 €). Selected projects are financed up to 85% of their costs (http://www.interreg-danube.eu/about-dtp/programme-presentation)

EU funding is granted from three different funds:

- European Regional Development Fund (ERDF)
- Instrument for Pre-Accession Assistance II (IPA II)
- European Neighbourhood Instrument (ENI).

One of the DTP`s thematic priorities - "Better connected and energy responsible Danube region" tackles common challenges related to environmentally friendly (including low-noise), low-carbon and safe transport systems including inland waterways & ports and multimodal links in order to contribute to sustainable regional and local mobility, modal integration and intelligent transport. The total budget for Priority 3 is: 45 541 913 €.

Amongst DTP's main actions, which are supported by the cooperation there are:

- Preparation of transnational investments (infrastructure, equipment) to be subsequently financed through other sources;
- Pilot activities including small-scale fixed investments (of testing or demonstration nature).

Cohesion Fund for fleet modernization funding are also worth mentioning. EU Cohesion Policy contributes to strengthening economic, social and territorial cohesion in the European Union. It delivers on the Union's political priorities with a key focus on green and digital transition. Amongst five policy objectives of the EU Cohesion Policy for 2021-2027 to fleet modernization can be attributed 2nd objective: "*A greener, low carbon transitioning towards a net zero carbon economy*", which is supported by Cohesion Fund and European Regional Development Fund, which are the main financial instruments established for the implementation of the regional policy of the European Union and one of the substantial positions in the EU budget.

2.1.2. National Funding Opportunities

a) Essential role of national state aid measures

Public funding at national level plays a key role alongside other funding opportunities to enable the energy transition of the IWT sector. The recent research work carried out by the CCNR[26] and highlighted by the European Parliament (resolution of 14 September 2021 towards future-proof inland waterway transport in Europe) points to the following results:

- Many technological solutions are available but with different levels of maturity
- No "one size fits all" technical solutions exist towards a near zero emission for the inland navigation fleet in 2050.

[26] https://www.ccr-zkr.org/12080000-en.html, RQC

- Many uncertainties exist as to technology development.

In addition, this work showed that the full commercial deployment of zero emission solutions for a large share of the fleet and operational profiles will not be ready before 2035. In the meantime, public funding will still be needed for a wide range of solutions, including traditional technologies such as internal combustion engines ('Stage V emission value' from regulation (EU) 2016/1628) or diesel-electric propulsion.

For this reason:

- the possibility for state aid measures to support solutions enabling to reduce emissions, even if they are not zero emissions, should remain intact,
- room for manoeuvre should be available at national level to adjust funding priority depending on the evolution of the fleet or the technologies available.

In this regard, attention should in particular be raised towards the taxonomy regulation and the related delegated acts listing the technical screening criteria on the basis of which an economic activity should be considered as environmentally sustainable or not. Indeed, the technical screening criteria stemming from the taxonomy are feeding into other policy areas, such as state aid policy or the lending policy of the European Investment Bank. For this reason, the definition of such technical screening criteria should be adequate. To give only one example, the adopted climate change mitigation annex to the taxonomy climate delegated act sets a criterion according to which inland vessels will need to have zero direct (tailpipe) CO2 emissions after 2025 for inland navigation transport to be considered as an environmentally sustainable activity. Keeping such a criterion is not desirable. It could lead to considering only electricity or hydrogen as energy source after 2025 in order for inland waterway transport to be considered as an environmentally sustainable activity. Promising technologies for high-powered vessels, relying on combustion engine and using climate neutrally produced fuels would be excluded while they could valuably contribute to the energy transition of the sector.

The technical screening criteria set up in the taxonomy should not lead to limiting funding opportunities in favour of technologies which would enable inland vessels to reduce their emissions and to contribute to the EU's emission reduction objectives. Therefore it is good that the Taxonomy delegated act for climate mitigation is currently under revision, especially to arrive at a more realistic and effective technical criteria for the period after 2025. Most likely a well-to-wake approach will be adopted, which will enable also the use of low/zero-carbon fuels in combustion engines to remain in scope of Taxonomy after 2025.

In general, any policy developments limiting the opportunities to provide funding at national level for technologies which contribute to realising zero emissions by 2050 would be counterproductive. It would be a hurdle to bridge the funding gap.

b) Updates regarding national funding opportunities

By comparison, there are striking differences among Eastern and Western Europe with regard to IWT financing incentives. While Western European countries heavily invest in the development of IWT and its efficient integration into intermodal transport chains, Eastern European countries lack any kind of financial instruments. Some Central European countries (Czech Republic, Germany, Austria) do however have instruments to proactively support the modernisation process of inland vessels. In Czech republic, the programme dedicated to the modernisation of inland waterway freight transport vessels terminated in December 2021. The renewal of the programme is under discussion.

Since the CCNR study was undertaken, some national funding programmes have been renewed or terminated. In fact, national funding programmes are regularly evolving. In Western Europe, the following new elements could in particular be mentioned (non-exhaustive list):

Germany	On 1 July 2021, the new Guideline of the Federal Ministry of Transport and Digital Infrastructure on grants for inland waterway transport companies for the sustainable

	modernisation of inland waterway vessels (funding programme for sustainable modernisation of inland waterway vessels) came into force. It will run until 31 December 2023. It is intended to give inland waterway vessel owners who have their seat in Germany and whose vessels are registered in the German Register of Inland Vessel (Deutscher Binnenschiffsregister) incentives to equip their vessels with lower or even zero-emission propulsion systems as well as with the latest digital technologies currently available on the market. Measures to increase profitability and competitiveness, reduce air pollutant emissions and to improve energy efficiency will in particular be funded. **Actions which are mandatory by law, ordinance or administrative regulation are not eligible for funding.** The grants are offered in the form of project funding as non-repayable grants to finance part of the investment. Depending on the scope of the project, the rate for large companies is up to 60%, for medium-sized companies up to 70% and for small companies and micro-enterprises up to 80% of the eligible investment expenditure and even 90% in some special cases. However, depending on the scope, it can be the case that regardless of the company size, amounts of up to 80% of the eligible investment expenditure can be granted in order to avoid the effects of shifting cargo to road transport in the event of low water level events. Outside of a funding call, grants can be still given (funding rates between 40% and 60% depending on the scope of the project). The prerequisite is that the drive system installed in the barge is no longer operational and a replacement investment is operationally necessary. For further details, please consult the official documentation here (available only in German).
	On 22 September 2021, the new **"Funding Guideline for the Procurement and Installation of Lower-Emission Diesel Engines"** came into force. It will run until 31 December 2022. In addition to the engines, the retrofitting of catalytic converters, particle filters and fuel-water emulsion systems will also be funded. Depending on the size of the company, the amount of the funding is **40% to 60%** of the so-called **eligible investment expenditure**, i.e. the proven expenses for the purchase of the diesel engine or the exhaust gas aftertreatment system as well as the removal and installation costs. **The maximum funding per company is 200,000 euros over a period of three years.** Funding is available until the **end of 2022** for the voluntary replacement of diesel engines already in use with lower-emission Stage V engines of the classes IWP, IWA, NRE (up to 560 kW) and engines recognised as equivalent within the European NRMM Regulation. The prerequisite for funding is that these engines are equipped with an exhaust gas aftertreatment system and that the emission limits currently to be complied with for new engines are significantly undercut. Exhaust gas aftertreatment systems are eligible if 90% of the particulate matter and 70% of the nitrogen emissions are reduced. For further details, please consult the official documentation here and here (available only in German).
France	The main funding programme dedicated to supporting the energy transition of the inland navigation fleet, the PAMI ("programme d'aide à la modernisation et à l'innovation du transport fluvial"), which will come to an end in 2022. The modalities for its renewal are under discussion.
The Netherlands	The Demonstratie klimaattechnologie en - innovatie scheme DKTI (Climate Technology and Innovation transport scheme) terminated in 2021. It aimed at stimulating innovative and climate-friendly developments and demonstrations in the transport sector.

	On the other hand, the Subsidieregeling verduurzaming binnenvaartschepen (Subsidy Scheme for the Sustainability of Inland Vessels (SRVB)) has been opened since 30 January 2021. The aim of this scheme is to improve air quality and CO emissions and nitrogen by vessels. SRC are also eligible for co-funding. For further details, please consult the official documentation here (available in Dutch). The total budget is € 77.7 million. Application for a subsidy for: - an inland navigation engine or the installation of an electric powertrain is open until 30 October 2023. - a new catalyst is 30 October 2025. Other funding programmes exists which are more generic and for which inland navigation projects are eligible, such as (non-exhaustive list): - Mkb-innovatiestimulering Regio en Topsectoren (MIT) – SME Innovation Stimulation Region and Top Sectors. Information here - Demonstratie Energie- en Klimaatinnovatie (DEI+) - Demonstration Energy and Climate Innovation (DIE+). Energy efficiency investment are for instance eligible. Open until October 2022. Information here - Subsidieregeling Duurzame Scheepsbouw (Sustainable Shipbuilding Subsidy Scheme) - intended for shipyards that want to implement a shipbuilding innovation project that contributes to sustainable development. Information here In the framework of the Nationale Groeifondsprogramma (NGF), requests for supporting the inland navigation sector were made. If approved, such requests could lead to the development of new funding programmes. In April 2022, it was for instance announced that 50 million euro will be made available for supporting the further development and roll-out of full battery-electric sailing[27], while in a next round of NGF funding may become available for hydrogen fuel cell roll-out as support for the RH2INE initiative.
Belgium	In Flanders, the scheme Nabehandelingstechnieken was renewed until end 2022 to support investments into after-treatment systems. For further details, please consult the official documentation here. However, the scheme Hermotorisatie kleine schepen (repowering of small vessels) was not renewed. It aimed at supporting the retrofitting of new engines to comply with the NRMM guidelines that are able to navigate on waters smaller than CEMT class IV. In Wallonia, the Plan Wallon was renewed until 2025, under which aid for river and rail transport companies can be granted. The overall budget of the plan amounts to 20 million euros in total (4 million euros per year for 5 years). One of these aids consists in a "premium for the greening, development and specialisation of the Walloon inland navigation fleet". For further details, please consult the official documentation here.

In order to stimulate funding opportunities in Eastern Europe, in 2016 similar policy framework was established for the Danube region - Green Deal for Danube River Transport.

[27] https://www.nationaalgroeifonds.nl/over-het-nationaal-groeifonds/hoe-werkt-de-selectie/voorstellen-toegangspoort/zero-emissie-binnenvaart-batterij-elektrisch

This was inspired by the ambitious aims of the European Green Deal for the promotion of IWT and its initiatives to increase and better manage the capacity of inland waterways, which amongst others are backed up with certain financial incentives.

The implementation of Sustainable Europe Investment Plan together with a wide range of instruments available under different funding programs counts among the programmes supporting the research and innovation for fleet modernization

Based on successful practices for fleet modernisation in Western Europe, Green Deal for Danube River Transport was developed to propose a set of solutions that focus, amongst others, on the modernisation of the fleet, the reduction of the environmental impact and the development of Danube ports as catalysts for economic development on the regional level and beyond.

Green Deal for Danube River Transport aims to bring together the main stakeholders with fleet & barge operators, port authorities, terminal operators as well as with representatives of the industrial clusters of the Danube waterway and logistics service providers.

Development of state aid schemes for fleet modernization was brought by DTP GRENDEL project, which was one of the pillars for fleet modernization within the Green Deal for Danube River Transport framework *(Grendel model state aid scheme[28])*. The model state aid scheme was developed to serve as a guideline for Danube riparian countries to develop national state aid schemes for fleet modernisation according to their individual needs. The model state aid scheme constitutes a tool at the disposal of the Danube Member States for the financing period 2021-2027 which shall later be implemented as national state aid scheme by relevant ministries in as many Danube countries as possible. Nevertheless, it is a model which needs to be adapted to each national situation. For its implementation in a concrete state aid scheme, the usual assessment work and steps, in particular in the case of a notification, will need to be pursued by the Member States, as for any state aid measure[29].

Based on the tangible results of the GRENDEL project and in order to obtain better information on the measures planned in the Danube region for the modernization of inland navigation vessels in accordance with the "Green Deal" concept, the Danube Commission elaborated and distributed between its Member States a questionnaire, which amongst other questions included addressing the development of a state support system for shipping companies for fleet modernization and for the construction of new vessels, taking into account requirements of the Regulation (EU) 2016/1628, Chapter 9 of the ES-TRIN Standard, as well as the "Green Deal" concept.

According to the preliminary feedback received from Member States on the aforementioned questionnaire, some of the Danube riparian states, for example Austria, have plans to implement certain programs of state aid for fleet modernization and energy transition in the upcoming years.

c) Role of the River Commissions with regards to funding solutions

When describing financing and funding for energy transition of the inland fleet, the NAIADES III action plan foresees financial opportunities, in particular for smaller fleet operators and shipowners, to be facilitated by public authorities at regional, national and EU levels and by involvement of private investment in sustainable transport infrastructure and zero-emission vessels[30]. A separate role in this document is also given to the river commissions, which can provide implementation of specific programs

[28] https://www.interreg-danube.eu/approved-projects/grendel/section/model-state-aid-scheme
[29] https://www.interreg-danube.eu/uploads/media/approved_project_public/0001/42/b617ee0ed634d82d8558eb3756624c31bffdb434.pdf
[30] NAIADES III action plan, p. 8 "Financial opportunities, in particular for smaller operators, should be facilitated by public authorities at regional and national levels, by the river commissions, as well as at EU level through funding instruments such as InvestEU or CEF" as well as flagship 8, actions 10 and 33.

taking into account the technical and economic interests of the Member states, their funding capabilities and their fleet modernization strategies. Still, the question of funding directed on the concrete investment to accelerate the deployment of zero- and low-emission vessels is still open and requires a comprehensive solution.

River commissions are foreseen to play an important role in energy transition by providing recommendations and launching technical programs, helping to address dedicated funding to particular projects, facilitating the implementation of new regulations and, furthermore, formulating proposals based on available technologies at certain river basins, taking into account the financial capabilities of the region and exploring realistic solutions with regards to it's the market potential of a particular region.

2.1.3. EU instruments for non EU-members

Considering that the new financial instrument is planned to be implemented to promote energy transition and future funding for 'greener' and innovative vessels on the European inland waterways, it is important to search for possible synergies and cooperation programmes between existing policies and initiatives taking place in the EU and beyond its borders (with regards to existing instruments and EU policies), notably with countries which are along European waterways such as the Rhine and Danube and are also using these waterways.

Several financing EU instruments for non-EU member states can be considered for future blending facility such as the European Neighbourhood Instrument (ENI), the Instrument for Pre-Accession Assistance (IPA III) or the Eastern Partnership (EaP). They are described in the Annex.

2.2. Financing products

Assuming a significant share of public funding is made available to enable a positive business case, financing products can play a role in supporting the energy transition, albeit with some limitations.

2.2.1. Commercial bank loans

Currently, 70-80% of IWT companies are already under mortgage loan. A loan is the sum of money borrowed by the owner to acquire for instance the vessel itself or upgrade it to follow new technical or environmental regulations. It is generally borrowed from a financial institution like a commercial bank. Currently, it is the conventional way of financing new powertrains in the context of the energy transition challenge.

However, several criteria are considered before such loans can be granted to a vessel owner to invest in greening technologies. Such criteria can vary between the commercial banks who each have their own lending policy.

In addition, the characteristics of the loan can vary depending on several factors, for instance the age of the vessel and its market value.

Typical ratio considered to determine loan amount:

The CCNR study on greening describes that Dutch, French and German banks[31] use the following scale, based on the age of the vessel and its market value, to define the maximum amount to finance:

- Ship younger than 15 years: 70% of the market value of the vessel;
- Ship between 15 and 30 years old: 60% of the market value of the vessel;
- Ship between 30 and 50 years: 50% of the market value of the vessel;
- Ship older than 50 years: 40% of the market value of the vessel;

[31] These data have been validated with stakeholders from Belgium, France and selected Danube countries.

Banks also take into account such ratios in case an investment relates to the greening of a vessel. This financing ratio can be higher if vessel owners can enter into longer contract periods[32], thus providing more guarantees for the loan repayment. While such longer contracts are currently very low, there is a tendency to enter into longer contract periods with greener vessels. This tendency applies both for IWT entrepreneurs and shippers and can be considered as a driver for the financing of greening.

Building on the information above, it can be concluded that the older the inland vessel is – generally the smaller barges in the fleet - , the larger the amount of financing to be obtained from other sources than its own to invest in greening, for instance through a second mortgage with higher interest rates.

For new-build vessels, banks are prepared to support innovative technologies through adjusted financing durations, such as higher loan amounts and limited interest discounts. This is supported by the increased assumed residual value of the ships.

Typical duration: The duration of the financing period varies from 7 to 8 years for older ships to 15 or even 20 years for new-build vessels.

Typical interest rate: in 2020, the typical interest rate that applied to loans granted to inland vessel owners by commercial banks ranges between 2.0% and 2.5% in interest[33], which was reasonably low. In the Danube region, slightly higher interest rates apply. Given the large amount of financing needed to invest in new powertrains, other sources of financing are emerging, for instance crowdfunding platforms, providing loans with higher interest rates (around 7%). However, to date only two cases of re-motorisation funded through a crowdfunding platform[34] are known.

2.2.2. State/European guarantees

A guarantee scheme provides third-party risk mitigation to lenders through the absorption of a portion of the lender's losses on the loans in case of default. In the IWT energy transition context, state or European guarantees could cover a significant part of the risks on loans provided by commercial banks and help the investment decision.

At the European level, **the new InvestEU Fund** will run between 2021 and 2027. It is part of InvestEU programme that will bring under one roof fourteen EU financial instruments, including guarantee facilities for Small and Medium Enterprises (SME) such as COSME and for Research and Innovation, such as InnovFin (see figure 6).

As a reminder, COSME and InnovFin were successful tools which were part of 2014-2020 European Multiannual Financial Framework (MFF):

- **COSME (EU programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises)**: implemented by the European Investment Fund (EIF) and aiming to make it easier for small and medium-sized enterprises (SMEs) to access finance in all phases of their lifecycle – creation, expansion, or business transfer. It included two financial instruments that had been available since August 2014, and among those, the Loan Guarantee Facility (LGF). Budget was over €1.4 billion in order to mobilise up to €35 billion in financing from financial intermediaries via leverage effects.[35]
- **InnovFIN (EU Finance for Innovator)**: the InnovFin SME Guarantee could provide guarantees and counter-guarantees on debt financing between EUR 25 000 and EUR 7.5 million, in order to improve access to loan finance for innovative small and medium-sized enterprises (SMEs) and small mid-caps (up to 499 employees). This facility was being rolled out through financial

[32] Today, contracts of 2 to 5-years could already be considered as long-term contracts. A 5-years contract is considered as very difficult to achieve.
[33] It is not excluded that such rates have evolved in the meantime
[34] Geldvoorelkaar and CollinCrowdfund
[35] https://ec.europa.eu/growth/access-to-finance/cosme-financial-instruments_en

intermediaries, which were guaranteed or counter-guaranteed against a portion of their potential losses by the European Investment Fund (EIF).[36] The InnovFin MidCap Guarantee could provide guarantees and counter-guarantees on debt financing of up to EUR 50 million, in order to improve access to finance for innovative mid-caps (up to 3 000 employees) which were not eligible under the InnovFin SME Guarantee. This facility was deployed through financial intermediaries, namely banks and other financial institutions, which were being guaranteed against a portion of their potential losses by the European Investment Bank (EIB)[37].

InvestEU: the 2021-2027 InvestEU Fund will support four policy areas which represent important policy priorities for the Union and bring high EU added value: sustainable infrastructure; research, innovation and digitisation; social investment and skills; small and medium-sized businesses. This last area is the one that could be used for SME in inland waterway transport.

Publication from March 2021 indicates a guarantee amount of €26.2 billion (including 6.9 billion for SME) that is expected to mobilise an overall investment of more than €372 billion[38]. The guarantee will be open to the EIB Group and also to National Promotional Banks and Institutions (NPBIs) and other International Financial Institutions (such as the European Bank for Reconstruction and Development (EBRD)), with a ratio of 75-25%. It will back investment projects and increase the banks' risk-bearing capacity. The guarantee will be provisioned at 40%, meaning that €10.5 billion of the EU budget is set aside in case calls are made on the guarantee.

It is to note also that the InvestEU Fund is open to contributions from third countries (non-EU countries) that are members of the European Free Trade Association in accordance with the conditions laid down between the Union and those countries.

[36] https://www.eib.org/en/products/mandates-partnerships/innovfin/products/sme-guarantee.htm
[37] https://www.eib.org/en/products/mandates-partnerships/innovfin/products/midcap-guarantee.htm
[38] https://ec.europa.eu/commission/presscorner/detail/fr/qanda_21_1045

Figure 6: transition from the 2014-2020 Multiannual Financial Framework to the 2021-2027 one

a) Concrete example of suitable products under InvestEU: The InvestEU Sustainability Guarantee

The instrument is still under development, while some of the aspects described below might evolve, the process to define product characteristics is well advanced. However, the elements described with regards to this product are subject to change.

Overall description

InvestEU and the EIB group (which includes the European Investment Fund) offer interesting financing possibilities for both RD&I and roll-out of products and services. Their focus are companies, especially SMEs, start-ups, etc. However, they can also support other types of stakeholders. While there is no dedicated waterborne (maritime and inland) financing available , inland waterway transport is eligible to a different range of products offered by the EIB Group. It is up to the stakeholders to present their projects and enquire about support opportunities. A business case should be demonstrated in order to obtain support from the EIB group. As a consequence, the potentially accessible financing source 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. Within the EIB group, the European Investment Fund (EIF) is better suited to servicing the needs of Small and Medium Enterprises (SMEs) and provide support for investments in low and/or zero emission transport assets, including inland vessels. In addition, in the context of inland waterway transport, it is also understood that the EIB would focus more on financing infrastructures rather than the vessels directly, as typically larger investments are required.

In particular, under the InvestEU Sustainability Guarantee, the EIF is developing a guarantee scheme, to which inland vessels running on alternative fuels and retrofitting of vessels with technologies reducing fuel consumption by at least 10% would be eligible.

The EIF is currently designing the next generation of portfolio guarantees. One of the new products will be the *Sustainability Guarantee*, specifically aimed at supporting the green transition of SMEs, Small Mid-caps[39], as well as private individual beneficiaries. In this respect, EIF's new Sustainability Guarantee has been designed to share the risk on new financing supporting green enterprises and investments, including the specific feature related to operating leases. One of the expected impacts of this product is in particular to encourage intermediary banks to provide loans and who might not have done so without a guarantee. Under this scheme, the EIF provides lenders with a financial guarantee providing credit risk coverage on a loan-by-loan basis, for different type of greening investments.

Go to market strategy

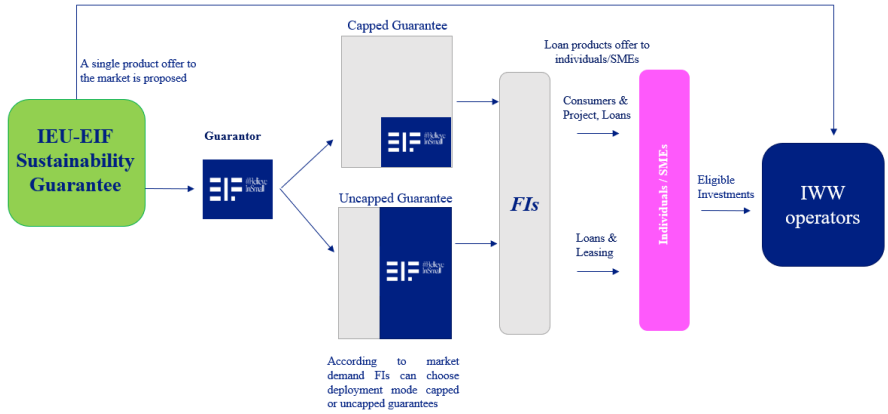

Figure 7: Description of the IEU-EIF Sustainability Guarantee (Source: EIF presentation, CCNR Economic Committee - October 12th, 2021)

Suitability of the product to the IWT sector

Under this product, zero and low emission mobility are eligible. The following investments will be eligible:

- investments in low and/or zero emission transport assets
- investments in renewal and retrofitting of transport assets
- infrastructure for zero-emission
- clean energy vehicles and vessels

With regards to the eligible investments into IWT projects, the following criteria will need to be met to be eligible under the EIF Sustainability Guarantee.

- Vessels running on alternative fuels (such as LNG; CNG; Hydrogen; Electric, hybrid, sustainable biofuels, synthetic fuels)
- The Sustainability Guarantee is designed to be aligned with the scope of the EU Taxonomy for Sustainable Finance, for inland navigation transport this means that only the following vessels would be eligible under the adopted delegated act (**note that it is to be revised, changes are therefore expected which open the scope to combustion engines using low/zero carbon fuels**):
    - For inland waterways freight transport, until 31 December 2025, the vessels have direct (tailpipe) emissions of CO2 per tonne kilometre (gCO2/tkm), calculated (or estimated in case of new vessels) using the Energy Efficiency Operational Indicator, 50 % lower than

[39] companies with less than 3000 employees and not considered as SMEs

the average reference value for emissions of CO2 defined for heavy duty vehicles (vehicle subgroup 5- LH) in accordance with Article 11 of Regulation 2019/1242.
    - For inland waterway passenger transport, until 31 December 2025, hybrid and dual fuel vessels derive at least 50% of their energy from zero direct (tailpipe) CO2 emission fuels or plug-in power for their normal operation.
- Retrofitting of waterborne vessels with technologies which reduce fuel consumption by at least 10%.
- Vessels are not built, retrofitted and acquired with the explicit intention to predominantly transport or store fossil fuels over the life of the project.

However, it should be noted that such criteria might evolve over time, especially to be in line with the Taxonomy technical screening criteria. The fact that the Sustainability Guarantee is designed to be aligned with the scope of the EU Taxonomy for Sustainable Finance, could bring some limitations as to the impact of the product as the conditions described above show. For instance, regarding the application of the criterion "Vessels are not built, retrofitted and acquired with the explicit intention to predominantly transport or store fossil fuels over the life of the project". Indeed, IWT vessels are versatile. For instance, an IWT vessel could transport petrol or diesel on one day and then on the next, after being cleaned, it could transport chemical products. Therefore, the application of the latter criterion to inland navigation is delicate. It would be recommended to assess this criterion on a case-by-case basis, in line with recital of the Taxonomy delegated act related to climate mitigation[40] and adaption reads that when applying this criterion, "*it is necessary to recognise the multiple uses, different ownership, user arrangements and fuels blending rates, in line with the relevant existing market practices*".

