

Towards the Realisation of Maritime Logistics Redesign through Automation: The SEAMLESS Project

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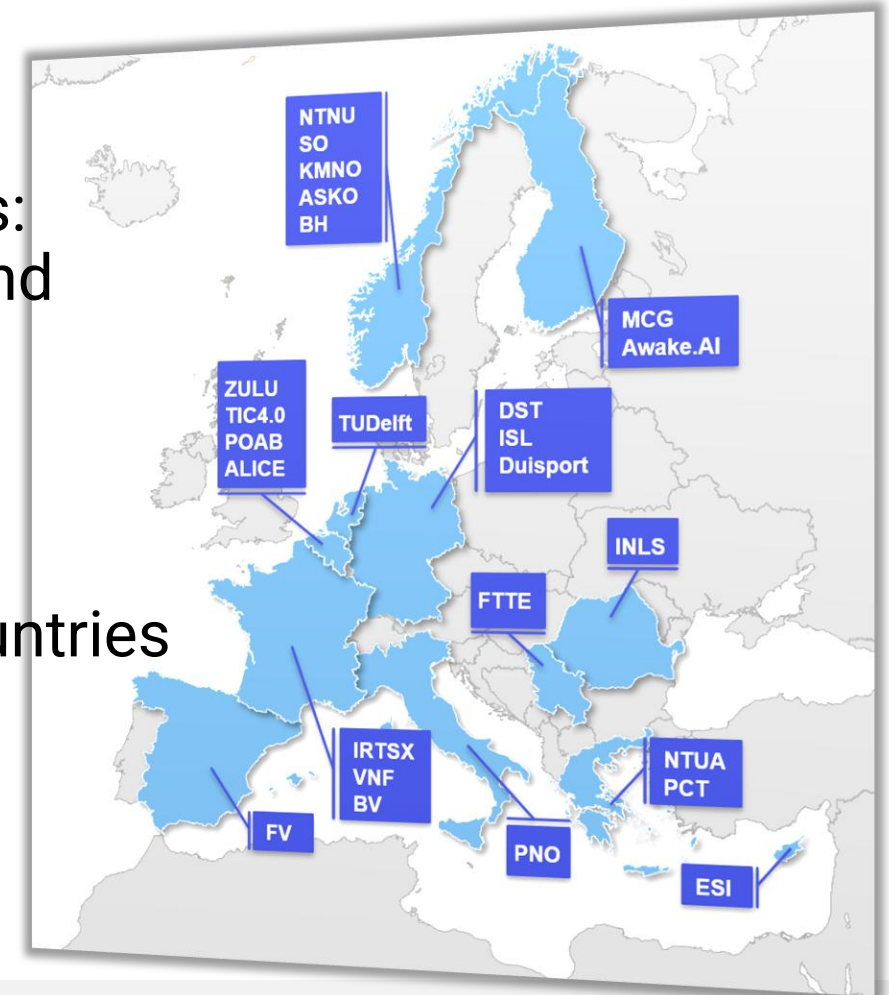
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Facts about the SEAMLESS Project

- **Project Title:** Seamless, Efficient, and Autonomous: Multimodal Library of European Short sea and inland Solutions
- **Duration:** 01/01/2023 – 31/12/2026 (48 months)
- **Budget:** ~15 million €
- **Consortium:** 26 Main Beneficiaries from 12 EU Countries



Mission Statement

SEAMLESS will develop and adapt missing building blocks and enablers into a fully automated, economically viable and cost-effective, waterborne freight feeder loop service for SSS (Short Sea Shipping) and IWT (Inland Waterways Transport)*

SEAMLESS will develop and integrate autonomous systems in a way that ensures safe, resilient, efficient, and environmentally friendly operation to shift road freight movements towards waterways*

*SEAMLESS GA



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Key takeaways

- SEAMLESS is about developing a waterborne **autonomous freight transport service**
- To realise this service, SEAMLESS will provide solutions through:
 - The SEAMLESS Building Blocks (technology-oriented)
 - The SEAMLESS enablers (desktop studies)
- The Building blocks will be demonstrated at full scale in real world scenarios*

*SEAMLESS Call Topic description:
<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/horizon-cl5-2022-d5-01-05>



SEAMLESS Mission Statement

SEAMLESS Building Blocks

DockNLoad

- Cargo handling
- Mooring
- Stowage planning
- Port calling

Modular vessel and operations concepts

- Low-attention Remote Operation Centre (ROC) design
- Vessel control systems
- Communication systems

ModalNET

- EMSW formalities
- Resilient logistics engine



SEAMLESS Mission Statement

SEAMLESS Enablers

- Identification of challenges and regulatory gaps
- Simplification of complex administrative procedures
- Framework for operational safety assessment of autonomous port infrastructure technologies
- Concept vessels design
- Optimal powerplant selection/Rapid prototyping
- Risk-based approval
- Cyber-secure communication protocols
- Cost Benefit analysis
- Environmental impact assessment
- Disruptive business models
- Social Acceptability
- Evaluation of the transferability Use Cases
- Evaluation of the SEAMLESS Demonstrations
- Policy recommendations for the seamless service

