PAVING THE WAY FOR THE FUTURE OF SHORT SEA SHIPPING

MOSES Consortium

AutoMated Vessels and Supply Chain Optimisation for Sustainable Short SEa Shipping

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VISION

Aim: To **enhance the Short Sea Shipping (SSS) component** of the European supply chain.

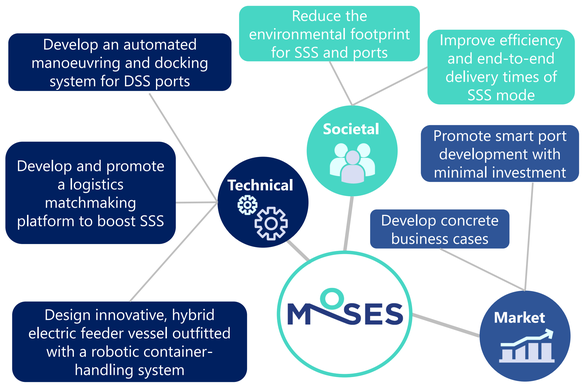
A two-fold strategy for **addressing the vulnerabilities** and strains related to the operation of large containerships, is followed:

- To **reduce the total time to berth** for TEN-T Hub Ports and
- To **stimulate the use of SSS feeder services to small ports** that have limited or no infrastructure.

MOSES Innovations

- For the SSS leg an innovative, hybrid electric feeder vessel including robotic cargo handling system **(MOSES feeder)**.
- For DSS ports the adoption of an autonomous vessel manoeuvring and docking scheme **(MOSES AutoDock)**.
- A digital collaboration and matchmaking platform **(MOSES platform)**.

OBJECTIVES

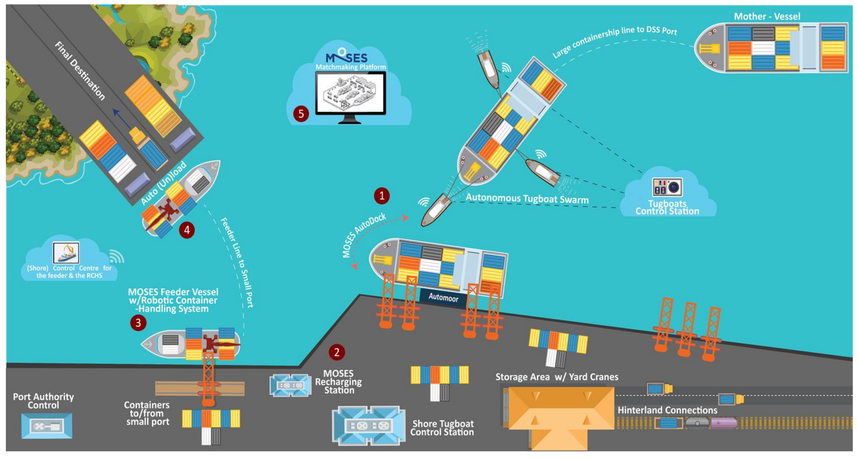


CONCEPT

A large containership (mother-vessel) approaches a DSS port (or a large container terminal). Upon her arrival, she asks for assistance to safely moor at the dock. The assistance is provided by the **MOSES AutoDock**, a combined intelligent mega-system consisting of the **MOSES Autonomous tugboat swarm** for manoeuvring and the **MOSES adapted AutoMoor system**. The MOSES Autonomous tugboats are dispatched and assist the containership with the manoeuvring process in a swarm/cooperative formation and are monitored through a remote-control station located in the DSS port (**MOSES Shore Tugboat Control Station**), which continuously monitors and gathers information about the process. As soon as the ship is on the right position at the dock, the AutoMoor system, intelligently communicates and cooperates with the swarm of the autonomous tugboats in order the ship to be safely docked, considering also the prevailed operational conditions. The automated docking process is also monitored through the MOSES Shore Tugboat Control Station.

The containers' loading and offloading processes are ready to start. Containers that may need to be shipped to destinations near small ports (in mainland or island) are stacked by existing port equipment near dedicated berths of the DSS port and then are loaded on the **MOSES Innovative Feeder Vessel**, which is equipped with the **MOSES Robotic Container-Handling System** that provides (semi-) autonomous (off)loading of the feeder.

The Robotic Container-Handling System and the feeder are remotely monitored through a Shore Control Centre. The innovative feeder, while berthed at the DSS port, may use the **MOSES Recharging Station**, which is an automated shore-based power station. MOSES recharging station is also used for powering the tugboats. As soon as the MOSES innovative Feeder vessel approaches the small port, where her docking is achieved without the need of tugboats, she automatically unloads the containers by using the Robotic Container-Handling System, either at the quay or directly on trucks. Even though the cargo has been successfully transported to its destination, the continuity and sustainability of the feeder service require the necessary adaptation of the existing port operations and the balance between demand and supply. To this end, the MOSES concept is supported by the **MOSES Matchmaking Platform** to handle effectively the changing of the freight flows, to increase the cost-effectiveness of partial cargo loads and to boost last-mile/just-in-time connections among the transport modes and backhaul traffic.



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**

PILOTS

Pilot 1: AutoDock

Intelligent cooperation of **autonomous tugboat swarm** to **manoeuvre** a large floating vessel and **dock it** by collaborating with an **automated mooring system**.

Pilot 2: Feeder

Seakeeping and **energy** performance **capabilities**. Capability to be used for **automated mooring**.

Pilot 3: Robotic CHS

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

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

CONSORTIUM

PROJECT FACTS

Title: AutoMated Vessels and Supply Chain Optimisation for Sustainable Short Sea Shipping

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