WATERBORNE TECHNOLOGY PLATFORM

# Strategic Research Agenda for the European waterborne sector

June 2025

## Towards a resilient, competitive and sustainable waterborne sector



The Waterborne Technology Platform (TP) has been set up as an industry-oriented Technology Platform to establish a continuous dialogue between all waterborne stakeholders, such as classification societies, shipbuilders, shipowners, equipment manufacturers, infrastructure and service providers, ports, universities or research institutes, and with the EU Institutions and EU Member States. Currently, Waterborne TP represents more than 120 members, originating from 19 EU Member States and four European countries associated with Horizon Europe. As one of our key activities, the Waterborne TP is coordinating the private side of the Co-Programmed Partnership on Zero-Emission Waterborne Transport (ZEWT).

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# 1. Preface

## 1.1 Context and drivers

The waterborne sector is a dynamic sector, featuring a diverse array of public and private stakeholders. 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) form the largest part of the EU waterborne sector and play a crucial role in the sector and the broader European economy. The sector encompasses various types of vessels and services, categorized based on power requirements and autonomy[1]. These categories include **inland waterway transport vessels, ferries, short sea, cruise, intercontinental and offshore ships, as well as underwater and unmanned vehicles**. 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. Finally, the sector is a key solutions provider for the broader blue economy, like the development and production of offshore wind platform technologies and the design, production, maintenance and operation of specialised vessels.

The waterborne sector is **critical for Europe's trade and economy**, handling nearly 90% of international trade, with 81% of the EU's external trade and 40% of its internal trade carried by waterborne transport. Beyond trade, the sector is a significant employer in the EU, providing 4.2 million direct jobs and contributing approximately € 500 billion annually to the EU's Gross Domestic Product (GDP). The European fleet is one of the largest in the world, representing 35% of the global shipping fleet[2]. Moreover, the European maritime technology sector[3] is a global leader in high-technology shipbuilding (such as maritime and inland cruise ships, electric ships, offshore support vessels and platforms[4] as well as underwater and unmanned vehicles) and in **green and smart port and shipping** technologies (such as battery electric solutions, clean engines, exhaust treatment systems, green equipment, smart technology for improved efficiency and operations and automation). European companies supply almost half of the world's maritime equipment and have played a leading role in designing and developing most of the global fleet's power systems.

The sector actively invests in research, development and innovation **to remain a frontrunner** in the global **green and digital** transformation. It plays a significant role in reinforcing the **EU's resilience in terms of trade, security, defence, energy supply, and sustainability,** while enabling the transition towards sustainable energy and a more robust supply chain. Ports, in particular, serve as strategic hubs for enabling the energy transition, promoting modal shift, and advancing the decarbonisation of waterborne transport.

Due to it inherently international nature, the waterborne sector is subject to regulations at multiple levels: international, European, regional, national and local. This includes ambitious environmental objectives, like the **EU's target of a 90% reduction in net greenhouse gas emissions**, as well as sector-specific policy objectives outlined in the upcoming **comprehensive port strategy** and the **industrial**

[1] https://www.waterborne.eu/images/231229_SRIA_Zero_Emission_Waterborne_Transport_2.0_clean.pdf
[2] https://ecsa.eu/european-shipping-key-for-europes-security-with-35-of-global-fleet-studies-find/
[3] https://www.waterborne.eu/images/documents/200527_Zero-Emission_Waterborne_Transport_Proposal_Final_Version_Spread.pdf
[4] https://www.waterborne.eu/images/240910_Press_release_Draghi_report_calls_for_a_dedicated_waterborne_partnership.pdf

**waterborne strategy**. **A joint and coordinated approach** towards **research, development, innovation and the deployment of innovations** is critical to achieve policy objectives.

## 2. Technology Leadership in Waterborne

Research, Development and Innovation (RD&I) are key to retain or increase the competitiveness of the European waterborne sector. **Technology Leadership**[5] will be essential to remain a worldwide frontrunner in the design, production, development and implementation of innovative technologies and solutions.

