

VISION 2020

**Waterborne Transport & Operations
A Key Asset for Europe's Development and Future**



WATERBORNE^{TP}
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Table of Content

Foreword	4
Waterborne transport partners – a grown and proven European maritime cluster	5
Partnerships and Collaboration	6
A vision for 2020	7
Overview of global issues, trends and driving forces	8
The pillars of the vision:	
1. Safe, sustainable and efficient waterborne transport	11
2. A competitive European waterborne industry	15
3. Managing and facilitating the growth in transport volumes and the changes in trade patterns	20
Cross industry enablers	22
From vision to implementation	25
A European Strategic Innovation Alliance:	
Stakeholders and objectives	25
Steps to implement the Waterborne Technology Platform	25
Commitment	25
Principles and Bodies of the Waterborne Technology Platform	27
Photos reference	30

Foreword



The history of civilisation and of commerce cannot be separated from that of waterborne transport. Trade of goods, passenger transport, exchange of knowledge, and the development of cities, regions and even civilisations,

were in past centuries often only possible by means of waterborne transport.

It is impossible to imagine today's Europe without waterborne transport and its related operations. Waterborne industries underpin our way of living by facilitating the supply of goods, food and energy as well as personal mobility and leisure on the water. The redistribution of goods from road to both waterborne and rail transport should much assist in avoiding transport constraints and slowing Europe's growth. The waterborne industries are economic enterprises in their own right, providing employment and contribute to Europe's economic development and competitiveness.

The waterborne sector has developed dramatically over the past century and has become increasingly complex in terms of specialised sub-sectors, technology, systems and in global competition. Indeed, globalisation and the need for a continued competitiveness bring threats, but equally offer opportunities to be exploited to the fullest extent. The World will not be standing by to see how and what Europe's waterborne sector develops and, while regulatory and economic pressures are setting boundaries, world wide competition is fierce and not always happening on a level playing field. However, all branches of the European maritime industry are still among the world leaders.

This paper describes a medium and long term vision in the true meaning of the word, as initiated by the 'cluster' of maritime industries and developed within the Waterborne Technology Platform. This vision aims to categorise where

the industries would like to stand by year 2020, the ambitious targets to be met and the related innovation challenges. These targets cannot be rigid in a dynamic environment and are subject to technological as well as economic feasibility; they therefore represent well considered drivers and challenges for innovation towards 2020, not absolutes nor deadlines. There is a responsibility for the partners in the Waterborne TP, ranging from the industry sub-sectors and research institutes to national governments and the EU institutions to address these innovation challenges in a joint undertaking.



The relation with the EU Lisbon Agenda, driving towards growth and employment through innovation is obvious. Coherent initiatives taken in the waterborne sector to support the continued focus on cooperation, innovation and technology leadership, the purpose for which the Waterborne TP has been launched, will provide the competitive edge for the European maritime industries required to retain their global leadership.

Partners in waterborne transport

– a grown and proven European maritime cluster

The European maritime industry consists of thousands of companies, organisations and professional bodies including: ship owners, barge owners, shipyards and boat builders, equipment manufacturers, systems suppliers, classification societies, ports and port services, engineering services and other knowledge providers. Many of these individual companies are SME's; several are international leaders in their business and sub-sectors and intend to remain so.

They serve Global and European supply chains through shipping services, operation of passenger transport, they are providing related infrastructures and logistics, coastal protection and

dredging works, ships and equipment for both merchant and military applications, as well as for the exploration and exploitation of the oceans, and they satisfy the demand for holidays and leisure at sea. At the same time, these businesses hold many common elements, commercial interests and often also have a “customer-supplier” relationship.

People employed in the waterborne sector, irrespective of which actor and in which sub-sector they are actually working, have a comparable background of qualification, know-how and experience, technically mainly basing on navigator-, naval architect- or marine engineering education, but also at managerial level.

To meet the current and future challenges new exploitation routes are essential. This is a common theme for all stakeholders in the waterborne community.

Despite the diversity of activity and business interests, it is the synergy created by a common environment and by shared challenges, that has linked the participants together in a successful “maritime cluster”, long before this jargon became fashion. The waterborne sector demonstrated this cluster-approach in the early 1990s by creating the Maritime Industries Forum (MIF), which also defined an initial research agenda in form of the Maritime Industry R&D Master Plan.





The **European Waterborne Sector** has been **successful in its global positioning**.

Some examples:

- European shipbuilders are world market leaders by turnover, reflecting the focus on high value ships, e.g. almost all cruise ships are developed and built in Europe
- The European ship systems and equipment suppliers' products are highly sought after on the world market, around 50% of their production is exported outside Europe
- Around 40% of the world merchant fleet is beneficially controlled by European companies, approximately 25% are flying the European EEA flag
- Almost 100% of the dredging technology and know-how is European. European companies dominate the world dredger and the free dredging market
- Among the top 5 world ports 3 are European
- The European Oil & Gas Service Industry is a world technology leader, exporting 70% of products. The top 3 engineering companies in this sector are European
- European maritime industry spearheads environmentally friendly technologies: e.g. European equipment suppliers have provided on-board total waste management systems ahead of future environmental regulations.
- European inland waterways and transport operators offer a unique and high quality capacity transport system, alternative or complementary to other modes.



»»» *Partnerships and collaboration*

It could be argued that innovation is primarily a task for individual businesses to further enhance their competitive position. However, it is evident that within the sector, the definition of needs, the setting of targets and the assessment of boundaries in R&D efforts, has always and will further benefit greatly from cooperation across the sector.

The medium and long-term vision of the waterborne sector, is broad and comprehensive. It seeks to coordinate the efforts of all stakeholders behind a strategy for competitive excellence dedicated to meeting market and society's most essential needs.

A vision for 2020

The **Starting Point** of the medium and long term vision is that waterborne operations

- are a major source of high qualified employment in Europe, including the related production industry and the research area
- are the most cost efficient, cleanest and safest mode of transport
- do enable the transport of very large quantities of goods and materials
- are one of the key facilitators of globalisation and a driving force of competitiveness
- are a backbone of European regional development and cohesion
- are contributing to solving Europe's traffic congestion problems
- are necessary to protect the European coastal environment
- are necessary to explore and exploit the "unknown continent": the ocean
- are necessary to gain food and energy from the sea
- are an increasing contributor to the European societies tourism and leisure activities
- are an important source of enjoyment for some 32 million Europeans a year
- are reliant on global regulation to reflect shipping's global nature
- have a strong European leadership

»»» The scenario and the related challenges

Building a worldwide scenario with a 2020 horizon is necessarily based on forecasts, assumptions and educated guesses. It is also subject to uncontrollable geopolitical and socio-economical developments and contains a fair degree of uncertainty. However, some global issues, trends and driving forces influencing the future development of waterborne transport and the related industries are relatively clear, they are listed below¹.



