AUTOFLEX

Remote Operations and Operational Automation in Inland Navigation

Autonomous Inland Waterway Vessels: market ready or are there still missing links?

Odd Erik Mørkrid / SINTEF Ocean / Online / 23.06.2026

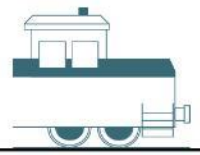
Funded by the European Union

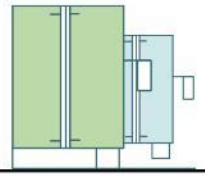
Grant Agreement No. 101136257

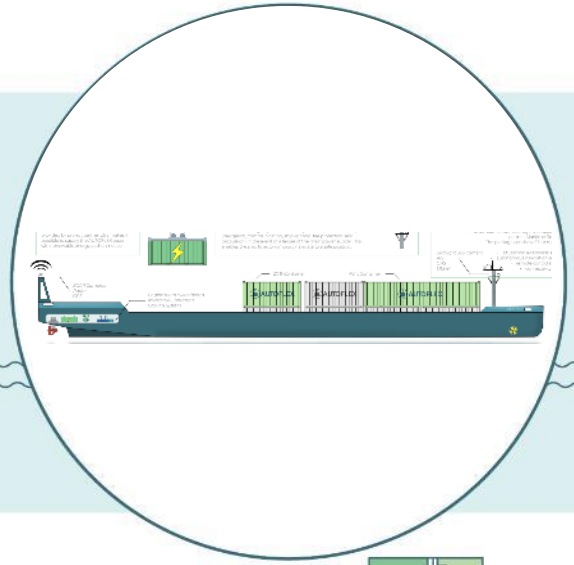
AUTOFLEX

AUTOFLEX develops uncrewed zero-emission vessels and combined cargo and zero-emission energy hubs.

Rail and Road Transport







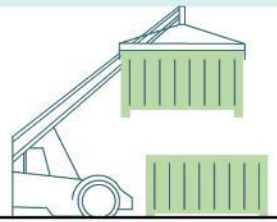
Stow&Charge

Energy hubs for efficient transhipments and energy

Stow&Charge

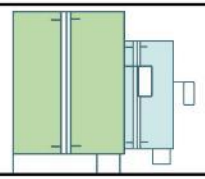
Energy hubs for efficient transhipments and energy

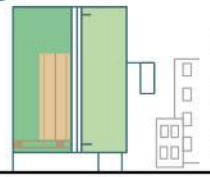
Temporary Port Terminal



cargo transfer for last-mile-distribution

onward transportation to urban areas





Mobile Distribution Centres

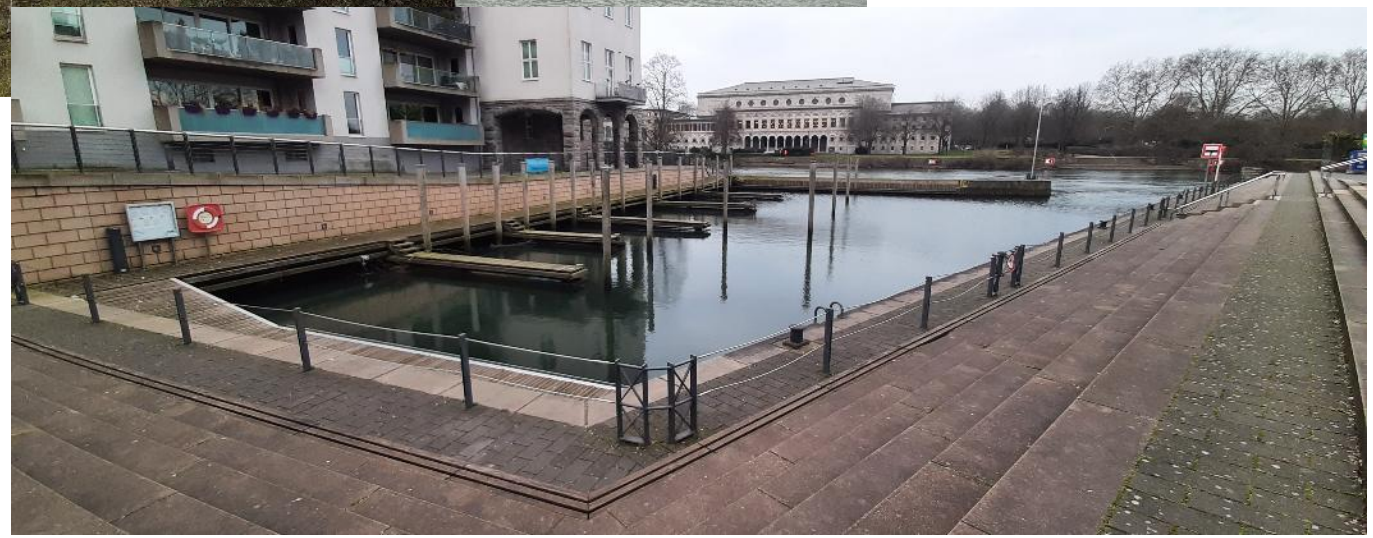
smaller cargo units can be loaded directly onto small electric vehicles