SEAMLESS Impact

- Enable seamless safe logistics through an autonomous waterborne service
- Increase legal and regulatory certainty concerning autonomous waterborne services
- Increase freight moved by water with high levels of safety, reduced environmental impact, increased operational resilience and decongested land transport infrastructure
- Develop business models based on autonomous waterborne feeder services
- Reduce risk for first movers concerning autonomous waterborne technologies
- Improve European competitive advantage within global markets with reduced costs and improved autonomous shipping
- Increase the understanding of the societal issues and consequences of automated shipping services
- Increase the exploitation of EU satellite navigation

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- **ModalNET**
 - **ROC**
 - **DockNLoad**
 - **GNC Schemes**
 - **Simplification of administrative processes**



SEAMLESS Use Cases

All SEAMLESS building blocks and enablers will be verified and validated through the **SEAMLESS Use Cases**, which are divided into:

- Two Demonstration Use Cases (DUCs), and
 - Six Transferability Use Cases (TUCs)
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- The project's technological Building Blocks (BB) will be developed to serve and accommodate the needs of the two DUCs and thus prove the feasibility of the SEAMLESS service
 - The TUCs will be examined and evaluated on a higher, conceptual level to determine the transferability potential of the project's BB
 - **Having the word “Demonstration” before the first two Use Cases, does not necessarily force us to conduct the actual BB demonstrations to this specific route****

**SEAMLESS GA*

***More on this, will be provided in the following slides*

SEAMLESS Use Cases



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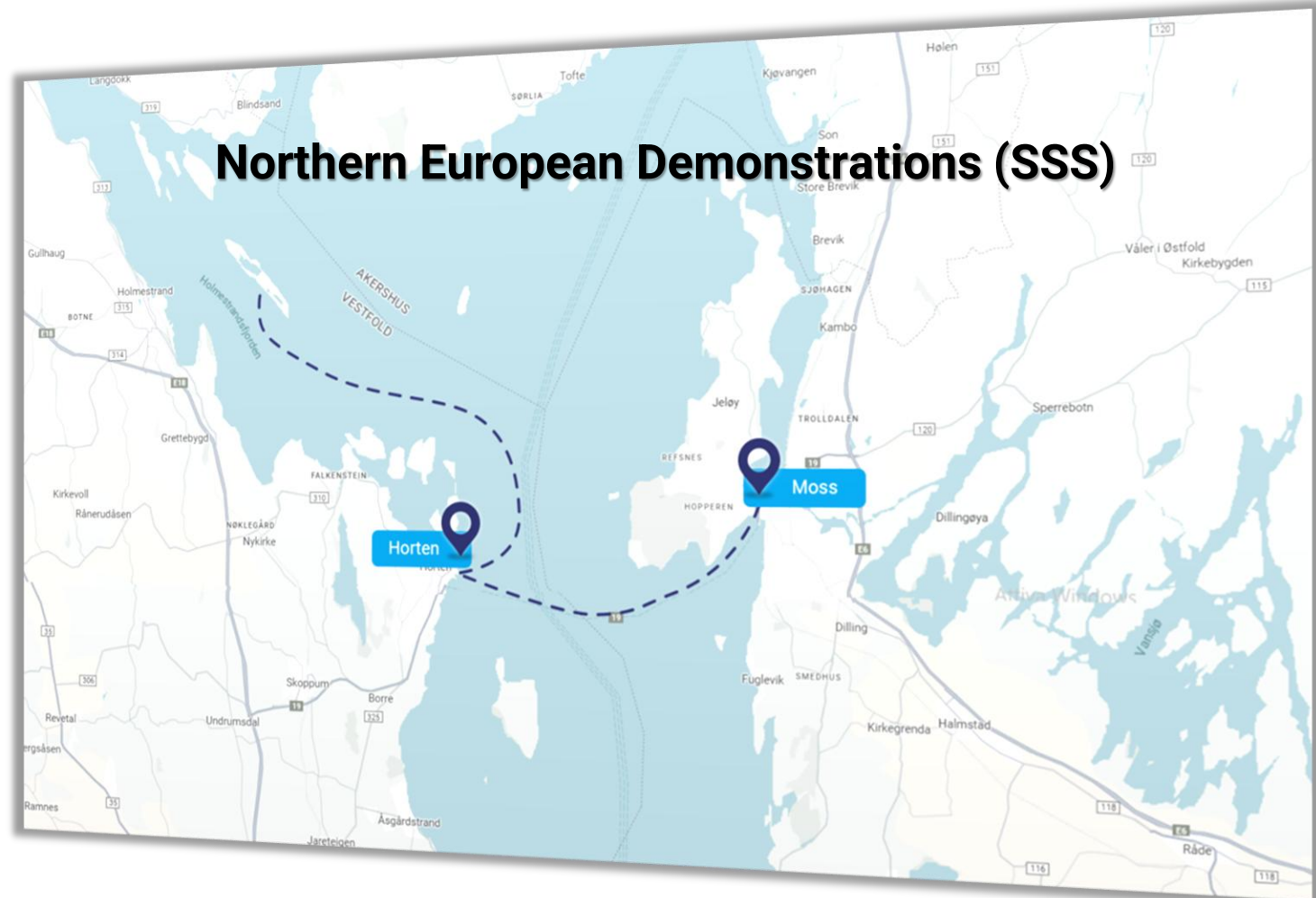
SEAMLESS Physical Demonstrations