The assessment of eligibility of the investment would be based on:

- A technical manual/certificate evidencing type of transport asset and CO2 emission + Financial intermediaries (FIs) cross checking with the relevant threshold, OR
- Self-certification of the borrower using web-tool, specifically designed for this type of assets OR
- Only for the renewal and retrofitting of vessels, external energy audit.

And, invoices.

This assessment should be made prior to the loan signature.

Such support, in the form of repayable loans with favourable conditions, could consist in additional support measures in the context of the energy transition challenge. It is important to stress that such loans can only be disbursed if a competitive business case if demonstrated, currently not possible for most of the technologies contributing to the energy transition, such as hydrogen in fuel cells or battery electric propulsion.

b) At national level

Some guarantee schemes are also available at national level. Such tools are generally identified as best practice examples.

[40] Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 Recital 35 "*To ensure that the transport activities considered as sustainable do not facilitate the use of fossil fuels, the technical screening criteria for the relevant activities should exclude assets, operations and infrastructure dedicated to transport of fossil fuels. While applying this criterion, it is necessary to recognise the multiple uses, different ownership, user arrangements and fuels blending rates, in line with the relevant existing market practices. The Platform on Sustainable Finance should assess the usability of this criterion in the context of fulfilling its mandate.*": https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021R2139

Examples of such guarantee schemes exist for instance in the Netherlands, such as the BMKB in the Netherlands (SME credit guarantee scheme up to 250 employees). Due to the Corona crisis, this scheme was extended in 2021 with increased budget (€1.5 billion), increased credit guarantee (75%) and lower interest percentage (2 to 3% depending on duration). The principle is the same as for a European guarantee: entrepreneurs apply for a loan from one of the banks participating into this scheme which in turn submits an application to the relevant Dutch Agency[41].

A similar scheme is also available in the Netherlands for large and medium-sized companies for important loans of no more than €150 million and a maximum of eight years: the GO business loan guarantee scheme, with maximum guarantee percentage up to 90%, in 2021[42].

There is also in the Netherlands this practice of "Green Financing" where the State provides guarantees, dedicated to green investments, of more than 25,000 euros, which can be financed by commercial banks. A certificate and approval are needed from the Dutch agency RVO. With this instrument, the commercial banks can use the state guarantee to reduce risks and therefore can provide a small discount on the interest rates to the vessel-owner. Moreover, the vessel-owner may benefit from tax reductions in the Netherlands when they have the certificate.[43]

In Germany, the promotional bank KfW supports in the context of its environmental program (credit 240/241)[44] investments in the construction or retrofit of environmentally friendly vessels in the form of low-interest loans. Beyond supporting alternative propulsion systems, other priorities relate for instance to the reduction of air pollutants or the improvement of energy efficiency.

2.2.1. Green bonds

Next to commercial bank loans, raising bonds can also be another way of financing an investment, particularly when such investment must be made within a tight deadline and funds need to be unlocked rapidly. A bond is a debt instrument used to borrow the funds for a defined period of time usually at a fixed interest rate. In the case of green bonds, the money raised must be used to invest in predetermined climate and environmental projects, in contrast to regular bonds, where the use of money raised is not specified. Green bonds also often benefit from a lower interest rate, thereby enabling to reduce the cost of capital for low-carbon projects. Today there is already strong competition for obtaining funding and public resources are limited. In addition, it can be expected that as the emission reduction objectives deadlines will be approaching, the competition of the funding might increase. In such cases, green bonds could in particular play a role to finance the energy transition until funding becomes available. The ability of a company to demonstrate its emission level, for instance through a labelling system, would be of added value to facilitate the issuance of green bonds.[45]

2.3. Other financial tools to support the energy transition

2.3.1. Fiscal incentives: the role of tax exemptions or reductions

The directive on the taxation of energy products (directive 2003/96/EC)46 currently in force foresees an optional tax exemption for energy products supplied for use as fuel. The rationale behind such an exemption lies in the role that inland navigation already plays in cutting transport-related greenhouse gas emissions. Indeed, a modal shift to less carbon intensive modes of transport, such as inland navigation, is

[41] Guarantee SME Apply for credit | RVO.nl | National
[42] Apply for a Corporate Finance Guarantee (GO) | RVO
[43] https://www.rvo.nl/subsidie-en-financieringswijzer/regeling-groenprojecten
[44] https://www.kfw.de/inlandsfoerderung/Unternehmen/Energie-und-Umwelt/F%C3%B6rderprodukte/Umweltprogramm-(240-241)/
[45] Comment made during PLATINA3 task 2.5 expert workshop, 16 December 2021
[46] https://eur-lex.europa.eu/legal-content/FR/TXT/?uri=CELEX:32003L0096

a considerable advantage in terms of reducing greenhouse gas emissions in particular. Gasoil used as a fuel for inland navigation is indeed currently exempted from tax in several European countries: The Netherlands, France, Germany, Switzerland, Belgium, Austria, Czech Republic, Hungary, Luxembourg, Poland and Romania.

Some stakeholders therefore have the opinion that any change in the current taxation of energy sources used in inland navigation should be phased in, at least until alternative (near) zero greenhouse gas emission energy sources are widely available.

However, tax differentiation and tax exemptions can also be important tools and incentives for promoting the deployment of alternative low carbon and zero carbon emission energy sources (including electricity) as well as shore-side electricity supply for inland vessels at berths. This opportunity is also used in many European countries. Energy taxation is a tool which could therefore be used in promoting the development of cleaner energy sources for inland navigation and ensuring an energy transition to a zero-emission inland navigation sector.

As part of its "Fit for 55 Package", the European Commission presented a proposal for a revision of the Energy Taxation Directive (ETD).[47] One of the main reasons for such a revision was to ensure the ETD supports the green transition by setting the right fiscal incentives. This revision therefore proposes to align the taxation of energy products with EU energy and climate policies, promoting clean technologies and removing exemptions and reduced rates that currently encourage the use of fossil fuels.

It is proposed to use fiscal tools in view of supporting the deployment of sustainable alternative fuels, in particular, it is proposed that:

- sustainable alternative fuels (including sustainable biofuels and biogas, low-carbon fuels, advanced sustainable biofuels and biogas, and renewable fuels of non-biological origin) and electricity are subject to a minimum rate of zero for ten years and are kept low after 10 years.
- Member States may exempt shore-side electricity provided to vessels while at berth in ports from tax.

These consist in relevant measures for reducing the TCO gap, particularly the OPEX costs of sustainable alternative fuels.

Fiscal tools are also used at national levels to promote the uptaking of alternative technologies. To name but a few examples:

- In the Netherlands:
    - Energie Investeringsaftrek (Energy Investment Allowance) – tax advantages for investment in specific energy-saving techniques. Year-on-year scheme renewal. More information available here.
    - Milieu-investeringsaftrek (MIA)/Willekeurige afschrijving milieu-investeringen (VAMIL) (Environmental Investment Deduction/ Accelerated Depreciation). Specific emission-reducing techniques can be subsidized by the MIA/VAMIL with which the skipper obtains a tax benefit (approx. 3-12%) because part of the investment amount can be deducted from the profit and/or accelerated depreciation. Detailed information is available here.
- In France, companies using vessels for the transport of goods or passengers, subject to corporate tax or income tax, may deduct from their taxable income part of the expenses related to the use of clean energy. This scheme applies from 1 January 2020 until 31 December 2024. Detailed information is available here

[47] https://ec.europa.eu/info/sites/default/files/revision_of_the_energy_tax_directive_0.pdf

Overall, to maximise the impact of taxation tools in closing the TCO gap, using such tools as "carrots" rather than "sticks", could be recommended. As described above, some aspect of the proposal for a revision of the ETD already follows this recommendation.

2.3.2. A labelling system to provide additional incentives towards greening

A labelling system can consist in a useful tool to provide support and positive incentives to vessel owners in the steps to make towards achieving lower energy consumption and emissions. Several types of possible end-users for a labelling system exist: policy makers ports and waterway managers, shippers / clients using inland vessels, vessel owners, financial institutions etc… Each might use the label to achieve different objectives. All the different functions of a label are addressed in task 2.6 of PLATINA3.

2.3.3. Reduction of port dues for greener vessels

This mechanism already applies in the Netherlands with the Green award[48]. Vessels obtaining a Green Award certificate (based on safety and Environmental considerations) are entitled to a various range of incentives including discounts on point dues, products and services. However, it must be noted that even if a reduction on port dues can reach up to 15% in some ports, port dues consist in a very limited share of total operating costs. Thus, this incentive cannot be considered to play a major role in the decision of a vessel owner to invest or not in an alternative technology, even if it consists in an additional and "nice to have" incentive. This kind of incentive, while not being a game changer with regards to closing the TCO gap towards a zero-emission inland navigation sector by 2050, can contribute to it.

2.3.4. Other cost optimisation solutions [49]

The potential **of pay-per-use and leasing** schemes for the European IWT market in the context of the transition towards a zero-emission fleet in 2050 will be rather limited in the short and medium term based on current conditions. Indeed, the leasing potential for complete powertrains is very limited as such schemes cannot be combined with mortgage financing of vessels. The situation is a bit more beneficial for pay-per-use schemes for exchangeable containerised energy systems (e.g. power packs using batteries and/or fuel cells), however, the parties developing pay-per-use solutions are generally larger companies which have better ability to use existing financing and funding instruments.

A similar statement can be made about joint procurement. While **joint procurement** in the IWT-sector could lead to cost reduction, stimulation of market development, innovation and an increase in standardisation, the potential of economic benefits through joint procurement is estimated to be rather small because of several constraints. Only a very small impact is expected on reduced costs for the transition of the IWT sector towards zero emission. In the case of IWT, even if the described constraints were overcome, the financial benefits of joint procurement would be limited, in the order of 1 – 5% of total investment costs, when procuring 10-20 vessels.

2.3.5. Price hedging[50]

Despite the commonly used principles of fuel hedging in sea shipping, fuel hedging is not a common practice in the inland waterways. For individual vessel owners working in the spot market, current hedging

[48] https://www.greenaward.org/inland-shipping/
[49] CCNR study, research question D on the potential of pay-per-use and leasing schemes for the IWT market: https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_D.pdf and research question E on the potential of joint procurement for the IWT market: https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_E.pdf
[50] CCNR study, research question F on expectations from national and European programmes and products providing funding and financing, part 10.3: https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_F.pdf

possibilities are cumbersome, potentially costly and not suitable for individual vessel owners to secure the price advantages in the long term.

3. Relevant observation regarding funding and financing products in the context of the energy transition challenge

3.1. Limitations associated with bank financing in the context of the IWT energy transition

Limitation relating to access to bank financial

The CCNR study points to the fact that, today, there is a limited business case to invest in greening propulsion technologies, fitting into a transition pathway towards zero-emission in 2050[51], thereby limiting access to commercial bank financing. Indeed, if a vessel owner cannot demonstrate that investing in a greening technology will provide some return on investment and if he cannot demonstrate that such a loan will be repaid, there is no solid basis for a bank to provide a loan.

Besides, the parameters influencing the bank's decision to finance or not investments in vessels and/or powertrains are also dependent on the market segment in which an IWT company operates. Case studies conducted in 2019 showed that liquid bulk tanker companies and passenger transport companies can present solid financial figures and therefore a better capacity to invest in greening. However, the liquidity (ability to pay daily operations and short-term debts) and the solvency (ability to pay longer term debts) ratios are in general not good enough for companies operating in the dry cargo segment to get access to financing. In addition, it is worth noting that such case studies were performed before the COVID-19 pandemic which resulted in negative impacts for many IWT companies and on the long run, especially the river cruise sector. It certainly reduced further, at least temporarily, the financial capacity of the IWT sector.

Whether a vessel is active on the spot market (no certainty regarding future revenues) or has a long-term contract (more certainty regarding future revenues), plays a great role in the decision of a bank to grant a loan or not. Currently, the spot market is dominating the dry cargo market, especially for seasonal products (cereals, coal …), while the container market and the liquid cargo market rely much more on time charter work and long-term contracts. Across all market segments, in 2014, the spot market share was about 56%[52].The desire to invest and the acceptance of the loan by the bank will also depend on the personal situation of the family, for instance the age of the owner, the type of company, and the possibility of succession. These are important factors to consider in the context of the energy transition challenge given that the workforce is ageing. For instance it might be difficult to convince a vessel owner to invest in a new powertrain if he/she is close to retirement.

Another interesting development relates to the changing corporate structure of tanker barging companies, moving away from the traditionally family-owned company towards a structure with shareholders. Such an evolution could be positive in terms of facilitating access to financing. Cooperatives can be seen as an effective concept to facilitate access to financing, particularly for those small companies owning and operating one or two vessels. They can also be a possible solution for small barge owners, including in the dry cargo market, to merge together and develop size and scale advantages, thereby allowing economies of scale and lower transport costs to be realised. Cooperatives could also have more bargaining power for negotiating freight rates and would be more able to achieve a vertical integration within the whole supply chain[53].

[51] Such as the ones identified in the CCNR roadmap for reducing inland navigation emissions, December 2021: Roadmap_en.pdf (ccr-zkr.org)
[52] Source PLATINA 2, Deliverable 1.5: Strategy to enhance market transparency and synergistic actions, 2015
[53] CCNR, European Commission, Thematic report on the European inland navigation sector labour market, February 2021, https://inland-navigation-market.org/wp-content/uploads/2021/02/Thematic-report_EN_web_BD.pdf

Limitation regarding the role of commercial banks financing in the energy transition

In addition, repayable loans alone are expected to have a limited effect on the financing of the energy transition of the IWT sector. Indeed, the considerable TCO gap to be bridged to realise this transition associated with the limited investment capacity of the IWT sector allows only a few entrepreneurs to bear the cost of greening investments themselves i.e. with own capital and commercial financing. Indeed, if there is no business case for a greening technology (no return on investment), there is no solid basis for a bank to provide a loan as it will be risky and uncertain if the loan can be repaid.

However, assuming a significant share of grants to make the business case (at least a financial break-even situation for a longer time period, e.g. 10 years) loans can play a role. Loans can be used for financing the share of the investment costs that do not belong to the unprofitable top. The unprofitable top is determined by the additional TCO in comparison with the investment (CAPEX). The additional TCO is defined as the difference with investing and operating state-of-the art technologies using fossil fuels. The assumption is that the TCO gap is compensated by means of a grant. The share of CAPEX which is left would therefore still need a financial arrangement. This part could be served by loans in case the vessel owner does not have or want to use own capital to cover this remaining part of the CAPEX.

However, it is important to highlight that the provision of such loans depends on the ability of the vessel owner to repay it. In other words, that a competitive business case can be demonstrated. This requires that the TCO of the green technology is competitive with a conventional powertrain. Therefore, the majority of the challenge lies in the first place in the provision of grants and other economic incentives to create this business case and ensure access to such loans is possible.

While lower interest rates for loans are expected to have a modest contribution in reduction of the TCO, the development of financing products tailor-made to the needs of the sector are nevertheless necessary to enable the energy transition.

3.2. Combining funds and blending options

As can be seen from the above sections, funding opportunities for the greening of the IWT sector do exist but are generally fragmented, focusing on different priorities, financing different aspects of the greening challenge, according to different conditions and imply high administrative costs. The possibility to combine the opportunities offered by the different programmes for the benefit of the energy transition of the sector is therefore a key question to be addressed. Indeed, in order to close the TCO gap, the IWT sector must be able to make use of the different funding opportunities.

In this section[54], the combination possibilities of funding programmes and financing products will be outlined only in a general manner. The main point of reference for the principles and procedures governing the establishment, implementation and control of the EU budget, including grants, are laid down in the Financial Regulation (FR). [55]

Within the EU there are some general rules applying for grants, which have to respect the following overall principles:

- equal treatment of all applicants or beneficiaries
- non-cumulative: each beneficiary may not get more than one grant per action or per financial year
- non-retroactive: actions already completed are excluded from EU funding

[54] Based on CCNR Study, research question F

[55] EU Financial Regulation, Regulation (EU, Euratom) 2018/1046: https://ec.europa.eu/info/publications/financial-regulations_en

- co-financing: the Commission and the beneficiary will share the costs
- non-profit: grant beneficiaries may not generate profit with the EU grant they receive.[56]

The following graph illustrates the potential structure of the financial setup of a project:

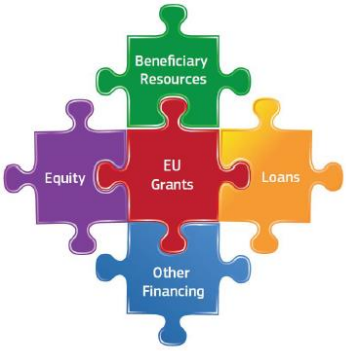

Figure 8: Combination of financial solutions (source: Eleftherios TSIAVOS, 2016, Financial Instruments, GD International Development and Cooperation "EU Blending framework")

3.2.1. Cumulation rules in funding programmes and financing products

The general applicable cumulation rules are laid down in the Financial Regulation, TITLE VIII *GRANTS*, CHAPTER 2 *Principles*, Article 191 "Principle of non-cumulative award and prohibition of double funding":

1. *Each action may give rise to the award of only one grant from the budget to any one beneficiary, except where otherwise authorised in the relevant basic acts.*

   A beneficiary may be awarded only one operating grant from the budget per financial year.

   An action may be financed jointly from separate budget lines by different authorising officers responsible.
2. *The applicant shall immediately inform the authorising officers of any multiple applications and multiple grants relating to the same action or to the same work programme.*
3. *In no circumstances shall the same costs be financed twice by the budget.*

Further combination possibilities for beneficiaries, besides sources from EU budget can be found in Article 190, regulation co-financing of grants, financed from the EU budget:

1. *Grants shall involve co-financing. As a result, the resources necessary to carry out the action or the work programme shall not be provided entirely by the grant. Co-financing may be provided in the form of the beneficiary's own resources, income generated by the action or work programme or financial or in-kind contributions from third parties.*
2. *[…]*

3.2.2. Blending possibilities between funding programmes and financing products

Blending means the combination of grants (non-repayable forms of support) with non-grant resources such as loans, equity and guarantees from financial institutions as well as commercial loans and investments in order to achieve a leveraged development impact.

[56] European Commission, "EU Grants and procurement": https://ec.europa.eu/info/strategy/eu-budget/how-it-works/annual-lifecycle/implementation/grants-and-procurement_en

The leveraging effect of the EU budget, supporting projects via grants, can close the funding gap (amount of money needed to fund the ongoing operations or future development of a project) and can therefore enable the planned implementation. After closing the funding gap, the projects are supposed to be bankable projects, ready to receive financial resources from public and/or private financial institutions. Those financial resources can be backed-up via budgetary guarantees provided by the EU.

The InvestEU Programme enables financial support and blending operations, which are defined as following: "blending operations" means operations supported by the Union budget combining non-repayable forms of support or repayable support or both from the Union budget with repayable forms of support from development or other public finance institutions, as well as from commercial finance institutions and investors; for the purposes of this definition, Union programmes financed from sources other than the Union budget, such as the EU Emissions Trading System (ETS) Innovation Fund, can be assimilated to Union programmes financed by the Union budget.

The World Economic Forum is characterising the benefits of blending operations, in their report produced jointly with the Organisation for Economic Co-operation and Development (OECD) on "How To Guide for Blended Finance" as following:

- *Leverage: Use of development finance and philanthropic funds to attract private capital*
- *Impact: Investments that drive social, environmental and economic progress.*
- *Returns: Returns for private investors in line with market expectations based on perceived risk*

However, there is also an evaluation on the current problems and limitations for institutions using blending possibilities and similar support. The main obstacles to overcome in the future, for a better uptake of blending operations by the private organisations are limited awareness, institutional constraints and also the organizational capacity; specially for SMEs not having the technical expertise and capacity of staff to develop projects using blended finance.[57]

3.3. Key observations regarding funding and financing opportunities

1. There are numerous funding and financial opportunities at European and national level. Often, they are considered not to be adequate. In order to support policy makers in making such opportunities more **adequate, the IWT sector could be asked whether it could present the specific drawbacks of existing schemes as well as their advantages. In other words, knowing what is working, and what is not.**
    - For instance, regarding national funding programme, eligibility criteria vary from one country to another (need for the seat of the company applying for funding to be established in a specific country, need to navigate in a specific country for several years …). Such criteria, as well as other factors such as the language barrier, can represent a hurdle in terms of accessibility of such funding programmes for the private sector parties in inland navigation.
    - Working towards better coordination between national programmes and providing transparent information about them would be of added value. This requires assessing amongst other aspects to which extent eligibility and application criteria could be harmonised or whether applications could be submitted in several languages (to overcome possible language barriers). As a first step, this can be achieved by regular mutual exchange of information on the eligibility criteria and the technologies / solutions to be financed, without prejudging any harmonisation.

    At EU level, another bottleneck lies in possible restrictive eligibility criteria. For instance, some type of passenger vessels, such as cabin vessels and day-trip vessels are considered as non-eligible under certain calls. This is the case of the CEF AFIF programme where the deployment of hydrogen/fuel-cell or electric powered vessels for waterborne transport can be for use in private fleets of vessels, however excluding cruises and exclusive day-trip tourism vessels. In addition, funding priorities are limited to zero-emission technologies (batteries and hydrogen)

[57] World Economic Forum, 2015 "A How-To Guide for Blended Finance": http://www3.weforum.org/docs/WEF_How_To_Guide_Blended_Finance_report_2015.pdf

2. **Barriers to information visibility and information transparency** hindering the effective flow of information between the stakeholders have been greatly reduced in the last 5 to 10 years, also due to the improvement of online communication/collaboration tools. Having said that, in order to give visibility to the IWT sector on their funding opportunities:
    - the availability of an **up-to-date funding and financing database** addressing both EU and national funding opportunities would be of added value. However, such an exercise is costly and will require dedicated resources for management and regular updates. It will be necessary to identify who should be responsible for such a task. Such a work is also being undertaken as part of the Lasting project[58] considering both maritime and inland waterway sectors. The findings from this project should therefore be considered for the development of such a database.
    - in order to maximise the impact of funding and financing opportunities, a manual, which would regularly be updated, providing relevant information on how to access relevant EU funding and financing instruments available under the current MFF and the NextGeneration EU would be useful. Such a manual should certainly include information about the possibilities for a given project to apply for complementary funding and financing opportunities at various levels, while respecting EU state aid rules.
    - a concentration of funding in a limited number of programs/budgetary lines supporting the IWT energy transition would be of great added-value.
    - Regional contribution to funding programmes at national level can also be considered as a best practice to improve visibility and information transparency. For instance in the context of the funding programme PAMI, regional authorities financially contributed, on top of national contributions, to PAMI overall envelop. This resulted in regional authorities being better aware of the funding opportunities resulting from the PAMI and being more proactive in terms of communication actions.

3. **Observations and recommendations** regarding the accessibility and effectiveness of EU funding and financing opportunities for IWT **were also made in the context of the CCNR study research question F, in particular sections 7, 8.3 and 11**. In particular, to maximise the effectiveness of funding programmes aiming at supporting the energy transition of the sector:
    - Applicants shall receive reasonable consultancy during the application procedure free of charge. This is in particular necessary for the smaller companies. As an example of a best practice, the “greening consultant” project which was set up in Flanders from 2018 to 2021 can be mentioned. Other examples of support services to companies are the Expertise and Innovation Centre for inland Barging (EICB) in The Netherlands and the European Inland Barging Innovation Platform “EIBIP”, a European platform of regional innovation facilitation centers, to promote the uptake of innovation by the Inland Waterway Transport sector. EIBIP was co-funded by the European Commission between 2016 and 2019 and key partners were EICB, VNF, ProDanube and Mariko. Existing tools should be used for this purpose or revived.
    - The preparation of an application shall not incur high costs (administrative and resources).
    - Lay more focus on the deployment of innovative solutions in new-builds and retrofits (not only in research activities).
    - Shall promote a technology neutral approach.

4. Public funding at national level plays a key role alongside other EU and regional funding opportunities to enable the energy transition of the IWT sector. **The possibility for state aid measures to support solutions enabling to reduce emissions, even if they are not zero tailpipe emissions, should remain intact,** and room for manoeuvre should be available at national level to adjust funding priority depending on the evolution of the fleet or the technologies available.

[58] https://www.waterborne.eu/projects/coordination-projects/lasting/about-lasting

5. **The EU, national or regional funding programmes should not exclude specific type of vessels (such as river cruises or day-trip vessels, floating equipment) as far as they contribute to energy transition and reducing the emissions from the sector.** The passenger transport sector in its entirety consists in a considerable part of the European inland navigation fleet and in an economic activity which will persist. They all contribute to "greening".

6. In general, **funding programmes should enable a wider support for investment in vessels**, and not foresee too limiting factors or criteria, especially in light of ambitious modal shift objective both at EU and national levels. Funding opportunities should be open to technologies which enable inland vessels to reduce their emissions and to contribute to the EU emission reduction objectives.

4. Proposal for a European financial instrument dedicated to IWT

4.1. Proposal for a European financial instrument

Extensive work has already been carried out in the context of the CCNR study on financing the energy transition towards a zero-emission European IWT sector (RQ I)[59]. The main research question of this part (RQ I) of the overarching financing study was:

"***What is the added-value of a new European funding and financing scheme for IWT and how could this work?"***.

As part of this scheme, the implementation of a European financial instrument, based on mixed sources (public and private), including a sector contribution, was recommended in the CCNR study. This recommendation was to be understood as part of a broader process of discussion at various levels to formulate recommendations on how to financially support the energy transition of the IWT sector and pave the way for political decisions.

Given the relevance of the IWT sector for sustainable transportation in Europe, it was recommended that policy makers focus on developing the proper financial instruments to meet the energy transition challenge rather than only imposing strict limits or bans for existing inland waterway vessels not meeting the emission limits. Focusing on the latter only, was expected to result in loss of market share of IWT and reverse modal shift resulting in higher external costs (more traffic jams, GHG emissions, noise, infrastructure cost, etc.). These effects were considered to be in contradiction with the policy goals, seen the opportunity to reduce the carbon footprint of transport due to modal shift from road transport to IWT.

