13 May 2025

EU Industrial Waterborne and Port Strategies: Contribution of the Inland Waterway Transport and Port sector

Executive summary

Major centres of production and consumption are located along Europe's waterways. Rivers and canals are therefore vital to the competitiveness of the EU's basic industries, from SMEs to large corporations. Large volumes of goods, including steel, agricultural products, chemicals, oversized cargo, alternative fuels, construction materials and waste can be transported by inland waterways. Disruptions to this system have a significant impact on downstream supply chains, industrial production and even food security. As a safe and energy-efficient alternative, inland waterway transport relieves congested land networks while offering increased opportunities for sustainable tourism and recreation. Inland ports act as key transshipment nodes and gateways in this ecosystem, extending the reach of maritime trade into the heart of Europe, enabling multimodal logistics and hosting a wide range of industrial activities. Importantly, inland ports are also becoming hubs for renewable energy and the circular economy.

As such, **Inland Waterway Transport (IWT) and Ports** play a crucial role in achieving Europe's **climate neutrality, economic resilience and strategic autonomy** and are a competitive and crucial component of the Clean Industrial Deal and the Waterborne ecosystem.


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This statement presents our sector's vision and concrete proposals for the upcoming industrial waterborne[1] and port strategies focusing on the **twin green and digital transition and achieving resilience while putting people at its core**. Aligned with the Competitiveness Compass goals – closing the innovation gap and developing a competitiveness roadmap in a rapidly changing environment –the sector advocates to reach these objectives with the following **key policy instruments:**

1. Fostering innovation from its inception phase to deployment across the value chain;

2. Pro-innovation regulation providing legal certainty to boost investment;

3. A funding and investment framework, which is stable, predictable, fit-for-purpose and easy-to-access in particular for SMEs.

The interplay between innovation and regulation is essential to ensure continued progress and encourage investment.

In order to achieve these ambitions, it is essential **to establish a robust, interconnected industrial ecosystem** that brings together the inland waterway sector, other waterborne industries, shipyards, equipment manufacturers, energy suppliers and ports. To reach Europe's industrial and climate objectives and maintain global leadership in the waterborne sector, it is vital to invest, support and strengthen this ecosystem, including the skilled and dedicated workforce at the heart of it.

1. Policy Context: the Industrial Waterborne and Port Strategies

The waterborne sector is a dynamic and multifaceted sector that involves a diverse array of public and private stakeholders[2]**.** These stakeholders include classification societies, shipbuilders, shipowners (both maritime and inland navigation), equipment manufacturers, ports, infrastructure and service providers (e.g. dredging), as well as universities and research institutes. Small and medium-sized enterprises (SMEs) make up the majority of the EU waterborne sector and have a critical role to play in the sector and in the wider European economy. The sector encompasses various types of vessels and services, categorized based on power requirements and autonomy. These categories include inland waterway transport vessels, ferries, short sea, cruise, intercontinental and offshore ships. Distinctions also exist between liner and tramp shipping and their respective business models, as well as between retrofitting existing vessels and building new ones. Ports are equally important, functioning as multimodal hubs that facilitate the movement of goods and passengers and support a wide range of economic activities, including shipbuilding, maintenance, logistics and energy production.

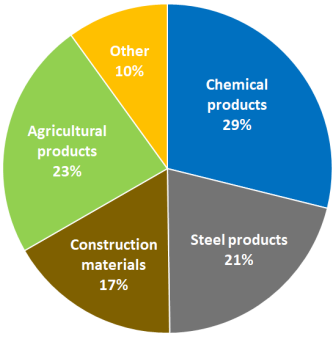
Our waterborne system is a unique continuum. With almost **50% of Europe's population living close to the coast and in the valleys of the 15 largest rivers,** the waterborne sector is inextricably linked to Europe's environmental integrity, economic vitality and social well-being. Oceans, seas, rivers and lakes shape our ecosystems, regulate the planet's climate, and support biodiversity. They are vital sources of water, renewable energy, food, critical raw materials, sustainable transport, recreation and tourism. From this holistic perspective, a waterborne policy approach is more effective than looking at the coast and seas in isolation.

The EU **Industrial Waterborne Strategy** is expected to set the course for strengthening the competitiveness, sustainability and resilience of Europe's maritime manufacturing sector and to support the wider waterborne value chain. It aims to drive the green and digital transformation of ships, shipbuilding, equipment manufacturing, ports and their interconnected supply chains. The strategy highlights the need to strengthen the EU's leadership in complex shipbuilding and advanced technologies while ensuring fair competition on the global stage. It calls for intensified research and innovation in green and digital technologies, increased investment to de-risk and accelerate decarbonisation, greater domestic capabilities and autonomy, and enhanced cooperation between Member States and across industrial value chains. At the same time, it will address labour and skills shortages, supporting the sector's green and digital transition while contributing to security.