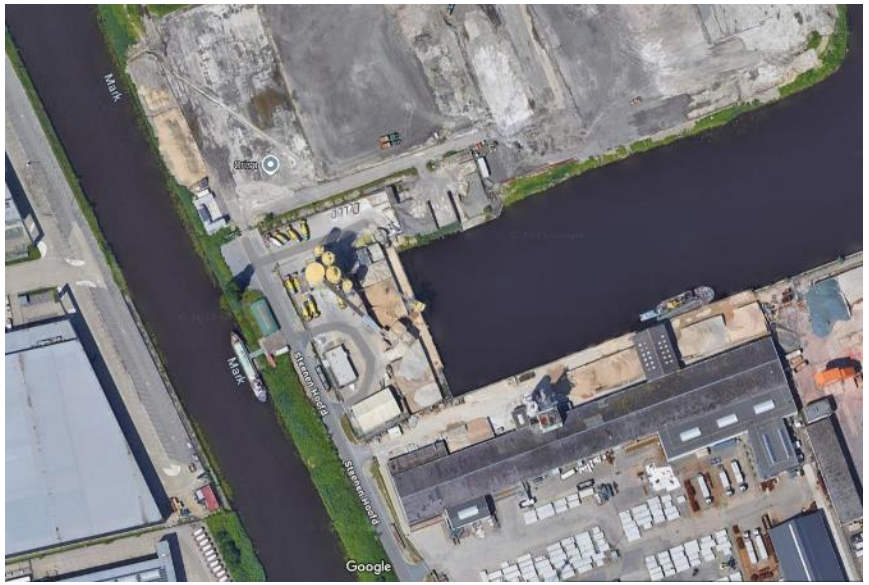
Grant Agreement No. 101136256

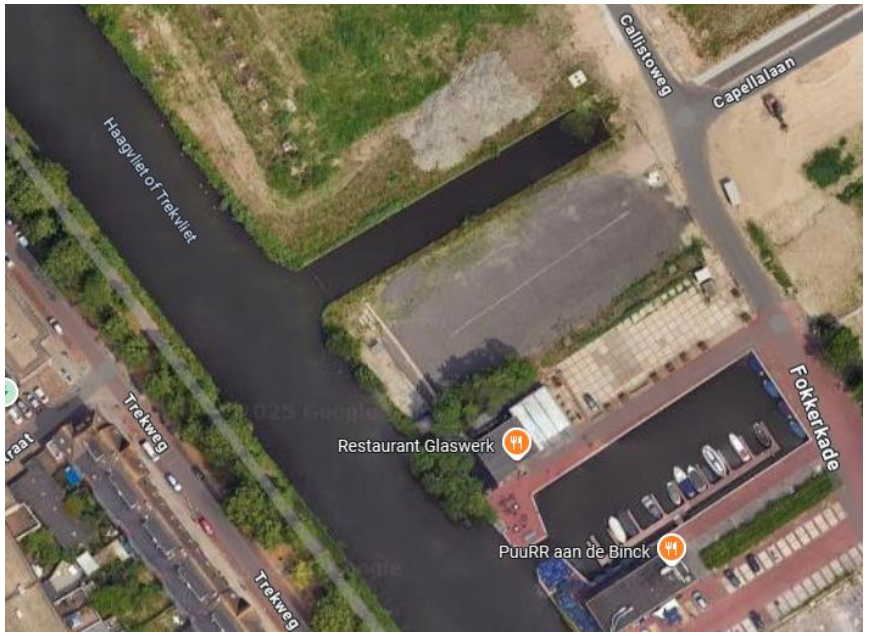
Funded by the European Union

Legend: Water Way Road

Temporary Port Terminals (TPT)