> *Competitiveness implies that the results of RD&I provide the European waterborne sector with a frontrunners position regarding the technology developed. In addition, it implies a competitive advantage of the waterborne transport sector in comparison with other modes of transport.*

The development of solutions is often interlinked with policy developments. Policies defined, for example, to protect the climate, mitigate climate change, stimulate economic development, improve the quality of life for citizens, and ensure the strategic autonomy of the EU. ***Technology leadership implies being a frontrunner in enabling the transformation, which entails developing and deploying competitive solutions that mitigate climate change, provide the capability to become climate resilient, eliminate all harmful pollutants, improve working conditions or create new jobs, and stimulate economic prosperity***, all while ensuring safety and security.

For the coming years, **digitalisation, circularity (or sustainability in the broad sense of the word) and competitiveness** will be the key hooks for research, development and innovation activities. Europe's waterborne value chain is a frontrunner in the development of innovative technological solutions and is engaged in implementing technologies to reduce and ultimately eliminate Greenhouse Gas (GHG) and air and water pollutant emissions from waterborne transport. Furthermore, the value chain is a leader in the digitalisation of the waterborne sector. A competitive value chain also heavily depends on a **resilient supply chain** that can source the entire product from raw materials to finished high-tech parts. **Reliable delivery** equally requires a well-connected and innovative trans-European network.


[5] https://www.waterborne.eu/images/24_01_15_Annex_5_Waterborne_Long_Term_Strategy.pdf

Stimulating the systematic deployment of economically viable innovations, will provide the European waterborne sector with a frontrunners position and stimulate the transition towards a resilient, competitive and sustainable European maritime technology sector. At the same time, this presents opportunities to export European expertise and products to the global market.

(Complex) vessels are typically one-off orders built in very short series, meaning that a significant amount of engineering work must be performed for each new project. To ensure the frontrunners role of the European waterborne sector, and the stimulation of demand at the European maritime technology sector, a systematic approach towards deployment of innovations is required. This could be further analysed per product type as in table 1.

This requires that all key players team up, including 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. In addition, financial institutions, and in case of electrification, utility companies, should be involved. As regards digitalisation, there is for example a need to ensure adequate 5G coverage, and relevant organisations should be involved. On a case-by-case basis, additional stakeholders need to be identified. The systematic approach would solve the "chicken and egg" dilemma as regards sustainable alternative energy carriers. In addition, green corridors (for liner traffic or traffic in certain regions, could be established). This will have a spin-off effect for other segments of the waterborne sector (e.g. in ports) or for other modes of transport or industries (e.g. in the hinterland).

The European waterborne sector is committed to mobilizing significant investments in research, development and innovation (RD&I), education and skills development, and deployment across the full value and supply chain, including SMEs, start-ups, and regional actors. These efforts must be supported by coordinated, forward-looking EU policies and funding instruments, from Horizon Europe to the Innovation Fund, the Connecting Europe Facility, and their successors in the Multiannual Financial Framework 2028 - 2035.

*Table 1: Involvement of the European waterborne sector in different products and services*

| | IWT | Short Sea Shipping | Ferries | Cruise | Intercontinental | Offshore | Blue Economy |
|---|---|---|---|---|---|---|---|
| Shipowners | X | X | X | X | X | X | X |
| Shipyards | X | X | X | X | (X) | X | X |
| Equipment manufacturers | X | X | X | X | X | X | X |
| Ports | X | X | X | X | X | X | X |
| Infrastructure and service providers | X | X | X | X | X | X | X |
| Classification societies | X | X | X | X | X | X | X |
| Research | X | X | X | X | X | X | X |
| Financial institutes | X | X | X | X | X | X | X |
| Energy suppliers | X | X | X | X | X | X | X |
| EU/MS | X | X | X | X | X | X | X |

(x) = retrofitting

# 3. Missions of the Waterborne sector

The European waterborne sector is committed to contribute to a competitive, resilient and sustainable future of Europe. To that end, the sector has developed ambitious visions based on a series of cross-sectoral missions and focused on the transformation of waterborne transport, the ports and specific contributions of the sector to ensure a flourishing future of certain activities in the blue economy.

