MOSES Project Overview

This project has received funding from the European Union's horizon 2020 research and innovation programme under grant agreement No. 861678.

MOSES Facts

- **Project Title:** AutoMated Vessels and Supply Chain Optimisation for Sustainable Short Sea Shipping
- **Call identifier:** H2020-MG-2.6-2019
- **Topic:** “Moving freight by Water: Sustainable infrastructure and Innovative Vessels”
- **Duration:** 01.07.2020 - 30.06.2023 (36 months)
- **Funding scheme:** RIA – Research and Innovation Action
- **EU contribution:** EUR 8 122 150
- **Coordinated by:** National Technical University of Athens (NTUA), Greece

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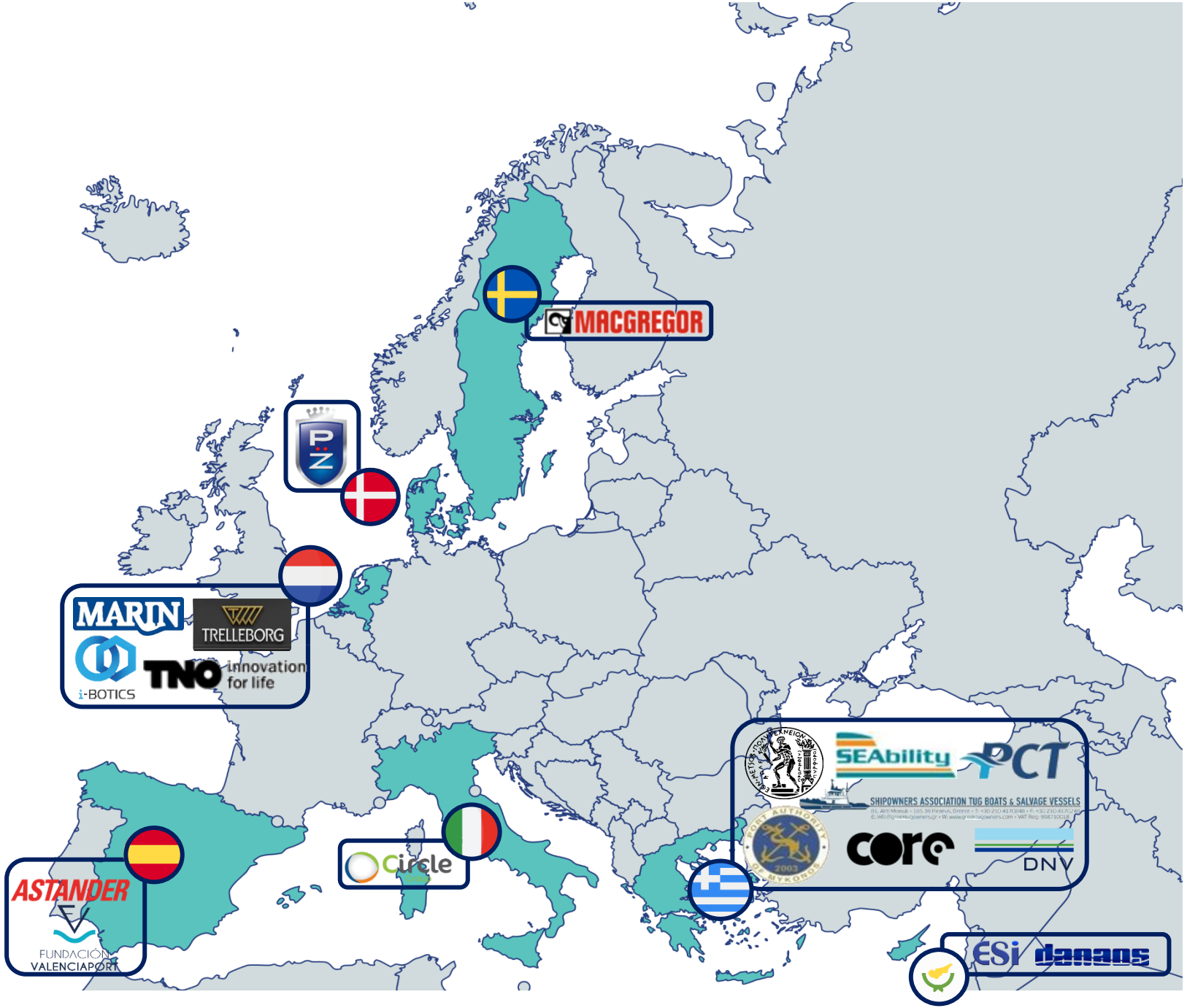
MOSES Consc