The EU **Port Strategy** aims to strengthen ports as vital multimodal hubs within the supply chain, thereby connecting maritime and land transportation networks. These ports are of crucial importance for the production, storage and supply of sustainable energy, driving industrial activity and the circular economy. Furthermore, ports play a pivotal role in military mobility and general security, a domain that encompasses both maritime and inland waterway infrastructure, which serve as hosts to critical assets.

2. IWT and ports: crucial for EU competitiveness, sustainability and resilience

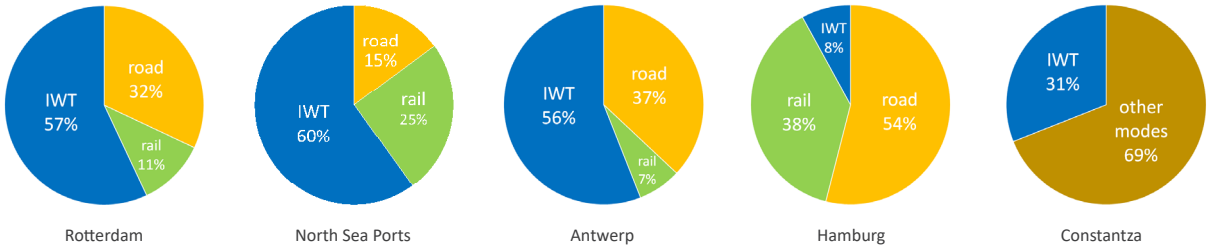
European inland waterways and ports play an essential role in European transport activities. 81% of the external trade arrives and leaves from European ports, and IWT connects the main seaports to inland regions, enabling the sustainable transport of large volumes of goods with lower environmental impact. IWT also plays an essential role in urban mobility of passengers, as well as in the tourism industry, by means of river cruises, ferries and waterbuses.



Commodities transported by IWT

Source: Eurostat 2023, transport performance in mln tkm, processed by EICB (2025)

Whilst IWT accounts for only 6% of the total freight transported within the EU, a closer look at the figures behind this statistic reveals that IWT has a significantly higher share in regions with a dense network of rivers and canals. Moreover, inland waterways carry the building blocks of our economy by transporting basic raw materials and semi-finished products – such as steel, chemicals, construction materials, agribulk and renewable fuels – that are indispensable to Europe's food and manufacturing base and energy transition goals. These commodities underpin the Clean Industrial Deal and the circular economy. Some of the EU's largest ports have a strong reliance on inland waterway transport for their hinterland connectivity, with IWT shares in modal split exceeding 50%.



Sources: port authorities (2023), Rotterdam CBS (2023)

This underlines the importance of IWT not only as a sustainable alternative but as a cornerstone of waterborne logistics. Furthermore, the sector plays a key role in military mobility, as inland waterways and ports offer substantial dual-use transport capacity, particularly for oversized and heavy materials.

European IWT and ports are a world-leading example of a sustainable, safe and innovative sector, and are indispensable for keeping our EU transport viable. In an era of increasing congestion on road and rail networks, inland waterways enable the expansion of logistics capacity for clean industrial growth. Connecting ports and cities across Europe, IWT ships goods deep into the hinterland where production and consumption centres are situated.

The competitiveness of IWT and ports depends heavily on Europe's innovation capacity **to improve the efficiency, safety, security and sustainability of ships, infrastructure and transshipment.** Cross-sectoral cooperation with maritime, land transport, and other related sectors is strengthening the entire logistics and mobility chain, while innovative business models are creating new opportunities and jobs.

While the majority of hulls for IWT vessels are produced in Southeast Asia, innovative concepts, designs and high-tech equipment for ships, sensors and drones are made in Europe. These technologies are then integrated on board in European shipyards and innovation clusters. Retrofitting a large part of the European IWT fleet —over 12,000 vessels— to improve efficiency, safety and security presents a major opportunity for the waterborne manufacturing industry. The industry will also provide key technologies for IWT and port infrastructure, including the development and deployment of green and digital technologies. These technological advancements offer great potential for jobs and turnover, strengthening European shipyards and equipment manufacturers. Concluding, IWT and ports offer valuable opportunities for developing and demonstrating innovative technologies, making them a suitable and effective frontrunner in the broader waterborne industry's twin green and digital transitions, while contributing to greater resilience.

3. Vision of the IWT and Ports Sector

Our sector's vision revolves around **four key transformation pillars** that reflect the ambitions outlined in the Industrial Waterborne Strategy.