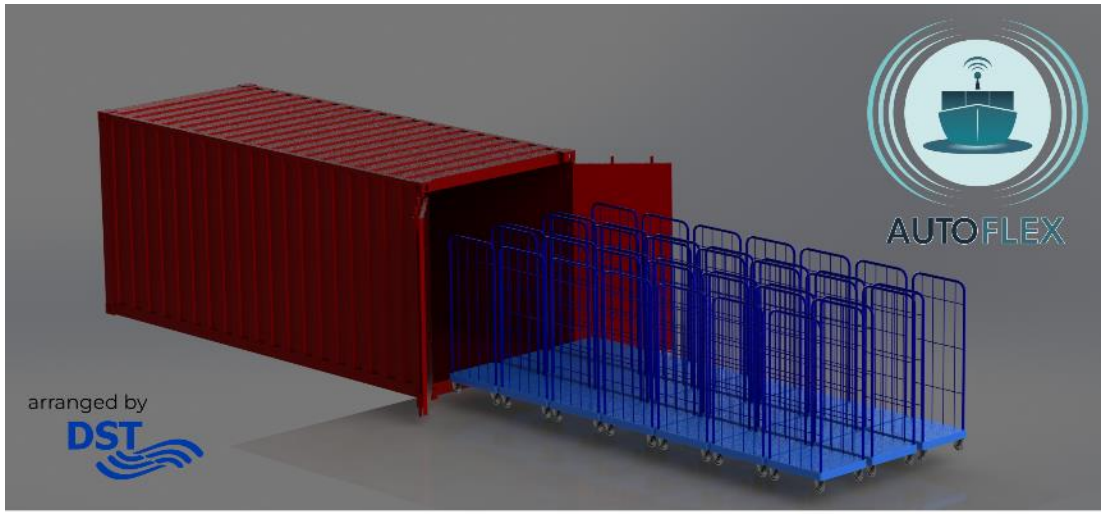


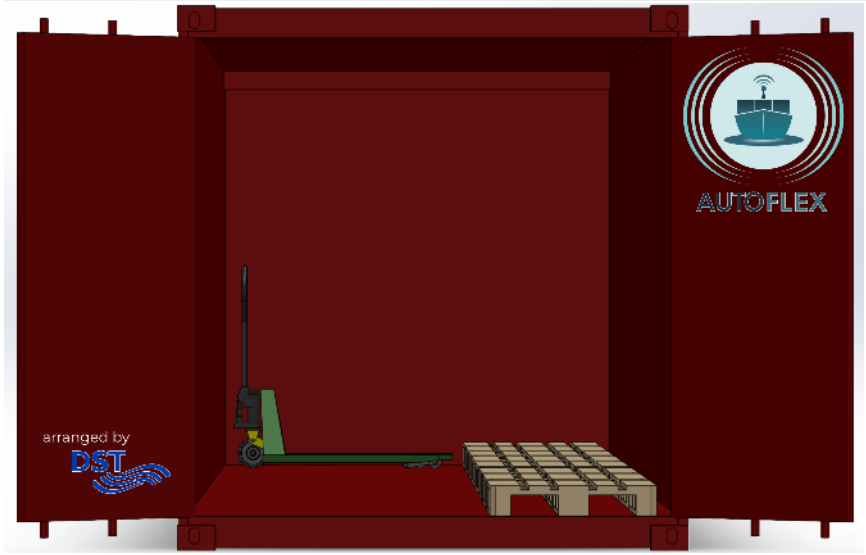


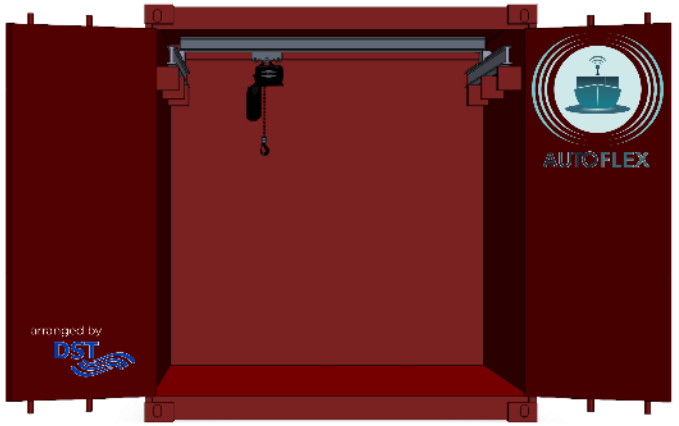
Funded by the European Union

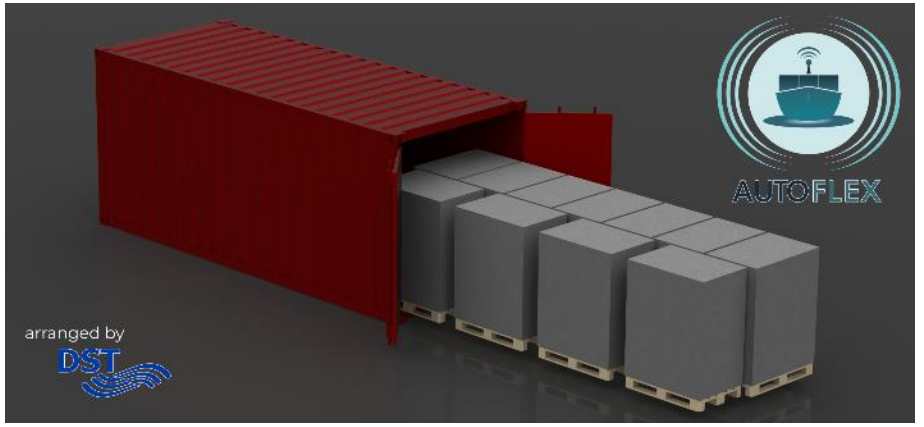
Grant Agreement No. 101136257

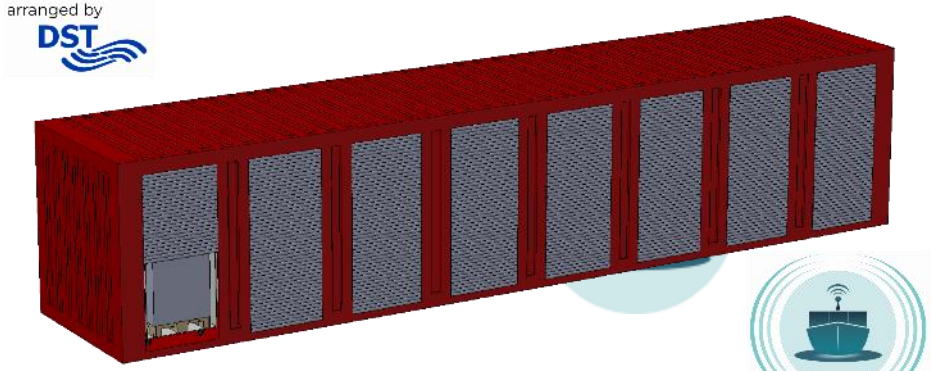
Mobile Distribution Centre (MDC)