17 Partners across E

Expertise in:

- Naval design
- Maritime Logistics
- Risk, Safety, Environmer Assessment
- Sustainability and Cost-l Analysis
- Autonomous System op
- Port Infrastructure & op
- Business Modelling
- Innovation Managemen



MOSES

MOSES Vision

The aim of MOSES project is to **enhance the Short Sea Shipping (SSS) component** of the European supply chain by **addressing the vulnerabilities** and **strains** related to the operation of large containerships.

A two-fold strategy

SSS feeder services

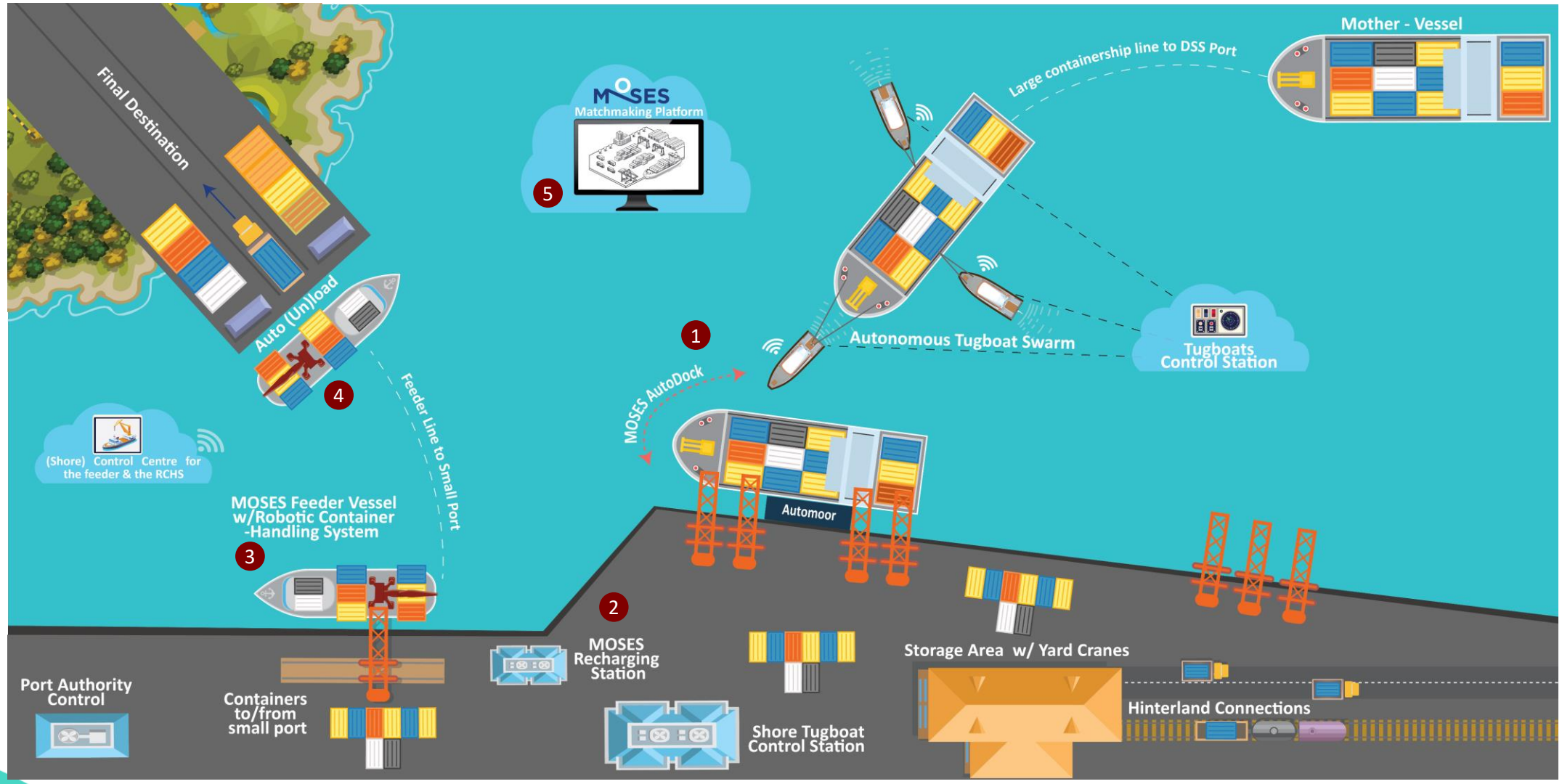
Ship design for sustainable services – no infrastructure required