1. We are committed to the **green transition**, developing and deploying the green ships of the future while implementing the renewable energy network along waterways and in ports. We aim to increase the adoption of zero-emission[3] ships and ensure sustainable practices. Circular economy principles will be embedded throughout the life cycle of ships, including waste-free and responsible ship recycling. We are also committed to extending decarbonisation, zero pollution, resource efficiency and waste minimisation to the lifecycle of infrastructure and equipment--from design and construction to operation, maintenance, upgrading and end-of-life recycling. Inland ports are enabling the provision of renewable energy by providers. At the same time they are expanding their circular economy activities.

2. We envision a **fully digitalised sector where vessels, equipment and infrastructure are seamlessly integrated into the multimodal transport chain.** Smart automation and connectivity will not only improve safety and efficiency, but also make the sector more attractive to new generations of researchers

and workers. Cyber-secure communication and interconnectivity will be ensured by sovereignty over data and digital networks to ensure digital autonomy and resilience.

3. We recognise the strategic imperative of **resilience of preparedness by design.** This will ensure that waterways and ports as well as relevant inland vessels, are adapted for dual-use purposes, serving both civil and defence logistical needs to enhance **European strategic mobility.** It will cover a climate-proof fleet, a reliable and resilient waterway network and **secure critical infrastructure** such as locks, dams, reservoirs or flood control systems, which are foundational to the security and functioning of the European economy and society.

4. We are determined to **put people first as we develop and deploy innovation and modernise the labour market.** By creating attractive job and career opportunities, modernising crewing regulations and professional qualifications, and supporting skills development, we will meet the needs of a rapidly evolving, technology-driven sector.

By realising these four interrelated and interdependent pillars, the **competitiveness of inland waterway transport and ports** will increase throughout the entire waterborne ecosystem. By connecting gateway seaports with inland ports and regions, Europe's industry will benefit from this increased competitiveness overall.

Only through the establishment and support of an integrated industrial ecosystem – one that unites innovation, manufacturing, ports, vessel operators and service providers – can these transformations be successfully delivered.

4. Policy priorities and actions to achieve the vision

Achieving this vision requires a coherent and ambitious policy framework relying on the following instruments:

- **Research and innovation from its inception phase to deployment across the waterborne value chain**: Further development and deployment of solutions for zero-emission, sustainable energy, resource efficiency, climate preparedness, circularity and digitalisation, including enhancement of the capability of the European maritime technology sector, will be critical to ensure a resilient, competitive and sustainable IWT and Ports sector. The current Co-Programmed Partnership on Zero-Emission Waterborne Transport (ZEWT) offers a unique stepping stone to achieve the objectives of the European Clean Industrial Deal, delivering tangible results scalable at European level also in the long-term. For the period 2028–2035, a co-programmed partnership focused on driving the transition toward a competitive, sustainable and resilient waterborne sector is the most effective path to achieving these objectives. The development and deployment of zero-emission and digital solutions and products (such as vessels and platforms) necessitates the involvement of many. All key stakeholders and joint investments from ports, shipowners, shipyards, equipment manufacturers, infrastructure and service providers, the research community, and the public sector must be involved. Therefore, the renewal of the current ZEWT Partnership in the framework of the MFF 2028-2035, including the extension of its scope, will be critical for a competitive, sustainable and resilient future.
- **Pro-innovation regulation providing legal certainty to boost investment:** Regulation, by creating a level playing field for innovations and setting ambitious targets, provides the necessary legal certainty for public and private investment and guarantees that new solutions are safe, interoperable and in line with societal expectations and policy objectives. It is imperative to establish regulatory certainty, agility and coherence to stimulate innovation. The rapid pace of technological and organisational change requires flexible regulatory frameworks. Regulatory sandboxes provide controlled environments for real-world experimentation and are an excellent way to strengthen EU competitiveness and foster innovation. At the same time, they ensure robust safety standards in an interactive learning process between public and private stakeholders.
- **A funding and investment framework which is stable, predictable, fit-for-purpose and easy-to-access.** Investments in inland vessels by the private sector are high and require long-term no regret technological solutions. The private IWT sector is primarily comprised of small companies. Therefore, SME-friendly access to EU funding and national state aid programmes is essential for the implementation of our joint vision for competitiveness, sustainability and resilience. Physical waterway and port infrastructure projects require a long-term planning process and thus a stable and predictable EU funding framework. National and even small-scale projects are essential to remove all bottlenecks and ensure cross-border connectivity, reliability and resilience. Finally, increased transparency in the award of EU funds will contribute to a favourable investment climate.

A well-considered interplay between the three policy instruments is key to ensure continued progress and encourage investment.

The IWT and Ports sector proposes **four concrete priority areas for action** under the upcoming Industrial Waterborne Strategy and Port Strategies.