Overview of global issues, trends and driving forces

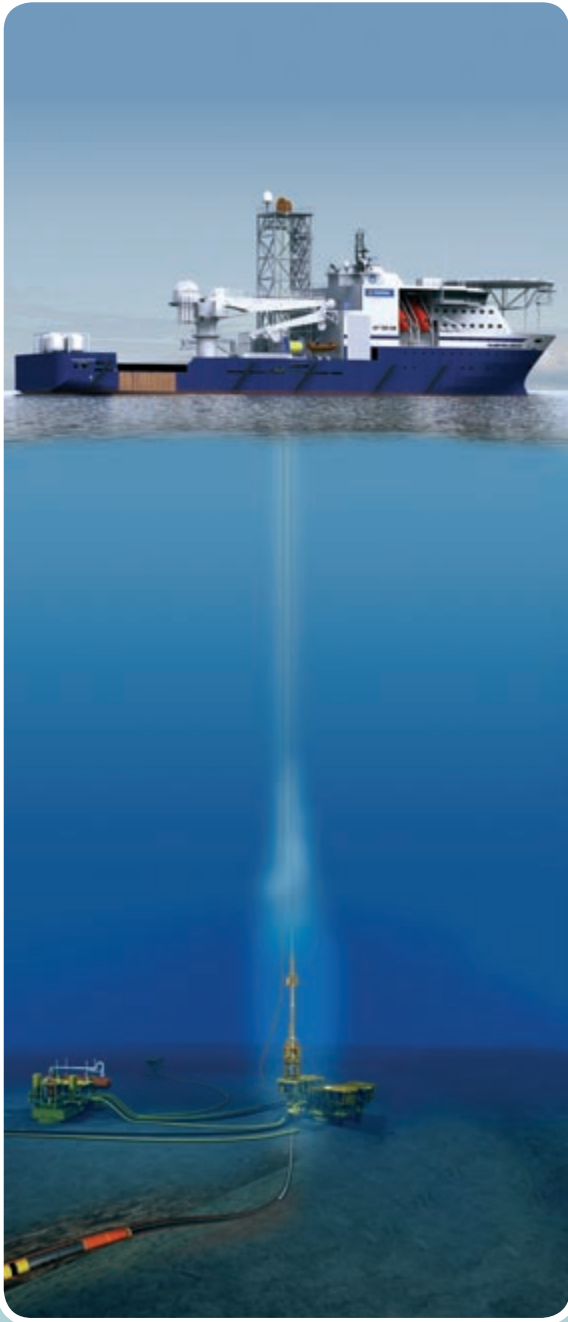
► Population, society and politics

- Production is no longer necessarily located close to the (main) markets
- A competitive low cost and educated labour force, good operational infrastructure and efficient transport services for raw materials are increasingly becoming the deciding factors in the choice of production location
- There is strong population growth in China, South East Asia, on the Indian sub-continent and in South-and Central America.
- The centre of gravity of economic development is moving towards Asia and S.E. Asia
- Know-how and ability of employees and companies is becoming increasingly specialised
- The mutual dependency between employees and companies is reducing strongly (no more life-long career commitments)
- The average age of the work force in the traditional (western) economies is increasing and the availability of highly qualified talent is scarcer
- Health, safety and environmental issues will continue to grow in importance, leading to stricter regulation, especially in the more developed and industrialised countries
- Public concern, national and international policy and legislation will focus increasingly on the environment, including lower emission levels and measures to reduce traffic congestion
- The mobility of persons for work and leisure will continue to increase
- Regional economic, political and security cooperation will increase
- International security concerns will have an impact on the supply chain and international transport operations and procedures, negative and positive
- Enhanced wealth and longer lifetime will offer opportunities for leisure related products and services
- The marine coastal zones will be used more intensively
- Negotiations with the WTO, to set international rules for trade in goods and services, for trade facilitation and potentially also for investment and guidelines for competition should lead to a much enhanced fair trade environment and legal certainty

► Natural resources, energy and environment

- Use of materials and energy are drawing increasing attention for environmental and cost considerations
- Energy consumption will continue to increase at an estimated 1.7% annually up to 2030 (IEA 2002 report)
- Developing nations will probably show an exponential growth of energy consumption in relation to growth in economic activity and/or GDP
- Supply of food for the poorer nations and supply of fresh water in the World at large will become increasingly critical





- Environmental considerations, costs and availability of natural resources will lead to a shift in energy sources (oil to LNG to hydrogen and renewable energy, perhaps a revival of nuclear power)
- International energy trade, almost entirely in fossil fuels, will expand dramatically. Cross-border gas pipeline projects will multiply, and trade in LNG will surge
- Demand for LNG shipping capacity will increase substantially
- Recently observed increasingly violent weather conditions – related to climatic change/global warming or not – may well be there to stay

► Economics and business development

- Markets will become global with the same products demanded and available the world over
- Regional trade appears to be growing more strongly than intercontinental trades
- New business models will be increasingly based on intelligent products and branding
- Takeovers and mergers aimed at market leadership in core businesses will continue, commonly based on efficiency considerations and even competitive survival.
- There will be an increased outsourcing of production and services, even of innovation and design
- Larger multinational industry groups will continue to reduce their supplier base and demand more tailor made (semi-) products and services at very competitive terms
- The drive for efficient production frequently results in a mismatch of (current) market demand and supply capacity
- The above trends may well vary substantially between type of products, e.g. foodstuffs, consumer electronics, industrial equipment, construction etc

► Knowledge and technology

- The life cycle of products will continue to shorten
- Development, production, procurement, logistics and marketing will become more and more complex
- E-commerce will have a strong impact on traditional and captive markets
- The increasing demands of growing world trade for cost-efficient transport will lead to larger (container) vessels, changing transport patterns and changing land-side requirements
- ICT development will continue progressively, offering efficient information exchange, automation, new tools for design, production, distribution and market access for products and services, new business models
- Continuous improvement of supply chain management will lead to a reduction of idle and transfer times, further operational integration between modes and changes in the transport management roles
- Development in technologies for other sectors will have an impact on and offer opportunities for maritime industries



