

WATERBORNE VISION 2030

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INNOVATION OPPORTUNITIES

Safe, secure and adaptable passenger vessels for inland, inshore and offshore duties

Increasing population in coastal areas will require safe and swift Waterborne transport. Ferries will be built according to high safety standards and with low emissions. Many ferries will be all electric, recharging in ports and from solar energy.

Demand for cruising will be driven by the growing middle class worldwide. Next generation cruise vessels will not only be larger, but also more diversified to match local market requirements and environmental restrictions. Use will be made of the newest light-weight materials to save energy. Noise emissions under water will be low to comply with strict regulations.

Customer experience will be enhanced by more open spaces and glass in the superstructure, and by an integrated interconnection between ship's IT infrastructure and passengers' personal devices.

The structural and safety aspects will be tackled by the latest insights in composites with regards to strength and fire resilience, hydrodynamic loads in the structure in intact and damaged situations, and in human behaviour for evacuation. Innovative rescue equipment will be applied.

Many technologies developed for cruise vessels and ferries will be applied to the newest recreational craft. On the other hand, recreational craft will be used as test beds for larger vessels, because of their relatively low power demand. Examples will be the electrification, and use of light-weight new materials. Super yachts will be used as launching customer for cutting edge technologies.

In a polarising world, security of passenger vessels against outside external attacks is a growing concern. The newest vessels will be able to withstand terrorist attacks, and be invulnerable to digital hijacking.

Flexible craft for coastal and offshore duties

With the onset of the Blue Economy, an increasing number of vessels for coastal and offshore duties will be in operation. Although many of these activities require dedicated vessels, all activities benefit from lowering of costs by employing a modular design of vessel and equipment. Within a relatively short period of time, ships can be refurbished to facilitate new offshore activities. Many of the vessels will be deployed as search-and-rescue vessels in case of emergencies.



Anchor Handling Tug Supplier 200, Courtesy of Damen

The offshore workboats will be characterised by a large operation window in adverse sea states. Cost of operation will be minimised by allowing crew to perform their tasks in a safe and healthy manner for most of the year. Although energy efficiency will not be the main economical driver for these vessels, dedicated ship design and propulsors will ensure a low power consumption in transit and operation. Noise emissions, both into the ship and under water, will be low to comply with strict regulations.

Green, efficient and flexible inland-waterway vessels

The new generation inland-waterway vessels will provide an integrated, energy-efficient, and flexible alternative to road transport.

Emissions from inland shipping will be very low through the use of low-carbon fuels, and hybrid propulsion. Dedicated shallow-water propulsors, and air lubrication will increase the efficiency of ships significantly.

All ships will be digitally connected to shore and each other to exchange information on local water depth, current profile, operations of locks, and congestion. Based on this information, the operation of the vessel is optimised with respect to fuel consumption and interaction with the logistic chain. Parts of the river navigation will be autonomous.

Flexibility of the inland fleet will be achieved by modular concepts, and the further application of barge trains.



Ecoliner, Courtesy of Damen

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Maritime Europe Strategy Action

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Powered by continuing research and innovation, the EU maritime industry will maintain its position as a global leader in high value maritime business. Our ships will be the smartest, greenest and safest on the World's seas; our autonomous vessels will be an increasingly common sight around the world and our passenger ships will be renowned globally for their safety and sophistication.

Smart ships, smart ports and smart infrastructure will be facilitated by the growing EU maritime data highway which will provide high capacity, low cost and secure data communications around our coasts. Close to zero environmental impact will be achieved by clean engines and clean fuels, low resistance hulls and rigorous management of all emissions. Adoption of green technologies on the operating fleet will be facilitated by plug-in refitting solutions.

Electric vessels in and around our maritime cities will be the norm. Port facilities will include clean, shore based power for larger vessels, and smaller vessels will routinely enter and leave ports and harbours under electric propulsion.

New sensors, data management and communications technologies will not only pave the way towards reduced manning and vessel autonomy but will also allow for smarter, cleaner and safer vessels. Fully integrated transport logistics will ensure the seamless transfer of materials and goods from source to final destination.

Safety and security of our shipping will be enhanced further by the development of improved materials for impact and fire resistance, by a better understanding of ship behaviour in abnormal conditions and by improved emergency planning and execution.