4.1 Green transition for IWT and Ports

Achieving a **short-term transition to zero greenhouse gas (GHG) emissions in IWT** is achievable through widespread use of sustainable drop-in fuels, such as **Hydrotreated Vegetable Oil (HVO100)**. At the same time, the elimination of air pollutant emissions is possible with after-treatment equipment, whereas the noise from stationary ships can also be minimized by using shore power. The use of sustainable and renewable drop-in fuels allows for complete decarbonisation, with no need for changes to existing engines or infrastructure. However, the transition is currently hindered by the inability to pass on the considerably higher cost of HVO to customers, leading to competitive disadvantages compared to fossil fuel users. As set out in the sector's contribution to the **Sustainable Transport Investment Plan STIP** [4], it is imperative to prioritise an **annual supply of 1.6 million tons at diesel-competitive prices and establish a stable EU regulatory framework and coordinated national efforts.** Such efforts should include the coordinated implementation of the REDIII framework, the implementation of the Energy Taxation Directive (e.g. tax exemptions for clean renewable energy and onshore power) and a technology-neutral legal framework for emission reduction. The latter could take the form of an EU-wide ETS2 opt-in, provided that revenues are earmarked to the IWT sector, including SMEs, to allow de-risking of investment. An alternative option could be the introduction of an EU-wide equivalent emission reduction framework. This would create a solid business case and a level playing field for operators to use sustainable drop-in fuels. In order to achieve a significant reduction in air pollution emissions (NOx, PM), older engines need to be replaced by modern Stage V engines (Euro VI) or retrofitted with catalysts and filters.

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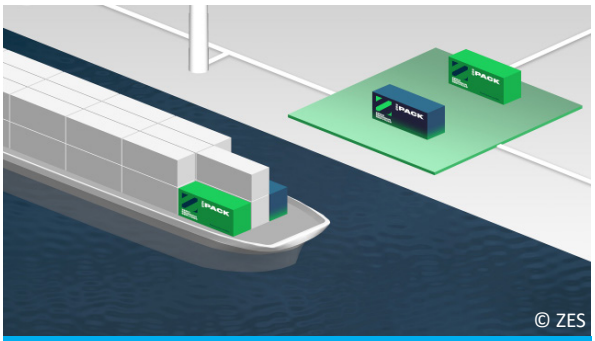
Short-term decarbonisation with HVO100

However, relying solely on renewable drop-in fuels carries potential risks due to the possibility of supply and price volatility. It is therefore essential to also **develop alternative zero-emission solutions** like battery-electric propulsion and propulsion systems using green methanol and hydrogen. To overcome the higher capital and operating costs, a **stable, technology-neutral framework is needed, consisting of robust, innovation-friendly regulation that provides legal certainty, combined with research, development and demonstration of technologies, as well as targeted funding and incentives to stimulate investment and expand renewable fuel networks.** With regard to hydrogen and methanol, it is imperative to amend the NRMM Regulation to include them as reference fuels for certification of internal combustion engines. In the field of electric propulsion, a variety of development and deployment options are available. These include container shuttle services, such as facilitating the exchange of EU-made battery containers at existing container terminals, as well as passenger ships, ferries and vessels for urban and short-range logistics.



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Battery electric propulsion with exchangeable containers

Inland ports play an instrumental role in providing efficient, reliable, and resilient services characterised by zero-waste and zero-emissions in a secure environment. Ports will be able to achieve zero-emissions in their own operations in order to adapt to the new demands following the energy transition. To ensure future readiness, inland ports must facilitate, where possible, alternative energy production and distribution capacity, supported by robust, multimodal supply chains and investment in alternative bunkering infrastructure, shore power (OPS), and digital coordination platforms to align energy logistics with vessel and grid requirements. IWT is well-positioned to transport large volumes of renewable fuels, continuing its long history of carrying conventional energy products. To meet the future demand for renewable energy and to facilitate electrification, we propose to include inland waterways in the development of green energy corridors, backed by ports as **vital nodes for renewable energy storage and supply.**

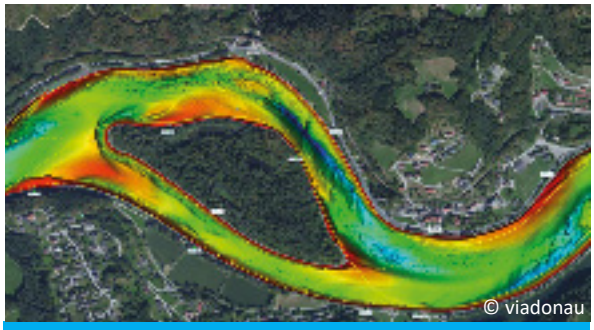
Inland port areas are also **hubs for the circular economy**, given their proximity to cities, industries and the terminals. Inland ports provide interfaces between transport modes for waste streams from the hinterland, on-site industries and nearby urban agglomerations, driving new activities around waste as a resource and their supply chain. Inland vessels, in turn, are scrapped and recycled in the EU.