Accordingly, waterborne stakeholders have set out three main priorities and developed ambitious visions around them:

- The transformation of waterborne transport.
- Technology leadership in blue economy sectors; and
- Optimising the link of waterborne transport with ports and logistics operations.

## 3.1. The transformation of waterborne transport

Waterborne transport will be the most resilient, competitive and sustainable mode of transport by 2050. To achieve this, all harmful emissions to air and water, as well as noise pollution will be eliminated. Zero accident and zero-fatality goals will also be realized. In parallel, digitalization will unlock the value of data, enhancing flows and enabling higher levels of automation and autonomy. These developments will improve operational efficiency, energy performance, safety, and overall sustainability and reliability across the logistics and mobility chain. This transition will be facilitated by a resilient, competitive and sustainable maritime technology sector along the entire value chain. Finally, the transformation of waterborne transport has the potential for spin-off to the defence sector.

### *3.1.1. Zero-emission waterborne transport*

#### Vision

By 2050, waterborne transport will be the most sustainable mode of transport. To achieve this aim, all harmful environmental emissions (including greenhouse gas emissions and other harmful pollution to air), as well as water pollution, waste and noise, will be eliminated. This will be achieved by utilizing sustainable alternative energy carriers with highest possible efficiency and optimized use of hybrid power systems whilst also capitalizing on other forms of renewable energy such as wind, solar and wave. Cross-sectoral cooperation with other modes of transport and even other related sectors, embracing the overall logistics and mobility chain, will be essential. The identification of innovative business models will be crucial in reaching such targets.

#### Mission

By 2050, the European waterborne transport sector will eliminate any negative influence on the environment, enabling customers to choose the most sustainable form of transport. The European waterborne sector will extend its global leading position in zero-emission waterborne technology and expertise to increase the global market share of the European waterborne sector, providing new highly qualified jobs and stimulating overall growth.

### 3.1.2. Safe and secure waterborne transport

#### Vision

The European waterborne sector will strengthen Europe's lead in waterborne safety and security in two ways. First, by 2040, new technologies and new methodologies will radically improve the management of the safety of vessels and of their operations and will contribute to zero fatalities. Then, by 2050, the waterborne sector will build and operate its fleet with a radically improved safety culture – applied onboard as well as on-shore – and characterized by zero accidents, zero loss-of-life and zero pollution, while ensuring secure data exchange and cybersecurity.

#### Mission

The European waterborne sector will preserve safety as a cultural value in all its activities, its products and its infrastructure. It is essential to protect the life and preserve the health of the waterborne workforce, passengers, and citizens living in coastal areas, near waterways and lakes, because we care about people. Sufficient consideration must therefore be given to social sustainability. The waterborne sector pursues a zero accident, zero fatalities, zero pollution policy and has an avowed policy to protect ships, vessels and infrastructures from perils, cyber-attacks, piracy and terrorism. Safety shall be ensured in developing new types of vessels and equipment that will become more complex. The sector shall safely enable new operating conditions and business models by developing new products and supporting the safe introduction of new technologies, materials and fuels.

The position of the European maritime technology sector will be strengthened by delivering safe and secure vessels. Europe will represent the forefront of innovation in safety defining standards, enabling the application of new materials and ensuring a safe "marinization" of innovative technologies. On the basis of a solid safety culture and by leveraging European technical excellence, technical contributions shall be provided to the process of regulatory definition at IMO, CESNI, CCNR, UN-ECE and other competent bodies.