The waterborne medium and long term vision is carried by **three pillars** and has been structured accordingly:

1 *Safe, sustainable and efficient waterborne transport*

2 *A competitive European waterborne industry*

3 *Managing and facilitating the growth in transport volumes and the changes in trade patterns*

I. Safe, sustainable & efficient waterborne transport

Waterborne transport is the most sustainable, fuel-efficient and environmentally friendly transport mode. However, ships with their unique capacity to transport very large quantities of cargo or large numbers of passengers, must always have a strong focus on safety and environmental protection. Special consideration is required of the consequences of accidents, particularly in sensitive coastal areas. The development and expansion of port capacity and hinterland connections requires appropriate consideration for the preservation of natural habitats in the surrounding areas. Waterborne operations must be protected

against security threats, without losing efficiency. The EU shipping industry in close collaboration with public authorities has progressively acted towards the enhancement of safety at sea and environmental protection through actively participating in the development of appropriate measures on an international basis. A global approach to rules and regulations is essential and must be continued. The European shipbuilding and equipment industry is the world leader in the development of environmentally friendly ships and processes.

»»» TARGETS

In 2020, advanced technologies, procedures and systems for deep and short sea shipping, port services and inland waterways will enable waterborne operations to cope with growing transport and mission demands while enhancing its undisputed position as the most efficient transport mode in terms of cost, resources, low environmental impact and safety. Through this approach the waterborne transport of goods and people will be secured for the benefit of society.





• Safety & security

»» TARGETS

Serious ship accidents in EU waters and by European vessels globally will be extremely remote.

Ships designed and built in Europe will be crashworthy and will be able to operate and survive under the most severe conditions (e.g. freak waves, ice etc.)

Ships built in Europe will be equipped with on board systems for performance monitoring, which are supporting safe operation and life cycle maintenance

A risk-based regulatory framework will be operating, enabling the maritime industry to develop innovative and safe transport solutions

Safe offshore terminals with re-gasification plants will be available to satisfy the increasing demand to deliver Liquefied Natural Gas to EU consumers.

The larger numbers of recreational craft will be able to participate safely in waterborne traffic

Security will be checked and safeguarded along the entire transport chain without creating extra bureaucracy, cost, congestion or delays.

Innovation Challenges

Effective designs, systems, procedures and techniques are to be developed, to increase the level and reliability of the ship system's performance, with the goal of a "zero accident" record, in order to deliver:

- Effective means to avoid accidents
- Robust ships and reliable equipment
- Improved survival in extreme conditions (ice, freak waves, etc.)
- Competent crew, ship management and shore operations

Man-machine interfaces will have to be improved and decision support systems must be developed to minimise impact of human error

The failure mechanisms of maritime accidents must be analysed and new design, material and production principles are to be developed with the so gained knowledge.

The knowledge regarding the challenges of changing operational conditions and new (e.g. Arctic) operational areas has to be improved by research.

Designs, technologies and procedures which are sufficiently safe for such challenging operational conditions must be developed.

Effective monitoring, prevention strategies and systems for corrosion and wear are to be developed.

Predictive maintenance and inspection capability through the whole life cycle is to be enhanced, efficient tools and systems for such purposes must be developed.

Research and support information will be provided in order to specify the high level risk/goal based standards and specify detailed risk acceptance criteria, to be implemented in the international community.

Techniques and tools will be developed to increase the practicality and efficiency of risk based design, regulation and approval processes.

The load and safety challenges for such floating structures have to be thoroughly analysed by systematic research.

Based on the so gained broadened and improved know-how safe designs and technologies for floating structures have to be developed based on risk based principles.

Cheap, fool-proof and safe communication and identification equipment has to be developed, which allows small coastal craft (e.g. fishing and recreational craft, craft with amateur crew) to communicate and to be dealt with in traffic management systems.

If a political decision should be made to include all small coastal craft into traffic management systems, respective safe and efficient data models and algorithms able to cope with the huge numbers of traffic participants are to be developed as a prerequisite. Alternative safe and user friendly strategies to this approach should be developed.

Strategies, methods and procedures for safeguarding security along the waterborne transport chain (port to port), that do not reduce (waterborne) traffic efficiency, will have to be outlined and developed. Such strategies, methods and procedures should consider intermodal transport chain's needs.

Environment sustainability

»» TARGETS

In 2020 the environmental impacts of air and water emissions will be reduced drastically. Efficient and economic techniques will be available for onboard treatment of liquids and solid waste. The pollution impact of maritime accidents will be reduced to a minimum

Innovation Challenges

A 'zero emission' approach, notably on substances like SO_x, NO_x, CO₂, PM, VOCs is an enormous technological challenge. Reducing one pollutant may well have a negative effect on other pollutants, while no single option will be suitable for all types of ships. Economically viable processes, systems and equipment have to be developed under a holistic approach, ensuring a balanced long term solution.

Clean propulsion systems and economic retrofit-packages for existing ships are to be developed, as well as non-fossil based propulsion solutions for economic application on large ships. In ship design and development of ship systems know-how gained by research must be systematically applied for minimizing operational polluting discharges into water.

The development of more efficient and economic processes and environmental friendly onboard systems for treatment and disposal of liquid and solid wastes, including ballast water decontamination, would strongly support their rapid adoption.

For smaller and recreational craft cheap, efficient and fool-proof anti-pollution processes, technologies and systems are to be developed with the aim of reducing pollutants by 75% of the current average.

Ship designs that allow minimization of spills as consequence of accidents have to be developed and made customer attractive.

Improved technical solutions for monitoring illegal discharges and occasional spills should be facilitated by implementing latest results of research and new technology, including the use of satellite systems.

To protect the coastline from consequences of accidents, which will be rarer but never totally excluded, a new, more efficient and modular usable generation of pollution combating equipment and craft will have to be developed.

Ships designed and built in Europe will be capable of disposal and recycling in a safe and environmentally friendly manner.

Technologies that enable the design and erection of new units for safe and environmentally acceptable recycling must be developed, in cooperation with the suppliers of the materials and equipment. The availability of environmentally acceptable disposal facilities is a prerequisite for new recycling ideas.

New environmentally friendly techniques are implemented for dredging of polluted sediments

Strategies and technologies for dredging water and seaways with contaminated sludge have to be developed.

More effective and practicable processes and techniques for effective treatment of polluted sediments in rivers, harbour basins and the seabed must be made available.