The EU will continue to lead the way with the design, build and operation of innovative, flexible, modular, and highly efficient working boats. With the inexorable increase in shipping and offshore activity, these vessels will take on an even more important role in the provision of the day to day services that keep our maritime industry on the move. The new challenges of Blue Growth will be met with specialised vessels, that are modular and reconfigurable throughout their entire operational life.

Increasing wealth around the world will lead to a growing middle class, with more disposable income to spend on goods, services and leisure. The EU will retain its lead in the design, build and operation of cruise vessels to satisfy this market and the recreational marine sector will lead the world with innovative craft responding to ever increasing customer expectations.

Advanced production technologies will underpin the high value products being built, using advanced modelling techniques, joining technologies and new materials to deliver flexible and cost effective solutions.

The future for the EU maritime industry is bright, with global trends clearly indicating an increasing market for the sophisticated, high value technologies and products for which our industry is renowned.

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Smart vessels, fleets and ports

Waterborne transport will be an integral part of an efficient logistic chain. Connection with other transport modalities, or inland-waterway transport, will be seamless. Smart vessels will communicate with smart ports to limit congestion, waiting time and thus costs. Smart vessels will adapt their sailing speed to match harbour slots automatically.



An important facilitator for seamless integration of transport modalities will be the further harmonisation of administration between EU member states and regions. Smart vessels will automatically file the necessary paperwork, and provide port authorities with cargo information.

Constant real-time connected and monitored vessels worldwide will see ships become more closely integrated into logistics or supply chains. Global companies will focus on using a whole fleet to best effect, generating cost savings and improving revenue generation. This has the potential to create new shipping services, such as online cargo service marketplaces, more efficient pooling and leasing of assets, and new alliances.

Smart vessels will be able to adapt their operations not only to congestion in ports, but also to for instance weather conditions. Fuel consumption over the whole sailing route will be minimised by taking weather predictions and loading condition into account for selecting the optimal route and speed.

Ports will facilitate the energy transition of the fleet, by providing bunkering possibilities for different fuels, as well as recharging capabilities for electric or hybrid vessels. Safe solutions for bunkering of LNG will be provided, possibly away from the quay.

Automated and autonomous vessels

With the increasing possibilities of ICT technologies, ships will become fully connected throughout the world. This will create a wealth of opportunities in automated and autonomous vessels. Remote monitoring of vessels is already possible, allowing for condition-based maintenance. Building on the increasing automation on-board, remote operations



Remote Controlled Ship Concepts, Courtesy of Rolls-Royce

of vessels will become possible, eventually moving towards full autonomy of vessels. The wider use of Unmanned Autonomous Vessels (UAVs) – either aerial, underwater or on surface – will increase flexibility and energy efficiency of operations.

Remote operations requires automation of all main systems on-board, and integration into a single communication channel to shore. A critical component will be the advanced navigation system, that will be able to maintain a vessel's course, detect and adapt to changing sea and weather conditions, avoid collisions and operate the ship efficiently within specified safety parameters. The system will be flexible to allow for different levels of autonomy, depending on location, congestion, or emergencies.

Onshore control centres will be responsible for operating vessels in congested sea lanes, or in proximity to ports and terminals, and in emergency situations. These control centres will be equipped with system simulators designed to swiftly simulate scenarios including all ships involved, and facilitate human intervention.

Reliability and security of communication will be key to the success of the connected vessel.

Inland waterway transport and short-distance ferries will be early adopters of the newest technology for autonomous shipping.

Ultra low energy and emissions vessels and systems

LNG will be the main fuel, with uptake first on short-sea ships operating in areas with developed gas bunkering infrastructure. Large ocean-going vessels will follow when bunkering infrastructure becomes available around the world. All new-builds will be equipped with multi-fuel engines, to allow for a smooth transition of main fuels.

Ultra low or zero emissions will be achieved by electric propulsion in special areas, such as ports or ECAs. Locally operating vessels will be fully electric; other vessels will have hybrid propulsion systems. Ships will become wind-assisted, and batteries for non-propulsion workload will be recharged by solar energy.

The power required to propel the ship will be minimal due to high efficiency propulsors, air lubrication or special coatings, and a hull design optimal for actual operational conditions. Latest virtual reality and simulation tools will be used to design the ship fit for operations.