The following main conclusions of that study are highlighted below and served as a basis to deepen the work:

- In general, the answer to the main question is that with the adoption of the appropriate legal framework there is an added value for a new European financial scheme. It is clear that the IWT sector cannot make the investments on its own, due to a lack of business case for (near) zero-emission technologies as well as lack of own resources and incentives (as made clear in the report on research question A developed in the context of the CCNR study[60]). The business-as-usual scenario as developed in the CCNR study[61] will therefore not reach the emission objectives as stated in the Mannheim declaration from October 2018 nor the European Green Deal.
- As part of this scheme, grants (non-repayable funds) are needed to close the gap in the business case. They could be provided in the form of a new European financial instrument which would therefore focus on providing grants. In addition, financial instruments such as pay-per-use and leasing schemes, joint procurement and fuel hedging (analysed in research questions D, E and F of the CCNR study) can have some but rather limited added value. These are expected to have only a relatively small contribution on closing the gap in the business case. Other financing products (such as guarantees, loans, equity, bonds) are also expected to play role once the gap in the business case will be closed. To enable this, blending opportunities between existing instruments should be available.

[59] CCNR study, research question I : https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_I.pdf
[60] CCNR study, research question A: https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_A.pdf
[61] CCNR study, research question C on the technical and economical assessment of greening techniques which fit into zero-emission development of IWT (edition 1 and 2)

- A European instrument based primarily on providing grants to vessel owners shall give the major contribution to close the gap between 'business as usual' and the transition pathways[62] for the European IWT fleet. This is required to reach the ambitious objective towards a zero emissions inland navigation sector by 2050 (at least 90% reduction of GHG emissions compared to 2015) while strengthening the sector to increase the modal share according to the EU Green Deal objectives.
- Next to public contributions an earmarked contribution by the sector is envisaged to support its energy transition. It is unrealistic to expect that the public sector will provide the full volume of resources needed to close the TCO gap by means of providing grants. Therefore, a contribution by the IWT sector, as described in chapter 4.2.1.1, would be expected[63]. However, it is important to note that such a contribution should not be understood as a goal in itself but as a means to trigger the energy transition at the level of the individual vessel owner, in particular by creating an incentive for vessel owners to invest in emission reduction technologies and making sure that those who invest now are not at disadvantage compared to those who invest later (ensuring a level playing field)

- Such a sector contribution scheme can be based for example on the energy consumption for a longer period, such as 2025 – 2050 and would be differentiated according to the emission performance of the vessel. Such a differentiated approach provides an additional incentive and would follow the principles of the "polluter pays" principle and rewards early investors and first movers taking a risk and financial burden. Compliance of such a scheme with international regulation (Act of Mannheim, Belgrade Convention) is however a possible barrier and was assessed by the competent authorities and was investigated by the CCNR.[64] The outcome of this assessment is presented in Chapter 4.2.2.3.
- Assuming that the legal framework can be arranged for the sector contribution, the result would be a mix of public and private funds provided as resources for the new dedicated instrument. The resources would be used primarily as grants to support the vessel owner wishing to invest in:
    - zero/low emission (both GHG and air pollutants) technologies, what is associated with higher CAPEX (e.g. investment in new or adapted powertrain and storage on board of energy carriers) and OPEX (e.g. more expensive maintenance and energy costs.
    - measures allowing to improve the energy efficiency of their vessel (i.e. improved hydrodynamics), thereby reducing fuel consumption and the related OPEX.

  In order words, compensate the vessel owner for the higher TCO linked to higher CAPEX stemming from the investment in new powertrain equipment as well as the higher OPEX linked to the use of more expensive alternative fuels/energies which contribute to reaching the intermediary emission targets for 2030/35 and the eventual targets for 2050.

- The private resources brought together by the sector with an earmarked purpose are to be co-financed by public parties (e.g. national governments and EU), either in a centralised (through the instrument) and/or decentralised way (separate EU and national public contributions).
    - This would need to be negotiated upfront.

[62] For the purpose of the CCNR study, two transition pathways towards zero-emission in 2050 were identified and elaborated: a conservative one and a more innovative one. The conservative pathway refers to a pathway in which mainly alternative fuels and techniques are considered which are relatively easy to implement and cost efficient. The innovative pathway takes a more innovative approach with less internal combustion engines into account.
[63] See also deliverable for RQ G and H for more information as regards the earmarked contribution.
[64] See Article 3 of the Mannheim Act of 17 October 1868 – *'In application of Article 3 of the Mannheim Convention, the Member States must refrain from imposing any toll, tax, duty or charge based directly on the fact of navigation*.' See report on research question G and H for a more in-depth analysis https://www.ccr-zkr.org/11020100-en.html.

  - Indeed, the sector made it clear that co-financing by public bodies would be a pre-requisite for the implementation of a sector contribution.
  - A mandatory contribution would enable to secure level playing field among the contributors.

- Ideally, the envisaged geographic scope of such a scheme would be European, covering navigable waterways of member states of the EU as well as member states of the Central Commission of the Navigation of the Rhine and of the Danube Commission connected to the European waterway network, Switzerland, Serbia and Ukraine in particular. Such an approach would therefore include also vessels active on isolated Trans-European Transport Network (TEN-T) waterways in the EU (e.g. Po, Douro). This ensure that there is wide European support for such a financial instrument, funding from the EU Budget (MFF 2028-2035) as well as a level playing field. In a first step, a smaller geographical scope could be envisaged, as far as level playing field is ensured, such as the connected inland waterway network in Europe or the Rhine area.

- An easy access to such an instrument is paramount as well as administrative simplicity and efficiency. The preparation of an application should therefore not lead to high costs for the applicants. Currently support from third-parties is often required. In case such support is needed for applicants, consultancy during the application procedure should be made available free of charge or at least be financially supported.

- It is also essential that such an instrument is open on the same terms (equal treatment) to vessel owners of Member States of the CCNR, the EU, and of Danube Commission States connected to the European inland waterway network.

- Preferably the proposed instrument could be accessible through a 'one-stop-shop' approach. The concept of a one-stop-shop approach focuses on providing the potential beneficiary of the instrument (vessel owner) with support in order to facilitate the application process and benefit from clear guidance on the different funding and financing opportunities (e.g. grant options, loan options) but also from technical advice and tips for a successful application process. Preferably there should be no language barrier and opportunities to meet an expert/advisor in person, which could mean that local offices in Europe speaking the native/national language are established, possibly in addition to a central office which can be used by all countries. The office providing a one-stop-shop approach may also support in creating a pool of vessel owners, resulting in a wave of investment projects to profit from lower costs as result of joint procurement and economies of scale, as well as receiving attractive financing conditions. The barriers and opportunities linked with the pooling of projects application should be further explored. It is considered that the sector itself is best placed to explore this possibility.

- Finally, a possible European instrument dedicated to IWT could take the form of a public-private partnership, with a multilateral framework. In particular, negotiations could take place as part of the next Multi Financial Framework (MFF) period (2028-2035) regarding the possible to dedicate additional funding from the EU budget to an instrument dedicated to inland waterway transport. Such a multilateral framework is also needed to align all the (EU and non-EU) member states as regards their public contribution (grants) to the instrument (whether directly or indirectly). It will need to be further analysed if and how a direct contribution from the EU budget to such an instrument dedicated to inland waterway transport would be in line with the EU´s budgetary rules. A key advantage of a European financial instrument is to enable and consolidate on a

European level an earmarked sector contribution combined with a stable and long-term multilateral commitment of grants provided by public bodies (budgets of national governments and EU). It could also be a way of providing more clarity on the investment priorities at European level and coordinating investment priorities further at national level. This will result in a level playing field, effectiveness, certainty, and acceptance.

4.2. New insights for the financial instrument based on PLATINA3 work

At the level of the EU, it was made clear that financial commitments (public side) to feed a new instrument supporting the IWT fleet and which could come on top of a sector contribution, would not be possible under the current MFF (2021-2027).

At the level of national governments, some financial commitments to support the IWT fleet have already been made in some countries, and not in others. Such financial commitments are limited in time. In addition, it is not always possible to dedicate financial means for the coming years "at will". In most cases, such financial means are negotiated in a law defining the budget and spending on a yearly/pluriannual basis. The definition of national budget a political process driven by needs and policy considerations. More certainty should be achieved as to what could be made available at level of national governments to support the energy transition of the IWT fleet.

In light of the above, a two-phase approach could therefore be envisaged to develop such an instrument:

- Phase 1 - under the current MFF (2021-2027): use existing funding and financing opportunities at various levels, setting grounds for a European instrument supporting the inland waterway fleet.
- Phase 2 - period of the new MFF (2028-2035): linking together EU, national and sector contributions under an instrument supporting the energy transition of the inland waterway fleet.

Given the ambitious emission reduction objective set at international levels, including for the IWT sector, it is now urgent to develop an appropriate financial solution to enable the transition. The need to develop a solution at European level was also highlighted on several occasions to ensure a level playing field. Indeed, should the financial solutions be developed only in parallel (EU, national/regional level) without a proper European coordination, it is to be expected that some vessel owners will not obtain the necessary support to make their transition. For instance, looking at national funding opportunities, there are striking differences among Eastern and Western Europe. While Western European countries significantly invest in the development of IWT and its efficient integration into intermodal transport chains, Eastern European countries lack any kind of financial instruments. Some Central European countries (Czech Republic, Germany, Austria) do however have instruments to proactively support the modernisation process of inland vessels. In addition, such a European approach could lead to a better concentration of funding opportunities in a limited number of programs/budgetary lines supporting the IWT energy transition.

When considering the development of new financial instruments, it is important to highlight that their impact on shippers and consumers should be taken into account. Funding instruments should not be pernicious for shippers and consumers. Indeed, while their role is not addressed to a great extent in this report (see Annex 5), they are key players.

A key question that was also raised related to whether a European instrument should be centralised or decentralised (see part 4.2.2.1).

4.2.1. Creating an incentive to invest at the level of the individual vessel owner

4.2.1.1. Different options available for a sector contribution

Given the considerable costs related to the energy transition, there is no doubt that all actors involved should contribute financially to the transition. Public sources (grants) are expected to play a great role. However, it is unrealistic to expect that the public sector will provide the full volume of resources needed in the form of grants. To address this challenge, the IWT private sector is also expected to contribute. While a sector contribution should not be a goal in itself, the current framework does not enable to trigger the energy transition at the level of the individual vessel owner. In addition, no mechanism currently exists to ensure that those who invest today in emission reduction technologies and take a financial risk in doing so are not put at disadvantage compared to those who decide to invest at a later stage. The identification of an appropriate scheme to address this issue is therefore necessary. As introduction, it is important to mention that first reflections regarding the setting up of a sector contribution scheme started before the COVID-19 crisis and the latest proposals from the European Commission in the context of the "Fit for 55" package. It is expected that the form which a sector contribution could take will depend on the developments regarding the revision of the EU Energy taxation Directive, the EU Emission trading scheme as well as the other proposals included in the Fit for 55 package such as the proposed revision of the RED2. The recent invasion of Ukraine by Russia and its impact of the war on energy prices is another factor to consider when reflecting on the most appropriate sector contribution scheme to stimulate investment on the side of vessel owners. In particular, the competitive position of IWT with regards to other modes might have changed as a result of the COVID-19 crisis and could also evolve as a result of the war in Ukraine or latest policy proposals. All such considerations might have an impact of the ability of the sector to contribute and the extent to which it could contribute to the energy transition.

It is clear that the successful implementation of a sector contribution to a possible European instrument lies on its acceptance by all relevant actors, the representatives of the IWT industry in particular. At this stage, it seems the IWT sector takes an inconsistent stance on the question of private contribution of any sort to a possible European financial instrument. Some actors are positive about this idea, others are opposed. However, there is willingness to explore a financial contribution on its part to the energy transition, under certain circumstances. The willingness of the IWT private sector to undertake this exploration depends in particular on:

- The availability of a substantial public sector contribution in parallel,
- the need for the collected resources from the private industry to be earmarked to the IWT sector,
- the need to differentiate such contributions depending on whether a vessel owner has already made some investments to green its vessel,
- the need to ensure that such a contribution would not negatively affect modal shift. Special attention must be paid to the risk of increased freight rates driving away shippers from IWT
- the commitment of clients of IWT to accept the price increase for IWT services as result of the earmarked contribution, resulting in costs which can be passed on completely to the clients/consumers. In this way the competitiveness on the market of cleaner vessels (which have lower contribution and thus lower extra costs) is also improving.
- the terms and modalities of such an instrument.

A dialogue will be necessary to generate this acceptance. Before such a contribution can be put in place, it will be essential to engage in a discussion with the representatives of the barge owners, operators as well as the shippers and clients of services performed with vessels. In general, the willingness of national governments and/or the European Union to engage in the development of such a European instrument remains necessary and will require collaboration. An efficient way to foster such cooperation and discussion would be to make:

- a proposal for an EU legislation supplemented by an international agreement for non-EU Member States.
- A proposal for an international agreement covering both EU and non-EU Member States.

Despite such uncertainties, it seems appropriate to further pursue the reflections on such a contribution and to identify the most appropriate way in which the sector could contribute. Such a contribution could take different form, some are identified below. In fact, it is the opinion of the IWT sector representatives that other proposals than the one based on a surcharge on fuel differentiated according to the emission performance of the vessels (proposal made in the CCNR study research question G and H) should continue to be explored.

Last but not least, it is important to consider the perspective of the complete logistics when planning possible surcharges on fuels, taxes and or other options to incentives the energy transition. With such an approach up to the end-customer (the user of the different products also when it comes to individual citizens or industry users), everyone can be informed about the environmental footprint that the transport of the good creates. This way, it can also be easier to leverage the financial impacts of such a surcharge, tax, other options, among the actors in the logistics chain. In fact, it should also be possible for the shipper or the user of the good transported/or the service to enjoy some benefits, for instance by showing that it used a sustainable transport option.

In this respect, financial contributions from the IWT sector should be proportional to decarbonisation efforts already undertaken and should not lead to unreasonable hikes in prices passed on to shippers and the final consumer. Indeed, passing on some costs to shippers/final consumers, irrespective of the environmental performance of the product/service in question, may demotivate further contributions and behavioural change. As much as possible, services/products with high environmental performance should not be economically more costly for shippers and the final consumer. This could also be achieved by setting up financial incentives for this change to take place, together with the marketing of labels and greater price transparency between shippers, cargo owners and other intermediaries.

Options which are identified within the PLATINA3 Task are the following:

- **Option 1: a differentiated and earmarked sector contribution**
    - **Option 1.a: a mandatory sector contribution**
    - **Option 1.b: a voluntary sector contribution**
- **Option 2: earmarking of revenues from a tax on fuel used in inland navigation**
- **Option 3: earmarking of revenues from a contribution of IWT to the European Union's Emission Trading System (ETS)**

Option 1: a differentiated and earmarked sector contribution

the form which such a contribution could take was driven by the need to:

- create an incentive for vessel owners to invest in emission reduction technologies and to use clean and low/zero carbon fuels (what is currently lacking) and,
- secure a level playing field between those who invest in emission reduction technologies today and those who chose to take this leap at a later stage.

In addition, in anticipation of expected legislative developments that would require the sector to contribute financially to the energy transition in ways which might not be the most appropriate (general tax, integration into Emission Trading Schemes…), this idea of a sector contribution also aimed at generating a large-scale discussion on what could be the most appropriate way for the sector to contribute to this transition. In this way, the sector could be in the driving seat to develop the parameters for such a contribution (bottom-up approach) instead of such parameters being imposed on the sector (top-down

approach such as an ETS for IWT) with possibly a very high cost impact but without having certainty on an earmarked use of the resources. In order to secure a level playing field, such a contribution would need to be collected on a European scale.

Such a sector contribution is therefore seen as an interesting scheme to create this incentive and secure a level playing field. In addition, other positive impacts are to be expected from this contribution, particularly in terms of green image.

As a first step, an important implication and support of the sector is therefore expected, with regards to the further development of a sector contribution.

To achieve this objective, the proposal was made in the context of previous research work that such a contribution should take into account the emission performance of the vessel[65] thereby consisting in an additional incentive to greening and raising the acceptance, effectiveness and fairness of the overall scheme.

Previous work undertaken in this regard, made it clear that a contribution by the sector would only be acceptable for the sector if the collected resources from the private industry would be earmarked to be used effectively for supporting the vessel owners and operators to adopt and operate the greening technologies.

Such a contribution would therefore need to be earmarked and could consist in a contribution from the IWT sector into a European financial instrument, the revenues from which could be reinvested in greening projects borne by the IWT sector. This contribution would need to be designed in a way that it creates a sufficient incentive for the industry to invest in greening and to get rewarded if done so. To reach this goal, this contribution would need to be differentiated based on the emission performance of the vessel. In concrete terms, this would mean that the level of the contribution would then be higher for a vessel generating an important amount of emissions compared to a vessel generating less emissions. A vessel generating zero emission would not pay any contribution. This enables to take account of investments made by a vessel owner prior to the setting-up of such a contribution and would contribute to making such a scheme fair.

It would also need to be implemented and collected on a European scale in order to secure a level playing field and acceptance.

Out of the 9 options assessed in the CCNR study to determine the basis for such a contribution and how it could be levied from the private sector, taking into account the polluter pays principle, it was concluded that raising an earmarked contribution based on the fuel consumption – contribution of a certain amount to be paid per litre of fuel consumed - combined with the emission profile of the vessel would be the most appropriate and feasible option. An energy index or emission label system could then be used as a means to further differentiate this contribution and was analysed and presented in PLATINA3 Task 2.6.

Based on first desk research incorporating a number of representative vessel categories, an average contribution of 4 eurocent per litre of fuel was assessed to be acceptable in the Rhine area: it would lead to a cost increase per transported ton or passenger between 0.6% and 2.1%.

An average contribution of 8 eurocent per litre could be less acceptable, with a cost increase between 1.1% and 4.2%, especially for the sector of gravel, sand and agribulk that have no lever for fuel consumption reduction.

As fuel costs make up a slightly larger share in the total costs of companies active in the Danube countries, it was assessed, based on interviews with Danube inland waterway transport operators, that an earmarked contribution of 1-2 cent per litre would already have significant market impacts.

[66] GRI - Standards (globalreporting.org)

heeft verwijderd: ¶

Assuming a European-wide contribution of vessel operators to a greening fund, ranging from a contribution of 4 cents up to 8 cents per litre bunkered fuel, the possible revenues solely on the basis of these contributions would range from € 53 mln up to €106 mln on an annual basis. Over a period of 25 years, the total revenues would range from approximately € 1.3 bln up to € 2.6 bln.

Nevertheless, it became clear from the work undertaken in PLATINA3 that different approaches for raising such a contribution should not be discarded. The reason is that a mandatory contribution based on fuel is in variance with the legal framework of river commissions and her member states (Act of Mannheim). In addition, there are concerns from ship-owner/operators that the additional costs based on the fuel and emission profile of the vessel could be difficult to pass to the clients of IWT.

Other alternatives to a surcharge on fuel based on emission performance of the vessel exist but require a thorough assessment.

- One could consider that such a sector contribution could be calculated based on the emissions (measured/calculated) from the vessel, both pollutant and greenhouse gas emissions.
- Once the emissions are measured, another possibility could be to set up a contribution, for freight transport on the basis of the emissions produced per ton-kilometer. This would require the vessel owner to report and monitor not only its emissions but also the tons transported, and the kilometers travelled. Such a system would also require setting up a relatively complex system to calculate, measure and register the emission, the tons transported, and the kilometers travelled, as well as managing the contribution based on those three different indicators. In addition, other methodologies/indicators should be identified in order to consider passenger transport as well as floating equipment.
- A sector contribution could also be based on a labelling system only. This option requires to identify the indicator on the basis of which a label would be delivered (link with PLATINA3 deliverable 2.6). However, such an option would not enable to consider the actual level of emissions and its intensity level. Vessel owners with a relatively low energy use would probably be disadvantaged.
- Another possibility could be to pay a contribution on the basis of the loading capacity of a vessel and one based on the emissions of the vessel. The first component has the advantage of reflecting the economic power and financial capacity of a company and its ableness to pay a contribution even if with these indicators, the activity of the vessel as such would not be taken into account. The second component is directly linked to the emissions.
- Other methodologies could be thought about in order to determine the level of a sector contribution. For instance, the level of such a contribution per company could also be based on the basis of a standardised process for reporting their level of sustainability such as the GRI standards (global standards for sustainability reporting). In fact, the GRI Standards "*enable any organisation – large or small, private or public – to understand and report on their impacts on the economy, environment and people in a comparable and credible way, thereby increasing transparency on their contribution to sustainable development*[66]." In this case, the amount of the contribution would however only be based on GHG emissions.

In this regard and based on existing literature, the IWT sector, including the shippers and clients of IWT would certainly be the best placed to come up with a concept for a sector contribution it would consider as the most appropriate.

In addition, the compatibility of such a contribution with relevant international agreements, in particular the MA and the Belgrade Convention, must be assessed. On the Rhine, Article 3 of the MA explicitly

[66] GRI - Standards (globalreporting.org)

prohibits Signatory States to impose any kind of rights based directly on the fact of navigation. On the Danube, the Belgrade Convention does not allow for the collection of fees related to navigation. On both Sava and Moselle rivers, payment of a fee could be also possible with some legal adjustments regarding respectively the nature of the contribution or its destination.

In principle, the compatibility issues that may exist between a sector contribution and the existing international agreements might be solved either by:

- making sure that such a sector contribution is compatible with the existing international regime,
- or by amending the existing l regimes to enable to collection of such a contribution.

In all case, such an assessment can only be performed by the competent entities. The CCNR with regards to the MA, the Danube Commission with regarding the Belgrade Convention.

Last but not least, the setting-up of such a contribution will require a legal basis, either in the EU treaties or on the basis of an international agreement.

i. Option 1.a: a mandatory sector contribution

A mandatory contribution by the sector could consist in contributions paid by vessel operators on a mandatory basis into a European instrument.

A mandatory contribution would appear as an appropriate instrument to guarantee:

- reaching the emission reduction goals, as all are mandatory part of the scheme
- that a sufficient incentive for vessels owners/operators will exist to make greening investments for their vessels
- a level playing field between the vessel owners who have already invested in low/zer-emission technologies and those who have not
- a level playing field between the vessel owners who contributes
- a steady and constant flow of money over time
- that sufficient revenues from the contribution are generated to ensure that such revenues can effectively be reinvested in the sector to an extent sufficient to support the fleet's

ii. Option 1.b: a voluntary sector contribution

A voluntary contribution by the sector could consist in contributions paid by vessel operators on a voluntary basis into a European instrument. However, the feasibility of such a voluntary sector contribution is questionable. In addition, it is not guaranteed that the emission reduction goals will be reached by means of a voluntary sector contribution.

First, from an economic point of view, in a competitive sector such as IWT, with marginal costs[67] equalling the price level, it is likely that there will be no margin on the side of companies to voluntarily pay a contribution. In other words, if some companies pay a contribution while others do not, the first mentioned companies will most likely be penalised.

It might therefore be difficult to ensure a level-playing field between those who contribute and those who do not financially contribute to a European financial instrument, if a sector contribution is "only" voluntary.

[67] Marginal cost is the additional cost for producing one more unit of a good. For example, if a vessel owner wants to meet increasing demand of freight, the marginal cost would describe the cost of meeting this new demand from the supply side.

Thirdly, if an insufficient number of companies contribute to this fund, the objective of such a contribution might not be met.

If a sector contribution is voluntary, the challenge therefore lies within identifying the incentives that would be attractive enough to convince as many vessel owners/operators as possible to pay a contribution to a European instrument. The advantage of this option lies in the limited legal hurdles that would exist for its implementation and in the complete control that the sector would have over this instrument.

However, it could be interesting to explore whether the mechanism of a “Contribution Volontaire Obligatoire” (a Voluntary Mandatory Contribution) which currently exist in the French legal system could be applied in other legal systems. The term "voluntary" refers to an interprofessional agreement by which the professional organisations undertake, on their own initiative, to set up a contribution. The term "compulsory" refers to the fact that the provisions of this agreement are generally extended to all members of the sector concerned, who are then obliged to pay it. In other words, if a professional organisation undertakes to set up a contribution, then all the members of this organization would be bound to pay a contribution.

Option 2: earmarking of revenues from a tax on fuel used in inland navigation

A tax on fuel could also be considered as another form of a sector contribution. However, it is questionable whether this would be the most suitable tool to provide an incentive to enable the energy transition and whether this revenues from this contribution could be earmarked to the IWT sector. In addition, such a tax should be introduced without prejudice to other international agreements.

It is currently proposed in the Fit for 55 package to revise the Energy Taxation Directive in view of ending the fuel tax exemptions for aviation, sea shipping, fishery and also for inland navigation in Europe. For IWT the introduction of a mandatory tax by January 2025 on fossil gasoil used as fuel for inland navigation amounting to 0.9EUR/Gigajoule is foreseen.

By imposing a tax on gasoil, one of the objectives of the European Commission is to encourage the uptake of alternative propulsion technologies and fuels (low or zero emission) through tax incentives and by imposing taxes to penalize the use of fossil fuels.

However, some stakeholders have the opinion that such a tax would not result in the desired incentivising effects as very few alternative fuels (low or zero emission) with the appropriate energy converter are yet available for wide roll-out as they are not mature enough, or not economically viable and there could be a situation of lack of sustainable biodiesels such as HVO and FAME. Under these assumptions, taxation of gasoil would not make those alternative technologies and fuels more attractive and would only impose an additional financial burden on vessel owners, who will have no widely available viable alternatives, without certainty that such financial contributions flow back to the sector.

In addition, the inland navigation sector’s energy transition to zero emissions in 2050, may not benefit from a tax whose revenues do not flow back to the inland navigation sector, as it would reduce investment capacity of the sector. It would be recommended that revenues from such a tax are earmarked to the IWT sector, and thus be considered as a financing source for a European instrument dedicated to IWT.

However, the introduction of a tax on gasoil would be at variance with existing international conventions. In particular, it would be at variance with the regime under the Mannheim Act (MA).

In addition, there isa risk that the revenues of such a tax are not earmarked to the inland navigation sector but are allocated to the general budget of Member States. Without specific EU regulation, earmarking the revenues of a tax to a specific sector is in most countries impossible or very difficult to achieve[68].

[68] Statement based on internal consultation with some EU Member States.