The transition to an innovative, green fleet will require the establishment of a dedicated **IWT investment fund** for barge owners and operators. This fund will ideally pool national and EU funding schemes to support large deployment projects involving all value chain partners. Active state aid implementation of GBER and CEEAG by Member States is equally important to de-risk future investments. It should be accompanied by additional funding schemes in refuelling and recharging infrastructure for renewable energy along waterways and in ports.

POLICY ROADMAP Green transition	EC	MS	IWT & Port sector	Technology sector	Energy suppliers	Timeline
Reliable annual supply of 1.6 Mt HVO100 for IWT at diesel-competitive pricing	X	X			X	As of 2025
Coordinated implementation of REDIII for IWT between MS	X	X			X	As of 2025
Technology-neutral legal framework for emission reduction: EU-wide ETS2 opt-in with revenues to sector	X					Before 2030
Taxation level playing field via ETD by exempting clean fuels and on shore power from taxation	X	X				Before 2030
Amendment of NRMM Regulation	X	X				Before 2030
Easy-access RD&I	X		X	X	X	New MFF
Dedicated IWT investment fund	X	X	X	X	X	By 2030
Active GBER and CEEAG implementation by MS		X				By 2030

4.2 Digitalisation for IWT and Ports

Digitalisation is a major horizontal enabler in the transition to a competitive, sustainable and resilient IWT and Ports sector. It is the broad transformation of societal and business models through the adoption and strategic integration of digital technologies[5]. The aim of digitalisation is to improve efficiency, enhance customer experience, provide new opportunities, enable automation, drive innovation and result in a more agile and competitive organisation. Digitalisation is an indispensable tool in making multimodality less complex, more economically viable and easier to use. Enhanced data flows enable a higher degree of automation and autonomy, from remote control from shore to automated and autonomous systems and operations. Vessels of the future will be designed to facilitate continuous updating and upgrading with digital technologies throughout their lifecycle. Digitalisation will not only improve nautical operations, safety and the energy efficiency of IWT, but will also improve asset management, logistics and mobility flows. In addition, it is beneficial for identifying vulnerabilities, achieving cybersecurity, and anticipating slow-onset changes such as those caused by climate change. It also strengthens resilience against sudden extreme events such as pandemics, natural disasters, and sabotage, while improving the robustness of systems and networks.



Transnational waterway monitoring system (WAMOS 2.0)

In the digital world, IWT and ports are making significant progress. They are at the forefront of the digitalisation wave, from waterway information services being implemented across borders to remotely operated infrastructure and vessels already in service. Smart Shipping is the whole cluster of

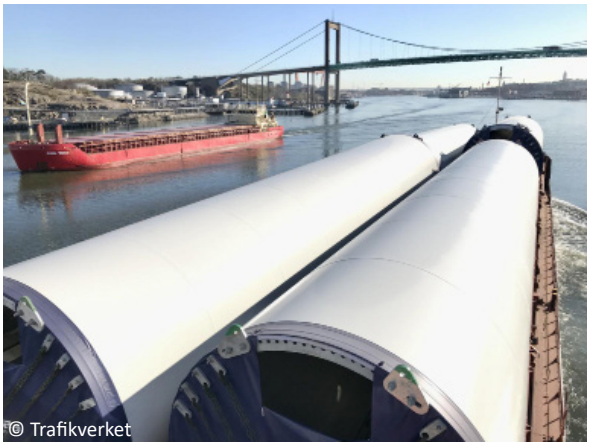
Remote control navigation from onshore traffic centre

connected and automated vessels, infrastructure, smart data and smart administration, all of which are in development to enhance interoperability, reduce administrative burdens and facilitate the shift to smart, automated navigation. This will help address labour shortages while improving safety and efficiency across the sector. Implementation of synchro-modality and the physical internet will support the handling of increased freight and passenger volumes, helping to boost IWT's share by 25% by 2030 and 50% by 2050.

However, full digital integration across borders and transport modes remains limited. The Digital Inland Navigation Area (DINA) Vision integrates IWT into the broader logistics chain, with the aim of facilitating seamless interoperability across modes and streamlining administrative processes while attracting talent. It is important that policy measures prioritise the **implementation of River Information Services (RIS) across connected waterways and the funding of digital tools onboard.** It is also important that the timely implementation of paperless operations through eFTI mirrors business' digitalisation needs. Finally, it is essential to develop a **flexible, goal-based framework to support automation** and **ensure adequate 5G coverage across the network.** This should include updating legislation by means of a **regulatory sandbox and new crew training schemes** to match the sector's evolving needs.

To fully harness the potential of digitalisation and automation, a robust policy framework, backed by research and innovation, is essential for widespread deployment.