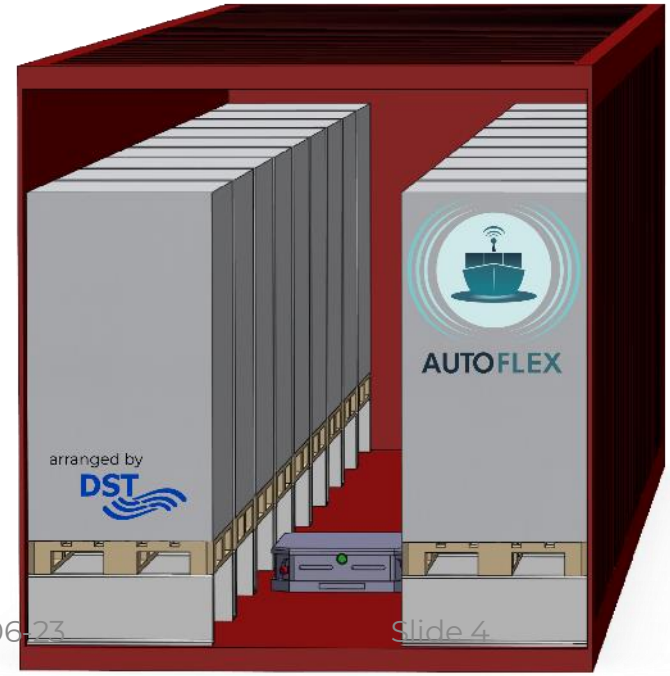




Funded by the European Union

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101136257.

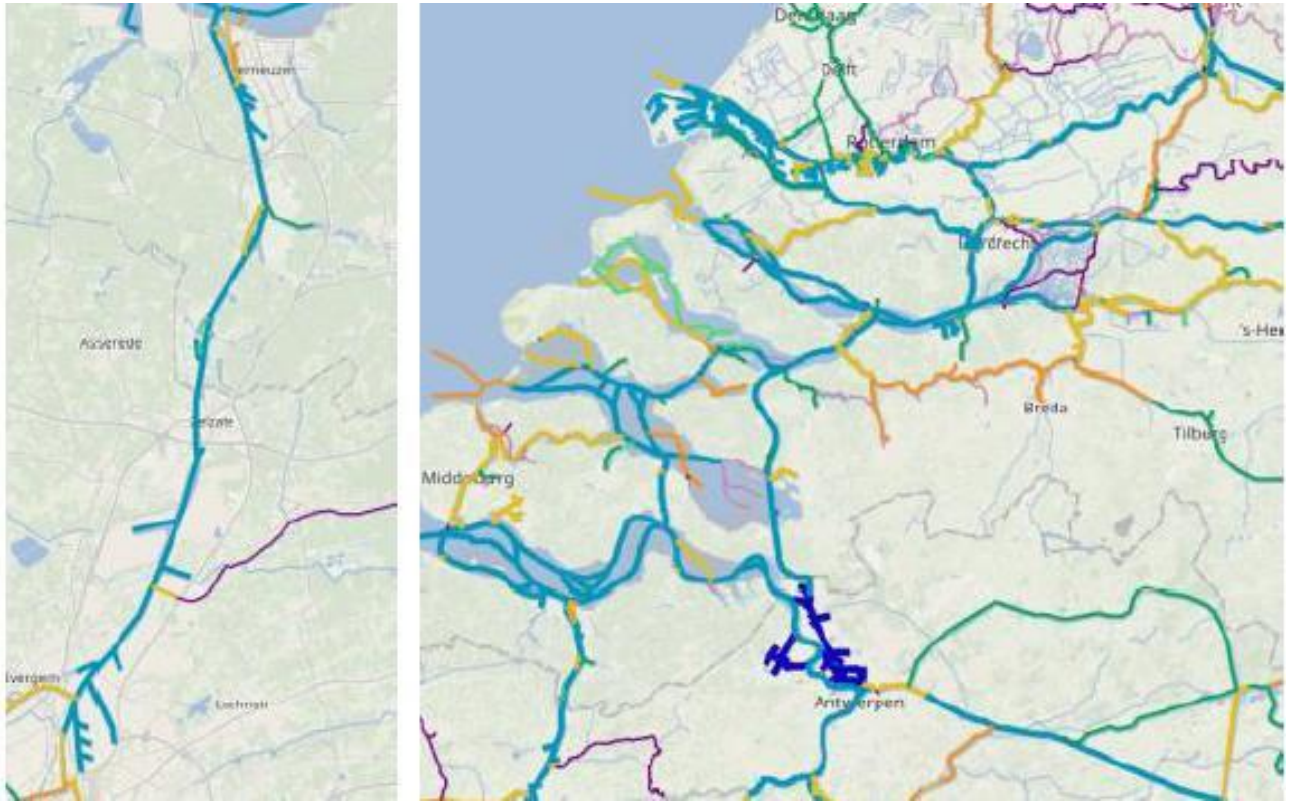
AUTOFLEX



The Zero-Emission Terminal – Stow & Charge (S&C)

DFDS Ghent terminal Zero Emission energy production - Stow&Charge:

- Combined cargo and energy logistics hub
- Experience from DFDS developments combined with ZES technology and business model