A tax of 36.6 €/1000 L of gasoil would amount to an additional financial burden of 49.2 million € for the fleet covered by the Convention on the collection, deposit and reception of waste generated during navigation on the Rhine and other inland waterways (CDNI - amounting to approximately 65% of the European fleet)[69] For the whole European fleet of inland vessels, the additional financial burden would amount to 75.7 million €. The extra burden stemming from such a tax would represent 0.7% of the turnover in the inland navigation sector in the CCNR countries and 1.0 % of the turnover in the inland navigation sector in the whole of Europe (taking into account the 2020 turnover figures as a basis). The increase which such a tax would represent compared to the overall bunkering costs varies greatly depending on gasoil price. For instance, based on the gasoil price in March 2022[70], such a tax would generate an increase of 3.7% in the bunkering costs. However, based on the average gasoil price in the year 2021[71], such a tax would generate an increase of 6.8% in the bunkering costs.

Option 3: earmarking of revenues from a contribution of IWT to the European Union's Emission Trading System (ETS)

A contribution to the EU-ETS could also be considered as another form of a sector contribution. However, no certainty exists as to whether the revenues from this contribution can be earmarked to the IWT sector.

The European Union's Emission Trading System (ETS) was launched in 2005, being the first carbon trading system on a global scale. It covers approximately 45% of the total GHG emissions in the EU. The Swiss and the EU greenhouse gas emissions trading systems were linked together through an agreement that was signed on 10 November 2017 and entered into force in January 2020. It became operational in September 2020.

The ETS is based on a cap-and-trade approach. In this regard, the cap puts a certain limit on the GHG emissions, that may become stricter over time. The trade element on the other hand, provides companies the opportunity to buy and sell emission allowances, which can be seen as the currency and as such creates a market in which demand and supply set the price. Companies must monitor and report their emissions each year adhered in a report which is being checked by an accredited verifier.

The trade element provides an incentive for companies to cut their emissions and possibly sell their allowances. Up to now, this trading system concerned the industry sector and aviation.

In its present form, the wider application of the ETS system to IWT was seen as unfeasible. Indeed, the European IWT sector is a relatively small and fragmented one, for example as compared to the European aviation industry or heavy industrial sector which are both included in the ETS. Hence, the possible deployment of an ETS-like scheme for the IWT sector would be extremely complex and expensive to operate. The cap-and-trade approach with its trade element and stringent accounting measures would be a burden too heavy for a relatively fragmented sector such as IWT.

However, the "Fit for 55" legislative package put forwards, inter alia, a proposal for a directive amending 2003/87/EC[72] to extend the EU ETS to maritime, road transport and building sector to meet the climate targets set by the European Green Deal. Inland waterway transport is excluded from the EU ETS.

- The ETS for road transport and buildings shall encounter a separate self-standing system from 2025 onwards. Throughout the first year of operation, regulated entities would be required to hold a GHG emission permit and report on emissions for 2024 and 2025. To allow a smooth functioning, the issuance of allowances for the regulated entities would be applicable only from 2026, on the basis of these reported emissions. As the market contains a substantially large

[69] On the basis of provisional amount of bunkered liters of gasoil in 2021 according to the Convention on the collection, deposit and reception of waste generated during navigation on the Rhine and other inland waterways (CDNI) 1

[70] 0,9854 euro per litre in March 2022. Source : https://www.itb-observatorium.be/page.aspx?id=44&lng=nl

[71] 0.5391 euro per litre in 2021 on average. Source : https://www.itb-observatorium.be/page.aspx?id=44&lng=nl

[72] Fit for 55 package : https://ec.europa.eu/info/sites/default/files/revision-eu-ets_with-annex_en_0.pdf

number of small emitters, the regulation will target not the emitters directly but the fuel suppliers further up in the supply chain. Further reasons supporting this upstream approach embrace technical feasibility and administrative efficiency.

- With the "Fit for 55" legislative package, it is proposed to establish a Social Climate Fund to finance Member States initiatives aiming at addressing social inequalities of the ETS for building and road transport. Light is particularly shed on "on vulnerable households, micro-enterprises and transport users".[73]
- The ETS for maritime transport starting from 2023 shall be included in the already existing ETS, thereby targeting shipping companies. For a smooth transition, a four-year period is foreseen to allow shipping companies to account for allowances, initially for a portion of their verified emissions, gradually rising to 100%. The Union-wide quantity of allowances should be increased by 79 million for maritime transport.

The "Fit for 55" legislative package proposed that a separate EU ETS system than the one currently in place is set up for road freight transport, which would follow an upstream approach (administrative and financial burden put on fuel suppliers and not directly on the road transport operators and truck owners).

In its current form, the general ETS system for industries and maritime transport would be inadequate for IWT.

In fact, the possible cost impact of a contribution to the EU-ETS could be equivalent for IWT to an increase in fuel price of around €213/1000l of diesel fuel, based on current EU-ETS[74] prices per ton of CO2 emission. This corresponds to 21 cents per litre and is therefore much higher than the option of an earmarked and differentiated sector contribution ranging between 4 to 8 cents. It may cause a strong price increase if compared with other modes which already are under ETS (maritime transport, road transport) and/or having easier access to CO2-neutral energy such as rail transport.

However, should such an option be favoured, it should be ensured that the revenues from the contribution to the EU-ETS are earmarked to the IWT sector. To date, it remains unclear whether earmarking of the revenue of ETS contribution to a specific sector is possible but such an earmaking cannot be excluded[75]. In fact, currently, part of the revenues is used to feed the Innovation Fund (no earmarking towards specific sector as part of this Fund) and are also used by the EU Member States. It was made clear to the PLATINA3 consortium[76] that allocating part of the Innovation Fund budget to a specific mode will be avoided. In addition, earmarking of the revenues of the EU-ETS to a specific mode, including in the 2021 proposal made in the framework of the Fitfor55 Package is currently not foreseen. It should also be ensured that non-EU Member States can be associated to this scheme. Last but not least, it is also worth noting that the EU ETS system covers only greenhouse gas emissions, not air pollutants and therefore could be seen as partially effective.

Overall it is important to note that should support for the setting-up of such a contribution be lacking, it is likely that regulatory evolutions will need to take place to stimulate the switch on the side of vessel owners.

[73] https://eur-lex.europa.eu/resource.html?uri=cellar:618e6837-eec6-11eb-a71c-01aa75ed71a1.0001.02/DOC_1&format=PDF p.6

[74] Calculation based on a CO2 price of €80 per tonne of CO_2

[75] The ETS proposal is currently being negotiated and the Environment Committee of the European Parliament proposed the setting up of an Ocean Fund based on the contributions from the maritime sector to the ETS.

[76] Interview with Innovation Fund Head of Unit, Roman Doubrava, 30/11/2021

4.2.1.2. Assessment of the legal compatibility of a sector contribution based on fuel consumption with the Rhine Regime[77]

Regarding the Rhine Regime

- Article 1 of the MA states that "*[…] no obstacle of any kind shall be offered to free navigation.*"
- As an integral part of this freedom of navigation, Article 3 provides that "*no duty based solely on navigation may be levied on vessels or their cargoes or on rafts navigating on the Rhine or its tributaries, in so far as they are in the territory of the High Contracting Parties or on the navigable waterways mentioned in Article 2*".
- No dues should be collected on transit either (Article 7.2).
- With a view to reconciling diverging views in respect of the MA as regards the customs and tax regime for diesel oil consumed fuel, Articles 3 and 7.2 of the MA were supplemented with an additional agreement, adopted on 16 May 1952 between the Rhine contracting States (the Strasbourg Agreement), exempting any customs or other taxes on diesel oil consumed as fuel by vessels.

Regarding the nature of the sector contribution

- The sector contribution cannot be qualified in the same manner as the CDNI contributions (disposal charge), which are paid for a service rendered to the vessel operator, disposal of oily and greasy waste, which is not at variance with Article 1 of the 1952 Strasbourg Convention. Indeed, the sector contribution would not be paid for a service rendered but to endeavour the reduction of emissions by granting aid for greening investments in return for the contribution.
- The sector contribution is comparable in nature with the contributions that were paid to the Reserve Fund, which were also goal based.
- While the sector contribution does not qualify as a tax[78] or as a fine[79], it would still consist in a financial burden on and restriction of free navigation.

Regarding the lessons learnt from the Reserve Fund

The concept of contributions paid by the sector with a view to improve the position of the sector as well as the concept of the establishment of a fund, based on contributions paid by the sector, are not new. In particular, the following two examples, based on EU Regulation in combination with CCNR regulation, can be cited:

- the scrapping and old for new funds, granting premiums from the fund to any owner scrapping a vessel forming part of the active fleet[80],
- the Reserve fund, financed by the surplus funding from the structural improvement schemes and special old for new contributions, both consisting solely of financial contributions from the industry and financial resources which could be made available in the event of serious disturbance of the market[81].

[77] Subchapter based on Pr. De Decker, 2021, "Legal opinion regarding the levying of a minimum energy tax rate or a contribution to a greening fund on waterways falling under the scope of the Revised Convention for the navigation of the Rhine"

[78] A compulsory contribution to state revenue, levied by the government on income and business profits, or added to the cost of some goods, services, and transactions with a view to cover public expenses

[79] The contribution is not paid as punishment for an infringement

[80] Council Regulation (EEC) No 1101/89 of 27 April 1989 on structural improvements in inland waterway transport

[81] Council Regulation (EC) No 718/1999 of 29 March 1999 on a Community-fleet capacity policy to promote inland waterway transport

The scrapping and reserve funds were established as national funds, set up by the Member States concerned and Switzerland, under its national legislation and with its own administrative resources. The funds are administered by the competent authorities of the states concerned, the national organisations representing inland waterway carriers are involved in the administration.

The payment of the contributions with regard to new capacity, were considered by the Rhine Contracting States as a restriction of the principle of free navigation, however reconcilable with the Rhine Regime due to its temporarily character. Therefore, with a view to preventing or eliminating a legal conflict with the Rhine Regime, the Rhine Contracting States adopted the Additional Protocols no. 4 and 5 and agreed that Rhine navigation may be subject to temporary measures of structural improvement, notwithstanding the general principles contained in the Revised Convention for Rhine Navigation.

Under fixed conditions and if unanimously requested by the organisations representing inland waterway transport, the Reserve Fund may be used to encourage innovation in respect of vessels and their adaptation to technical progress as regards the environment, including environmentally friendly vessels. The use of the reserve funds for measures to encourage innovation in respect of vessels is also subject to action at Union level.

The foreseen earmarked contributions from the sector are, like the contributions that were paid to the scrapping and old for new funds, goal based. The contributions to the scrapping and old for new funds were regarded by the Rhine Contracting States as a (financial) burden on and restriction of (free) navigation. However, because of the temporarily character of such contributions, they were considered as not infringing with the general principles of the Rhine regime, laid down in the articles 1 and 3 of the Revised Convention for the Navigation of the Rhine.

Regarding the compatibility of a mandatory sector contribution with the Mannheim Act and the 1952 Strasbourg Agreement

- A mandatory obligation put on the sector to pay a contribution which is in turn used for the sector, may be justified as not being at variance with the Articles 1 and 3 of MA if it has a temporary, non-disproportionate and non-discriminatory character and is paid with a view to achieve improvement of the environmental conditions of navigation and furthering technical innovation.
- With a view to preventing or eliminating an eventual legal conflict, it would in any case be advised that the conformity of a temporary, non-disproportionate and non-discriminatory sector contribution scheme with the general principles of the Rhine regime, is laid down in an additional protocol.
- A mandatory sector contribution is at variance with art. 1 of the 1952 Strasbourg Agreement. With a view to eliminating or preventing a legal conflict with this Agreement, the Agreement would need to be amended or, at least, a CCNR Resolution or interpretative declaration would be needed to ascertain that the sector contribution is not at variance with Article 1.
- This would require the common consent of all Rhine Contracting States. As the Strasbourg Agreement also forms part of the provisions of the Moselle Convention, it would be advisable to seek also the consent of the G.D. of Luxembourg.

Regarding the compatibility of a voluntary sector contribution with the Rhine regime

- Sector contributions paid by vessel operators on a voluntary basis cannot be regarded as duties levied by the Contracting States solely on the fact of navigation.
- Therefore, such a voluntary sector contribution is not at variance with the MA or the Strasbourg agreement.

- However, at first sight the willingness to pay such a contribution might only exist if it offered an alternative to a tax. This would imply therefore the recognition of the legality under the Rhine regime of an energy taxation on fuel used on board of a vessel.
- Thus, a solution should be found to ensure that the voluntary contribution is not linked to a taxation scheme.
- One should look for flanking measures, in line with the Rhine regime, to endeavour undertakings to financially contribute to the foreseen instrument.

Conclusions and assessment by the CCNR

In consideration of the legal opinion mandated by the CCNR and conducted by Professor Marc de Decker, at this stage, the CCNR is of the opinion that amending the MA or the 1952 Strasbourg Agreement or granting a temporary derogation from the MA is not an option. The two remaining possibilities for the setting up of a sector contribution, which can be considered as compatible with the Regime under the Mannheim Act would therefore be as follows:

- **Possibility 1: a voluntary sector contribution based on fuel consumption and differentiated according to a labelling system**

  As long as it is voluntary, a contribution based on fuel consumption would be in accordance with the regime under the Mannheim Act. However, the setting-up of a voluntary contribution comes with challenges. First because it implies willingness on the part of the sector, which is not given and second because it is not clear that a contribution of this nature will achieve the desired objectives.

- **Possibility 2: a mandatory contribution, not based on fuel consumption.**

  A mandatory sector contribution would need to be based on a different indicator than fuel consumption to be compatible with the regime under the Mannheim Act. It should be avoided that such indicators are also based on the "fact of navigation" as this could be at variance with the Mannheim Act as well. The challenge therefore lies in identifying new indicators and a new methodology for raising such a sector contribution.

4.2.2. A two-phase approach

4.2.2.1. Phase 1: period towards 2027

For the time period until the next MFF a first phase could be considered, while creating a base for expansion under the next MFF from 2028 onwards.

During this period, the grounds for the setting up of a European wide instrument should be agreed upon (which investment priorities, which size, which contributors, which administrative costs etc…). This requires beforehand that the concept is supported by all relevant actors and requires answering to several questions. At this stage, some parties have provided explicit reservations[82], while others have expressed their support. For most actors, no clear-cut position has been communicated at this stage.

For instance, the amounts which could be dedicated to supporting the energy transition of inland navigation by the EU budget (MFF 2028-2035) and national governments should be discussed, together with the amount that could be paid by the sector. A sector contribution could be put in place towards the end of this period, provided that several conditions are reunited. In this context, it must also be kept in mind that a legally watertight solution for a European financial instrument taking into account the sector

[82] Germany made clear that it did not support the setting-up of a sector contribution.

contribution will require substantial legislative efforts as well as persistent administrative costs which might hinder the efficiency of such an instrument. This must be carefully assessed.

Regarding possible funding priorities, it could be discussed, whether financial support should be provided beyond the vessel itself in order to cover the training of crew members or even automation. Such a holistic approach would however require that additional financial means are made available. In parallel, use of existing funding and financing opportunities should be maximised and optimised.

For zero-emission tailpipe technologies (hydrogen FC and battery electric applications) on inland vessels

The EU funding via Innovation Fund and CEF AFIF can be used for closing part of the TCO gap for zero-emission tailpipe technologies such as hydrogen fuel cell and battery electric applications on inland vessels. However, this will only fit a small part of the sector and will only focus on the first pioneers.

In phase 1, pooled investments for a group of vessels may be combined in project applications under the Innovation Fund (large scale projects) and CEF AFIF. Co-funding from other sources is also possible, including funding sources stemming from national funding scheme or commercial/public banks. Whether the revenues from the sector contribution can be used as a co-funding source will depend on the agreement made with the sector regarding the use of the sector contribution. Indeed, paying a contribution would create claims of contributors and it will need to be ensured that all contributors get their share out of their contribution. In general, the use of such revenues would target the roll-out of zero/low emission technologies and not research, which entails greater financial needs. In such a situation, it could be imagined that co-funding from the revenues from such contributions could be used to support investments related to the vessels, as far as such vessels are retrofitted or purchased by a company paying a sector contribution. A large consortium seeking for funding, for a project aiming at developing pay-per-use schemes for electric sailing, by means of using swappable batteries from third parties, could for instance apply both to the Innovation Fund and the CEF AFIF. Projects like the RH_2NE project, aiming at realising a market-ready hydrogen applications along the RALP network corridors, or projects like CLINSH, seeking to reduce air pollutant emission in IWT, and supported under the LIFE programme, consist in typical examples of IWT projects which can benefit from the support of EU funding such as dedicated calls in Horizon Europe Clean Hydrogen partnership.

This kind of projects could also be co-financed using national funding programmes (i.e. The Netherlands, Germany, France, Austria, Czech republic, Belgium …). However, language barriers can be a hurdle as well as eligibility requirements linked for instance to either:

- the establishment of the undertaking in the territory of the relevant State;
- the need for the vessel benefitting from the support to operate on a certain amount of days in the relevant national waterways.

Private investment (own investment and/or sector contribution) and support from commercial and public banks will also be needed. For instance, the sustainable Guarantee of the EIF will provide guarantees to intermediary banks to facilitate the disbursement of loans for investments allowing to reach a certain emission reduction.

Possibly and if this is decided by sector representatives, the Reserve Fund resources could play a role in supporting such investments. The reserve Fund often called the “scrapping fund” was financed on the basis of money collected from 1999 to 2003[83], mostly from “old-for-new” contributions. The entrepreneurs who ordered a new vessel had the choice between handing in old tonnage for scrapping or pay a contribution to the fund. The money can be used by the IWT sector for its benefit, if unanimously

[83] based on Council regulation (EC) 718/1999: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999R0718&from=EN

requested by the organisations representing inland waterway transport. In 2014, this regulation was amended. What the money can be spent on is governed by this updated regulation. The two organisations at European level, the European Skippers' Organisation (ESO) and the European Barge Union (EBU), therefore play a key role in this respect. It is estimated that € 26.9 million are currently available. The scope of the regulation would allow for the money available to be used support the greening of the IWT fleet, as far as the European organisations representing inland navigation (ESO and EBU) request this jointly (or agree on the spending) and as far as the fund is implemented at Community level. However, only a relatively small contribution can be expected from this Reserve Fund seen the overall demand for funding (approximately 0,5% of the TCO gap).

To address the deployment of low emission technologies such as cleaner engines (such as Stage V engines) or after treatment systems, as well as energy efficiency measures.

Such investments do not fit well within the current EU funding priorities which are rather focused on zero emission tailpipe technologies. An evolution of such priorities at EU level in order to integrate not only zero emission tailpipe (Tank to Wake) technologies but also technologies contributing to reducing emissions from a wider Well to Wake perspective would be recommended to support the energy transition of the sector.

Support from national funding and financing programmes might seem more adequate for the short term.

Possibly, the Reserve Fund resources could also be used as a kick-off for the first phase of the new financial instrument.

Private investment (own investment and/or sector contribution) and support from commercial and public banks will also be needed. Possibly and if this is decided by sector representatives, the Reserve Fund resources could play a role in supporting such investments.

In parallel

Access to funding programmes supporting the energy transition of the sector should be improved.

- Given the numerous funding and financial opportunities at European and national level as well as the uncertainties of the proposed instrument, the IWT sector should during this period strive to identify the specific drawbacks and benefits of existing schemes, in order to provide guidance to public authorities on how to better adapt their funding and financing tools/programmes. Such an exercise should help in designing adequate programmes both at EU and national/regional levels. Many national programmes will come to an end by 2023 and will need to be renewed. Negotiations on the renewal and content of such programme are already ongoing. Therefore, it would be extremely useful if such reflections could be undertaken as soon as possible.
- This exercise would also be paramount in view of developing funding programmes supporting the energy transition of the sector, in countries where such programmes do not currently exist. Exchange of good practices between European countries would also be valuable in that regard.
- The outcome of Grendel project, with the design of a State Aid model as well as the key state aid rules to consider when establishing a national funding scheme is very useful in this regard.[84]

[84] https://www.interreg-danube.eu/uploads/media/approved_project_public/0001/42/b617ee0ed634d82d8558eb3756624c31bffdb434.pdf

4.2.2.2. Phase 2: period after 2028

In order to give life to a European instrument, a common understanding should be reached on the meaning of such a European Instrument. During an expert workshop that took place on 16 December 2021, in the context of the PLATINA3 project, 3 different options for the setting up of such an instrument were presented, together with their possible pro and cons.

Option 1 A fully centralised instrument: combining EU, National and Sector contributions **dedicated to IWT fleet + helpdesk**	**Option 2** EU programme, decentralised national programmes and a sector contribution (mandatory) **dedicated to IWT fleet + helpdesk**	**Option 3** A dedicated EU programme, national programmes, a sector contribution (voluntary) **dedicated to IWT fleet + helpdesk**
Fully centralised instrument where all contributions would be part of a the same "pool" of money. This money would be dedicated to the IWT fleet. **A helpdesk foreseen**: provide assistance with application process, funding and financing opportunities, technical advice, support in creating a pool of vessel owners.	**Setting up interconnected EU, national and sector contributions dedicated to the IWT fleet in a decentralised manner.** **The sector contribution would be mandatory** **However, an underpinning arrangement should be negotiated, governing how such sources would be integrated, investment priorities, scope, long term vision …** **A helpdesk foreseen**: provide assistance with application process, funding and financing opportunities, technical advice, support in creating a pool of vessel owners.	**Setting up interconnected EU, national and sector contributions dedicated to the IWT fleet in a decentralised manner.** **The sector contribution would be voluntary** **However, an underpinning arrangement should be negotiated, governing how such sources would be integrated, investment priorities, scope, long term vision …** **A helpdesk foreseen**: provide assistance with application process, funding and financing opportunities, technical advice, support in creating a pool of vessel owners.

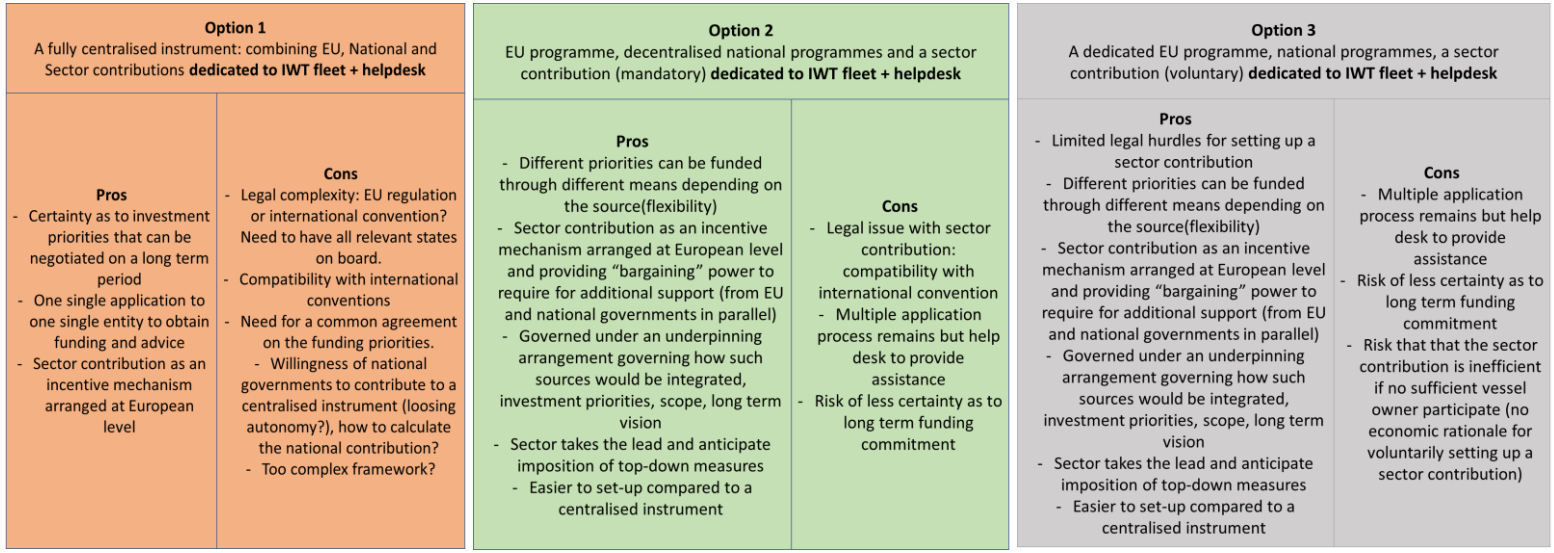

Figure 9: different options for the setting up of a European instrument dedicated to the energy transition of the IWT sector (Source: PLATINA3 expert workshop , 16 December 2021)

The outcome of this workshop showed that one centralised instrument (option 1) combining, EU, national and sectoral contributions as part of a common pool of money would not be realistic, seen as a too complex framework. The legal feasibility of such a centralised instrument was also put into question.

A more realistic concept for a European instrument could therefore be a decentralised instrument (option 2 or 3) Option 2 comes with more legal hurdles than option 3.In case of a decentralised option, national/regional funding programmes, together with national contact points would be available in parallel to resources managed at European level coming from the EU budget and a possible sector contribution.

- Regarding regional or national funding: the use of such funding opportunities could be maximised (adaption of existing programmes, renewal of existing programmes, setting up of new programmes).
- Regarding EU funding: the setting-up of a new funding programme or the adaptation of existing funding programmes (such as CEF) to better capture the specificities of inland navigation would be recommended. It remains necessary to assess whether a single instrument for one specific transport mode is possible and in line with EU budgetary rules. In additional, it remains to be analysed whether an adaptation of existing programmes and instruments, which already have management structures and rules in place, could be used to accommodate the needs of the sector. This should enable to decide whether it is preferable to establish a separate instrument rather than being eligible under an existing one, hence avoiding additional set-up costs and possible low absorption risks. Indeed, it can generally be difficult to ensure a sufficient absorption rate when targeting a specific sector At this stage, given that total public grants needed to enable the transition to remain an estimation, it could be recommended to work on the basis of an existing instrument, under which a specific envelop could be dedicate to the inland waterway fleet. This should enable to keep some flexibility. Contributions from non-EU member States should be allowed in order to ensure that vessel-owners from all countries in Europe, which are relevant for IWT transport can benefit from it. The new or adapted funding programme should therefore be structured in a way that not only funding to vessel owners in the EU but also outside may be made available. Good practices could also be taken from the H2020 programme which provides the opportunity for organisations outside the EU to participate in H2020 projects (e.g. Switzerland). In the case of H2020, the associated countries provided a financial contribution proportional to their GDP and on the basis of an international agreement with the EU.[85]
- Regarding a sector contribution: in order to ensure that an incentive exist for vessel owner to invest in emission reduction technologies and that those who invest today are not at disadvantage compared to those who invest later (preservation of the level playing field), an instrument would need to be set up at European level to enable the collection of a sector contribution, as well as to manage and spend the revenues from this contribution. The geographic scope of such an instrument should be European and go beyond the European Union in order to include non-EU Member States, such as Switzerland, Serbia and Ukraine, which play an important role for IWT in Europe.