### 3.1.3. Connected and automated waterborne transport

#### Vision

Digitalization will connect smart vessels as well as smart ports and smart infrastructure and maintenance. It will enhance data flows leading to a higher degree of automation and autonomy, automated and autonomous systems, ship operations (both maritime and inland navigation) and remote control from the shore by 2040. Future ships and vessels will be designed so that they can be continuously updated with the digital technologies throughout their lifecycle. Digitalisation will not only improve nautical operations, safety or the energy-efficiency of waterborne transport, but will also improve logistics and mobility flows.

#### Mission

The European waterborne sector will increase efficiency, flexibility and safety by means of the transformation of business models and automation of operations, thereby increasing the share of waterborne transport in the worldwide and regional logistics and mobility chain. It will develop, implement and maintain automated and interconnected work processes in waterborne integrated systems and infrastructures, enabled by digital vessels, with a focus on improving efficiency in waterborne logistics. The digital capabilities throughout the whole value chain from the waterborne fleet to ports and equipment providers will be developed to support efficient and resilient operation The sector will aim at the largescale introduction of resilient and secure autonomous operations in 2050 and will extend its global leading position regarding the integration and automation of waterborne systems, utilizing its strengths in developing creative solutions and cooperation with all stakeholders. Europe will keep its leading position in terms of the deployment of integrated automated systems and will set the standard in data exchange and communications.

### *3.1.4. A resilient, competitive and sustainable maritime technology sector*

#### Vision

By 2040, digitalisation will also lead to the use of advanced design and production technologies, which will deliver flexible and cost-effective vessels and offshore structures with competitive production costs and increased productivity by 30% compared to current levels. Digitalisation will furthermore contribute to the establishment of an entire production chain of safe, competitive and eco-friendly maritime technology companies. It will enable European shipyards to master the increasing complexity of ships and vessels, maintaining their leadership in high complex, high added value vessels and increasing their market share of vessels of other types.

#### Mission

The waterborne sector will be the world leader in design, engineering, construction and maintenance of vessels, equipment, infrastructure and integrated complex systems, equipment and infrastructure throughout their lifecycle.

The European waterborne sector will provide ship-owners with zero-emission and digital vessels in accordance with the highest technical standards. The sector will provide a safe working environment, with a zero-accident target and long-term job creation through the local networks. The maritime technology companies will ensure green operation with zero emissions into the environment and 100% recycling of production waste and decommissioning. The complexity of the construction of a vessel or other floating structures requires excellence in design, engineering and construction. The various segments of the blue economy offer potential for the further growth of the sector, as long as it maintains the capability to manufacture a large range of products, thereby maintaining and diversifying specifically tailored production.

## 3.2. Technology leadership in blue economy sectors

The waterborne sector is a key enabler for many of the related blue economy sectors, such as fisheries, aquaculture, renewable offshore energy as well as critical infrastructure at sea and underwater. The waterborne sector will be the worldwide leaders as regards the design and manufacturing of offshore infrastructures, pipelines, cables, etc. and in the support of their maintenance, operation and protection. Furthermore, the waterborne sector will be the frontrunner in the development of artificial islands for different purposes such as floating piers, ports, energy island or for living at sea. Finally, enhancing the technology leadership in emerging blue economy sectors has the potential for spin-off to the defense sector.

### *3.2.1. A leader in the design, production, operation and maintenance of specialised blue economy vessels*

#### Vision

By 2040, the European waterborne sector unlocks the full potential of building, equipping, maintaining, operating and dismantling specialised vessels for the different segments of the blue economy. Besides the developments in zero-emission and digitalisation, the principles of integrated and circular business models will be fully exploited by 2050.

#### Mission

The waterborne sector will be the world leader in design, engineering, construction and maintenance and operation of specialised blue economy vessels, inter alia, fishing vessels, leisure boats, supporting vessels for the European aquaculture and tourism sector, vessels for advanced environmental monitoring, carbon capture and storage (CCS), underwater drones underwater unmanned vehicles.
The European waterborne sector will provide the blue economy sector with safe, secure and stable vessels in accordance with new rules, regulations and policies to be jointly developed. The potential of digitalisation will be fully unlocked, to contribute to a resilient, competitive, safe, secure and sustainable blue economy. Finally, the development of skills will be essential to unlock the full potential of the blue economy.

