

# Autonomous shipping initiative for European waters

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Europe effectively supports new paradigms of multimodal transport to develop sustainable businesses and relieve road congestion and related pollution.

Since 2001, the concept of a motorway of the sea (MoS) has been developed following the EU target of shifting 30 per cent of road freight of more than 300 km to multimodal solutions by 2030 and more than 50 per cent by 2050.

However, coastal short-sea shipping and inland waterways struggle with competition from trucks in many parts of Europe and are losing relative market shares to road transport.

The AUTOSHIP project aims to speed up the transition towards the next generation of autonomous ships in the EU. The project will develop and operate two different autonomous vessels, demonstrating their operative capabilities in short-sea shipping and inland waterways scenarios, focusing on goods mobility. The vessels will help ship operators and owners improve the economy of scale of their investments, to effectively gain competitiveness and renew their fleets, making them more competitive to replace road transport.

The vessels developed within the project will optimise efforts and investments to

advance common standards and enable operations in a shorter timeframe than expected. To achieve this goal, the AUTOSHIP project will address nine specific objectives:

- Retrofitting and operating two ships turned into smart and autonomous vessels: two fully autonomous vessels for short-sea shipping and inland waterways services respectively will be demonstrated in the real environment, defining an important step forward.
- Demonstrating technologies for both use cases: the vessels will be used to demonstrate a complete set of key enabling technologies (KET) for autonomous operations to achieve level five (AL5 in Society of Automotive Engineers). The project includes the design of new shore control centres for remote operations and fleet management.
- Digital technologies: on top of on-board and onshore KETs, advanced simulators and digital tools will be upgraded to better support testing, commissioning, training

and operations. They will be built on important assets from previous research, lab experiments and ship on-board testing.

- Develop standards, tools and methods: the demonstrators will aim at verifying on-board safety, security and reliability by testing specific failure scenarios and considering possible malevolent attacks.
- Skilled and updated operators: based on newly identified crew and operators' skills requirements, best practices, methodologies, tools and training protocols will be defined.
- Regulatory and socio-economic framework: a comprehensive impact analysis will link the KETs and the new vessels capabilities to their interaction with the operations and logistics value-chain. Their effects on operability, reliability and safety will be related to the complex scenarios addressing social and economic dimensions such as jobs, change management and logistics, (cyber)security, liability, international regulation and environment.







- Business case and models: thoroughly investigating this socio-economic framework for autonomous ships adoption and acceptance, the AUTOSHIP project will eventually propose a comprehensive business case analysis with a focus on the two early adopters use cases and how this knowledge can be transferred to other maritime transport segments.
- Roadmap to intercontinental R&A navigation: prepare a roadmap to generalise and apply results to other use cases in view of scaling-up services for international and intercontinental navigation.
- Communication acceptance and dissemination: to achieve the aforementioned objectives, the involvement of the necessary stakeholders will be assured, both with one-to-one interaction and by disseminating the results in the marine/maritime industry and forums.

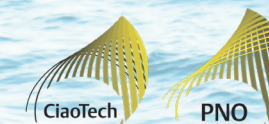
The two use cases developed by AUTOSHIP will be the first ones out of a series of more vessels to be delivered after the project ends and will be used to demonstrate a complete set of key enabling technologies (KET) for smart and autonomous operations. Functions and controls will be determined along the vessels' routes, including remote-controlled/monitored sailing and totally unmanned sailing.

### Pioneer and Zulu4

Pioneer and Zulu4 are the two vessels that AUTOSHIP will make autonomous by 2023.

The consortium is currently focusing on the preparation of the vessels installing new sensors and upgrades of essential automation, control and navigation system, as well as required modification for key enabling technologies (KET) integration.

In addition, connectivity systems are being installed to provide operational data for use in the different tasks related to demonstrating and validating enabling technologies for short-sea shipping and inland waterways. This will all serve as an imperative platform for the demonstration of the installed KET's and sub-functions.



## CONNECTING AMBITIONS

### CiaoTech (PNO): the project coordinator

<https://www.pnoconsultants.com/>

CIAOTECH S.r.l., a wholly-owned company of the PNO Group, is Europe's largest independent public funding and innovation consultancy with more than 30 years of hands-on expertise with more than 500 funding programmes in most EU countries, annually raising approximately 1 billion euro for its clients. Created in 1985, PNO is a high-growth knowledge-intensive company, supporting over 2000 clients throughout Europe, annually developing over 250 European consortia. PNO has a presence in seven European countries (the Netherlands, Germany, France, Belgium, Italy, the UK and Spain), employing around 250 people in western Europe alone. PNO's "Innovation Management" services deliver high-quality support to large-sized companies, SMEs, universities, research institutes, associations and clusters in the full cycle of the innovation process, including:

- analysing, defining and planning innovation processes
- building innovation networks, partnerships and projects
- managing projects and driving innovation.

Through its experts' intimate knowledge in the review, definition and preparation of potential business models associated with every technology, and managing dissemination, exploitation and IPR aspects, taking particular care of the industrial liaison and transfer, being especially skilled in the organisation of dedicated events and workshops, PNO engages daily in promoting and stimulating innovations in agro food, bioeconomy, chemistry, education and labour, energy, environment & circular economy, ICT, life sciences and health, transport and water.

In the frame of AUTOSHIP, PNO coordinates the activities and hence is the leader of WP1 (Project Coordination and Risk Management). It is also the leader of WP9 (Dissemination, Communication and Exploitation management), where it is involved in the development of the stakeholder and market analyses, in the definition of the exploitation plans and the facilitation of successful dissemination and transfer of the project results to relevant stakeholders in Europe.

PNO is also supporting WP7 (Liability, Regulations and Socio-economic Perspective Study) and WP8 (Business Perspective, Roadmapping and International Shipping Scale-up Requirements), where a cost-benefit analysis of the autonomous ship use case scenario will be completed, along with the development of business cases and a roadmap for the implementation of maritime autonomous surface ships in maritime logistics.

### PROJECT SUMMARY

AUTOSHIP aims at speeding-up the transition towards a next generation of autonomous ships in EU. The project will build and operate two different autonomous vessels, demonstrating their operative capabilities in Short Sea Shipping and Inland Water Ways scenarios, with a focus on goods mobility.

### PROJECT PARTNERS

The AUTOSHIP consortium is composed of ten experienced partners with proven capability to cover the essential parts of the developments (KET development, testing, manufacturing, environmental/cost/social life cycle analysis, logistics). The companies involved in the initiatives are: CiaoTech (PNO Group), Kongsberg Maritime AS, Kongsberg Digital AS, Kongsberg Norcontrol AS, Sintef Ocean, University of Strathclyde, Eidsvaag AS, ZULU Associates, Bureau Veritas, De Vlaamse Waterweg NV.

### PROJECT LEAD PROFILE

Ciaotech is the Italian branch of the PNO Group, Europe's largest independent public funding and innovation consultancy company. PNO is the coordinator of AUTOSHIP and the partner responsible for the dissemination, communication and exploitation management task, where it is involved in the development of the stakeholder and market analyses, in the definition of the exploitation plans and in the facilitation of successful dissemination of the project results to relevant stakeholders in Europe.

### PROJECT CONTACTS

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