Given the size of the financial challenge to enable the energy transition of the sector as well as its European dimension, a European solution to this challenge must be found, even if a decentralised approach is supported. Agreeing on a clear European strategy would play a paramount role to ensure that:

- the different funding sources (from the sector, from the EU, from regional/national level) are complementary, sufficient and appropriate to enable the transition,
- the different national co-funding schemes in parallel to not disturb the level playing field,
- no vessels owner is side-lined,

[85] https://ec.europa.eu/info/research-and-innovation/strategy/strategy-2020-2024/europe-world/international-cooperation_nl

- the burden set on the different actors is fair.

However, in order to match the European ambition towards a zero-emission inland navigation sector, it is clear that the financial commitments to be deployed at all levels should be increased.

Such a strategy would need to be agreed upon between the different parties and should describe the funding and financing strategy towards a zero-emission inland navigation sector by 2050 as well as how the different sources could be used in view of enabling the energy transition, the different amounts which each party would be ready to commit to the energy transition, the funding priorities.

- Regarding possible contributions at **EU level**. Commitments from the side of the EU cannot be made for a period longer than the Multiannual Financial Frameworks (i.e. currently 7 years). It could therefore be envisaged to organise periodic reviews in the period towards 2050, in line with each MFF preparation, to revaluate the different funding priorities and budget contributions which could be available to support the energy transition of the sector.
- At **national level,** budget commitments are also generally made for a multiannual period, which can vary depending on the countries. Strong coordination effort or even an international agreement will be needed, as governmental commitments depend on multiple factors.
- Regarding the **sector contribution**, discussion regarding its acceptance, nature, amount and possible parameters is still needed. In addition, certainty is needed as regards investment priorities for the next 30 years for the sector to be in a position to invest in alternative fuels/technologies and ensure that such investment will pay off on the long run. This is further described in detail in chapter 4.2.2.2.

As example, the following table presents an indicative impression of the contributions needed to close the TCO gap based on the CCNR study (RQI – research question I). Assuming that a sector contribution can be collected, to close the full TCO gap, the amount of grants needed (stemming from EU and national, regional levels) would therefore represent at least between 60 and 75% of the overall TCO gap.

TCO Gap (average) until 2050	Public contribution (Grants – EU/National)		Private contribution	
	EU (?)	National (?)	Reserve Fund	Sector contribution
€5.22 bln	€3.24 to 3.89 bln		€0.027 bln	€1.3 bln - 1.95 bln
100%	62,5% - 74,5%		0,5%	25% - 37%

Table 2: indicative impression of the contributions needed to close the TCO gap

The Sustainable and Smart Mobility Strategy[86] adopted on 9 December 2020, which lays the foundation for how the EU transport system can achieve its green and digital transformation and become more resilient to future crises, underlined the need to increase the use of more sustainable transport modes, and indicated that inland waterway transport and short-sea shipping should increase by 25% by 2030 and by 50% by 2050. This modal shift objective could serve as a basis to identify the share of the contribution which could be made by the EU towards 2050, which could therefore reach 50% of the TCO gap.

At this stage, the option of a decentralised instrument where national, EU and sector contributions would be made in parallel would appear as a more feasible option than a fully centralised instrument. As already explained, to be successful this decentralised approach is however conditioned to a coordination of all actors. This option can therefore only be implemented if the support from all actors involved is secured.

[86] Sustainable and Smart Mobility Strategy – putting European transport on track for the future, COM(2020)789 final

At this stage, the willingness from all involved actors to move forward towards the development of a European solution for financially supporting the energy transition is considered as a turning point.

It is too early at this stage to determine the governance, status and legal bases for the implementation of such an instrument in detail, at least until the willingness to set-up such an instrument is established. Nevertheless, thorough considerations about the choice of the most suitable legal instrument and its governance will be needed. In particular, the type of institution which would manage such an instrument and how remains to be addressed. It is expected that such an instrument would be managed at European level. Detailed considerations regarding the possible parameters of this European financial instrument are available in annex 4.

In addition to financial support, it is important to note that regulatory solutions could be implemented additionally, in order to further decrease the operational advantage of conventional fossil fuels over renewable fuels/energy and thereby improving the business case for cleaner technologies. However, the aspects related to regulation are outside the scope of this report.

5. Proposal for a preliminary roadmap to improve the funding and financing of the energy transition and develop a European financial instrument

The objective of this chapter is to identify the actions/barriers which still must be taken/overcome to improve the funding and financing opportunities for the IWT sector to make its energy transition as well as to make a European financial instrument alive, which public and private stakeholders will be involved and what role they should have.

Regarding the setting up of a European financial instrument, based on mixed sources, public and private, including a sector contribution, it is important to note that such a proposal was made in anticipation of expected legislative developments that would require the sector to internalise external costs of the current levels of air pollutant emissions and greenhouse gas emissions without a view on earmarking the revenues from the internalisation of external costs, which would lead to having only (very high) costs but not the benefits in terms of financial support for the investments in emission reduction technologies and energy types. Instruments such as a tax and integration into Emission Trading Schemes are therefore not seen as most efficient and beneficial for the sector. Such legislative developments were proposed in the meantime, notably for maritime transport and road haulage with the publication of the Fit for 55 Package on 14 July 2021. European Commission announced in NAIADES III to review the policy measures by the year 2025 for inland navigation. It therefore remains appropriate to reflect on the proposed way to support the energy transition of the IWT sector. This is why it is recommended in the context to pursue the reflections on the setting-up of a European financial instrument. In any case, an important implication of the sector is expected, as well as its support, with regards to the further development of such an instrument. In the context of such reflections, lobbying towards all possible parties involved in the setting up of the envisaged instrument is encouraged.

On the basis of the work undertaken in the context of PLATINA3, it is important that all possible contributing parties to a European instrument indicate the conclusions of the report which it shares and those which it does not and are involved in the further elaboration for the practical elements of this European instrument

It is also clear that without the support of the IWT sector, the steps towards the setting up of a sector contribution will probably not be taken. In this regard, the IWT sector, if it supports in principle the idea of the sector contribution, could agree on the kind of contribution which it would consider as the most appropriate to enable the reduction of emissions and the energy transition. If the principle of a sector contribution feeding into a European instrument is not considered as a good concept, it could come up with an alternative substantiated concept to financially support the energy transition of the sector.

An overview of the different actions is available below:

I. Make best use of the existing funding and financing programmes at national and European level		
Priority I		
1	Ensuring that state aid measures to support solutions enabling to reduce emissions are possible, even if they are not zero emission solutions	Regular task
2	Identification of best practices and drawbacks of existing funding and financing programmes	2023
3	Working towards better coordination between national programmes	2023-2024
4	Agree on a strategy between the EU, national governments and the IWT sector representatives regarding the funding and financing for the energy transition towards 2050	2025
5	Setting up a networking platform for possible IWT project partners in view of applying to funding programmes	2022-2023
6	Organisation of a workshop between European countries to share experience on existing funding programmes for IWT	2023
Priority II		
7	Setting up of a centralised and free "advisory desk" available to vessel owners willing to make an investment in a technology contributing to the transition towards zero emission in 2050	2025
8	Reflect on the opportunities and barriers relating to the setting of cooperatives to facilitate access to financing, particular for smaller companies	2025
9	Ensuring that new funding and financing programmes are suitable to overcome the energy transition of the inland waterway transport sector financial challenge – lobbying	Regular task
10	Ensuring that existing funding and financing programmes are suitable to overcome the energy transition of the inland waterway transport sector financial challenge – lobbying	Regular task
11	Increased visibility of existing funding and financing programmes relevant for the energy transition of the IWT sector – up-to-date funding and financing database	2025
12	Active communication regarding innovative projects in IWT - Setting up of a database on innovative vessels	Regular updates

13	Active communication regarding innovative projects in IWT – Innovation award	from 2025 onwards
14	Increased accessibility of existing funding and financing programmes relevant for the energy transition of the IWT sector – a manual for applicants on access to funding and financing	2025

II. Actions related to the role of customers and intermediaries in the greening challenge		
Priority I		
15	Enquire about the willingness of cargo owners to contract with low/zero-emission vessels, even if this implies additional costs, and whether commitments could be made in that regard	2023
Priority II		
16	Improve the transparency between vessel owner and end customers to ensure that the latter make a conscious choice for low/zero-emission transport on inland waterways.	2025
17	Identifying incentives for customers to making contracts with low/zero-emission vessels	2025

III. Actions related to the setting up of a European financial instrument		
	Questions of political nature	
Priority I		
18	Reaching a common understanding on the meaning and the goals of a European financial instrument to support the inland navigation energy transition.	2023
19	Evaluating the willingness of public and private parties to contribute to the European financial instrument	2024
20	In case there is willingness and if the idea of a European instrument is viable, need to investigate whether a pilot instrument could be created at the level of the Rhine	2024

	Specific consideration regarding the setting of a sector contribution	
Priority I		
21	**In case there is willingness and if the idea of a European instrument is viable, finding an agreement on the methodology to be applied to determine the level of a sector contribution)**	**2024**
22	**Examining the compatibility of such a contribution with relevant international conventions**	**2024**
23	**Decide on the use of Reserve Fund to support investments in the greening of the IWT fleet or to support the setting up of an advisory desk**	**2024**
	Specific considerations regarding the parameters of a European instrument (relevant if willingness to develop a European instrument is confirmed)	
Priority II		
24	**Need to determine the share of public and private contribution to this instrument**	**2026**
25	**Need to determine the size of the instrument**	**2026**
26	**Need to consider several elements when it comes to implementing the instrument**	**2026**
	Specific considerations regarding the governance and the legal base of a European instrument (relevant if willingness to develop a European instrument is confirmed)	
Priority II		
27	**Examine the governance structure of the instrument**	**2026**
28	**Examine what would be the most adequate legal base for such an instrument**	**2026**
29	**Examine the administrative costs related to the setting-up of such an instrument**	**2026**
30	**Examine the compatibility of such an instrument with EU state aid law**	**2026**

IV. Monitoring and reporting progress – Priority I		
31	**Keep track on the progress and execution of the actions listed and organise periodic meetings where the overall progress regarding the setting up of a European financial instrument and in view of overcoming the financial challenge. The lead partner(s) for each action could present the main progress and results.**	**From July 2023 (after PLATINA3 ends)**

5.1. Make best use of the existing funding and financing programmes at national and European level

Action 1 – priority I	By whom (proposal)	By when (proposal)
Ensuring that state aid measures to support solutions enabling to reduce emissions are possible, even if they are not zero emission solutions.	**Lead: European Union** With the support of: IWT sector representatives such as IWT Platform, EBU, ESO, PDI as well as River Commissions	Regular task
Given the essential role played by national state aid measures, the possibility for state aid measures to support solutions enabling to reduce emissions, even if they are not zero emissions, should remain intact and room for manoeuvre should be available at national level to adjust funding priority depending on the evolution of the fleet or the technologies available. This requires taking better account of inland navigation and its specific characteristics in the taxonomy regulations and related delegated acts. Indeed, the technical screening criteria stemming from the EU taxonomy are feeding into other policy areas, such as state aid policy or the lending policy of the European Investment Bank and could limit the funding and financing opportunities both at EU and national level in EU Member States. The IWT sector, European Member States and the EU should be attentive to the evolutions regarding the taxonomy regulation and contribute where necessary to improve the technical screening criteria.		

Action 2 – priority I	By whom (proposal)	By when (proposal)
Identification of best practices and drawbacks of existing funding and financing programmes	**Lead: IWT sector representatives such as IWT Platform, EBU, ESO, PDI. IWT Platform could however take a leading role** With the support of: EU and non-EU member States, River Commissions	2023
There are numerous funding and financial opportunities at European and national level. Often, they are considered to be inadequate. The IWT sector could therefore be asked whether it could present the specific drawbacks of existing schemes as well as their advantages. In other words, knowing what is working, what is not, and why. Such an exercise can in particular be useful when funding programmes at national and or EU level will be renegotiated and could lead to a constructive dialogue between the sector and public authorities.		

For instance, regarding national funding programmes, eligibility criteria vary from one country to another (need for the seat of the company applying for funding to be established in a specific country, need to navigate in a specific country for several years …). This can represent a hurdle in terms of accessibility of such funding programmes for the profession.

At EU level, another bottleneck lies in possible restrictive eligibility criteria. For instance, some type of passenger vessels, such as cabin vessels and day-trip vessels are considered as non-eligible under certain calls. This is the case of the CEF AFIF programme where the deployment of hydrogen/fuel-cell or electric powered vessels for waterborne transport can be for use in private fleets of vessels, however excluding cruises and exclusive day-trip tourism vessels. The exclusion of this type of passenger transport is an important bottleneck given that supporting their energy transition also contribute to realising the energy transition of the sector. Indeed, to achieve the emission reduction objectives set at international level, the emissions generated by both inland waterway passenger and freight transport should be tackled. Without efforts being made in both market segments, the emission reductions objectives will not be achieved.

It is worth noting that examples of joint venture between cruise and cargo vessels as well as infrastructure managers are being launched, confirming that such limitations in the eligibility criteria could have a negative impact. For instance, HAROPA Port launched in August 2021[87] a call for projects aiming at deploying hydrogen/alternative fuels bunkering infrastructures targeting in priority public and private fleet, both for freight and passenger transport, for companies located in the port of in the surrounding areas.

Action 3 – priority I	**By whom (proposal)**	**By when (proposal)**
Working towards better coordination between national programmes	**Lead: CCNR (for the Rhine countries) and DC (for the Danube Countries)** With the support of: Moselle and Sava Commission, EU and non-EU member States, IWT sector representatives	2023-2024
A better coordination between national funding programmes can support in maximising the effects of such funding programmes. This requires assessing amongst other aspects to which extent eligibility and application criteria could be harmonised or whether applications could be submitted in several languages (to overcome possible language barriers). As a first step, this can be achieved by regular mutual exchange of information on the eligibility criteria and the technologies / solutions to be financed, without prejudging any harmonisation. In addition, an assessment of the efficiency of existing funding programmes could also be performed in parallel: to which extent did they result in reducing emissions or energy consumption, how many vessels retrofitting/newbuilt did it lead to…		

[87] https://www.haropaport.com/sites/default/files/media/downloads/Réglement%20AAP_Multisites%26Multiénergies.pdf

Action 4 – priority I	By whom (proposal)	By when (proposal)
Agree on a strategy between the EU, national governments and the IWT sector representatives regarding the funding and financing for the energy transition towards 2050	**Lead : European Commission or CCNR** With the support of: EU and non-EU Member States involved, IWT sector representatives, such as IWT Platform, EBU, ESO, PDI, other relevant sector representatives such as logistics and shippers alliances/associations	2025
Given the size of the financial challenge to enable the energy transition of the sector as well as its European dimension, agreeing on a clear strategy at European level would play a paramount role to ensure that the different funding sources (from the sector – if feasible -, from the EU, from regional/national level) are complementary, sufficient and appropriate to enable the transition. In addition, it can be a way of ensuring that the burden set on the different actors is fair. It could also be investigated to which extent different funding priorities could be identified depending on the source of the contributions. Such a strategy could also describe the (financial) commitments of each party to enable the energy transition, how the different financial sources should be used and the relevant funding priorities.		

Action 5 – priority I	By whom (proposal)	By when (proposal)
Setting up a networking platform for possible IWT project partners in view of applying to funding programmes (possibly as part of the advisory desk).	**Lead: IWT sector representatives such as IWT Platform, EBU, ESO, PDI. IWT Platform could however take a leading role.** With the support of: a European project/consortium similar to PLATINA3. This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.	2022-2023
Pooled investments for a group of vessels may be combined in project applications under the Innovation Fund (large scale projects), CEF AFIF or LIFE which can be co-financed by sector contribution and contributions by involved Member States. Projects like the RH_2NE project, aiming at realising a market-ready hydrogen applications along the RALP network corridors, or projects like CLINSH, seeking to reduce air pollutant emission in IWT, and supported under the LIFE programme, consist in typical examples of IWT projects which can benefit from the support of EU funding. To enable the creation of similar projects, the setting-up of a networking platform for possible IWT project partners view of applying to funding programmes could be of added value.		

The NAIADES III action plan also calls for such development to take place: "*The key is to ensure, to the greatest extent possible, that smaller vessel operators can combine their projects to receive attractive financing conditions*."[88]

Action 6 – priority I	**By whom (proposal)**	**By when (proposal)**
Organisation of a workshop between European countries to share experience on existing funding programmes for IWT	**Lead: CCNR and DC** With the support of: Moselle and Sava Commissions	2023
Many funding opportunities exist. In some countries, there are currently no specific funding programmes to which inland waterway transport actors to apply to support their energy transition. On the other hand, some countries have good experience with managing IWT funding programmes. Such a workshop could be an opportunity for countries to exchange on best practices, give idea for some countries to develop new funding programmes and identify the pros and cons of existing programmes. This workshop could completement the work to be undertaken by the sector to identify the best and bad practices regarding the existing funding programmes. In order for such a workshop to be successful it would require a high level of participation and lead to the identification of political guidelines. The idea would not be to present the different funding programmes and the technicalities of the different programmes but rather identify the implementation difficulties, the success factors and provide guidelines for those countries willing to set up new funding programmes.		

Action 7 – priority II	**By whom (proposal)**	**By when (proposal)**
Setting up of a centralised and free "advisory desk" available to vessel owners willing to make an investment in a technology contributing to the transition towards zero emission in 2050	**Lead: IWT Sector representatives such as IWT Platform, EBU, ESO, PDI. IWT Platform could however take a leading role.** With the support of: European Commission. As well as a European project/consortium similar to PLATINA3. This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.	2025

[88] NAIADES III Action Plan, flagship 8.

Currently, main barriers to have access to funding and financing for vessel owner are the lack of certainty regarding technological development, lack of information regarding the available financial support programme, as well as administrative and human resources costs related with the filing of an application for existing programmes.

Such a centralized advisory desk could therefore provide free of charge[83]:

- advice to vessel owner on the most suitable investment to be made
- advice to vessel owner on the most suitable funding/financing programmes at national and European level according to the type of investment foreseen
- support to vessel owner throughout the entire application process

Should such a service be set up free of charge for vessel owners, this will need to be financially supported. The source of this financial support must also be identified. Such a tool could be supported by the Reserve Fund, a CEF PSA, or national contributions.

Project Vergroeningsconsulent, which ran until March 2021 in Flanders (Belgium) can be used as best practice example to set up such an advisory desk. Information regarding the cost of such a service and how it was financed would be useful. Other examples of support services to companies are EICB in The Netherlands and EIBIP.

This could be accompanied by an online research tool providing support to project owner looking for financial support. Best practice examples already exist such as European Investment Advisory Hub, research tool to help identifying financial support solutions for inland shipping activities set up by Netherlands Enterprise Agency (RVO) etc…

Action 8 – priority II	**By whom (proposal)**	**By when (proposal)**
Reflect on the opportunities and barriers relating to the setting of cooperatives to facilitate access to financing, particular for smaller companies	**Lead: IWT Sector representatives such as IWT Platform, EBU, ESO, PDI. IWT Platform could however take a leading role.**	2025
Cooperatives can be seen as an effective concept to facilitate access to financing, particularly for those small companies owning and operating one or two vessels. Small Cooperatives could act as one single group to have more bargaining power for negotiating freight rates.		

Action 9 – priority II	**By whom (proposal)**	**By when (proposal)**
Ensuring that new funding and financing programmes are suitable to overcome the energy transition of the inland waterway transport sector financial challenge – lobbying	**Lead: IWT sector representatives such as IWT Platform, EBU, ESO, PDI. IWT Platform could however take a leading role.**	Regular task

	With the support of: River Commissions, EU and non-EU Member States, research institutes, other relevant sector representatives such as logistics and shippers alliances/associations	
It is important to ensure that new funding and financing programmes which emerge to support the energy transition of the transport sector take into account the specificities of the IWT sector. Close cooperation with the designers of such programmes/products with IWT experts is important in that regard. IWT experts should proactively engage with financing institutions, such as the EIF which is currently developing a new product, to which IWT will be eligible, under the Umbrella of InvestEU. The same is true with funding programmes being developed at national or EU level. For instance, this can take the form of active lobbying at the time when programme themselves are being developed.		

Action 10 – priority II	**By whom (proposal)**	**By when (proposal)**
Ensuring that existing funding and financing programmes are suitable to overcome the energy transition of the inland waterway transport sector financial challenge – lobbying	**Lead: IWT sector representatives such as IWT Platform, EBU, ESO, PDI. IWT Platform could however take a leading role.** With the support of: River Commissions, EU and non-EU Member States, research institutes	Regular task
It is important to ensure that existing funding and financing programmes take into account the specificities of the IWT sector. Close cooperation with the entity responsible for the implementation of such programmes is important in that regard. IWT experts should proactively engage with such entities to ensure that the upcoming calls fit the needs of IWT actors. This can take the form of active lobbying at the time when calls for application are being developed. Such lobbying actions should also serve to stimulate research and innovation projects. Indeed, support to pilot projects contributes to improving knowledge and experience as to zero-emission technologies in the inland navigation sector. This can take the form of contributions and participation in key R&D forums and initiatives relevant to the inland waterway transport sector. This would also require that the efficiency of existing funding programmes is assessed. In particular, whether the investment made in retrofitting existing vessels or building of new vessels led to a reduction of fuel consumption. In particular, it would be relevant to know from the entrepreneurs who received support whether improvement in terms of fuel consumption led to possible cost reduction.		

Action 11 – priority II	By whom (proposal)	By when (proposal)
Increased visibility of existing funding and financing programmes relevant for the energy transition of the IWT sector – up-to-date funding and financing database	**Lead: European project/consortium similar to PLATINA3. This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.** With the support of: IWT sector representatives such as IWT Platform, EBU, ESO, PDI.	2025
Barriers to information visibility and information transparency hindering the effective flow of information between the stakeholders have been greatly reduced in the last 5 to 10 years, also due to the improvement of online communication/collaboration tools. However, increasing the visibility of existing programmes further would be an added value. Best practice examples exist, such as the European Inland Barging Innovation Platform "EIBIP". Such a work is also being undertaken as part of the Lasting project[89] considering both maritime and inland waterway sectors. The findings from this project should therefore be considered for the development of such a database. This aspect should be investigated further in future work, to ensure the feasibility of such an approach, in particular in terms of the budgetary and human resources needed to keep a funding and financing database up to date. Should there be sufficient support for such an action, particularly from the sector, such a work could be performed by research and consulting institutes as a result of a dedicated call for tender. Funding could perhaps stem from a CEF PSA or Horizon Europe.		

Action 12 – priority II	By whom (proposal)	By when (proposal)
Active communication regarding innovative projects in IWT – Setting up of a database on innovative vessels[90]	**Lead : CCNR** With the support of: DC, Moselle and Sava Commissions, research institutes, EU and non-EU Member States, IWT sector representatives	Regular updates at least once a year
In order to justify additional funding and financing opportunities for the IWT sector, it is important to demonstrate that such programmes are important for the IWT to innovate. An up-to-date database on innovative vessels would contribute to this objective.		

[89] https://www.waterborne.eu/projects/coordination-projects/lasting/about-lasting

[90] Action also included in the CCNR roadmap for reducing inland navigation emissions, December 2021: https://www.ccr-zkr.org/files/documents/Roadmap/Roadmap_en.pdf

Action 13 – priority II	By whom (proposal)	By when (proposal)
Active communication regarding innovative projects in IWT – Innovation award[91]	**Lead : CCNR** With the support of: DC, Moselle and Sava Commissions, research institutes, EU and non-EU Member States, IWT sector representatives and other relevant sector representatives such as logistics and shippers alliances/associations	Every two years from 2025 onwards
Every two years, an innovation award event could be organised to communicate on the latest innovations in the IWT sector that could emerge thanks to specific funding and financing schemes. Such award can be delivered for special innovations for the transformation of the inland navigation energy system		

Action 14 – priority II	By whom (proposal)	By when (proposal)
Increased accessibility of existing funding and financing programmes relevant for the energy transition of the IWT sector – a manual for applicants on access to funding and financing	**Lead: European Commission, DG MOVE** With the support of: a European project/consortium similar to PLATINA3. This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.	2025
In order to maximise the impact of funding and financing opportunities, a manual, which would regularly be updated, providing relevant information on how to access relevant EU funding and financing instruments available under the current MFF and the NextGeneration EU would be useful. Such a manual should certainly include information about the possibilities for a same project to apply for complementary funding and financing opportunities at various levels, while respecting EU state aide rules. Indeed, the possibility to combine the opportunities offered by the different programmes for the benefit of the energy transition of the sector is key in order to close the TCO gap. The IWT sector must be able to make use of the different funding and financing opportunities.		

[91] Action also included in the CCNR roadmap for reducing inland navigation emissions, December 2021: https://www.ccr-zkr.org/files/documents/Roadmap/Roadmap_en.pdf

5.2. Actions related to the role of customers and intermediaries in the greening challenge[92]

Action 15 – Priority I	By whom (proposal)	By when (proposal)
Enquire about the willingness of cargo owners to contract with low/zero-emission vessels, even if this implies additional costs, and whether commitments could be made in that regard	**Lead: ESC** With the support of: European project/consortium similar to PLATINA3. This presupposes the existence of a call for proposals (i.e. under Horizon Europe) to perform this work. IWT sector representatives such as IWT Platform, EBU, ESO, PDI and other relevant sector representatives such as logistics and shippers alliances/associations	2023
Uncertainties regarding the willingness of cargo owners and customers to contract with low/zero-emission vessels if this implies additional costs is a hurdle for vessel owners to invest in zero emission technologies. In order to give more certainty to vessel owners, further research could be made and statements from various customers regarding their willingness to engage with low/zero emission vessels could be obtained**.** European Shippers Council could have a proactive role in this regard.		