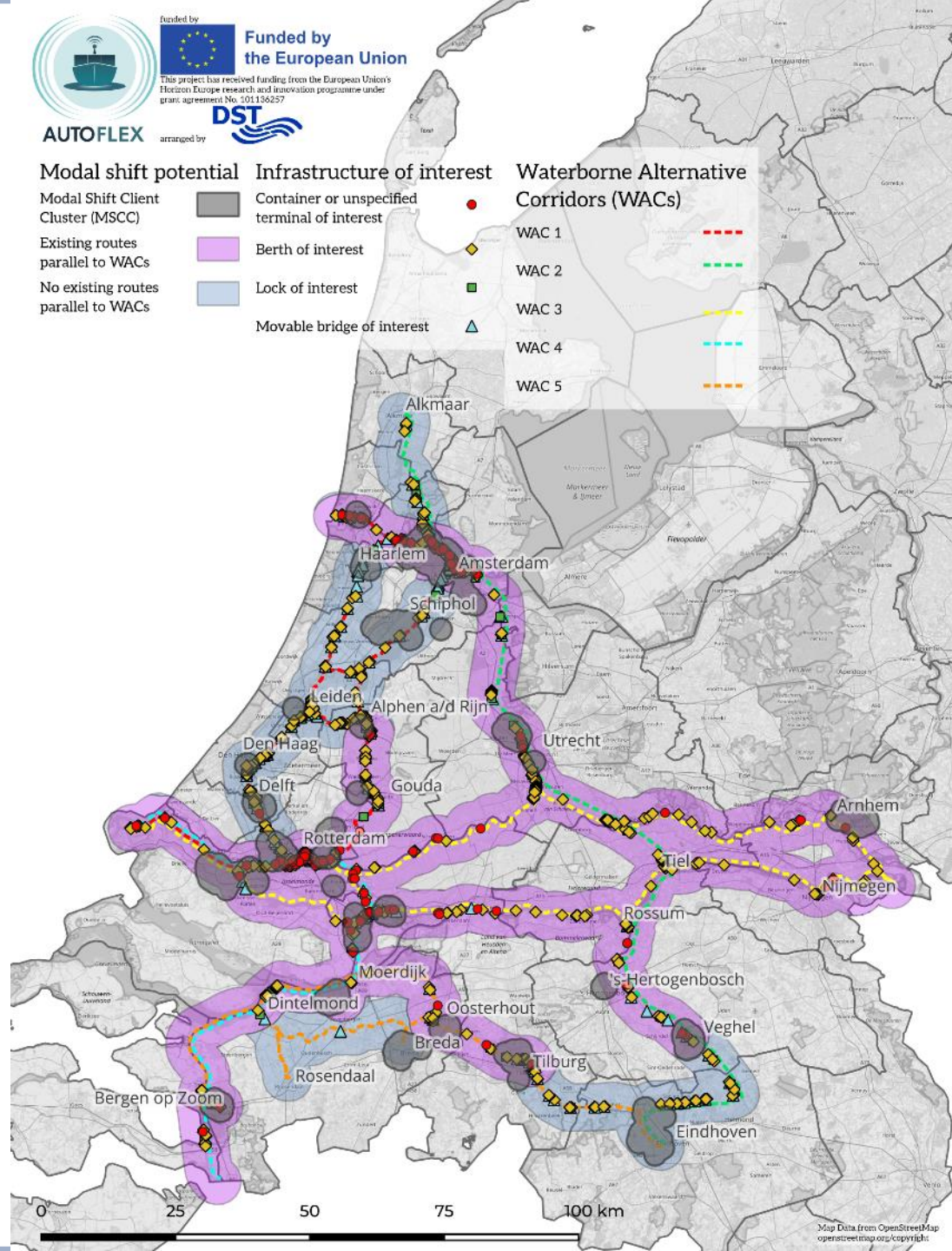


Funded by the European Union

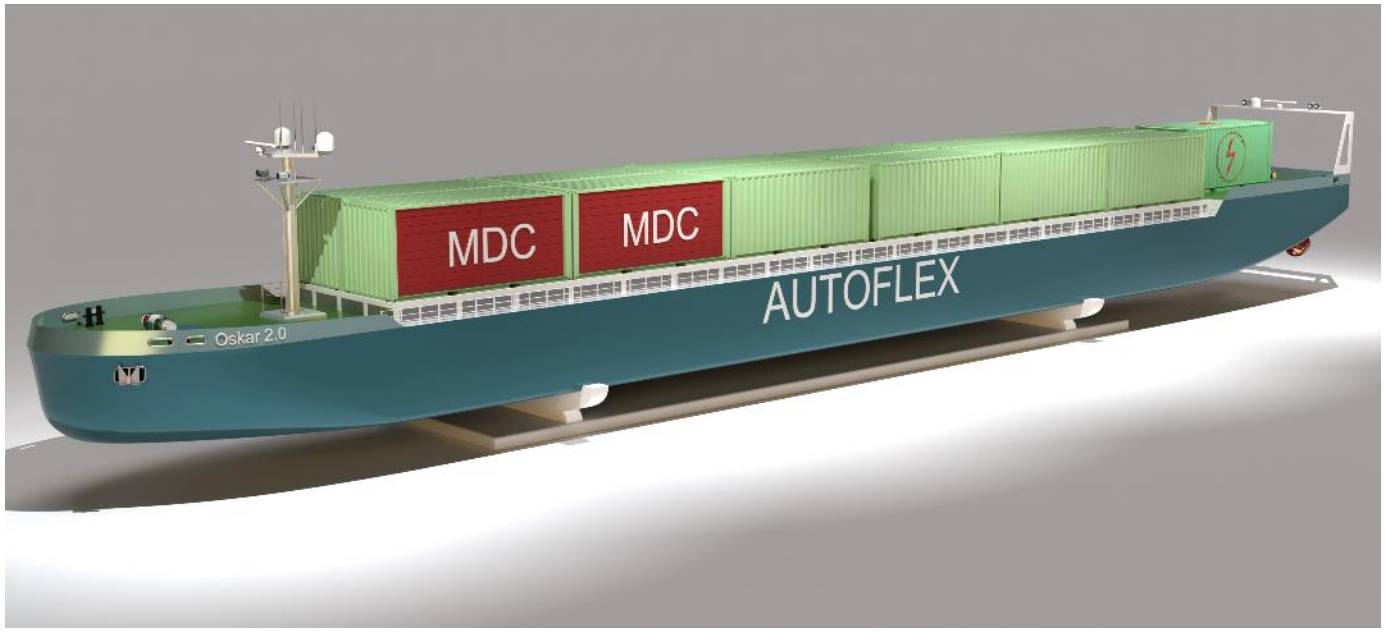
Grant Agreement No. 101136257

Main take-aways

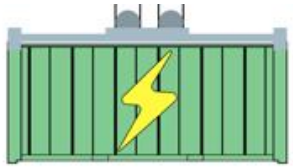
- **The MODAL-SHIFT framework** provides a structured approach to **identifying modal shift opportunities** by integrating **supply** (waterways, infrastructure etc.) and **demand** (customers, distribution centers etc.) factors.
- A key finding is that much modal shift potential lies along **smaller CEMT waterways**, highlighting that smaller (autonomous) ships may be an important component in achieving Europe's modal shift goals.