Enhancing efficiency

»» TARGETS

Innovation Challenges

In 2020 seamless monitoring, identification, communication and vessel traffic management systems will be operational around Europe to improve the coordination and efficiency of operations

Efficient data models and algorithms, especially for high risk / dense traffic areas as well as for port approaches and port call preparation, are to be developed and tested. Optimal and easy to handle man-machine and communication interfaces for complex integrated traffic management systems must be available. It has to be ensured that information systems are integrated across intermodal boundaries.

In 2020 the cost for sustainable, safe and secure waterborne transport will continue to be clearly lower than other transport modes

The efficiency of all elements in the waterborne transport chain has to be continuously improved, optimised and missing technologies must be developed, with the goal of maintaining a cost level of approx. 20% (or less) compared to road transport.

Short sea shipping is fully acting as an alternative transport mode in the supply chain

Fully integrated European supply chain systems are to be developed and optimised with a systems approach, addressing the combination of the different transport modes in terms of costs, reliability, safety, environmental friendliness, ease of choice, integration, security and market demand.



Motorways of the sea



2. A competitive European waterborne industry

Deep sea, short sea and inland waterway, the three areas of activities of waterborne transport cover a multitude of types of markets requiring dedicated ships, landside infrastructures, supporting operational services and systems, as well as maintenance of vehicles and equipment. A non-exhaustive summary of types of ships and services includes: large volume dry bulk; liquid bulk and gas, conventional cargo, containerised cargo, specialised cargos (e.g. temperature controlled and heavy lift), passenger ro-ro ferry, ro-ro cargo ferries, passenger ferries and cruise ships, short sea shipping, sea river shipping, to-wage, icebreaking, dredging and infrastructure support, offshore supply and so on. The demand for quality ships and installations throughout their entire life cycle is involving designers, yards, equipment manufacturers and other suppliers.

First class, efficient ships and systems offer efficiency also for the transport operations. Most of the products, services and operations in the above mentioned areas are largely subjected to increasing global competition, while short sea and inland waterways are competing with land based transport (road, rail, pipelines). At the same time, efficient supply chains also require optimal integration of the waterborne and land based

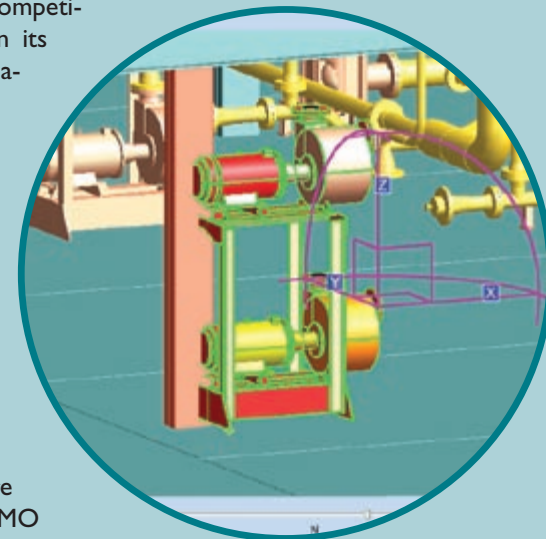
transport operations.

Maritime transport grows at double rate of global GDP. Around 80-90% of global trade, as well as the goods imported and exported by Europe are transported by sea. More than 40% of EU internal trade is waterborne and a major part of the food and energy supply for Europe is produced outside Europe or offshore. On average, the external cost of waterborne transport (by sea and inland) is less than 1/5 of the cost of road transport. With a shift of larger transport quantities from road to waterborne transport hundreds of million € in external costs of transport could be saved².

In total more than 3 million people work in the European waterborne sector and generate a turnover of about 200 billion with an added value totalling about 90 billion representing more than 1% of the EU's GDP³.

The European maritime industry is well placed to take the challenges on the global markets. As a truly global and high added value sector, we acknowledge the worldwide differences in labour and social conditions. General framework conditions, notably with an eye on regulations, for doing business in Europe are imperative to re-

main competitive. Seeking a level playing field, industry bases its competitiveness strategy on its productivity, the quality of performance of its innovative products and of its services, to be continuously enhanced by knowledge deriving from R&D. In the level playing field context it is also mandatory that maritime regulations are international and IMO based, e.g. on safety and environment.



² Commission estimates (DGTREN)

³ Commissioner Joe Borg speeches

»»» TARGETS



In 2020, Europe will remain the leading player in waterborne transport thanks to proactive planning and investments in the transport chains, the best quality of service, low transport costs.

In 2020, European waterborne transport will continue to play a significant part in meeting the global demand for the mobility of goods and passengers in Europe. 50% of Europe's internal trade will be waterborne.



In 2020 the number of passengers days in cruise business will have doubled and the EU will remain the leading cruise ships builder worldwide. The world annual demand for recreational boats larger than 8m will have tripled.

In 2020, the European marine manufacturing industry will remain to be world leader in systems and equipment as well as in selected high value added ship building market segments. This will be due to its ability to understand emerging requirements, innovate and deliver on time and to the required qua-

lity, representing the best choice in performance and costs. The industry will be at the leading edge of competition by mastering the most advanced methods for design, production, networking and knowledge management, optimised value chain and cooperation.

In 2020, world oil and gas demand will have more



than doubled, making the exploitation of offshore oil and gas in very deep waters and/or extreme environments economically viable. This will push the demand for highly reliable exploration and extraction equipment and systems.

Transport and operations

>>> TARGETS

In 2020 European deep-sea shipping will still be leader in maritime transport. European short sea shipping and inland waterway transport will be the favourite choice and the backbone of many existing and new logistic transport chains.

Innovation Challenges

Under the conditions of a level playing field, notably also including strict global application of international regulations like on safety and environment (IMO), EU ship-owners will benefit from innovative, highly efficient ships, equipment and systems, capable to comply with highest international standards and regulatory requirements. Close coordination between the EU ship-owners, shipyards and suppliers in the development of such capability will offer a strong basis for competing globally

Short sea and inland waterway transport operations will be supported by newly developed advanced ships and equipment and, where appropriate, be fully integrated with easily accessible intermodal interfaces

Shipbuilding and equipment

>>> TARGETS

In 2020 Europe's ship and boat builders as well as the marine equipment manufacturers will work at the world's highest productivity level and will command the shortest lead and delivery times as important elements to defend their competitive-ness in a global market.