### *3.2.2. Resilient, sustainable and interconnected infrastructure*

#### Vision

By 2040, the European waterborne sector will design, build, maintain and operate resilient, sustainable and interconnected infrastructure for the benefit of the waterborne and blue economy sectors. By 2050, the full utilization of digitalisation will be integrated in the operation and maintenance of infrastructure, as well as the concept of working with nature and nature-based solutions. The effects or regional differences (e.g. temperatures, differences in activities on the waters) will be fully included in the concept designs for the infrastructure.

#### Mission

Resilient, sustainable and interconnected infrastructure is critical for the functioning of the European waterborne sector and the blue economy. This concerns emerging permanent and semi-permanent infrastructure at sea, as well as more permanent constructions like offshore wind platforms. Offshore ports and floating offshore substations will provide a new opportunity for a sustainable use of oceans. In addition, the support to building, maintaining and operating critical undersea infrastructure will be key for the security of Europe. Finally, resilient and interconnected waterways are critical to the functioning of the inland waterway transport sector in Europe, as well as for supply of water to the population, industries, energy companies and agriculture around these waterways. Finally, developing and deploying infrastructure at sea, inland or in coastal regions will be critical to the functioning of Europe, specifically with climate change effecting current infrastructure and living areas. Europe is a

and should remain a frontrunner in working with nature and nature-based solutions, including its unique dredging sector.

## 3.3. Optimising the link of waterborne transport with port and logistics operations

Changes in global trade will impact waterborne transport. Seaports are key ecosystems for the economies of the (surrounding) countries, regions and cities, but they face congestion and other challenges limiting their flexibility and potential growth. Inland ports also have a role as a logistics node, alleviating road congestion and strengthening the local and regional economies. Ports need to respond to the continued increase in maritime and hinterland traffic, to new challenges raised by environmental, safety and security issues and to the emergence of new business models for waterborne transport and offshore activities.

By 2050, due to demographic, technologic and societal changes, the demand for trade of freight and passenger traffic will be significantly different than it is today. Better use of uncongested transport by water in multimodal logistics and mobility will reduce the impact on the living environment, safeguarding air quality, safety and living and working conditions in cities, while increasing their competitiveness through effective and reliable transport, as well as sustainable jobs.

Ports are integrated in the urban fabric. The location of ports in urban environments has created opportunities for seamless multimodal logistics and mobility. Land use planning schemes have replaced the mono-function management of space with a shared use of the waterfront for housing, distribution, leisure, alternative energy, multimodal mobility and logistics.

In addition, ports have become hubs of clean energy, serving multiple modes of transport, as well as surrounding villages, cities and industries.

Finally, ports play a facilitating role in military mobility.

### *3.3.1. Port operations*

#### Vision

By 2050, ports will offer fast, reliable and resilient services with zero-waste and zero-emissions in a safe and secure environment. Ports will be able to achieve zero-emissions in their own port operations to adapt to the new demands following the energy transition. Digitalisation and other new technologies will allow the development of new digital and automated port environments to facilitate more efficient and competitive port operations. This dynamic will increase the capacity to accommodate changing cargo and passenger flows and to adapt to new energy demands.

#### Mission

Port operations serve both the vessel and the cargo and passengers that pass through the ports. Port operations add value to the port infrastructures by providing nautical services (signalling, traffic management, locks management, piloting, mooring, towage, etc.) and other complementary services (dredging, bunkering, waste management, inspection, maintenance, etc.). Port operations add value to the port ecosystem by providing a smooth cargo and passenger flow in their transition to the next node in the transport chain, providing efficient cargo handling services and seamless connections between transport modes. Port operations furthermore serve an important role in Europe's security facilitating military mobility and safeguarding geo-political and geo-economic resilience, for instance by serving as an energy hub.