- Achieving a modal shift (e.g. via autonomous ships) requires the creation of **aligned business ecosystems with shared value propositions and risk distributions**.



The CEMT II vessel Oskar 2.0



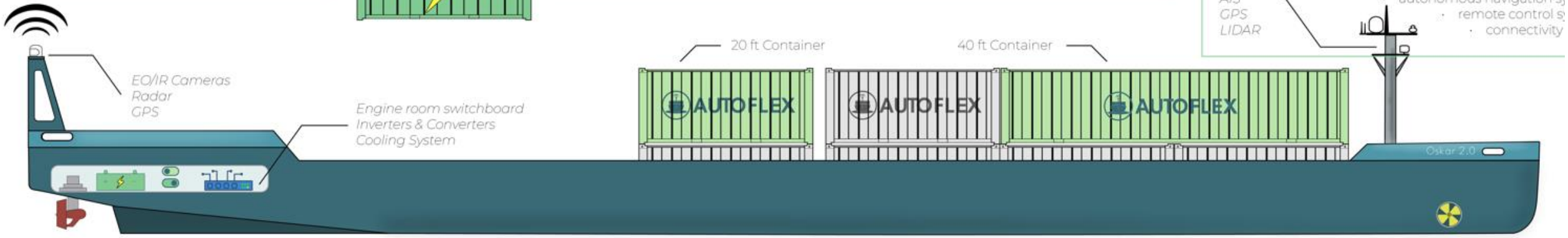
provided by project partner ZES makes it possible to supply the AUTOFLEX vessel with renewable energy at short notice.



(navigation, communication, ship lighting, fire protection, and propulsion) in the event of a failure of the main power supply. This enables the ship to autonomously navigate to a safe position.

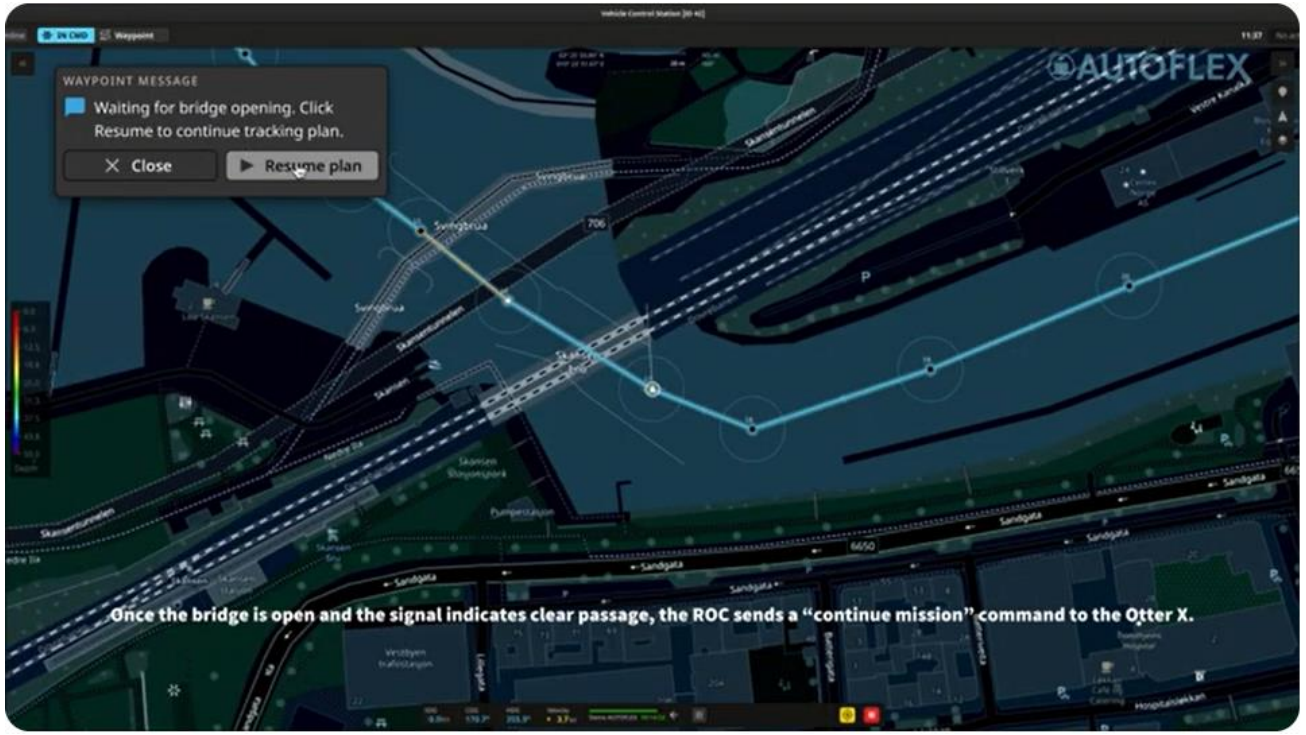
partner Maritime Ro
The package consists of four m