Innovation Challenges

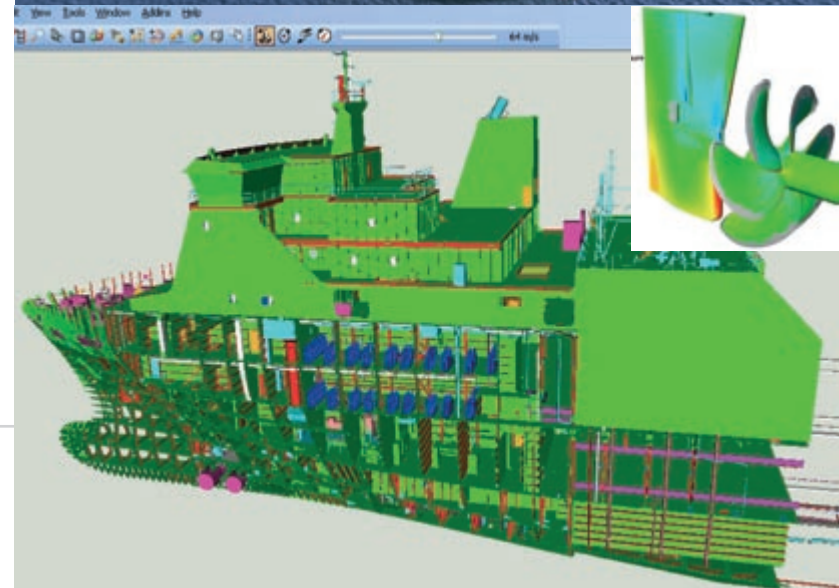
Strategies, methods, tools and processes in design and production have to be continuously improved, using the latest R&D results, which will enhance the ability to deliver high quality and high performance products and supporting services, with the aim of reducing the overall delivery time of a new built vessel by at least by 20%. To reduce the manpower for design and production preparation works by 50% and to increase the productivity of ships and equipment production by 30%.

Vessels produced in Europe will be the worlds most advanced, have the lowest energy cost, life cycle cost and the highest customer focus.

The R&D efforts have to be focused on integrated, customer-friendly solutions (vessel, equipment, life-cycle support, recycling). The excellence and performance of products has to be continuously improved, including the implementation of emerging new key technologies. The energy consumption of the vessel as an entire system as well as of its subsystems has to be reduced and optimised, using a holistic, integrated approach and develop the necessary energy management strategies and technologies, with the goal of 25% reduction of overall on board energy consumption through increase of system efficiency. A life cycle approach has to be implemented, translating new technical, regulatory and business requirements into improved materials, production technologies and design.

Integrated life cycle management products have to be developed, including modularity in use, with focus on easy retrofitting, on-line monitoring systems, etc.

Design for easy and environmental sustainable dismantling, recycling and disposal will be a unique sales point for European vessels and requiring the development of the necessary strategies and economic solutions.





The European shipbuilding industry will continue to be the leader in the world market for high tech vessels (new and refurbished) ships.

The development speed for building, converting and repairing complex and high tech vessels must be kept faster than that of competitors, with the goal of defending a market share of more than 90% for high tech ships and of close to 100% for cruise ships and cruise ferries. Emerging risk based design principles must be used to obtain competitive advantages (“intelligent concepts and designs”) to provide the worlds most advanced, economic and safe products.

The European shipbuilding industry will offer interesting, motivating and desired professional careers for highly qualified people, without risk for health, safety and environment (HSE)

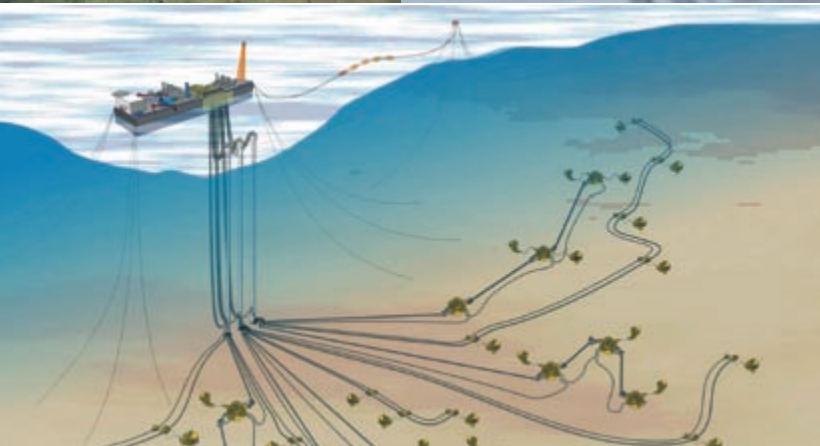
An excellent HSE record must become one of the main drivers for competitiveness, for the acquisition of contracts as well as for the recruiting of employees. This includes the responsibility of the general contractors for the selection of subcontractors. Research and development results supporting challenging, safe and efficient work environment are to be implemented.

The EU maritime equipment industry will still be the favourite supplier of world shipbuilding and offshore operations. The export share will have increased further.

The European equipment industry must maintain superiority by maintaining a technological edge and reducing through life cost. The service market share must be increased through innovative after sales, global maintenance and training concepts to at least 60%.

Waterborne operations will have a clear perspective of the feasible and most economic systems for the propulsion of large ships as the supply of fuel oil reduces.

Economic and reliable large-scale applications for alternative power and propulsion systems have to be developed and tested, including: higher efficient electric propulsion; use of LNG instead of heavy/diesel fuel; fuel-cell electricity generation by use of hydrogen and/or LNG, sail support, etc.



Inland waterway transport will be regarded as an efficient, modern, high tech mode

Multipurpose vessel types and modular concepts in inland waterborne transport have to be developed. Focus on equipment for flexible integrated solutions for D2D-transport chains is necessary.

Offshore services and technologies

>>> TARGETS

Innovation Challenges

In 2020 platforms and technologies to access to marine resources in water depths exceeding 2000 m and in extreme regions of the Arctic will be ready to use.

The necessary support ships and high tech solutions for specialised tasks and platforms, especially in challenging environments, must be developed, based on ongoing research regarding e.g. sea keeping, floating platform / vessel interaction and arctic environment.

EU operators will be the world leaders in commissioning offshore renewable energy installations.

The necessary strategies, solutions, technologies and floating infrastructure must be developed as well as safe operating routines.

EU companies are the world leaders in design and construction of elements of the Natural gas transport chain.

The necessary equipment, technologies for LNG offshore terminals, LNG tanks and carriers and related facilities must be improved and missing items must be developed. Many of the presently used technologies in LNG handling and transport are more than 40 years old and require innovation.