Action 16 – Priority II	By whom (proposal)	By when (proposal)
Improve the transparency between vessel owner and end customers to ensure that the latter make a conscious choice for low/zero-emission transport on inland waterways.	**Lead: European project/consortium similar to PLATINA3. This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.** With the support of: ESC, IWT sector representatives such as IWT Platform, EBU, ESO, PDI and other relevant sector representatives such as logistics and shippers alliances/associations	2025

[92] More information available in Annex 5

Indeed, in general the inland waterway freight transport sector is quite fragmented and most of the transport services, about 56%, are being arranged through the spot market and not through time charters and long-term contracts. Small IWT companies operating on the spot market often get their assignments on a daily basis through intermediary organisations such as brokers. Hence, there are no direct contracts/contact with the shippers/cargo owner and vice-versa, shippers/cargo owners often do not know which vessel is being used to transport their goods, and whether this vessel is low/zero-emissions and if so, to which extent.

Action 17 – Priority II	**By whom (proposal)**	**By when (proposal)**
Identifying incentives for customers to making contracts with low/zero-emission vessels	**Lead: European project/consortium similar to PLATINA3. This presupposes the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.** With the support of: ESC, IWT sector representatives such as IWT Platform, EBU, ESO, PDI and other relevant sector representatives such as logistics and shippers alliances/associations	2025
Such incentives can be of different kind. • Regulatory/mandatory incentives: for instance, making it mandatory for cargo owners/shippers and brokers to report on their environmental footprint for their transport operation. • Voluntary incentives: for instance, by developing a clear methodology for identifying the most energy efficient vessels • Financial support: State aid measures to compensate customers for additional costs incurred by using IWT “greener” vessel		

5.3. Actions related to the setting up of a European financial instrument

5.3.1. Questions of political nature

Action 18 – priority I	By whom (proposal)	By when (proposal)
Reaching a common understanding on the meaning and the goals of a European financial instrument to support the inland navigation energy transition.	**Lead: European Commission and/or CCNR** With the support of all relevant actors in particular IWT Platform	2023
At least three options: - Option 1: a fully centralised instrument: combining EU, National and Sector contributions dedicated to IWT fleet and setting up of a central advisory desk. - Option 2: dedicated EU programme, decentralised national programmes and a sector contribution (mandatory) dedicated to IWT fleet and setting up of a central advisory desk. - Option 3 dedicated EU programme, national programmes, a sector contribution (voluntary) dedicated to IWT fleet and setting up of a central advisory desk. In light of the work performed in the context of PLATINA3, the option of a decentralised instrument, where EU, Sector and national contributions could be made available in parallel for supporting the IWT energy transition seems to be a preferred option. It should also be investigated what the emission reduction goal for the inland navigation sector towards 2050 and intermediary targets should be, at all relevant levels. - Such a goal is already set at the level of the CCNR, but no such goal is fixed at EU level for IWT. - The EC sets a 90% emission reduction goal for transport compared to 1990 in their Smart Mobility Strategy but no dedicated goal for IWT. It should be investigated whether a common goal can be found between all parties involved in order to set up a European instrument. The ultimate objective of the instrument would be to enable vessel owners to receive funding or financing for their transition towards cleaner propulsion methods. Intermediate emission reduction goals could be supported as a first step (first years of the instrument). The actions to be supported to achieve such intermediaries goal should however not prevent to achieve the 2050 goals (i.e. depletion of available resources).		

Action 19 – priority I	By whom (proposal)	By when (proposal)
Evaluating the willingness of public and private parties to contribute to the European financial instrument	For the EU level, **lead:** Member States representatives in Council. With the support of: European Commission (D3), Parliament For the regional level, **lead**: CCNR and DC, With the support of Moselle and Sava Commissions For the sector **level**: IWT sector representatives, such as IWT Platform, EBU, ESO, PDI. However, IWT Platform could be best placed to play a leading role.	2023
This requires investigating the willingness of all actors to contribute in the first place.		
At EU level, it would mean that the following questions would need to be answered		
- Enquire whether EU would be willing to dedicate funding to IWT fleet? If so, how much? Over which period? - Are there pre-existing examples of EU fund being attributed to a specific sector (AFIF blending Facility)? - Would direct contribution from the EU budget to an instrument dedicated to inland waterway transport be in line with the EU´s budgetary rules? - In which format should such EU contributions be made: extending the envelope of an existing instrument (CEF or LIFE for instance) and ensuring that a specific envelope Is dedicated to IWT projects, a distinct EU programme dedicated to IWT. It remains necessary to assess whether a single instrument for one specific transport mode is possible and in line with EU budgetary rules. In additional, it remains to be analysed whether an adaptation of existing programmes and instruments, which already have management structures and rules in place, could be used to accommodate the needs of the sector. This should enable to decide whether it is preferable to establish a separate instrument rather than being eligible under an existing one, hence avoiding additional set-up costs and possible low absorption risks. At this stage, given that total public grants needed to enable the transition to remain an estimation, it could be recommended to work on the basis of an existing instrument, under which a specific envelop could be dedicate to the inland waterway fleet. This should enable to keep some flexibility. - Under which conditions would EU be ready to commit to make some/more funding available for the energy transition of the IWT fleet?		

- Would the setting up of a sector contribution be an additional argument which could convince the EU to make more money available?
At regional/national level, it would mean that the following questions would need to be answered
- Enquire whether national/regional governments would be willing to dedicate funding to IWT fleet? If so, how much? Over which period? For the EU member States, this could also be achieved by lobbying in favour of higher contributions dedicated to IWT transport in the MFF. - Under which conditions would national governments be ready to commit to make some/more funding available for the energy transition of the IWT fleet? - Would the setting up of a sector contribution be an additional argument which could convince national governments to make more money available? - Enquire whether some existing programmes could be renewed - Enquire whether more adapted programmes could be negotiated - Enquire whether new programmes could be set up where no pre-existing programme exist? ○
At the level of the sector, it would mean that the following questions would need to be answered
- Enquire whether the sector would be willing to contribute? According to which modality? Which volume? Do they support the concept of a sector contribution as described in this deliverable? - If not, which other proposals could be made to create an incentive for vessel owner to invest in emission reduction measures? - If not, the sector could come up with its own substantiated approach to support the energy transition of the sector and with alternative proposals for the development of a European instrument. In case this process takes too much time, the risk exists that in parallel, other instruments which might not be the most appropriate (general tax, integration into Emission Trading Schemes…) develop in parallel without having certainty on an earmarked use of the resources. - If the IWT sector representatives agree with the principle of a sector contribution, enquire whether the proposed methodology upon which a contribution could be based is widely supported? If not, the IWT sector could come up with other methodologies which could be more appropriate.

- Enquire about what would the sector consider as sufficient guarantee from national/regional governments and/or the EU to agree with the setting-up of a sector contribution. For which duration should financial commitment be made on their side to secure the sector's acceptance?

  This could take the form of a large consultation of the IWT profession at EU and national levels, to examine the degree of acceptance of such a contribution by the sector. Such a consultation could be organised by consulting EU as well as national representatives of the IWT profession. Vessel owners operating in all sectors as well as floating equipment should be in the scope of this consultation. Both River Commissions and the IWT Platform could serve a platform for organising such a consultation. A statement from each relevant professional organisation at national level could be collected.

Action 20 – Priority I	**By whom (proposal)**	**By when (proposal)**
In case, there is willingness and if the idea of a European instrument is viable, need to investigate whether a pilot instrument could be created at the level of the Rhine	**Lead : CCNR** With the support of : European Commission, IWT sector representatives	2024
This could enable to test whether such an instrument effectively needs more investment in the energy transition of the fleet and whether this has led to reducing emissions.		

5.3.2. Specific consideration regarding the setting of a sector contribution

Action 21 – priority I	**By whom (proposal)**	**By when (proposal)**
In case, there is willingness and if the idea of a European instrument is viable, finding an agreement on the methodology to be applied to determine the level of a sector contribution	For the development of a labelling system, **lead : CCNR** For identifying the best parameters for raising a contribution and the most appropriate level – **lead: IWT Platform and PDI** With the support of : European Commission, European project/consortium similar to PLATINA3. This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work, river	2024

	Commissions, other relevant sector representatives such as logistics and shippers alliances/associations	

The acceptance of such a contribution by the sector greatly depends on the modalities which will be chosen to raise such a contribution, how the money will be used and the contributions from other parties (national and EU levels). The methodology according to which such a contribution will be raised therefore needs to be agreed upon.

A labelling system or an energy index could be used in view of raising such a sector contribution. This would require deciding and introducing such a system on European level (see links with PLATINA3 task 2.6).

Such a methodology should enable to ensure that a constant and stable flow of money is collected and in sufficient amounts to support the energy transition. It should also enable to differentiate such contributions depending on whether a vessel owner has already made some investments to green its vessel. Green investments already made by vessel owners must be properly taken into account.

Regarding the appropriate level of a sector contribution

This requires, based on previous work, a sensitivity analysis and impact assessment to be carried out. This can be carried out on the basis of previous work[93].

The volume of earmarked contributions by the IWT sector would strongly depend on:

- Scope of fleet: how many vessels will contribute?
- How will energy demand by IWT develop?
- How will the competitive position change over time compared to other modes?
- How strong to differentiate between emission performance of vessels and what does this mean for the average rate and revenues?

Regarding the sensitivity and impact assessments

- These should pay particular attention to the positive and negative impacts of a contribution by the sector
- These should take into account how the competitive position of IWT might be affected compared to other modes (i.e. in light of recent fit for 55 package, covid-19 crisis, war in Ukraine).
- Special attention must be paid to the risk of increased freight rates driving away shippers from IWT/disturbance of competitive position of IWT.
- Any measure/action supporting the greening of the inland navigation must not lead to reverse modal shift

On the other hand, if IWT does not keep pace with other modes, IWT risks losing all arguments for active modal shift support, what will also have an impact on market shares.

[93] CCNR study, research question G and H

Action 22 – priority I	By whom (proposal)	By when (proposal)
Examining the compatibility of such a contribution with relevant international conventions	**Lead : CCNR and DC**	2024
Such an examination has already taken place at the Rhine level (see chapter 4.2.2.3) Similar examinations should be undertaken by the Danube, Moselle and Sava Commission to assess the possible legal hurdles and solutions which could be found for the setting up of such a contribution at European level.		

Action 23 – Priority I	By whom (proposal)	By when (proposal)
Decide on the use of Reserve Fund to support investments in the greening of the IWT fleet or to support the setting up of an advisory desk	**Lead: EBU and ESO to make decision** Together with the support of: EU Member States, Switzerland, EC	2024
This requires: - A common agreement by EBU and ESO - Applying to the European Commission and describing the reasons why the sector would like to use the Reserve Fund. - A consultation and agreement by the Member States - A European Commission decision authorising the use of the Reserve Fund		

5.3.3. Specific considerations regarding the parameters of a European instrument

It should be noted that complementary reflections on the actions identified below regarding the parameters of a European Instrument are available in Annex 4 and that the following actions would become relevant only if there is willingness to develop a European instrument

Action 24 – priority II	By whom (proposal)	By when (proposal)
Need to determine the share of public and private contribution to this instrument	**Lead: European project/consortium similar to PLATINA3.** This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work. With the support of: IWT sector representatives, EU, EU and non-EU States	2026

Action 25 – priority II	By whom (proposal)	By when (proposal)
Need to determine the size of the instrument	**Lead: European project/consortium similar to PLATINA3.** This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work. With the support of : IWT sector representatives, European Commission, River Commissions	2026
This requires taking political decisions as to: - The technology pathways to retain for reaching the 2050 objectives and which investment priority to lay focus on. - The emission targets - The geographical scope: before 2027? After 2027? Possibility to - Price estimations - Scope of fleet - The type of investment to support: OPEX/CAPEX - The kind of co-funding rates envisaged		

Action 26 – priority II	By whom (proposal)	By when (proposal)
Need to consider several elements when it comes to implementing the instrument	**Lead: European project/consortium similar to PLATINA3. This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.** With the support of: IWT sector representatives, EU, EU and non-EU States	2026
- How to prioritise investments? How to update investment priorities? Which actions should be eligible? - Which eligibility criteria - What criteria to determine the level of co-funding? - For whom? Which beneficiaries? - How to measure the efficiency of the instrument? - How to ensure that the instrument is open on the same terms to all potential beneficiaries (non-discriminatory). - What budget distribution over time? When to give high support to make a big step in emission reduction? How to ensure a steady and constant flow of money over time. - What about the application process? How to make it as efficient as possible? - How to ensure the accessibility of the instrument? - How to ensure that all contributors receive their fair share? - What should be the duration of the instrument? - How will the application process take place? Single stage application? Two stage application? - How to ensure administrative simplicity and easy access?		

5.3.4. Specific considerations regarding the governance and the legal base of a European instrument

Action 27 – priority II	By whom (proposal)	By when (proposal)
Examine the governance structure of the instrument	**Lead: European project/consortium similar to PLATINA3.** This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work. With the support of: IWT sector representatives, EU, EU and non-EU States	2026
How will it be managed? How will be administered? Who will be part of the advisory board?		

Action 28 – priority II	By whom (proposal)	By when (proposal)
Examine what would be the most adequate legal base for such an instrument	**Lead: CCNR and European Commission**	2026
An international convention? An EU Regulation in combination with a CCNR Regulation and agreements with other non-EU Member States? In all cases, the compatibility with international law should be guaranteed, notably the Mannheim Act.		

Action 29 – priority II	By whom (proposal)	By when (proposal)
Examine the administrative costs related to the setting-up of such an instrument	**Lead: European project/consortium similar to PLATINA3.** This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.	2026
It should be ensured that the administrative costs generated by the setting up of such an instrument do not affect the capacity of the instrument to generate sufficient revenues and to effectively reinvest such revenues to an extent sufficient to support the fleet's energy transition. However, this requires that the scope, size, concept for such an instrument is defined.		

Action 30 – priority II	By whom (proposal)	By when (proposal)
Examine the compatibility of such an instrument with EU state aid law	**Lead: European project/consortium similar to PLATINA3.** This implies the existence of a call for proposals (i.e. under Horizon Europe) to perform this work.	2026
An aid scheme setting the goal to achieve a zero emission and climate neutral inland navigation in 2050 and open to all EU and non-EU operators (Swiss, Serbian etc…) on a non-discriminatory basis for vessels that are not under a legal obligation to be equipped with a Stage V engine, may be considered to be compatible with the Union aid rules. If funding for OPEX is foreseen, the compatibility of such a proposal with EU State Aid law should be checked.		

5.4. Monitoring and reporting progress

Action 31 – Priority I	By whom (proposal)	By when (proposal)
Keep track on the progress and execution of the actions listed and organise periodic meetings where the overall progress regarding the setting up of a European financial instrument and in view of overcoming the financial challenge. The lead partner(s) for each action could present the main progress and results.	**Lead: CCNR and European Commission**	July 2023 (after PLATINA3 ends)
This requires: - Agreement with the European Commission (DG MOVE) and the CCNR - The governance is to be defined but could be organised through regular meetings organised by the CCNR or via a sub-group of the NAIADES Implementation Group - This exercise will require to provide funding for the organization of such meetings (chair and secretariat support)		

Annexes

Annex 1 – Strategy for the Danube Region

ın addition to the "Strategy on fleet modernization" (December 2019) elaborated by Priority Area 1a – To improve mobility and multimodality: Inland waterways of the EU Strategy for the Danube Region, which provides an overview of the current state and peculiarities of the Danube inland fleet, level of its modernization with regards to main existing greening technologies and evaluates possibilities for future funding and financing for energy transition, there was developed additional document – "Policy recommendation on fleet modernization: Discussion paper" (June, 2021).

This document discusses and evaluates the outcomes of the GRENDEL project, the Strategic Research and Innovation Agenda (SRIA) for the Partnership on ZeroEmission Waterborne Transport and CCNR study regarding new financial instruments for "green" vessels. Study comes up with two policy recommendations for:

- creation of national aid schemes;
- development of a strategic research agenda including technology pathways.

Based on the results from relevant reports this discussion paper addresses particular questions to the public entities of the Danube riparian states with the further aim to develop a guidance on possible short- and long-term measures to improve the environmental and economic performance of the Danube fleet:

1. To what extent have fleet modernisation and greening measures been anchored in Operational Programmes for EU Structural Funds or in other facilities such as the Recovery and Resilience Facility so far?

2. What is the current status of concrete fleet modernisation measures and programmes in your country? - Are any programmes in preparation or are they being implemented already?

3. What are the priority topics in these programmes?

4. Would a state aid programme such as the Dutch programme be an option for your country?

5. If not, what would be main barriers for implementation of such a programme in your country?

6. Which technologies would you consider to be the most feasible considering the specific profile and situation of Danube navigation?

7. What would be main barriers for implementation of such technologies in your country?

8. What would need to be done first to set things in motion along this pathway towards 2050?

Aforementioned questions were addressed by Danube Commission (DC) to its Member States through a working document, which is together with a questionnaire developed, based on the outcomes of the GRENDEL project and distributed by DC, will provide a future base for further and more concrete steps for the development of a road map for Danube region, which would envisage 2 scenarios of a transitional period for the modernization of the fleet in stages:

- conservative scenario, until 2030, providing, for example, the implementation of measures to achieve the level of harmful emissions in the exhaust gases of engines in accordance with Phase V of Regulation (EU) 2016/1628;

- innovative scenario, until 2050.

Another step, which is currently under elaboration, is the DC`s Fleet modernization platform. The main goal of this Working Platform is to develop and implement, within a certain time frame, specific general measures, namely:

- ensuring the energy efficiency of shipping, namely, reducing the greenhouse gases (CO2) in the exhaust gases of engines during the navigation of vessels;
- ensuring compliance with regulatory requirements to reduce the level of other harmful emissions in engine exhaust gases.

These measures will be recommended for targeted national programs for the modernization of the fleet in Danube states and should not only ensure environmentally friendly shipping, but also increase the competitiveness of shipping on the Danube.

Annex 2: detailed description of the different funding programmes at EU level

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).

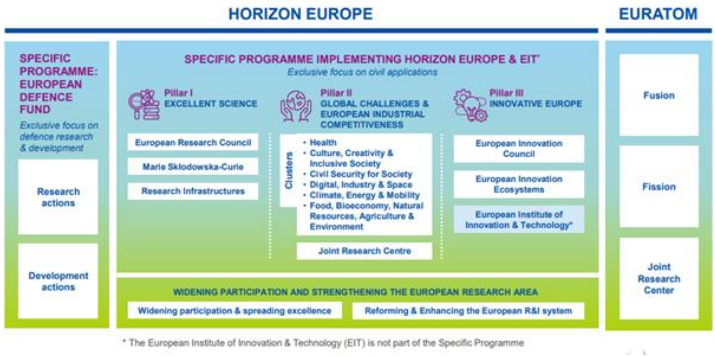

Figure 10: Horizon Europe structure[94]

According to the proposed regulation "establishing Horizon Europe"[95], 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%;

[94] Horizon Europe, the EU research and innovation programme (2021-27) Factsheet
[95] [1] 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

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.[96] 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[97].

Although in **Pillar I** no dedicated funding for the IWT sector has been identified, part of its components can still be relevant for IWT-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[98]. Past MSCA have already funded waterborne-related topics (both maritime and inland), and this is expected to continue throughout HEU. No specific funding for the waterborne transport sector is allocated out of 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 €15.12 bln (including €1.35 bln from NextGenerationEU).

Furthermore, 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).[99] Figure 7 provides an overview of the 49 candidate/approved European Partnerships, out of which some are relevant for the waterborne transport sector.

[96] 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

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

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

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

Figure 11: Overview of 49 candidate European Partnerships[100]

In regards of the European partnerships specifically relevant for the waterborne transport sector (maritime and inland), 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.[101] 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.* [102]

The ZEWT Partnership ensures an earmarked EU contribution of €530 million 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.

[100] European Commission, Horizon Europe - Investing to shape our future: https://ec.europa.eu/info/files/horizon-europe-investing-shape-our-future_en

[101] 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

[102] Waterborne, ZERO EMISSION WATERBORNE TRANSPORT: https://www.waterborne.eu/partnership

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 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 million 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[103]. 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, IWT-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.

Pillar III, just as Pillar I, also comprises interesting funding opportunities even if no dedicated IWT 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[104]. 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

[103] BATT4EU: a new milestone for a more competitive and sustainable eu battery value chain – BATT4EU (bepassociation.eu)
[104] European Innovation Council | European Commission (europa.eu)

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[105]. 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). 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 IWT RD&I activities at the EU level, with an unprecedented attention and funding resources dedicated to the sector.

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[106].

The budget of the LIFE programme is implemented through direct management. Funding is disbursed in the form of grants, procurements and prizes.[107] 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;

[105] EIT at a glance | EIT (europa.eu)

[106] François Delcueillerie LIFE programme unit, DG ENV, European Commission, "The future LIFE Programme 2021-2027"

[107] European Union (2021): The EU's 2021-2027 long-term Budget and NextGenerationEU; facts and figures

- 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 recommended to submit "large ambitious projects" above €500,000. In the case of integrated projects, the project budget is typically around €17 million.[108]

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 (maritime and inland) 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[109]:

- 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' maritime and inland transport stakeholders, including on topics that pertain to the ZEWT Partnership. Some past examples: the Zero.Emission.Ships (ZEM/SHIPS) project[110], the LNG Tanker project[111] 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 addressed and the often high TRLs required make it more suitable for companies and authorities. Further information can be accessed via the CINEA website[112] and the Funding and tender opportunities portal.[113]

[108] European Commission, LIFE Frequently asked questions (FAQs) LIFE; https://ec.europa.eu/easme/en/section/life/frequently-asked-questions-faqs#Q6

[109] LIFE - Calls for proposals (europa.eu) (presentations of the calls).

[110] https://webgate.ec.europa.eu/life/publicWebsite/project/details/2657

[111] https://webgate.ec.europa.eu/life/publicWebsite/project/details/2129

[112] https://cinea.ec.europa.eu/life/life-calls-proposals_en

[113] https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/life2027

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).[114]

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".[115]

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 the next figure.

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

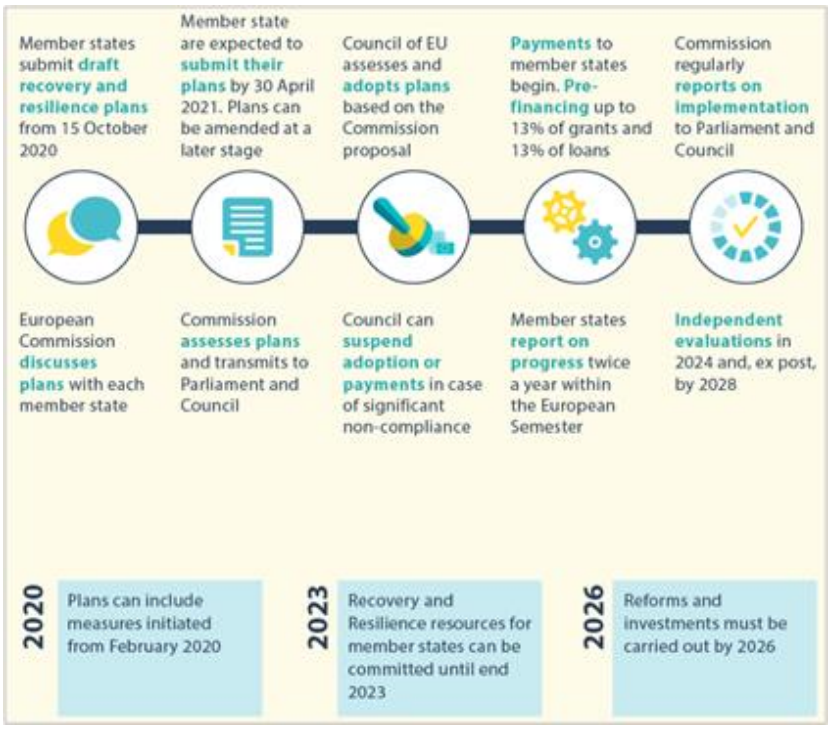

Figure 12 : Recovery and Resilience Facility Timeline and work process[116]

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. 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 IWT and maritime 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.

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

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

complementarity (within the development stages) to Horizon Europe, CEF and InvestEU can be seen in the following figure.

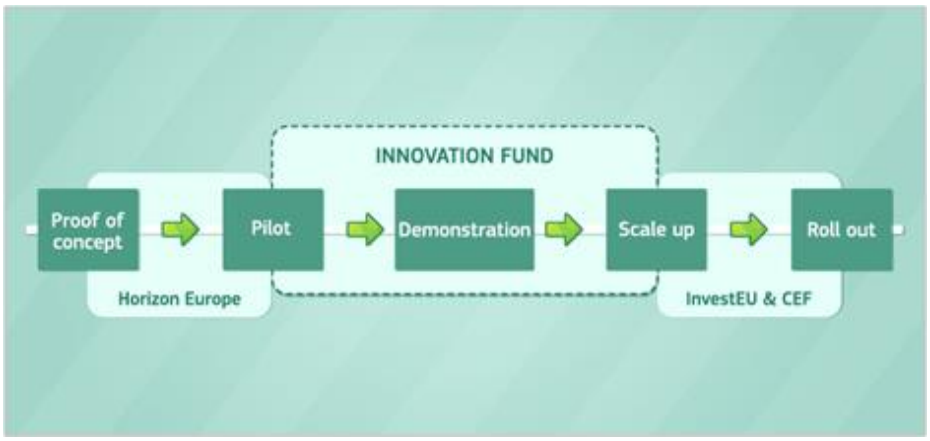

Figure 13: Scope of the Innovation Fund and complementarity to Horizon Europe and CEF / InvestEU[117]

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 million) as well as large-scale projects (above €7.5 million), 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);
- 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.118

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 Technology Platform (WATERBORNE TP) and EC Directorate General for Climate Action (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**

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

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

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 Co-Programmed Partnership on Zero-Emission Waterborne Transport (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).[119]

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.

The IF can also receive funding from The FuelEU Maritime initiative. This initiative aims to support emission reductions in the maritime sector by increasing the share of renewable and low-carbon fuels in the fuel mix through mandatory emission intensity reductions and the obligation to use an onshore power supply or zero-emission technology in EU ports. It applies to ships above a gross tonnage of 5000 and covers their stay in EU ports, intra-EU voyages and 50% of voyages coming from or departing to a port outside the EU. It aims to reduce emissions by 75% by 2050 relative to 2020. Each year, ships shall have a verified certificate of compliance. If a company has a compliance deficit, it shall pay the penalty.

The CEF - Connecting Europe Facility

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 (maritime & inland) 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

[119] EU invests €122 million to decarbonise the economy (europa.eu)

- 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; […]"[120]

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 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."[121]

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 to companies.

There is no budget specifically earmarked for the IWT and maritime 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 IWT 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.