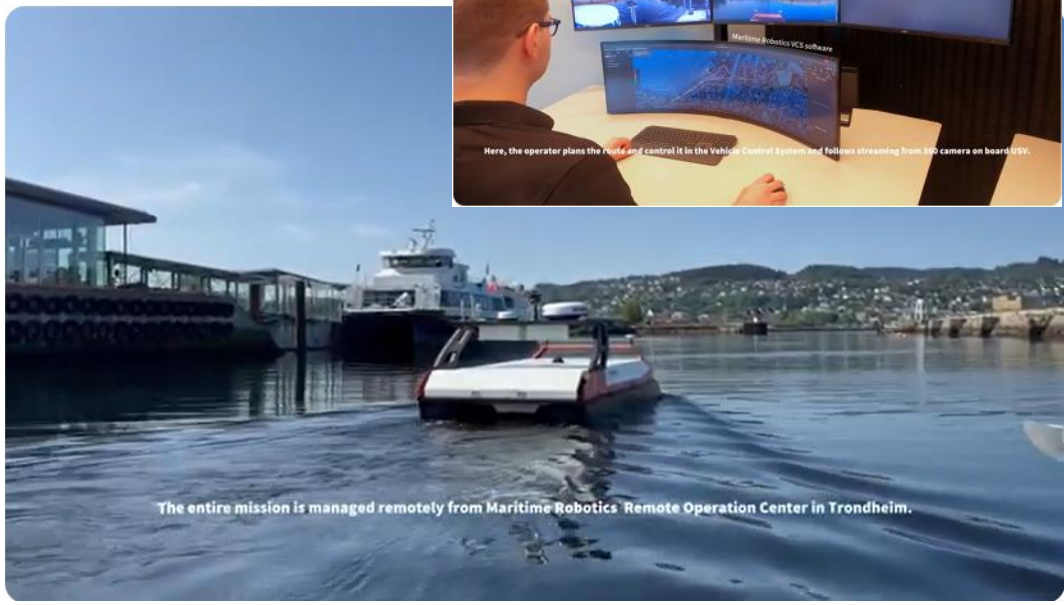
SeaSight 360 camera · situational awareness s
AIS · autonomous navigation sy
GPS · remote control sy
LIDAR · connectivity



Mission planning and ROC

AUTOFLEX autonomy control loop: mission planning, route execution, live monitoring, and situational decision-making