Logistics solution for balancing demand-supply

DSS ports efficiency

Technological solutions for improving DSS ports inefficiencies – reduce berthing time, improve safety

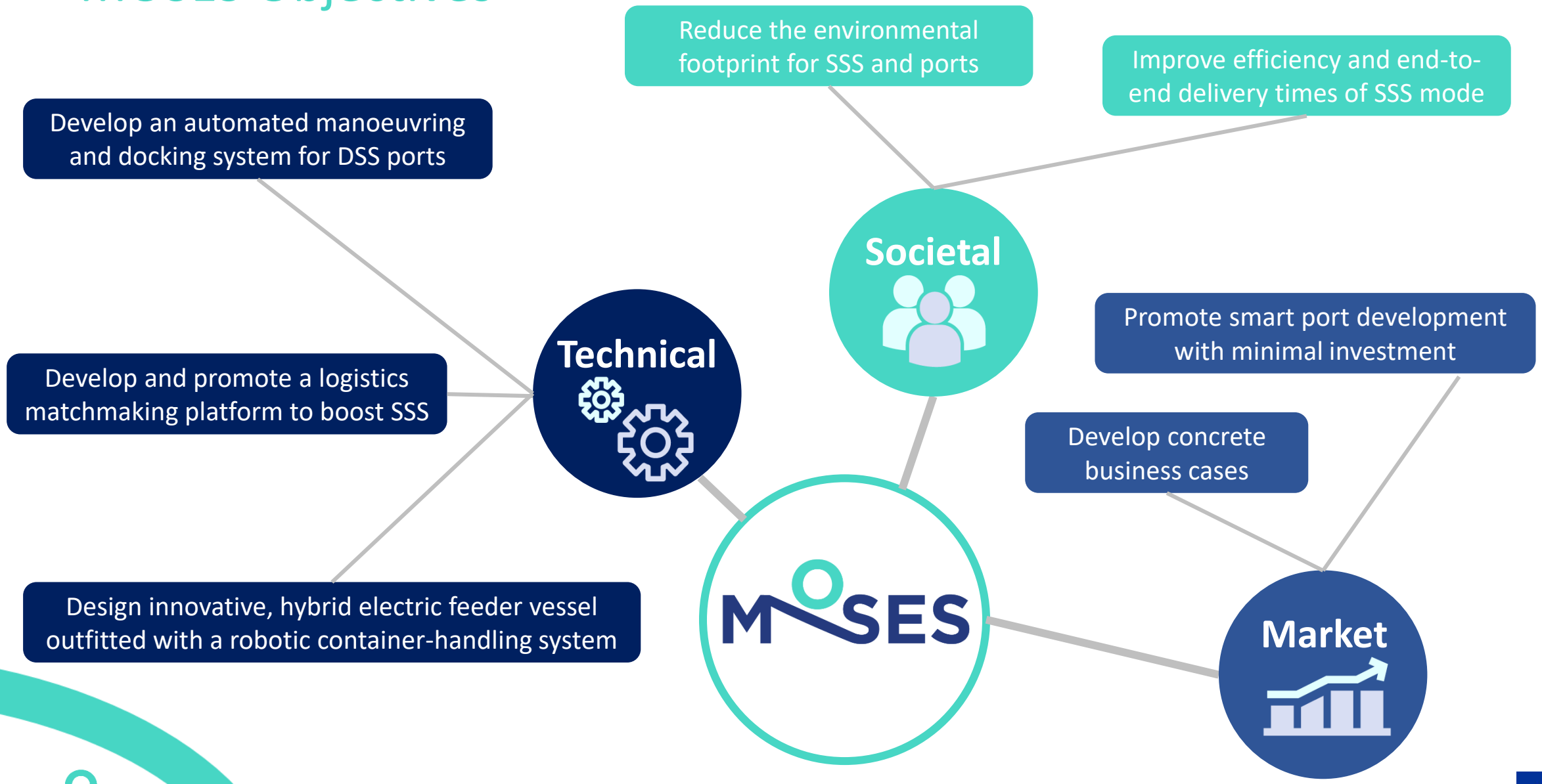
MOSES Concept & Innovations



MOSES Innovations:

1. **MOSES AutoDock (MOSES Autonomous tugboats + AutoMoor)**
2. **MOSES Recharging Station**
3. **Innovative Feeder Vessel**
4. **Robotic container-handling system**
5. **MOSES matchmaking platform**

MOSES Objectives



MOSES Business Cases (1/2)

BC #1 (Western MED-Spain)

Containers are trans-shipped from Valencia port using land-based transportation modalities

Port	TEUs/*year*	Pax/year
Valencia	4.5 m	950 k
Sagunto	48.5 k	50
Gandia	7	35 k

BC #2 (Eastern MED-Greece)

Cargo from Piraeus to the Aegean islands is picked up by truck, delivered to warehouses and then loaded on another truck that off-loads it on RoRo ferries that serve the islands from Attica ports

Port	TEUs/*year*	Pax/year
Piraeus Container Terminal	4.5 m	-
Mykonos	20 k	1.2 m

MOSES Business Cases (2/2)

MOSES Transferability Business Case for North Europe

Open call and dedicated reserved budget in the first project year.

State of the art criteria

- Underperforming SSS route for **domestic traffic competing with other modes**
- TEN-T corridor (besides MED, Orient/East-MED)

MOSES Pilot Demonstrations

Pilot 1:AutoDock

SCOPE: Intelligent cooperation of autonomous tugboat swarm to manoeuvre a large containership and dock it by collaborating with an automated mooring system.

Faaborg harbour, Denmark (TUCO's facilities)

METHOD: 2x TUCO's Pro:Zero workboats will be equipped with MOSES autonomy package. The workboats will cooperate to maneuver a floating vessel to the dock. TRELLEBORG will fabricate and install on the dock a 1-off small-scale automated mooring unit prototype, outfitted with MOSES intelligence to collaborate with the workboats.

Pilot 2:Feeder

SCOPE: Seakeeping and energy performance. Capability to be used for automated mooring.

MARIN's Seakeeping and Manoeuvring Basin (SMB), Netherlands

METHOD: A scaled ship model will be fabricated for 1 vessel design (out of the 3 evaluated in MOSES) and tested in seakeeping and manoeuvring basins.

Pilot 3:Robotic CHS

SCOPE: Autonomous container handling capability and shared control between human operator and system.

MacGregor test facility, Örnsköldsvik, Sweden

METHOD: A full-scale, operational MacGregor GLE Crane, outfitted with sensor package, will be controlled by an operator at the MOSES Shore Control Station (SCS) to handle a container. The demo will be implemented with the SCS onsite and at a remote location.

MOSES upcoming outcomes

conceptual designs for the innovative feeder vessel / robotic system and a **roadmap** to fully autonomous operation, designed on concrete business cases

beta version of a matchmaking logistics platform

a **concept design** of a recharging station for automated vessels

working architecture and interface for Autonomous Tugboat Swarms that cooperate with **a prototype** of an Automated Mooring system

Technologies that will enhance the role of SSS and small ports

Pilot Demos

viable exploitation paths

MOSES impact

- Decongestion of road and/or city infrastructure
- Reduction of Co_2 and air pollutant emissions of intra-European freight transport
- Enhancement of the performance of the CEF TEN-T network
- Sustainability increase freight fed from intercontinental European ports using waterborne transport
- Modernization and increase of the reliability and competitiveness of Intra European Waterborne transport
- Demonstrate that the deployment of solutions can increase the quality of freight moved by SSS by at least 10% by 2039 compared to 2010 baseline data

Additional impact of MOSES project is on

- The creation of new business opportunities for industry and SMEs in the EU
- European policies for manufacturing and automation
- Safety of port processes
- Competitiveness of European ports and shipping companies

www. moses-h2020.eu

MOSES project2020

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MOSES Project

Thank you for your attention!

If you have any questions or require further information, please contact us:

Prof. Nikolaos P. Ventikos
National and Technical University of Athens-NTUA
National Technical University Campus
School of Naval Architecture and Marine Engineering, Office Γ.304
9, Iroon Politechniou Str.
GR-15773, Zografou Athens. GREECE
Tel: +30 2107723563
email: niven@deslab.ntua.gr, mosesproject20@gmail.com.

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