POLICY ROADMAP Digital transition	EC	MS	IWT & Port sector	Technology sector	Energy suppliers	Time-line
RIS Directive implementation by MS	X	X				As of 2025
eFTI regulation implementation		X				By 2027
EU regulatory sandbox for smart shipping	X	X				Asap
Easy-access RD&I and deployment funding	X	X	X	X		New MFF



4.3 Resilient and dual-use IWT and Ports through preparedness by design

Inland waterways and ports are of vital importance to the EU waterborne ecosystem. They function as **sustainable, resilient and strategic transport corridors and nodes for shipping and transshipment of goods, which are critical for the functioning of our economy.** They extend the reach of maritime trade deep into seaports' hinterlands. IWT's heavy-duty capacity also provides essential support to the offshore industry and wind parks at sea and on land, ensuring the reliable delivery of materials and services.

Inland waterways and ports are also of great value to military mobility and therefore for the security of the EU. In light of the present geopolitical and economic turmoil, the dual civil/defence approach is essential. Given the weight and dimension constraints that road and rail transport face, **IWT's unique dual-use capacity** to handle large volumes of fuels and oversized cargo, including heavy military equipment, is a key asset for military mobility. Inland ports also play an important role in military mobility by providing staging areas for strategic cargo, provided they are equipped with ro-ro ramps, reinforced quaysides and high-capacity cranes.

Heavy-lifting capacity at inland port for dual-use

IWT is a very safe mode of transport, regulated by high and strict standards. This is the reason why dangerous cargoes are preferably transported by IWT. Furthermore, with its ability to adapt to unexpected events and respond quickly to sudden disruptive changes, inland navigation has proven to be a strong back-up mode supporting the continuity of Europe's supply chains. During the COVID-19 pandemic, inland waterway transport maintained essential supply chains, including pharmaceutical raw materials. More recently, the Danube became the main EU-UA solidarity lane, accounting for more than 25% of Ukraine's grain exports, after the Black Sea corridor was compromised- demonstrating the ability and the critical role of IWT to act as a vital contingency route.

Serving a broad range of functions and industries across the continent, inland waterways and ports therefore provide reliable, energy-efficient transport solutions for vital industries, consumer goods, urban logistics, passengers, military mobility and more. By offering a cost-effective and sustainable alternative to road and rail transport, inland waterways help reduce congestion, lower emissions, and strengthen supply chain resilience and EU security. **A reliable and future-ready inland waterway infrastructure network is essential not only for the operational success of the IWT and Ports sector but also for attracting new investments and industries critical to Europe's long-term prosperity, competitiveness and strategic autonomy.**

However, several barriers and threats exist to the optimal use of IWT and ports in the waterborne ecosystem. Decades of underinvestment in inland waterway and port corridors, and their multimodal connectivity, has led to bottlenecks that threaten to reverse modal shift and divert freight back onto already congested roads and railways. **An overview of bottlenecks per EU transport corridor is available**[6]. In addition, the optimal functioning of inland ports is under pressure from waterfront real estate development in various urban agglomerations. Finally, in a number of seaports, access to infrastructure remains suboptimal and the handling of inland barges does not have priority in container terminals. This has resulted in extended and costly waiting times, diminishing the appeal of IWT in the multimodal transport mix. All these **barriers undermine the performance and contingency capacity of the network for military mobility and effective disaster response, as well as the EU's strategic goals for modal shift.**

In addition to their transport function, waterways are fundamental to the security and functioning of European societies. The surface waters of rivers and canals are essential for water supply to the population, agriculture, energy and industry. Locks, dams, reservoirs, dikes, flood protection systems and ancillary infrastructure hosting key utilities such as pipelines, electricity grids and high-capacity data lines are critical assets. Inland navigation, waterways and port infrastructure are increasingly vulnerable to digital and physical disruption. In addition to the challenges posed by foreign digital dependency and the risk of sabotage to critical shipments and infrastructure, waterway authorities are facing

an increasing number of cyber-attacks and system intrusions that threaten the locks, dams, reservoirs, dikes and flood control systems that provide access to critical societal and economic functions. Ensuring EU sovereignty over data and digital networks, through a unified vision of digital autonomy is crucial to safeguarding cyber-secure communication and interconnectivity.

Doubling of locks as backup to avoid disruptions in case of maintenance. incidents and accidents

Moreover, **climate change exerts a detrimental multiplier effect.** Adverse consequences include both gradual changes and extreme events such as increased flooding and prolonged periods of water scarcity and drought, invasive species that clog propellers. These effects have a negative impact on the competitiveness and safety of day-to-day operations. In the event of high water, this can result in navigation stops and speed restrictions. During periods of extreme low water, the carrying capacity of transport by waterway is significantly reduced due to the adoption of limited load factors. This has a detrimental effect on economic efficiency and reliability. It is important to note that small vessels are being withdrawn at an increasing rate from the fleet due to high operating costs and limited support from credit institutions for investment in innovation. However, these vessels are serving an important market of smaller waterways and are more flexible during periods of water scarcity. **Further research is needed to design, test and implement advanced technologies and interdisciplinary resilience solutions that not only reduce vulnerability but also increase robustness and agility.** These solutions are needed to mitigate the effects of climate change and ensure reliable and resilient operations. These could take the form of better forecasting tools, early warning systems, climate-proof ships, improved logistics planning and infrastructure upgrades with adaptive solutions.