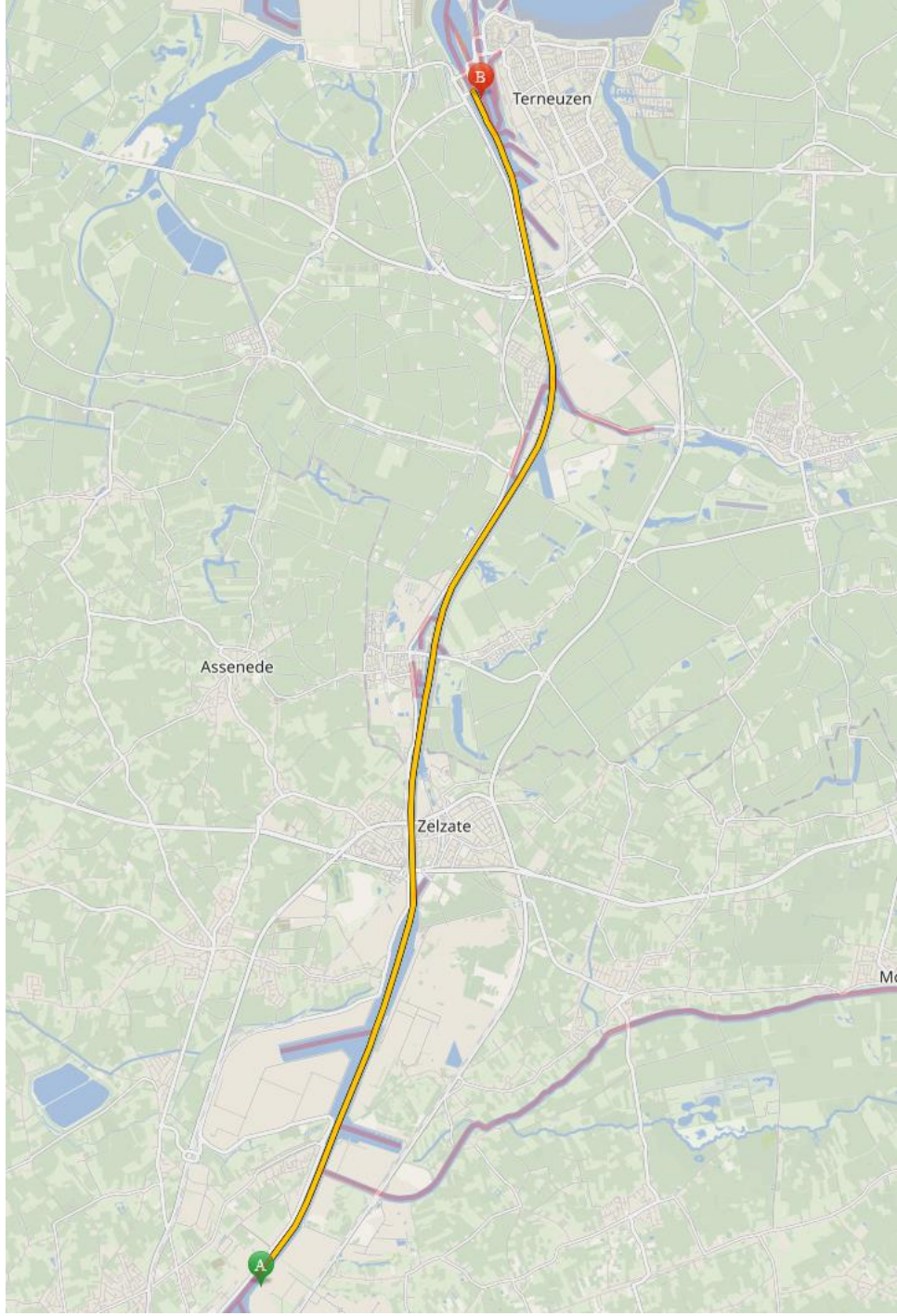




The demonstration route

Demonstrate autonomous navigation of a container vessel operating in inland waterways.
Assumption:
CEMT-class Va inland vessel at CCNR level 3.

- The demonstration will be performed with an existing commercial container vessel.
- The vessel will be retrofitted with necessary equipment
- Collaboration between Maritime Robotics and another third-party delivering auto/position pilot systems for control of the vessel's propulsion system



Funded by the European Union

Grant Agreement No. 101136257

AUTOFLEX enables aligned autonomous inland logistics

AUTOFLEX with FOREMAST and SEAMLESS: A shared reference for connecting transport system design, vessel capability and autonomous operations.

01

Transport system

Creates the operating network: Temporary Port Terminals, Stow & Charge and Mobile Distribution Centres bring modal shift closer to demand and energy supply.

Enables flexible access points and viable logistics ecosystems.

02

Vessel design

Fits the network: The CEMT II / Oskar 2.0 concept links modular cargo handling, zero-emission operation and access to smaller waterways.

Enables right-sized vessel capability for constrained inland corridors.

03

Autonomous technology

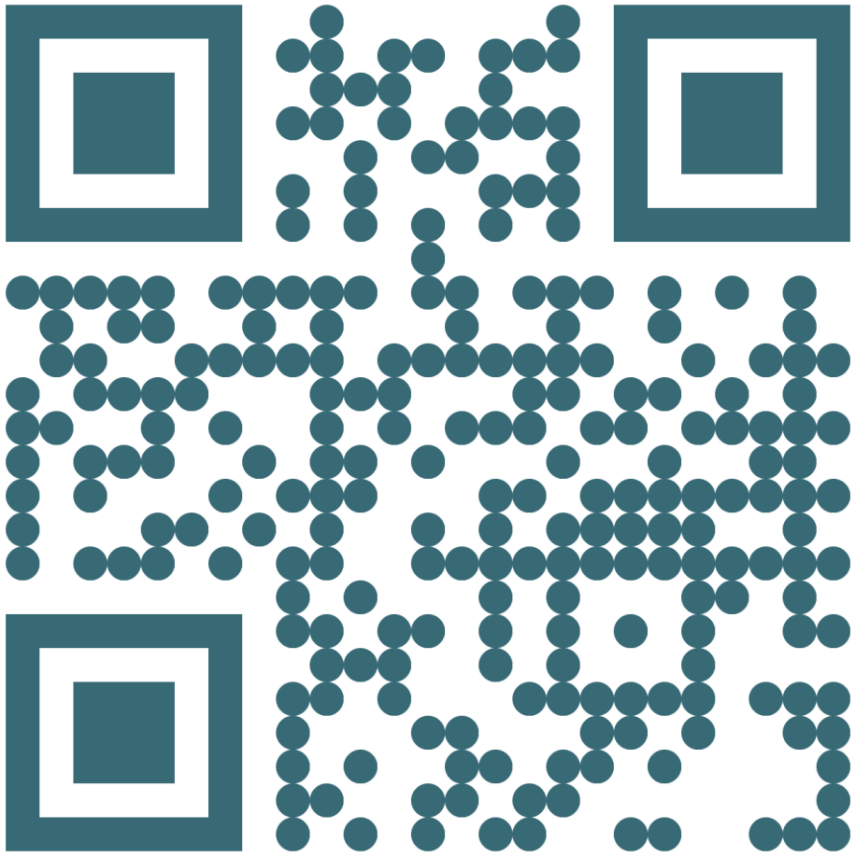
Turns concepts into operations: Mission planning, route execution and ROC supervision connect vessel behaviour to safe real-world demonstrations.

Enables a scalable pathway from supervised autonomy to demonstration.

Funded by the European Union

Grant Agreement No. 101136257

AUTOFLEX Homepage



Funded by
the European Union

Grant Agreement
No. 101136257

Thank you very much for your attention

Funded by
the European Union

Grant Agreement
No. 101136257