Recreational craft

>>> TARGETS

In 2020 the European recreational craft industry will have strengthened its position as a global market leader in the production of sailing boats, powerboats and super yachts.

Innovation Challenges

A sustainable future for the recreational craft industry will be ensured by the intelligent use of through life design and the creative development of environmentally sound products, processes and operations.

Global market leadership will be retained by producing competitively positioned craft with high level of innovation, added value and customer satisfaction.



Infrastructure, ports and dredging

>>> TARGETS

In 2020 European ports are on the leading edge in the use of innovative cargo handling systems and overall efficiency.

Innovation Challenges

New techniques for faster and automated cargo handling have to be developed to maximise port throughput within given infrastructure constraints.

This will require also the development of logistics planning tools.



The European dredging industry will remain the world's leading technology provider and operator, offering the most advanced and environment friendly dredging methods

The necessary equipment, technologies and ships will have to be developed, with the goal to hold 90% of the free world market of dredging activities.

Dredging technology must be improved to minimise impact on the marine and aquatic environment.

The knowledge regarding level, extent and duration of suspended sediment concentrations caused by natural events and commercial fishing has to be enhanced through research, relative to those caused by dredging activity. The understanding of the effects of estuarial dispersion, or disposal methods will have to be enhanced through long term field trials and measurement. This is essential for enhancing infrastructure planning processes.



EU companies are world leaders in advanced rapid and low cost site investigation methods.

Remote sensing and airborne site characterisation and measurement technology and interpretation techniques must be improved, better methods of in situ measurement of density and strength in seabed soils must be found.



3. Managing and facilitating the growth in transport volumes and the changes in trade patterns

Growth and dynamics of the global economy are to a large extent driven by changes in the world's demography, productivity, relative welfare, demand and availability of energy, of raw materials and of food. Historically; international waterborne trade has grown by at least double the rate of the global economy, but constraints have occurred and are increasingly to be expected in the responding to the rapidly increasing demand for waterborne transport and increasing vessel sizes. This is most notable in infrastructures such as ports and terminals, locks and inland connections, which require long lead times for development to accommodate increasing trades.

Europe has the largest single share in global waterborne transport. Maintaining this position requires focused efforts to accommodate and safeguard the growth of trade flows and adapt rapidly to changes in global trade patterns. Europe faces immense challenges to keep its ports and seaways capable with the increased number and size of ships.

The continued positive development of competitive EU waterborne transport services can be stimulated by a variety of actions the most important of which is ensuring sufficient port capacity. This requires the constant improvement of the efficiency of port services and the development of effective hinterland connections and support services.



»» TARGETS

In 2020, efficiency in shipping and maritime logistic chains will have further lowered the transport cost of many products and will have contributed to growth. The EU will have put in place the infrastructures and related facilities necessary to accommodate the shifts and the growth in trade volumes and passengers. The forecast demand will be converted into achievable business opportunities for operators.

In 2020, the global maritime trade, standing at some 29,000 billion ton miles in 2005, will have increased by 80%. Europe, as the largest player in waterborne transport, will maintain its leading position and will be fully capable of coping with the consequences of this enormous growth in trade and changing trade patterns. This will be based on the ability of EU waterborne transport stakeholders to assess future trade trends better and quicker than their competitors and to plan accordingly their needs and investments accordingly.

Technology tools to cope with trade growth and changed patterns

»» TARGETS

In 2020 advanced scenario planning techniques for world trade growth and trade patterns estimations will be in common use to support public and private planning and investments.

The increased use of un-tised cargoes will offer much enhanced streamlined transport operations, avoiding congestion and delays in supply chains.

European short sea shipping and inland waterways transport will cater for around 50% of regional trade as well as for the feeding between main and smaller ports, thus alleviating pressure on longer haul road and rail capacity.

Advanced logistic chain management systems and operational tools will be available, facilitating very fast sea land interchange

Innovation Challenges

The necessary data and support models will have to be developed.

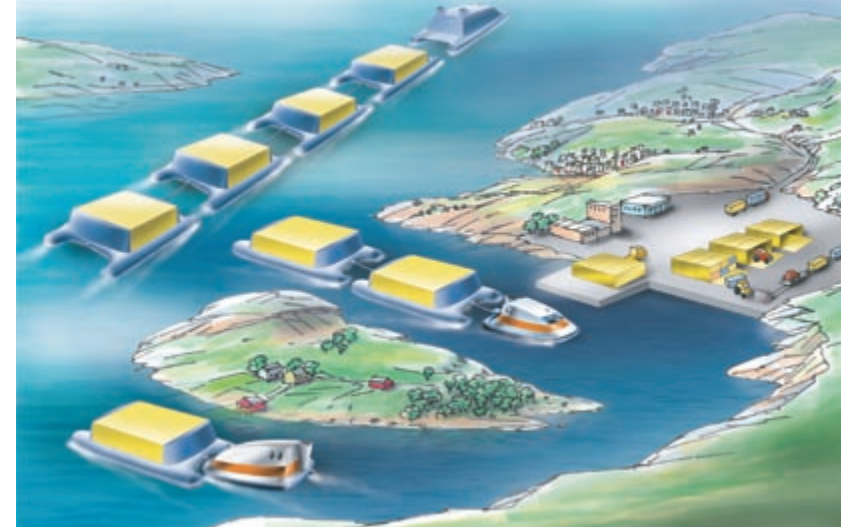
Ports, terminals and hinterland connections – not only in Europe - must be subject to adequate and broad based planning and permission procedures for timely construction and availability, also in context with the growth of ship sizes.

Visions and scenarios will have to be developed as an ongoing exercise on innovative ships, cargo handling, landside transports to feed to data and support models

Ships, terminals and facilities will have to be developed, which are specifically designed and/or adapted to ensure efficiency of the waterborne transport by short turnaround of ships in ports and a high degree of automation of berthing and cargo handling

Integrated ICT (Information and Communication Technologies) and ITS (Intelligent Transport Solutions) will have to be developed, to enable much more efficient planning, booking, simulation, routing and control of cargo along the different transport modes as well as other services supporting efficiency, safety and security.

A modern network of inland ports and sea ports must be established, to offer the European and Global manufacturers and trade the necessary and reliable operational and information services as required for efficient and economic transport of goods



Cross industry enablers

»» Education:

Market leadership is based on competency, know-how, innovation capability and collabora-



tion. It is strongly dependent on the ability to foresee future needs and to forestall problems. People are the main asset. Continuous improvement of human skills is a must. This is true across the whole waterborne sector and is an essential ingredient of the EU knowledge based society.