Climate change affects water resilience with consequences for the availability and quality of water supplies, which are essential for the energy and industrial sector. Climate change also compromises the stability and safety of critical waterway infrastructure and water-related structures such as dams, locks, reservoirs, bridges, dikes, embankments and hosted utilities. While resilient infrastructure does incur higher costs compared to conventional infrastructure, neglecting to address these issues will result in cascading and costly disruptions.

Finally, in order to ensure preparedness by design of infrastructure, a strategic approach to infrastructure research, planning and funding is required. It is essential that current vulnerabilities and gaps in civil and military mobility, and critical infrastructure are addressed by means of a **comprehensive pan-European risk assessment of inland waterways and ports on supply chain continuity, climate resilience and security, including cybersecurity, with due attention for innovation. The assessment should formulate clear guidelines for inland waterway and port infrastructure regarding military mobility, security, and climate resilience and provide a cost estimate of the investment gap**. It is recommended that inland waterway and port authorities be included in discussions on military mobility. Dual-use needs should be incorporated into the Connecting Europe Facility (CEF3) and national investment programmes. There should be particular emphasis on small-scale projects, for instance in inland ports, that address important bottlenecks, through dedicated calls or envelopes. In order to enhance efficiency, the permitting process for infrastructure development should also be streamlined and the reporting requirements reduced.

In order to promote the shift of cargo from roads to waterways, it is recommended that the scope of the Combined Transport Directive be extended to include multimodal transport in the ongoing revision process. Finally, the draft Transport Block Exemption Regulation and the Land Transport and Multimodal State Aid Guidelines should not discriminate against multimodal transport. In combination with

competitive bidding, there should be room to raise aid ceilings to support climate proofing of vessels, digitalisation and modal shift.

POLICY ROADMAP Infrastructure	EC	MS	IWT & Port sector	Technology sector	Energy suppliers	Timeline
Comprehensive network risk assessment	X		X	X	X	2026
Infrastructure preparedness by design guidelines, incl. cybersecurity	X	X				2027
Easy-access RD&I and deployment funding	X	X	X	X		Before 2030
Continuation & strengthening CEF, incl. dedicated calls/envelopes small-scale and inland port projects	X	X				Next MFF
Streamlining permitting	X	X				2026
Reduction reporting requirements	X	X				2027
Cohesion Operational Programmes to address multimodal connectivity	X	X				Next MFF
Revision of CTD into a real Multimodal Directive	X	X				Asap
Increased aid rate in TBER and LMTG	X					2025

4.4 Jobs and skills in inland waterway transport and ports

In 2020, approximately 41,923 people were employed on board of inland vessels across Europe, with 44% in passenger transport and 56% in freight transport. The **sector since long is facing a shortage of qualified personnel, prompting efforts to attract young people and lateral entrants**. Digitalisation and automation will enhance the sector's attractiveness and efficiency, offering new job opportunities and career prospects.

To address the labour shortage and prepare the workforce for the green and digital transformation, updating legislation, supporting lateral entry into the profession and providing targeted funding for training are essential steps. Efforts are being made at various levels to attract new entrants, particularly from adjacent sectors like maritime professionals transitioning to inland navigation. Current qualification frameworks are too rigid to allow for lateral entry into the profession, limiting the pool of potential workers. In 2022, Regulation (EU) 2017/2397, aimed at harmonizing professional qualifications and improving labour mobility, came into force. While it introduced flexible educational pathways for sector transitions, it has unintentionally created more entry barriers. It is essential to urgently **adjust the EU Professional Qualifications Directive and modernise European crewing standards. Equally important are funding mechanisms to support training in areas such as alternative fuel operations and digital vessel management**.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Digitalisation is often interpreted as a means to remove the human factor, in terms of eliminating errors or increasing efficiency. In the IWT and Ports sector, people are at the centre, without neglecting the impact of digital transformation on the individual. Digitalisation leads to a mixed environment where people interact intensively with rapidly changing technology. Digitalisation contributes to solve current and future labour shortages by digitally upskilling the workforce and creating attractive jobs for young and old in research and operations. Technological innovations, such as remote and automated navigation, promise to alleviate workforce shortages and increase productivity. Remote vessel operation, managed from central control centres, currently already is in use in designated and controlled test areas and is expected to grow.