Our mission is to develop solutions for port operations to meet the future challenges of the waterborne sector, focusing on capacity, efficiency and environmental, social and security concerns. Energy transition, the circular economy, digitalisation, automation, cyber security and inter-modality, will play a crucial role. Specific attention should be given to how to deal with the transition from the current situation to a new state. An example of this is how to ensure safe traffic management in a situation with mixed traffic of autonomous and manned vessels.

### 3.3.2. Towards digital and green maritime and hinterland corridors

#### Vision

By 2050, port actors will connect and integrate maritime and hinterland logistics to a point where they offer the lowest costs and the fastest, most reliable service with zero waste and emissions in a safe and secure environment. Inland waterways and railways corridors will evolve rapidly and play a crucial role in achieving these objectives, offering integrated multimodal solutions. Technological and logistical developments will allow real time information (digital corridors) to flow throughout the entire supply chain, providing the opportunity to transfer the cargo in a seamless way and offering customer-tailored solutions. This dynamic will enable an innovative business environment and will foster the smart collaborative planning of ship/vessel to hinterland logistics. The integration of maritime and hinterland logistics will also provide expanding services to waterborne tourism and mobility.

#### Mission

Ports are key multimodal nodes linking maritime and hinterland logistics. Therefore, seaports and inland ports are not isolated, and their challenges are those of the logistics and transport system. The waterborne sector plays a key role in the integration of maritime and hinterland logistics, paying special attention to inland waterways and multimodality. The logistics sector is facing the new challenges of the logistics and transport system (characterised by capacity, efficiency, environmental, social and security concerns) through the development of new digitalisation concepts such as the physical internet, which involves innovations in modularisation, intelligent cargo units, the setting of standards, collaboration schemes, robotization and artificial intelligence. This requires a further step forward in terms of the integration of maritime and hinterland logistics, in which the waterborne sector, including seaports and inland ports and waterways should retain a leading position and develop new versatile concepts for integrated door-to-door transport solutions. In developing these innovations, special attention needs to be given to cybersecurity and resilience of the network. The concept of Autonomous Cargo Transport is also a key challenge to boost more efficient solutions to move cargo by means of autonomous ships and logistics.

Besides the field of digitalisation, collaboration of logistics networks also has an important role in the adoption of new energy carriers through the setup of green corridors. Collaboration between different public and private stakeholders on specific maritime or hinterland trade lanes can assist in alleviating technical, operational and financial barriers for adopting sustainable alternative fuels. Numerous initiatives worldwide have started, with a great variety in goals and scope of the collaboration. Current experiences show that roll out of the concept of green corridors requires innovations in business models (such as risk sharing models) and digital decision support tools.

### 3.3.3. Port infrastructure

#### Vision

By 2050, port infrastructures will increasingly support and become integrated with port operations and maritime and hinterland logistics by establishing flexible and resilient solutions for future vessel types, hinterland logistics, new port activities and climate change. In this respect, new facilities for the bunkering and supply of sustainable energy carriers and supply of shore power for vessels, port activities and society will be developed. Cutting-edge adaptive secure communication (5G-6G, Satellite solutions, etc.) and IT architecture (real time information, etc.) will be introduced to the benefit of traffic and port management (Smart Port concept). In addition, ports will function as hubs of sustainable alternative energy, with the required infrastructure in place. City-port-nature oriented planning (building with nature, smart industry, coastal recreation, etc.) will promote leisure and business integrated hubs for passenger transport, closely linked to public transport, the cities and the local tourism sector.