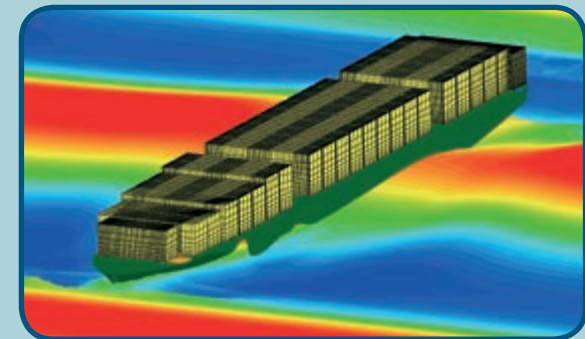
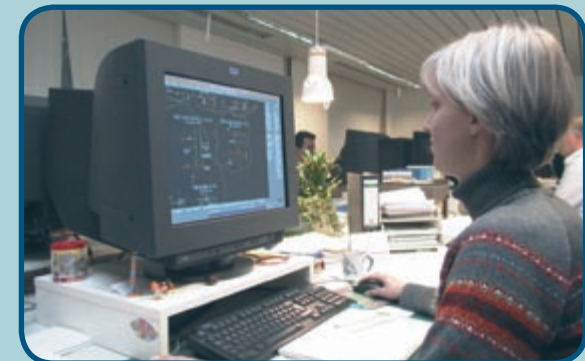
The need for capable Navigators, Naval Architects, Marine Engineers and general business managers is evident for most areas of the mari-

time cluster. Advanced maritime knowledge in research, design, manufacturing and the operation of ships, is a fundamental factor to fuel the EU economy. Therefore a favourable environment for the education, training and recruitment of qualified resources, including seafarers, should be created and developed. The maritime sector also needs to be perceived as offering reliable, safe workplaces for highly qualified people and an attractive and challenging career opportunity. This requires appropriate communication and education strategies for young pupils, within and outside the waterborne sector.

The waterborne industry does not stand isolated with this education challenge. There are wider interests and interrelations, such as with commercial service providers like financial services and not in the last place supporting, controlling and regulating governmental institutions. To fulfil their tasks well, they require personnel that know the maritime industry from the inside. Although not the immediate aim, maritime industry thus in practice also has a role as a training pool for supplying qualified and experienced people to the 'outside'.

»» ICT:

A further factor of crucial importance is the further development of information and communications technologies (ICT). To ensure systematic and integrated development in this field the Waterborne TP will define specific actions.



»» Policy:

The European Commission through the Maritime Policy Task Force and the preparation of a Green Paper, intends to replace the fragmented approach to oceans and seas management with a collaborative and integrated approach. This integrated approach should be at the heart of any future maritime policy.

There are many reasons for such an EU policy approach, among them :

- Creating an appropriate balance between maritime-related economic activities, leisure along the coast lines, environmental concerns, health and food supply, energy supply, coastal defence and maritime related employment. This equates to sustainable economic development for the maritime sector.
- EU Regulations and Directives: The waterborne transport sector is heavily regulated, it is of great importance that EU regulations to be considered in the context of the regulatory regime worldwide (e.g. the one of the IMO). This is essential to ensure that the European maritime industry is not disadvantaged in the global market place.
- Transport and Infrastructure Policy: waterborne transport is a key link in the trade chain that is Europe's lifeblood. Recognition of the environmental costs of road transport has drawn attention to the importance of waterborne transport as an alternative. This, together with the relocation of manufacturing activities outside Europe, poses major challenges and opportunities to the European economy, our ports and the maritime industry.
- Need for synergies : Considerable resources are needed to develop marine science and research as well as new technologies for improved sustainable uses of the seas. Increased efforts at all EU levels are required in order to create synergies among all the players concerned.

»»» TARGETS

In 2020, a major competitive factor will be the reduced time between research and industrialisation. The EU waterborne manufacturing sector will enjoy a short “time to market” because research institutions and universities will be fully integrated in a cluster structure with industry and will be used to teamwork on focused product development.

In 2020 technology transfer from other sectors will be as common as transfer from the maritime to other sectors today. Systematic screening of emerging technologies will be developed and implemented, to accelerate transfers from sectors such as biotechnologies, embedded systems, nanotechnology, materials and wireless communications.



technology, materials and wireless communications.

In 2020, naval and civil sectors will share technologies. The organisation of permanent technology screening and assessment will enable the exploitation of military technologies in civilian markets.

The consequences of “Commercial off the Shelf” (COTS) strategies in naval shipbuilding will be investigated further, with the aim of increasing the implementation of such strategies in other sectors.

In 2020, the market will demand skilled seafarers and shore-based staff, capable of managing a waterborne transport system which will be fully integrated into the total supply chain. They will be able to manage innovation and to networking with



other professionals. EU seafarers will be among the best in the world thanks to their technical and operational skills, supported by continuous professional development schemes. The waterborne sector will be able to draw on a

pool of highly qualified individuals including seafaring officers with advanced management skills.

In 2020, the increased technological sophistication of specialised ships, including loading and unloading interfaces, implies the need for ship-type-specific training.



Waterborne professionals, whether working on short and

deep sea, inland navigation, ports and terminals or in the logistic sector, will benefit from customised courses.

In 2020, the inland navigation sector will have a comparable level of qualification as the short sea sector.

In 2020, the shipbuilders, equipment manufacturers and recreational craft builders in Europe as well as the other players in the maritime cluster must be

able to recruit an appropriate quality of workforce if they are to maintain their technological edge.



The necessary educational and career development schemes need to be enhanced and promoted. In this context it is essential, that EU waterborne research institutions and universities remain attractive to young researchers by working closely with the industry. This will allow the development of leading edge, relevant and exploitable technologies.

For this purpose it will be necessary to organise permanent network structures between industry, maritime universities and research institutes. Regular meetings of the most qualified and relevant researchers in the different topics will be held, focused on the industry needs.

In 2020, a transparent and consistent regulatory framework will be in place, fostering the European maritime industry’s continuous development and prosperity.

In 2020 the technology drain from Europe to Asia will be stopped, supported by appropriate international IPR law enforcement. Therefore it is necessary to develop feasible IPR protection strategies for the waterborne industry, in particular equipment, systems and ship designs.