The goal of the SEAMLESS Physical demos is to verify and validate the functionality of the technology-oriented Building Blocks (Target TRL:6)

SEAMLESS Physical Demonstrations

BBs to be demonstrated:

- Autonomous Navigation System for fleet management via a low-attention Remote Operation Centre (ROC); led by KM
- Autonomous Cargo Handling; led by MacGregor (MCG)
- Voyage and Container Optimisation Platform (VCOP); led by MCG
- ModalNET; led by Fundación Valenciaport (VPF)



SEAMLESS Physical Demonstrations

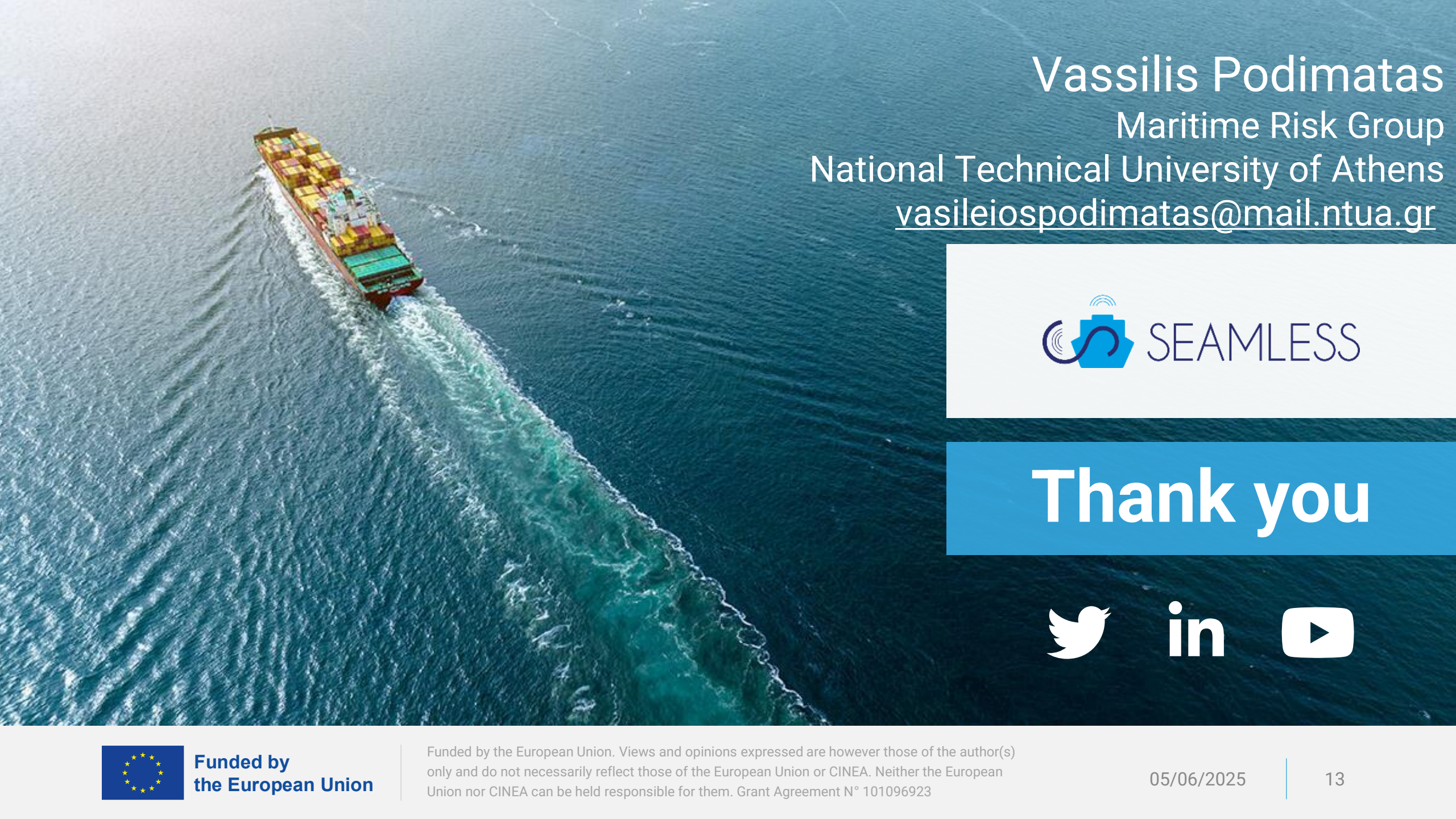
Central European Demonstrations (IWT)



BBs to be demonstrated:

- Autonomous Mooring; led by MCG
- Voyage and Container Optimisation Platform (VCOP); led by MCG
- ModalNET; led by Fundación Valenciaport (VPF)
- Autonomous Vessel Smart Port Manager (AVSPM); led by AWAKE.AI





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Thank you



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