## Mission

The port infrastructure is the base for port operations to serve the vessels, cargo and passengers which pass through them. The development of port infrastructures requires capital-intensive investments, a long lead-time and therefore long-term planning. This implies that the design of port infrastructures should anticipate the needs of the waterborne, logistics and transport sector. This is an especially difficult task at a time when the transport and logistic sector is immersed in a deep transformation, as is currently the case, affecting both maritime and inland aspects (new sustainable energy carriers, shore power, autonomous transport and cargo handling, self-organising logistics, offshore port infrastructures, etc.). Port infrastructures should also anticipate and adapt to the development of new waterborne activities (blue economy or circular economy) and to other external factors, such as new extreme weather conditions resulting from climate change. There is a need to design more flexible, intelligent and resilient port infrastructures which are able to adapt to future requirements. The European waterborne sector should identify and develop different lines of research and innovation in order to adapt port infrastructures to this vision of the future implementing digital data collection and Decision Support Systems accordingly.

The waterborne sector wishes to lead a long-term business transition; port infrastructures will become adaptive to vessels, inland waterways and offshore activities but also new types of cargo supporting blue economy, which are suited to further scalability. Connectivity and integration will be developed to ensure continuity among different transport means and different vessels and vehicles. Infrastructure must be resilient to environmental challenges. To accommodate the fast implementation of the energy transition, clarity is needed on the most likely transition path.

The development of new, more flexible solutions for bunkering and energy management is required to enhance the resilience of investments in sustainable alternative energy carriers. For the uptake of these energy carriers, standardised equipment, procedures and training need to be further developed to ensure a safe and efficient uptake. To facilitate the uptake of the use of onshore power supply in ports throughout Europe, flexible and adaptive solutions are needed to take into account local port conditions. An important factor in this regard is the availability of sufficient electricity throughout the port to cover the demand of shipping, but also the demand of all other infrastructure (and industry) in the port. Flexible solutions, such as use of moored vessels as temporary local storage of energy need to be explored. The adoption of Clean Power Supply Plans and the management of the energy produced, transported and distributed at ports have to been aligned with the strategies of the port stakeholders from an holistic point of view.

Port infrastructure should also integrate intelligent technologies and efforts should be made to allow infrastructures to be able to collect data in order to meet all requirements from the point of view of the market and the maintenance of the infrastructures themselves. Within European ports, infrastructure will be developed following the paradigm of city-port-nature oriented planning, cohesively linking waterborne transport to the territory in a sustainable manner. The social, education, political and regulatory elements are fundamental to future changes in the sector. The workers and the inhabitants of the cities annexed to the ports, etc. are the sector's main assets as both customers and suppliers of labour to ensure the sustainability and viability of the infrastructures through which the cargo and the associated information move.

# 4. Annex I

## 4.1. List of definitions

The purpose of this list is to clarify the meaning of some of the terms in the document to facilitate the reader's understanding.

***Blue Economy***: In the 2024 EU Blue Economy Report[6], the European Commission defines the Blue Economy as activities that are marine-based and marine-related activities which use products and/or produce products and services for the ocean and marine-based activities."

***Waterborne Sector***[7]: The European waterborne sector includes all relevant actors of the sector, including, inter alia, shipyards and equipment manufacturers, shipowners (both maritime and inland navigation), ports, classification societies, blue economy, infrastructure and service providers and the academic and research communities. It includes, inter alia, all main ship types, included in the cPP Zero-emission waterborne transport, and has been extended with underwater vehicles: inland waterway transport vessels, ferries, short sea shipping, offshore, cruise ships, long-distance shipping, underwater and unmanned vehicles.

***Digitalization***[8]***:*** Digitalization is the broad transformation of societal and business models through the adoption and strategic integration of digital technologies. Research, development and implementation will focus on programs to improve efficiencies, enhance customer experience, provide new opportunities, enable automation, drive innovation and results in a more agile and competitive organization.



[6] https://oceans-and-fisheries.ec.europa.eu/news/eu-blue-economy-report-2024-innovation-and-sustainability-drive-growth-2024-05-30_en
[7] https://www.waterborne.eu/images/250123_Waterborne-Digitalization_Paper_Digital_Version_Final.pdf
[8] https://www.waterborne.eu/images/250123_Waterborne-Digitalization_Paper_Digital_Version_Final.pdf