From vision to implementation

»» A European Strategic Innovation Alliance

In December 2003 the Maritime Industries Forum (MIF) initiated the process for the establishing an Advisory Council for Waterborne Transport Research in Europe (subsequently named Waterborne TP) functioning as a forum where all the stakeholders would agree on a medium to long term vision (“Vision 2020”), assess the key challenges for the maritime industry and waterborne transport and operations, would formulate the R&D actions to be fulfilled to meet these challenges in a Waterborne Strategic Research Agenda (WSRA), and would promote the mobilisation of the necessary resources.

Waterborne TP was launched during the MIF-plenary on 25 January 2005 in Bremen, in the presence of Günter Verheugen, Vice President of the European Commission.

»» Stakeholders and Objectives

Waterborne TP includes all parties involved in the waterborne value chain: those who use and operate ships for transport and services, those who build ships, boats and their systems and equipment, those who provide the related infrastructure and ports and those who organise the exploitation of ocean resources. Waterborne TP builds on the know-how of navigators, naval architects and marine engineers, who are the driving force behind the development in all areas included in the technology platform.

The aim of Waterborne TP, which is organized as a transparent and consensus-based forum, is to bundle RDI efforts of the European stakeholders to remain champions in maritime transport. In doing so it is committed to creating high value added products and knowledge based employment opportunities in Europe.

»» Steps to Implement the Waterborne TP Strategy

The medium and long term vision (called “Vision 2020”) of the waterborne sector is described in this document. The next step in the path to achieving this vision will be to publish the first issue of the Waterborne Strategic Research Agenda (WSRA). This will be developed by the Waterborne TP stakeholders based on consensus and will detail the RDI actions necessary to deliver the Vision 2020.

Both Vision 2020 and WSRA are tools rather than position papers and will be updated regularly in response to rapidly changing business environment.

We consider consensus to be a major asset and a prerequisite for the success of our strategy. We will ensure that the main elements of the strategy, Vision 2020 and the WSRA, are widely supported.

»» Commitment



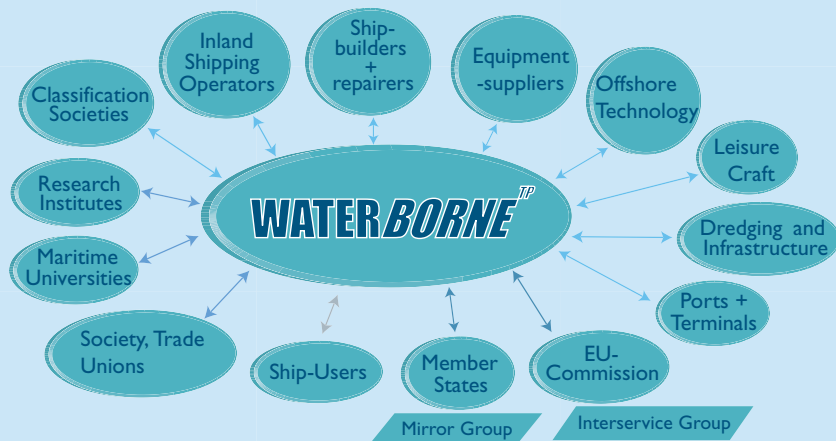
This document is the first element of the WaterborneTP strategy, a long term industry based and widely supported vision, reflecting a consensus among all relevant stakeholders in the European Maritime Cluster as well as their responsibility through commitment on text, targets set and initiatives outlined.

The targets contained in this vision paper cannot be rigid in a dynamic environment subject to technological as well as economic influences; they should be considered as aspirations, not as absolutes or deadlines. It is the intention and the responsibility of the partners in the WaterborneTP, in which all relevant stakeholders, ranging from the industry enterprises and the research institutes to trade unions, national governments and the EU institutions are participating in a transparent, open and representative structure with high level commitment, to address the innovation challenges in a joint undertaking.

The alignment with the EU Lisbon Agenda, which also drives towards growth and employment through innovation, is obvious. To facilitate and support innovation, which is to a large extent dependent on R&D, the activities of the WaterborneTP will turn the vision into a Waterborne Strategic Research Agenda (WSRA) for active engagement in the European Research Area and will further stimulate and organize means to implement and execute the WSRA.

»»» Principles and Bodies of the Waterborne Technology Platform

A European Round Table for Waterborne R&D Policy



The guiding principles for the organisation structure of the Waterborne Technology Platform have been;

- Transparency and openness
- Consensus basing on representative structures
- Effectiveness.

Considering the different stakeholders of the waterborne sector and the thousands of companies shaping their industry, a consensus building by individual companies, institutes, etc. would have been unmanageable. Consequently Waterborne TP has been developed using the structure and the representative opinion building and decision approval mechanisms of the stakeholders' European associations. These associations have the responsibility to organise and encourage the participation of their individual members in the different Waterborne TP tasks, working groups and discussions as well as to guarantee their members' commitment, demonstrated by high level attention and participation in the General Assembly. This democratic structure avoids also that Waterborne TP will become a "closed circle" of some individual larger enterprises.

The forum for experts of individual companies and research institutes of the stakeholders are the (thematic) Working Groups. The results of the Working Groups are discussed and transformed into policy proposals and action plans in the Support Group, into which all stakeholder Associations, the Member States and the Commission services send their representatives. In order to facilitate an easier consensus among the 25 Member States, they have their own Mirror Group, which sends "en-bloc" 2-3 representatives into the Support Group. Final approvals and commitments are made by the annual General Assembly, which is formed by high-level representatives of the industry and all other stakeholders.

This document was jointly developed by the Waterborne TP Support Group and the Mirror Group of Member States whose members are the following:

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EURACS (European Association of Classification Societies)	- Mario Dogliani - Pierre Besse
• Support Group secretariat	
CESA (Community of European Shipyards' Associations)	- Michael vom Baur - Paris Sansoglou
EMEC (European Marine Equipment Council)	- Bernard Dognaux - Patrick Person
EUROGIF (European Oil & Gas Innovation Forum)	- Paola Mazzucchelli - Jean Courjault
EBU (European Barge Union)	- Ton Roos
ECSA (European Community of Ship-owners' Associations)	- Herman de Meester
ESPO (European Sea Ports Organisation)	- Etienne Devisch
EuDA (European Dredging Association)	- Anthony Bates
EURMIG (EU Recreational Marine Industry Group)	- Tony Rice
FEPOR (Federation of European Private Port Operators)	- Rolf Stuchtey
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Society and Environment	
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MIRROR GROUP

Representatives

Member States

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• Mirror Group secretariat

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