CEF Transport call for Alternative Fuels Infrastructure Facility (AFIF)

The objective of the AFIF call for proposal is to support the deployment of Alternative Fuel supply infrastructure, contributing to decarbonising transport along the TEN-T network. It is a relevant instrument for inland vessels, as zero-emission electric vessels, vessels propelled by hydrogen or hydrogen carrier fuels can be eligible for co-funding if it is demonstrated that an initial number of vessels is needed to kick-start the use of the supporting recharging or refuelling infrastructure.

With a total budget of €1.5 billion, the AFIF will fund actions by the combination of CEF grants with financial support from financial institutions to achieve a higher impact of the investment. It will be

[120] 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
[121] 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

implemented through a rolling call for proposals launched on 16 September 2021, with five cut-off dates for the submission of proposals until end 2023.

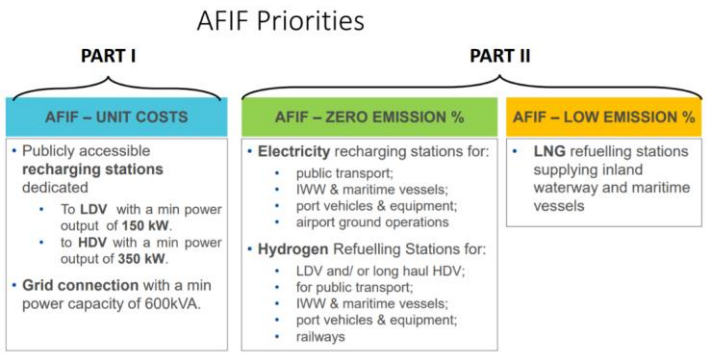

Figure 14: AFIF Priorities (Source CINEA)

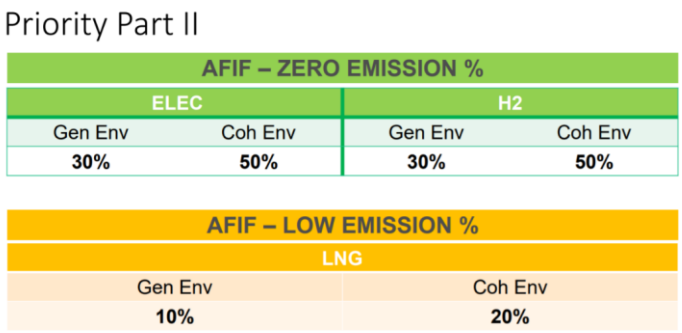

Figure 15: AFIF Priority Part II – funding rates relevant for IWT (Source CINEA)

Electricity related actions

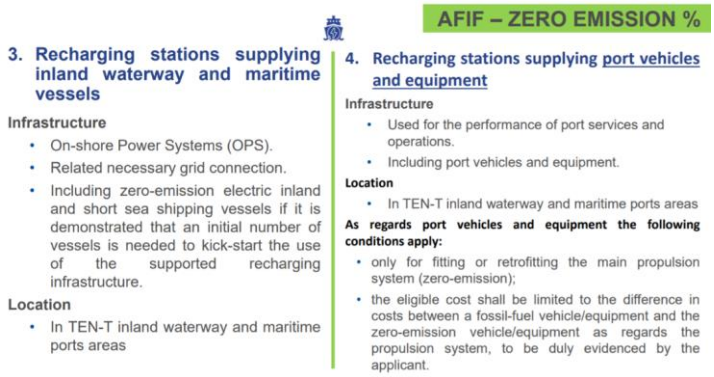

Figure 16: AFIF Priority Part II – IWT related actions (Source CINEA)

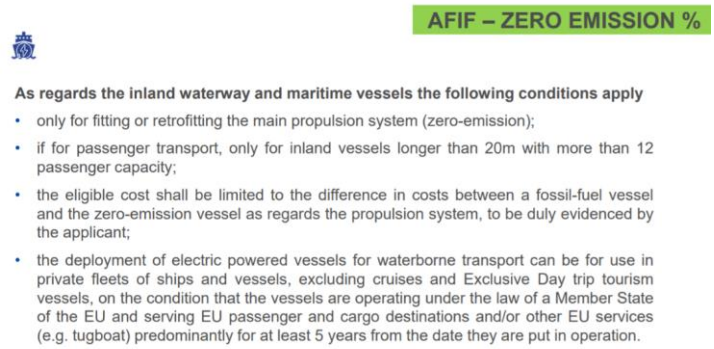

Figure 17: AFIF Priority Part II – IWT related actions - conditions (Source CINEA)

Hydrogen related actions

Figure 18: AFIF Priority Part II – IWT related actions - Hydrogen related actions (Source CINEA)

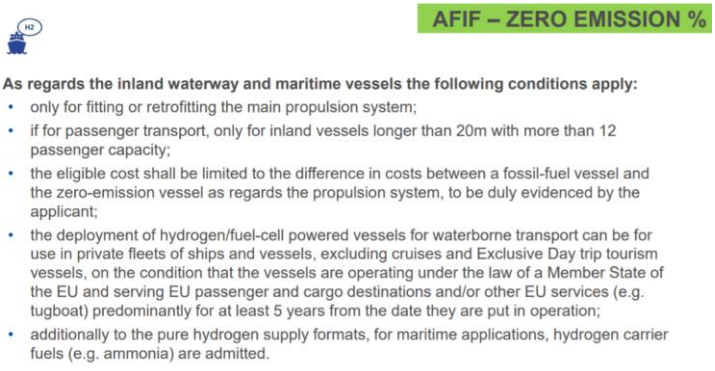

Figure 19: AFIF Priority Part II – Hydrogen related actions - conditions (Source CINEA)

LNG related actions

Figure 20: AFIF Priority Part II – LNG related actions - conditions (Source CINEA)

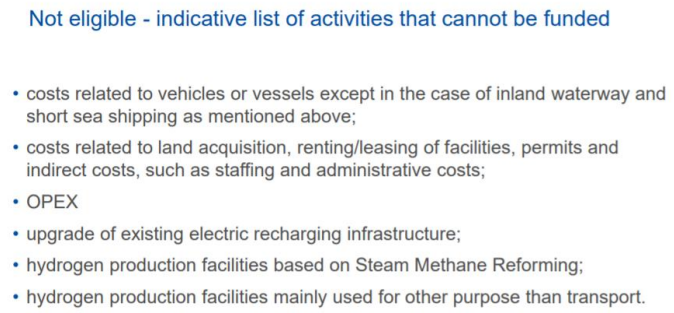

Figure 21: AFIF Priority Part II – non-eligibility criteria (Source CINEA)

Annex 3: EU Instruments for non-EU members

ENI – European Neighbourhood Instrument

The EU's European Neighbourhood Policy (ENP) was launched in 2003 with the objective to support and develop stability, security and sustainable solutions in the EU's neighbourhood. The EU supports the ENP objectives through a number of other tools, including financial support and technical cooperation[122].

The European Neighbourhood Instrument[123] (ENI) established by Regulation (EU) No 232/2014 of the European Parliament and of the Council of 11 March 2014 is the main financial instrument for implementing the European Neighbourhood Policy (ENP) and provides EU funding to the 16 ENP partner countries, covering such European countries (non-EU) as Moldova, Ukraine and Belarus. ENI funding also provides support to various regional, Neighbourhood-wide and Cross Border Cooperation programmes (e.g. Danube Transnational Programme).

The Proposal for a Regulation of the European Parliament and of the Council establishing the Neighbourhood, Development and International Cooperation Instrument (NDICI) set new flexible, more coherent and more efficient financing instruments for EU external action under the new Multiannual Financial Framework 2021-2027 (€80 billion funding for 2021-2027).

It is proposed that the NDICI would contain an investment framework for external action to raise additional financial resources for sustainable development from the private sector. It will consist of the European Fund for Sustainable Development (EFSD+) and the External Action Guarantee, with increased guaranteed capacity. The new instrument proposes to preserve the core specificities of the European Neighbourhood Policy, on the basis of which the EU develops a special relationship with neighbouring countries.

Amongst ENI's main priority areas, such as "Supporting smart, sustainable and inclusive development in all aspects", "Enhancing sub-regional, regional and Neighbourhood wide collaboration as well as Cross-Border Cooperation", which can be related to a new blending instrument for future funding for green vessels, the following targets were considered to be correspondent for future funding: transport connections; climate change action; energy cooperation.

The Neighbourhood Investment Platform (NIP) is a blending instrument under the European Fund for Sustainable Development (EFSD), which is a part of the External Investment Plan of the European Union. The NIP aims to achieve the objectives of the EFSD and the European Neighbourhood Policy (ENP) or related EU thematic policy priorities by leveraging additional financing for the region.

ENI support to energy interconnections and energy efficiency is continuous to help Partner Countries to reduce energy dependency and to bolster their resilience. It also supports the implementation of the political commitments to pursue a green, low-carbon transition, as reinforced by the Paris Climate Agreement, Climate Action Summit, Madrid Climate Change Conference and EaP Ministerial Declaration on Cooperation on Environment and Climate Change (SDG 13, 'Take urgent action to combat climate change and its impacts').

IPA III – the Instrument for Pre-Accession Assistance

This funding instrument established by Regulation (EU) 2021/1529[124] supports EU candidate countries and potential candidates (Bosnia and Herzegovina, Serbia, Montenegro, Albania, Kosovo, North Macedonia, Turkey) in the processes of implementation of various political, institutional, social and economic reforms

[122] https://ec.europa.eu/neighbourhood-enlargement/european-neighbourhood-policy_en
[123] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2014:077:0027:0043:EN:PDF
[124] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2021:330:FULL&from=EN

in accordance with main EU policies, regulations and standards. IPA III will provide future funding for such key priorities as: enhanced connectivity, infrastructure, environment and climate, as well as energy and digital transition of transportation sector.

A total budget foreseen within IPA-III for the 2021-2027 Multiannual Financial Framework period is over €14 billion.

With regards to the aforementioned NDICI, future funding for 2021-2027 MFF in connectivity of infrastructure, SMEs, energy efficiency, innovation, digital and green economy will be complemented with the External Action Guarantee under the NDICI – Global Europe, which will have the capacity to guarantee investments up to €53.4 billion (including in IPA beneficiaries).

EaP – Eastern Partnership

Another specific form of cooperation between the EU and eastern neighbouring countries was established within ENP is the Eastern Partnership, where EU remains a major partner. These aim at strengthening connectivity and deepening economic integration with Belarus, the Republic of Moldova, Armenia, Azerbaijan, Georgia and Ukraine, strengthening environmental and climate resilience.

Within "EU4Climate" – programme targeting climate change and aimed towards a low-emissions and climate-resilient economy, the EU contributed to the establishment of the Ukrainian Energy Efficiency Fund (EUR 104 million) and is offering for energy efficiency investments.

'EU4Business' – an umbrella initiative covering all EU support for small and medium-sized enterprises (SMEs) in the Eastern Partnership region – improves SMEs' access to finance and the business environment across the region. This decision complements reforms in the sector in view of making transport more secure, safer and more environmentally friendly.

Annex 4: Complementary reflections regarding the setting-up of a European financial instrument

Based on the findings and conclusions presented in the deliverable, key questions remain to be addressed, particularly regarding the possible parameters of this European financial instrument. These parameters are presented below.

What shall be the size of the European financial instrument?

Given the uncertainties surrounding the development of certain technologies and the production capacities of alternative fuels, the identification of two possible pathways were identified, one conservative and one innovative, but both sufficiently ambitious to achieve ambitious emission reduction targets was necessary.

The study carried out on behalf of the CCNR (research question C) provided an assessment of the TCO gap, based on how the type of technologies/fuels would be applied by the sector on the basis of those two pathways.

The TCO gap was calculated for the years 2020-2050 for the inland waterway transport vessels active on the connected international waterways in Europe, with the aim to reach at least 90% emission reduction (both GHG emissions and air pollutants) in 2050 compared to 2015.

It should always be kept in mind that estimations of the TCO gap can vary depending on the set of factors chosen to determine it and how such influencing factors will evolve in the future. For instance, the extent to which there will be parallel / supporting measures and incentives which may influence the decision by ship owners to invest in greening (e.g. port tariff differentiation, better contractual conditions with shippers/forwarders), promoting investment in clean technologies and discouraging the usage of fossil fuels, and how this will impact the TCO gap, cannot be assumed with full certainty. Similarly, with a different emission target, the TCO gap estimations will change as well. In addition, it can be noted that some vessel types are excluded from the study, such as floating equipment for infrastructure works such as dredgers and crane vessels. Moreover, the geographic scope however did exclude the isolated TEN-T waterways in Europe (e.g. Po, Douro and vessels for inland waterways in Sweden and Finland).

However, setting aside the fact that estimations of the TCO gap can vary depending on the set of factors chosen to determine it and how such influencing factors will evolve in the future, it can already be concluded that the financial challenge is considerable.

Having said that, in order to ensure the suitability of a new European financial instrument in the long run, regular updates of the TCO gap estimations will be required in order to possibly reassess the funding size and priorities of this instrument and modify its main parameters.

Indeed, the **main challenge is to create a positive business case for greening technologies** and the transition towards reaching the final 2050 objective[125]. Research question C made clear that there is a gap of several billions in the TCO between the BAU scenario and both transition pathways, taking into account a bandwidth of price assumptions for technology hardware costs and energy/fuel prices.

[125] at least a 90% emission reduction compared to 2015 volumes of GHG emissions and air pollutant emissions (NOx and PM)

In the **conservative pathway as compared to the BAU scenario** the TCO gap (total of 30 years, 2020-2050) is approximately:

- €2.43 bln in the minimum price scenario
- €2.67 bln in the average price scenario
- €6.38 bln in the maximum price scenario

In the **innovative pathway as compared to the BAU scenario** the TCO gap (total of 30 years, 2020-2050) is approximately:

- €5.26 bln in the minimum price scenario
- €7.80 bln in the average price scenario
- €10.19 bln in the maximum price scenario

It can be seen that there is a substantial bandwidth in the estimated TCO gap, ranging between 2.43 and 10.19 billion euro. The average TCO gap of both transition pathways, assuming the average price scenario, would be €5.22 bln for the scope applied in the CCNR study.

Therefore, in order to determine the fund size, a political decision should be made as regards:

- The technology pathway to be retained for reaching the emission objectives for 2035 and 2050: Conservative scenario with relatively more focus on relatively easy to implement solutions such as biofuels or an Innovative scenario with slightly more focus on innovative solutions such as fuel cells and batteries. Or a mix between the two scenarios. Lock-in effects should be avoided.

Proposal: In light of the most recent developments pushing towards the use of hydrogen and electric propulsion, it seems like political ambitions are rather heading towards the innovative pathway. However, given the uncertainty surrounding the pathway developments and the estimation of the TCO gap for both scenarios, it is proposed to assume, for the purpose of developing the financial instrument, that the TCO gap for the energy transition is an average of the TCO gap of both transition pathways. Indeed, in any case, this TCO gap will reach several billions.

- Price estimations: Minimum, average or maximum price scenario?

Proposal: it could be recommended to retain an average price scenario given the high uncertainty surrounding the price estimations.

- Emission target: achieving the 2050 target, intermediary targets or a different target?

Proposal: it could be recommended to focus on the long-term target of zero emission by 2050.

- Geographical scope and type of fleet:
  - Connected European international waterways
  - Also isolated waterways, local waterways?
  - Inclusion of other vessel types such as floating equipment?

Proposal: Ideally, the envisaged geographic scope of such a scheme would be European, covering Member States of the EU as well as Member States of the Central Commission of the Navigation of the Rhine and of the Danube Commission connected to the European waterway network (Switzerland, Serbia and Ukraine in particular). Such an approach would therefore allow vessels active on isolated TEN-T waterways in the EU (e.g. Po, Douro) to be eligible under the financial instrument. This would allow to make sure that

there is wide European support for such a financial instrument including public contribution, while the broad coverage ensures the level playing field and allows economies of scale.

In addition, the energy transition challenge is relevant for the entire inland navigation fleet. Therefore, all vessel owners of Member States of the CCNR, the EU as well as of Danube riparian States connected to the European waterway network (Serbia and Ukraine in particular) should be allowed to obtain financial support from such a financial instrument.

It would however be disproportionate and unnecessary to involve European countries in which there are no inland waterways, or inland navigation is not used to a significant extent. In the EU, these are the countries that have not adopted the technical requirements for vessels as stated in Directive (EU) 2016/1629.126 This concerns the countries: Denmark, Estonia, Ireland, Greece, Spain, Cyprus, Latvia, Malta, Portugal, Slovenia and Finland.

In this ideal set-up, the geographical coverage of the instrument would be the following: Sweden, Lithuania, Ukraine, Romania, Bulgaria, Serbia, Hungary, Slovakia, Poland, Czech Republic, Germany, Austria, Croatia, Italy, Switzerland, France, Belgium, the Netherlands, Luxembourg.

In a first step, a smaller geographical scope could be envisaged, as far as level playing field is ensured. Such a smaller geographical scope could exclude isolated waterway, i.e. those which are not linked to other waterways within the EU territory, be limited only to the Rhine? The CDNI (Rhine and connected waterways)?

- The minimum co-funding rate needed to close the TCO gap, which share to be covered by the vessel owner/operator?

- The minimum co-funding rate needed to close the TCO gap, based on the current estimations, what is needed to ensure that vessel owners will have a business case, can demonstrate a certain return on investment, thereby triggering investments toward the energy transition.

Proposal: in light of the uncertainties surrounding the estimations of the TCO gap (which can vary depending on the set of factors chosen to determine it – price scenario assumed, transition pathway, other funding options existing in parallel to this European instrument etc… - and how such influencing factors will evolve in the future) as well as the development of the regulatory framework, two scenarios should be assumed. One whether the new European financial instrument would need to close the full TCO gap, including CAPEX and OPEX, one where only the CAPEX would be addressed by the financial instrument. For the purpose of providing context in this deliverable, an average price scenario for the evolution of the technology and fuel costs was assumed.

- Should the OPEX gap be supported by the instrument? Or should OPEX costs be covered by other regulatory measures (e.g. increase of share of renewable energy / reduction of carbon intensity through the Fuel Quality Directive and RED?)

[126] Directive (EU) 2016/1629 of the European Parliament and of the Council of 14 September 2016 laying down technical requirements for inland waterway vessels, amending Directive 2009/100/EC and repealing Directive 2006/87/EC

Which public/private contribution to the European financial instrument?

Given the funding gap to be bridged to achieve the transition, **it is unrealistic to expect that the energy transition in IWT will be funded completely with public resources**. Therefore, **a significant contribution by the sector itself is also expected**. As also reflected in the latest EU policy documents, each mode of transport shall take its responsibility and work on a fair and efficient system to create the right incentives to reduce the negative externalities and reaching the goals for reduction of GHG emissions and air pollutant emissions. The share of contribution by public or private sector to feed the financial instrument will subsequently depend on the value of the TCO gap and the share of that TCO gap which each party would be ready to cover.

The Sustainable and Smart Mobility Strategy[127] adopted on 9 December 2020, which lays the foundation for how the EU transport system can achieve its green and digital transformation and become more resilient to future crises, underlined the need to increase the use of more sustainable transport modes, and indicated that inland waterway transport and short-sea shipping should increase by 25% by 2030 and by 50% by 2050. This modal shift objective could serve as a basis to identify the share of the contribution which could be made by the EU towards 2050, which could therefore reach 50% of the TCO gap.

As example the following table presents an indicative impression based on the CCNR study (RQI – research question I). To close the full TCO gap, the amount of grants needed would therefore roughly represent between 60 and 75% of the overall TCO gap. It cannot be stressed further that this ratio is approximate as it is based on the average TCO gap of both transition pathways, assuming the average price scenario and on average revenues that could derive from an earmarked contribution.

TCO Gap (average) until 2050	Public contribution (Grants – EU/National)		Private contribution	
	EU (?)	National (?)	Reserve Fund	Sector contribution
€5.22 bln	€3.24 to 3.89 bln		€0.027 bln	€1.3 bln - 1.95 bln
100%	62,5% - 74,5%		0,5%	25% - 37%

Table 2: indicative impression of the contributions needed to close the TCO gap

Assuming that the private sector contribution can be set up at 1.95 bln euro[128], the higher the TCO gap, the higher the share of public contributions needed to close the gap. For instance, should the energy transition follow the innovative pathway at a maximum price scenario, the share of public contributions required to close the gap could be approximately 90% of the costs. The table above shows the paramount role that public contribution will need to play in the financial challenge of the energy transition.

Should the TCO gap cannot be fully closed on the basis of such public and private contributions, efforts will need to be deployed to reduce this TCO gap, most probably through regulatory measures (outside the scope of this report). For instance, such measures improving the business case of cleaner technologies could consist in the following:

- Stricter emission regulation for new and existing engines and vessels (possible revision of NRMM) as well as mandatory reduction of carbon intensity levels of provided fuels (revision of the

[127] Sustainable and Smart Mobility Strategy – putting European transport on track for the future, COM(2020)789 final

[128] This depends for instance on how the different modes might be affected by the "Fit for 55" package and whether it has an influence on the competitive position of IWT, on how the taxonomy criteria might impact the ability of IWT to have access to funding and financing opportunities. The amount of public contribution that can be made available in parallel also has an impact on the amount which could be collected through private contributions.

Renewable Energy Directive 2018/2001 II (RED II) and Directive 98/70 (FQD) on the quality of petrol and diesel fuel, currently in force).

- possible out phasing of most polluting technologies and vessels inconsistent with the 2050 emission reduction ambitions far as a long transition period is foreseen until alternatives become available on the market and financially accessible.
- Incentives for the development of alternative technologies, increased R&D for the development of such alternatives, leading to such technologies becoming more commercially viable. However, it must be noted that the relatively small size of the European inland waterway vessel market implies that technological solutions designed specifically for the inland navigation sector alone are generally not commercially viable. It is therefore unlikely that a technological solution will be developed for the inland waterway transport sector alone. From this perspective, synergies should be found with solutions developed for seagoing vessels and for non-marine applications whether in Europe or in other parts of the world.
- Creating synergies with building and financing infrastructure to reduce OPEX cost and make the business case for greening technologies more attractive.
- Intensify contribution by the sector in application of the polluter-pays principle, in parallel to increased public contribution, as far as it does not lead to reverse modal shift.
- Fiscal incentives in favour of alternative technologies.

In addition, prioritisation of investments will need to take place to ensure the best use and allocation of resources.

Which mix of instruments?

In order to determine which mix of instruments could be provided as part of this European instrument, it should be enquired:

- how blending with financing source could be arranged under this instrument?
- It whether a combination of funding and financing could be foreseen as part of the instrument?
- whether any example of instruments at European or international level providing both funding and financing products exist.

Based on previous research, it is clear that such a European instrument should first focus on providing grants (to close the business case). In a first step, the instrument could therefore focus on providing grants to vessel owners. In a second step, it could be explored whether financing products could also be provided through this instrument. In the meantime, existing financing products can be used.

In addition, the following figure provides an indicative and simplified overview of the possible financial flows in and out of the European instrument, with respect to the grants. This simplified overview is made based on the average TCO gap of both transition pathways assuming the average price scenario, as compared to the TCO of the BAU scenario again assuming the average price scenario. The inflow consists of the earmarked contributions by the sector, assuming total revenues of €1.95 bln evenly distributed over 25 years, and complementary the same amount of grants.

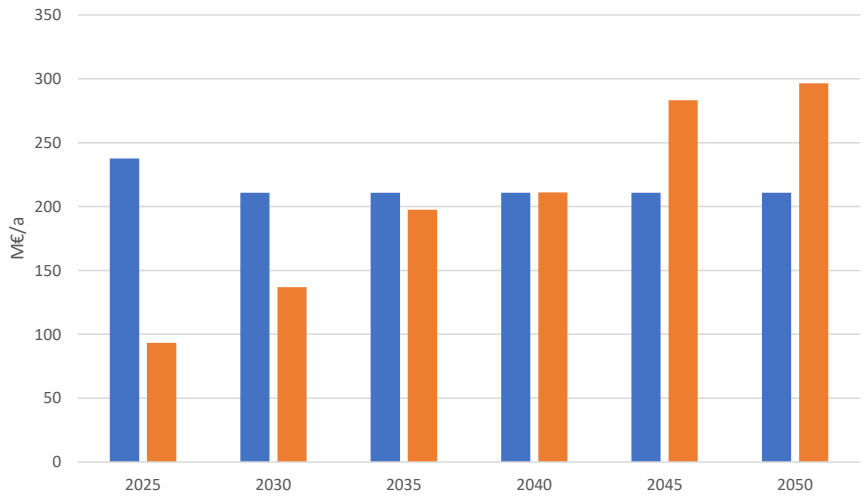

Figure 22: European instrument inflow (blue) and outflow (orange) per year for given years (Source: Own elaboration based on results from report RQ C, CCNR study)

This indicative figure shows, for the averaged figures from the scenarios, that the volume of investments in the first years would still be relatively low and this would support the assumption that pre-financing from the reserve fund, together with earmarked contributions and grants, may be sufficient for the start-up phase of the European instrument.

Which type of investments?

Closing the TCO gap for the vessel owner/operator is key to eliminating the unprofitable top. The grant size to be provided by the financial instrument for investment costs (CAPEX) should therefore be equal to the TCO gap. Otherwise, there is no economic reason for the ship owner/operator to make the transition towards a technology and energy source which fits in the pathway towards zero-emission.

Any remaining CAPEX (CAPEX minus TCO gap) is the volume which can be addressed by offering loan facilities in addition to the grant.

As explained in chapter 2, the TCO gap and the limited financial capacity of the IWT sector itself limits the access of vessel owners to **repayable loans**. Loans will only be of use to the few entrepreneurs who can bear the costs themselves, i.e. with own capital and commercial financing.

If there is **no business case for a greening technology** (no return on investment) there is **no solid basis for a bank to provide a loan** as it will be risky and uncertain if the loan can be repaid. However, in the outlined scenario it is assumed that a significant share of **grants makes the business case**, at least a financial break-even situation for a longer time period, e.g. 10 years. Subsequently the TCO gap is closed, and loans can play a role.

Loans can be used for financing the share of the investment costs that do not belong to the unprofitable top. The unprofitable top is determined by the additional TCO costs for the technology in comparison with the TCO costs which would be seen in BAU. The assumption is that the TCO gap between the BAU and the (near) zero-emission technology is compensated by means of a non-repayable grant. The share of CAPEX which is left would therefore still need a financial arrangement. This part could be served by loans in case the vessel owner does not have or want to use own capital to cover this remaining part of the CAPEX.