However, current international crew regulations require a certified boat master to be present both on board and at the control centre. At present, this paradoxically increases the manning requirements for more advanced high-tech vessels. The current test areas will provide evidence as to whether or not safety levels are compromised by reduced manning and what action may be required. New insights from these test areas should be implemented in the regulatory frameworks as soon as possible.

The transition to renewable energy presents another important challenge for the IWT sector and its labour market. While the industry is committed to eliminating emissions, high costs and rapid technological advancements complicate long-term planning. The choice of technical solution and the type of energy carrier to be used (e.g. HVO, biomethane, hydrogen, methanol, batteries) remains uncertain, impacting training and safety protocols.

Regulatory agility and coherence are essential to stimulate such innovation. **The rapid pace of technological and organisational change requires flexible and innovation-proof regulatory frameworks to create the economic business case for automating navigation. Additionally, remote operations will require new training programmes to equip personnel with the necessary skills.** Furthermore, as hybrid and zero emission vessels increasingly automate, they may eventually operate with minimal or no crew. Emergency management procedures and training for remote operations need to be addressed and developed in view of the new technical systems and energy carriers.

Finally, as digital tools and remote control become more prevalent, the risk of malicious disruptions increases. Both **crew and companies must be prepared to prevent and respond to sabotage and cyber threats. This requires heightened awareness and the development of robust protection measures across vessels, control centres, port and waterway infrastructure and communication networks**.

POLICY ROADMAP Jobs & Skills	EC	MS	IWT & Port sector	Technology sector	CCNR	Timeline
Easy-access RD&I and funding for training	X	X	X	X	X	Next MFF By 2028
Revision Professional Qualifications Directive	X	X				Before 2027
Revision Crewing Regulations	X	X			X	Asap before 2027

Endnotes

1 We strongly recommend renaming the strategy 'Industrial Waterborne Strategy'. This is because it represents the entire ecosystem of shipyards, equipment manufacturers, shipowners, ports, classification societies, infrastructure and service providers and research institutes. An ecosystem approach will be critical for the transition to a resilient, competitive and sustainable sector.

2 EU Waterborne Transport Sector Joint Declaration- March 2024

3 Zero-emission is defined as the elimination of all harmful air and water emissions, as well as noise pollution.

4 https://www.inlandnavigation.eu/wp-content/uploads/2025/04/STIP-statement-final-250407.pdf

5 https://www.waterborne.eu/images/250123_Waterborne-Digitalization_Paper_Digital_Version_Final.pdf

6 https://www.inlandnavigation.eu/waterway-campaign/

Supporting organisations

Inland Navigation Europe (INE) is the European Platform of waterway authorities and bodies promoting transport by water, working together to improve waterway infrastructure for navigation and other important economic and societal functions.
www.inlandnavigation.eu

The European Barge Union (EBU) represents the inland navigation industry in Europe. Its members are the national associations of barge owners and barge operators of 9 European inland navigation countries (Austria, Belgium, Czech Republic, France, Germany, Luxemburg, Netherlands, Romania and Switzerland).
www.ebu-uenf.org

The European Skippers Organisation is the voice of the independent Inland Waterway Transport entrepreneurs. ESO looks after the interests of the barge owners at European level with representatives from 6 European countries (Belgium, France, Germany, Netherlands, UK and Poland).
www.eso-oeb.org

As an executive body of EBU and ESO, the European IWT platform aims at a stronger positioning of Inland Navigation in European and national transport policies by an intensified contribution to various governing bodies, working parties and standard setting committees like CESNI and ADN.
www.inlandwaterwaytransport.eu

Europe's inland ports, Enablers of Green Logistics, are represented since 1994 by the European Federation of Inland Ports. EFIP consists of nearly 200 inland ports located in 18 Member States of the EU and Switzerland, Serbia and Ukraine.
www.inlandports.eu

The industry-oriented Waterborne Technology Platform establishes a continuous dialogue between all waterborne stakeholders and EU Institutions, including Member States.
www.waterborne.eu

The EICB aims to make inland waterways transport more economically attractive and innovative by investigating opportunities & threats, and propose next steps such as market stimulation via promotion, innovation, fleet renewal, reinforcement & security of the chain, ICT, elimination of bottlenecks in the physical, logistical and knowledge infrastructure.
www.eicb.nl

The EU-funded PLATINA4Action project aims to promote inland waterway transport in Europe through targeted coordination and support activities. It bridges the gap between current IWT research and future innovation needs, focuses on deploying green and connected inland waterway transport, evaluates NAIADES III, and prepares a policy agenda.
This project received funding from Horizon Europe research and innovation programme of the European Union under grant agreement No 101137650.
https://platina4action.iwtprojects.eu