A question to decide is whether the difference in OPEX costs can be covered by a grant. Funding, by public bodies for example, is usually being provided based on the investment costs (CAPEX) and not the OPEX. Hence, the most common approach for the European instrument would be to address the CAPEX for providing grants. The CAPEX represents a value of the asset which can be seen as collateral for the grant in case of issues. Indeed, it is common banking practice that OPEX are not funded by investment loans, as they consist in recurring incremental costs, not in an investment. An example of an EU funding mechanism covering part of the OPEX which exists to date is the Innovation Fund[129]. In addition, funding for OPEX with public financial resources may be a critical issue with regards to EU state aid rules. In order to support for OPEX cost, laying focus on regulatory solutions which could allow vessel operators to recover the higher OPEX cost related to investment in technologies would therefore need to be identified. The Renewable Energy Directive 3 can provide the legal framework to implement a regulatory solution to make sure that a certain share of the energy provided to inland waterway vessels will be from renewable sources.

The following table presents only the aggregated view. However, it shall be noted that the TCO impact is limited to the time horizon 2020-2050. Therefore, if the capital expenditure takes place later within this time-horizon, for example in 2045, the TCO costs are not fully included but limited to only the period 2045-2050 while significant additional TCO costs for the vessel owner/operator would also occur after the year 2050. Therefore, the following table is only meant as illustrative and indicative. A choice shall be made regarding the duration of the instrument, if and how long compensation should be provided to vessel owner/operators for the higher TCO costs after 2050 compared to the technologies from the 'Business-As-Usual' scenario.

	Price scenario	Accumulated TCO Gap 30 years (2020 – 2050)	Accumulated CAPEX 30 years	Capex-TCO Gap (absolute numbers)	Potential share loan/own capital in Capex	Share Grant in Capex
Conservative Pathway	Min	2430	5969	3539	59%	41%
	Avg	2646	6649	4003	60%	40%
	Max	6384	7157	773	11%	89%
Innovative Pathway	Min	5257	7884	2626	33%	67%
	Avg	7801	9344	1543	17%	83%
	Max	10186	10443	257	2%	98%

Table 3: backing of CAPEX (in million euros)

As indicated, the role of the EIB Group, more specifically EIF, could be to become involved in a dedicated investment platform to provide easier access to repayable loans for vessel owners for the part not covered by the grant. Indeed, guarantees for loans from the EU or on a national level (e.g. state guarantees) could help to lower the threshold for acquiring loans for investments in green technologies. Thresholds which may be adapted could be for instance the share of own capital to be invested, requirements on private collateral as security for the loan as well as financial indicators for the company willing to make an investment such as the profitability and solvability over the past years and the projected revenues and costs for the next years and the risk assessment. However, it needs to be kept in mind that the situation on an individual level regarding the vessel and the operational profile will vary to a large extent, depending on:

- the type of technology
- the type of energy/fuel

[129] https://ec.europa.eu/clima/policies/innovation-fund_en

- the moment of investment and the price levels at that moment
- the price levels of energy/fuel and maintenance costs for the lifetime of the equipment after the investment is made as well as possible other impacts[130] (OPEX).

It is important to stress that such **loans can only be repaid if there is a competitive business case, meaning that the TCO of the green technology is competitive with a conventional powertrain**. Therefore, the vast majority of the economic challenge to close the gap is to provide the grants and other economic incentives to make the business case. Lower interest rates for loans only have a very modest contribution in the reduction of the costs for the vessel owner / operator. Preferential conditions for granting a loan could be the result of products provided by the EIB Group. However, it seems like the EIB Group will follow the guidelines provided in the Taxonomy regulation Delegated Acts[131], which may give limitations, depending on the evolution of the technical screening criteria. The same can be said about commercial national banks who might also follow the taxonomy principles. Examples of such limitations in the **adopted** Delegated Act for the area of Climate Mitigation is that only zero-emission tailpipe solutions are in scope after the year 2025 while such solutions are not expected to be economically viable for the vast majority of the fleet. However, the European Commission is working on a revision of the Delegated Act.

Consideration for implementation of the financial instrument

The envisaged European financial instrument aims at supporting the vessel owner in the transition to technologies which contribute to emission targets for 2025 and 2050. Therefore, the fund may give larger grants to ship-owners making big improvements compared to ship-owners making small steps in emission performance. Irrespective of the form of the instrument (centralised or decentralised), key questions will need to be addressed, the main ones being outlined below:

Questions to be discussed and answered will be:

- How to prioritise investments? How to update investment priorities? Which actions should be eligible?

  As principle, the investment costs of applying greening technologies shall be supported for vessels using the inland waterways of Europe. Greening investments **for both newbuilt and existing fleet (retrofit)** should be supported by the envisaged European financial instrument. In parallel, pilot projects should continue to be supported by existing funding and financing programmes.

  Seen the absence of the significant financial incentives, it is important to not only support the first few pioneers, but the majority of vessel owners to push the wider roll-out of investments in the suitable technologies and the uptake of alternative fuels and electricity on a large scale.

  The envisaged instrument should support the deployment of innovation, insofar as this encourages environmental progress which contributes to reaching the targets for emission reduction. The objective will therefore be to directly support the deployment of innovation ("market uptake"), and not to finance research and development work (R&D. This issue is important because the investments required are not the same depending on the type of activity supported. R&D requires greater investment and is already addressed by existing instruments such as the Horizon Europe programme (ZEWT partnership) and national programmes as well.

[130] such as loss of revenues due to longer waiting times for energy transfer and loss of effective payload to more weight and/or volume of the energy storage on board.
[131] Texts available on the following website: https://ec.europa.eu/info/publications/210421-sustainable-finance-communication_en#taxonomy

Solutions shall be supported on a technologically neutral basis, however, the solutions to be applied and supported shall be certified solutions, as well as the emission reduction shall be proven. On top an ex-ante assessment of the emission reduction potential of the different projects applying for support, an ex-post assessment should be foreseen, to ensure that the expected emission reduction potential of the project is met, thereby ensuring the effectiveness of the instrument and that the public and private money is well spent. This ex-post assessment can be facilitated by the existence of a labelling/energy index system for inland navigation.

Especially if (financial) resources are limited, it seems advisable to prioritise grants for those projects delivering the largest reductions of emissions for the reason of cost-effectiveness. A best use and allocation of resources possible should be sought. This also requires to regularly update the inland navigation energy transition pathways and monitor the emissions of the fleet.

In the case of the NOx Fund, investment priorities are reviewed annually. Whether to update such priorities is decided by the Board of industry representatives supported by consultants.[132]

Depending on whether the instrument would be centralised or decentralised, it could be enquired whether different priorities could be agreed upon depending on the source of funding.

- What criteria to determine the level of co-funding?

  Adapting the co-funding rates can be a tool to prioritise investment. A relevant criterion to determine the level of co-funding could be to measure the improvement in terms of emission levels as a result of the project. How important is this emission reduction compared to the average emission level for the vessel and operational profile?

  A goal-based approach could be developed in this regard, focussing on the actual emission performance of the vessel and the emission reduction potential of the project. This requires to agreeing on a common goal. Possibly, this can be expressed in a certain emission budget which gradually will reduce until 2050 and can be monetarised to express the value of emission reduction.

  The evaluation of the amount of the grant shall realistically take into account the possible technology and energy/fuel suitable for the vessel and the operational profile. For example, for long distance transport requiring a high amount of energy on board, this may lead to different options compared to the same vessel operating on short distances.

  The existence of a vessel performance-based label or index would be valuable to provide transparency in the ex-ante and ex-post emission performance, also for monitoring the evolution of the emission performance of the fleet. In this respect, the development of an Energy Efficiency Operational Indicator for inland navigation would be an appropriate tool.

  A periodic measurement and adjustment will be needed, taking into account the actual prices of hardware and energy carriers, the available funds and the evolution of the emission levels. For example, in case emission reduction of the fleet is lacking, while there is sufficient money available in the fund, the fund conditions may become more attractive (e.g. higher funding rates) to achieve the requested result.

- For whom? Which beneficiaries?

[132] Interview with Tommy Johnson, General Manager NOx Fund

This requires setting some eligibility criteria regarding the type of applicants. Such criteria could be set based on existing funding programmes at national and EU level. It seems important that companies of all size, in commercial transport of passengers and goods shall have access to this instrument. In fact, it is known that the smaller companies (operating one or two vessels) are those who have the most difficulties in accessing funding and financing programmes/tools.

Criteria regarding financial situation of the company could be considered as well. For instance, the applicants shall provide adequate descriptions of the technology to be applied together with a reasonable business plan and financial indicators based on the annual financial results (to avoid investing in companies which have a high risk of bankruptcy). At the same time such criteria should not be too stringent, otherwise, those companies who have difficulties in making an investment to improve the energy efficiency of their vessels because of their financial situation might not be able to benefit from this European instrument. This aspect will need to be discussed thoroughly with the IWT sector representatives.

It should be made possible to ensure the longer-term impact of the investment, meaning a contract with the vessel owner to maintain the equipment on board and to utilise it in Europe (despite possibly higher operational costs). Other possible requirements which could be considered when reflecting on the kind of beneficiaries which should be eligible are the following:

- Should it be required that the beneficiary navigates on European waterways (therefore contribute to achieving or not the emissions reduction objectives at European level), for at least a certain number of days per year? Or a certain number of years?
- Should it be required to be registered in one of countries covered by the geographical scope?
- Should the vessels have been authorised for operation on European waterways for a certain number of years?
- Should the vessels be asked to on European waterways for a certain number of years after the completion of the project?
- Should a maximum duration of project be foreseen?

For instance, the following conditions usually apply for CEF: In CEF the following applies as condition: *Vehicles concerned must have been authorised for operation in at least 1 Member State before the submission of the proposal. CEF-funded vehicles must remain and operate in EU/EEA territory for at least 5 years following the action completion (transit through non-EU/EEA countries does not compromise this obligation). The rules above apply to vehicles used for public passenger transport and other categories of transport (2014 ERTMS FAQ 1.10). Mobile equipment supported by the CEF grant must remain registered & operated in an EU Member State for at least 5 years. Example: retrofitting of vessels to use alternative fuels or conversion for LNG bunkering (2015 Innovation FAQ 14)]*

- How to measure the efficiency of the instrument?

- What budget distribution over time? When to give high support to make a big step in emission reduction? How to ensure a steady and constant flow of money over time.

  The experience stemming from the NOx Fund in Norway is quite relevant in this respect.[133] Experience shows that it is rare that project applications are filed all at the same time thereby creating bottlenecks in the disbursement of the money collected within the Fund. Application was in fact filed quite evenly over time. During the first years of life of the Fund, very few project

[133] Interview with Tommy Johnson, General Manager NOx Fund

application were received. More money was collected compared to the money that was disbursed.

- What about the application process? How to make it as efficient as possible?
- How to ensure the accessibility of the instrument?
- How to ensure that all contributors receive their fair share ?
  In other words, why should a vessel owner who has already made some investments to improve the energy efficiency of its vessel should pay a contribution when he will probably not need financial support for the next 10 to 20 years? In the implementation of the instrument, it must be ensured that investments already made are taken into account and do not result in penalising the frontrunners. With such a system it is however possible that those who have made investments recently would only need financial support in a longer timeframe. From that perspective there is indeed a certain dose of "solidarity" stemming from the contribution proposed.
- What should be the duration of the instrument?
- Should a minimum rate of financing be required (blending)?
  In the case of the AFIF blending Facility, the eligible activities have to be supported by a financing from an Implementing Partner or another public or private financial institution (non-Implementing Partner financial institution) of at least 10% of the Total Project cost.
- Which penalties or safeguards to be fixed in case the project does not deliver?

Consideration regarding the governance of such a financial instrument

As for governance considerations, it seems to early at this stage to determine the governance, status and legal bases for the implementation of such an instrument, particularly regarding the possibility to collect earmarked contributions at a European level until more fundamental questions are addressed.

To secure level playing field and effectiveness, the instrument should have a Pan-European coverage and it is therefore recommended to pursue a cooperation on European level with the EU as well as other river commissions (CCNR, Danube Commission, Sava Commission and the Moselle Commission) and other interested third countries.

In any event, thorough considerations about the choice of the most suitable legal instrument will be needed: an international convention or an EU Regulation in combination with a CCNR Regulation and eventually agreements with other non-EU Member States.[134]

To give life to the envisage financial instrument supported by a sector contribution, a new entity capable of collecting the sector contribution, , managing the revenues from such contributions and reinvesting them will need to be created. With regards to the possible governance structure of the instrument, a common structure consists in the following roles:

Person	Description

[134] See deliverable RQ G-H which can be found on: https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_G-H_Oct2020.pdf (p.68-69)

Instrument initiator	Typically, those financing the instrument, e.g. EU, (EU) Member States along with other financing parties (e.g. shippers & IWT sector)[135]
Instrument management	Responsible for total funding and risk management on behalf of fund initiator
Instrument investment	Activities related to the actual investment process (upfront)
Instrument administration	Administrating the financing (back office)
Instrument advisory board	Stakeholders from sectors, finance, governments, NGO
Beneficiaries	Applicants of funding (e.g. vessel owners)

Table 4: possible governance structure of a European instrument (Source: CCNR study on the energy transition of the IWT sector, research question I, CCNR study)[136]

A key question also relates to the administrative costs can be associated with the functioning of such a European instrument.

Consideration regarding the compatibility of such an instrument with state aid law

The financial support granted by the foreseen instrument would most likely qualify as state aid and would need to comply with EU state aid regulation in this regard. Pursuant to Article 107 (1) of the Treaty on the Functioning of the European Union ('TFEU') "any aid granted by a Member State or through State resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings or the production of certain goods shall, in so far as it affects trade between Member States, be incompatible with the internal market".

Furthermore, according to a constant Commission decision practice, aid for the coordination of transport is deemed compatible with the internal market under Article 93 TFEU if the following conditions are met: (1) The aid must contribute to a well-defined objective of common interest; (2) The aid must be necessary and provide an incentive effect; (3) The aid must be proportionate; (4) Access to the aid in question must be open to all users on a non-discriminatory basis. Such an instrument may be considered compatible with the Union aid rules, inter alia meeting the needs of coordination of transport as well as art. 107 TFEU, provided the aid measures do not distort, or threaten to distort, competition, in particular by favouring certain undertakings to an extent which is contrary to the common interest.

An aid scheme setting the goal to achieve a zero emission and climate neutral inland navigation in 2050 and open to all EU and Swiss operators on a non-discriminatory basis for vessels that are not under a legal obligation to be equipped with a Stage V engine, may be considered to be compatible with the Union aid rules.

[135] A seat in the governance board for EBU, ESO and ESC is recommended to cover the interests of the vessel owners/operators, intermediaries, and shippers.
[136] Deliverable_RQ_I.pdf (ccr-zkr.org)

While the question of the compatibility of such an instrument with EU state aid law will need to be addressed in the future, it seems too early to perform an in-depth assessment at this stage, until more fundamental questions are addressed.

Annex 5 - Additional topic to consider for future work - role of customers and intermediaries in the greening challenge

Methodology

Customers can play an important role in stimulating the greening of vessels. In this section, the focus will be set on the role of customers (cargo owners/shippers) and intermediaries.

It is relevant to identify the position of these parties with regard to the greening challenge in IWT, both from their own perspectives as well as from the perspective of vessel owners and operators. The necessary input for this analysis was collected in three ways:

- Interviews with two shippers/brokers and one cooperative representing ship owners/operators
  - Dow Chemical
  - Europäische Vereinigung der Binnenschiffer (EVdB)
  - TTS (Transport Trade Services) GmbH
  - Bourgogne container service: IWT vessel owner who provided written input
- An expert workshop organised on 16 December 2021
- Questionnaire distributed by the ESC amongst shippers/brokers and vessel owners
- Desk research on this topic[137]

Based on the retrieved input, the paragraphs below provide insights into the position of customers, with a specific focus on cargo owners/shippers and intermediaries and if/how these parties can be targeted and supported in stimulating the energy transition in IWT.

Current position of customers and intermediaries

The energy transition towards zero-emission IWT in 2050 is one of the biggest challenges (and opportunity) the sector has faced until now. The lack of suitable financial instruments to finance/fund the transition is a big hurdle. In addition, there is a need for additional measures to support the transition. Shippers and intermediary organisations in the value chain can play an important role in this respect.

The demand for low and zero emission vessels and transport services from customers (i.e. shippers and brokers or tourists) could be a huge push factor for ship owners to invest in greening technologies (i.e. clean engines, FC's, batteries, etc.) and sustainable alternative fuels. As investment in greening technologies implies additional costs for the vessel owner/operator, this push factor can only work if a financial benefit for the vessel owner/operator exists. For instance, if the customer pays more for the use of a clean vessels or is willing to conclude more attractive/long term contracts. In the freight transport market specifically and considering the current market conditions with fierce competition, overcapacity[138] and low freight rates, a demand side push from shippers and brokers not accompanied with a financial incentive, will have a limited effect on investments in greening.

In fact, the influence of customers in stimulating the energy transition is different depending on whether the vessel operates in the passenger transport market of the freight transport market.

[137] Relevant studies are https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_A.pdf (p.29, 30), https://ce.nl/wp-content/uploads/2021/03/4330_IWT_EU_main_report.pdf (p.11-14, 33, 50, 60, 62) https://lngbinnenvaart.eu/files/Act%204.3%20Survey%20Report.pdf (p.11), https://lngbinnenvaart.eu/files/Act%204.3%20Stakeholder%20Consultation%20Report.pdf (p.12, 21)

[138] https://repository.uantwerpen.be/desktop/irua

In the passenger transport market for instance, there is a direct relation with the customer, the passenger or tourists on board, and these clients are more demanding as regards the emissions compared to shippers in freight transport. It is found that consumers (in normal market situations) are willing to pay more if they know that the vessel is low/zero emissions. Passenger ships and especially daytrip vessels benefit from a green image, which enables operators to differentiate their services from the competition and thus attract more passengers. "Green" is therefore experienced to be a marketing tool, to a larger extent than in the freight transport market.

The paradigm is indeed different in the freight transport market, where the TCO plays a more important role. Inland navigation entrepreneurs provide transport services to cargo owners/shippers for a set price. Because competition between cargo owners/shippers is also very strong, the price criterion plays a major (if not the only) role. In the current market conditions should be as low as possible but also as qualitative as possible (i.e. reliable transport service). In practice, cargo owners are not yet ready to pay more to transport their goods via a low/zero-emission vessel, often because of existing bottlenecks.

Nevertheless, the "green image" is becoming increasingly important for society and hence for cargo owners/shippers and brokers. Hence, final customers, especially large multinationals, are paying more attention to their corporate social responsibility (CSR) and carbon footprint in their processes. Using a green vessel to transport goods is therefore welcomed, but in practice little or no extra payment is made for it with a small number of exceptions.

There are some examples[139] in which large multinationals are directly involved or strongly stimulate the greening of vessels owned by IWT shipping companies they have a direct relation with for the transportation of their goods. This is being done through paying higher freight rates and/or conducting long term contracts for the transportation of their goods.

However, in general the inland waterway freight transport is quite fragmented and most of the transport services, about 56%, are being arranged through the spot market and not through time charters and long-term contracts.[140] Small IWT companies operating on the spot market often get their assignments on a daily basis through intermediary organisations such as brokers. Hence, there are no direct contracts/contact with the shippers/cargo owner and vice-versa, shippers/cargo owners often do not know which vessel is being used to transport their goods, and whether this vessel is low/zero-emissions and if so, to which extent. In that respect, there is also a lack of transparency in the chain that does not contribute to a conscious and educated choice by cargo owners/shippers for low/zero-emission vessels/sustainable transport on inland waterways.

The European Shippers Council distributed a questionnaire[141] amongst cargo owners/shippers/brokers and vessel owners to map a recent state of play of the willingness of cargo owners/shippers/brokers to stimulate the energy transition of IWT.

In total, 19 responses were considered for further analysis, of which approximately 58% consisted of vessel owners, 37% of shippers and 5% of brokers. The parties are involved in the transport of a large variety of goods (containers, bulk material, liquids, oil, chemicals, etc.) in different volumes and for a range of distances. Four relevant statements were drawn up to map the respondents' opinions on green transport in IWT and their willingness to stimulate it:

[139] Large multinationals such as Heineken (https://binnenvaartkrant.nl/alphenaar-elektrisch-en-emissieloos-over-gouwe-en-ijssel) and AkzoNobel (now Nouryon) https://www.bureauvoorlichtingbinnenvaart.nl/vervoer/duurzaam-vervoer/groene-zoutpendel/ are two examples.

[140] https://www.ccr-zkr.org/files/documents/EtudesTransEner/Deliverable_RQ_A.pdf

[141] The questionnaire was distributed on 26-07-2021 by the ESC on their website and the results were presented on 29-09-2021. There were in total 43 entries with 19 valid ones that were analysed further.

Statements to agree with	% of the respondents
The number of shippers that apply long-term contracts, is still very low. Mainly large companies/multinationals carry out such long-term contracts	58%
Shippers are in general not able to or willing to pay higher freight rates for less polluting vessels	47%
Government tenders generally do not encourage the use of vessels with better environmental performance	47%
I cannot agree to any of these statements	16%

The results show that about half of the respondents agree with the first three statements. Because these statements are optional, it does not mean that automatically the other half disagrees with the statements. For this reason, the fourth statement has been drawn up; 9% of the respondents disagree with the statements. A higher response rate would probably have strengthened the results of the desk research in the previous paragraphs.

In this respect, the interview results, collected through an in-depth discussion, are more strongly in line with the desk study results. Of the interviewed three parties, two shippers/brokers and one IWT cooperative, all indicated that greening has a high priority in the sector they are active in, both on the side of the shipper as well as for the IWT sector (vessel owners/operators) itself. Although in IWT there are some differences across the different type of companies (e.g. large vs small vessel owners) and regions (e.g. Rhine vs Danube area) in terms of the e.g. capacity/resources/urgency[142] to invest in greening.

Despite the priority, ship owners/operators do not see a strong push from cargo owners/shippers accompanied by incentives such as a higher freight tariffs and/or long-term contracts. This applies only in certain cases. As indicated, in the current market conditions, shippers and brokers usually pursue a low price and high quality. Even if cargo owners/shippers are willing to enter a (long-term) contract, higher freight rate, etc., there are still a several bottlenecks, some of which are:

- Difficult for cargo owners/shippers to know how “green” a vessel is: lack of methodology to ascertain whether using a specific vessel is more sustainable than having recourse to road transport. Introduction of a labelling system (i.e. Dutch label introduced in November 2021) can play a role.
- Cargo owners/shippers do not always have the volume and frequency to run a ship entirely for themselves.
- Strong competition between cargo owners/shippers based on price.
- The use of intermediaries to negotiate transport contracts leads to lack of transparency. There is no transparency and no control over this process. It prevents a conscious and educated choice by cargo owners to opt for a more sustainable mode of transport.
- Absence of 'green' vessels for a specific transport demand. For example, there are no zero-emission vessel available yet for long distance transport on the Rhine or the Danube.
- For cargo owners/shippers who currently do not use IWT, but would like to with 'green' vessels, there are sometimes also infrastructural limitations (lack of terminals/infrastructure).

[142] In the Danube area companies can flag out to Moldova or Ukraine if certain matters (e.g. such as investments in Stage V type approved engines) are getting obligatory, requiring difficult investments.

- A long-term contract of e.g. 5 years or longer is very difficult, as flexibility is desirable for the cargo owners/shippers. It is difficult to predict how the market will develop over a period of 5 years.
- Depending on the country in which the cargo owner/shipper operates, a time charter contract may result in the vessel ending up as an asset in the cargo owners/shipper's financial books, which is not desirable from a financial point of perspective.

The vessel owners/operators indicate that, depending on the commodity/goods transported, a period of 6 months up to 2 years can currently be considered as a long-term contract. Longer contracts and higher tariffs would stimulate investments in greening though.

However, some vessel owners/operators also deliberately do not opt for long-term contracts. This is partly due to the character/culture of the sector. Vessel owners want some freedom in their operations and the assignments they accept. This is partly also a financial consideration; operations on the spot market can be financially attractive in an economic boom, while the opposite is also true during worse economic times.

Incentives for customers to making contracts with low/zero emission vessels

Such incentives can be of different kind. A non-exhaustive list of possible incentives is provided below.

Regulatory/mandatory incentives

- Measures enabling to increase competitivity of IWT. i.e. reduced transhipment costs.
- Internalisation of environmental costs for all modes (i.e. a levy on carbon emissions, ETS), reduction of subsidies for the benefit of the most polluting fuels and promotion of alternative fuels. The use of less emitting modes would then become more financially attractive.
- Setting up a regulatory framework enabling the possible phasing out of the most polluting technologies.
- Making it mandatory for cargo owners/shippers and brokers to report on their environmental footprint for their transport operation. Such an obligation could also be put on the transport companies to ensure that the customers have all the information needed to make a conscious choice for low/zero-emission vessels/sustainable transport on inland waterways. Based on EU rules on non-financial reporting, large public-interest companies with more than 500 employees already need to report they CO_2 emissions in the company accounting. This could be used as a tool for governments to receive and monitor such data. Such data can guide political decision making to reward those companies which already report low CO_2 emissions or punish those which report high CO_2 emissions.
- Government tenders encouraging use of greener vessels.

Voluntary incentives

- A clear methodology for identifying the most energy efficient vessels, for instance through an emission label or an energy index system. This is linked to the PLATINA3 task 2.6 report. The role of ISO developing standards in measurement and regulations should be considered with regards to their use by cargo owners/shippers/customers.
- A clear vision on long term emission target would also be helpful, in view of entering longer term contract (i.e. for the transport of sustainable fuels – hydrogen, biomass …)

Financial support

- Harmonised port dues discounts across Europe
- State aid measures to compensate customers for additional costs incurred by using IWT “greener” vessel such as the French « PARM » (Plan d’Aide au Report Modal) or the Swedish « ECO bonus »

The energy transition is gaining momentum and is identified as a crucial challenge for inland navigation. To enable this transition, vessel owners and operators need certainty that their investment in low/zero emission vessels will pay-off.

This section outlines solely some main challenges and first ideas. However, additional work is needed to identify the right framework and incentives which are needed to ensure that cargo owner/shippers, customers are ready or able to use low/zero emission even if it means paying more for such services.

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Project coordination	Stichting Projecten Binnenvaart
Contact	info@platina3.eu

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