PLATINA4Action project overview

Objectives, scope, progress and strategic framework

Technology Transfer Workshop
Budapest - 3 November 2025
Martin Quispel, SPB/EICB

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137650.

Project summary PLATINA4Action

Title: ***PLAT****form for the* ***I****mplementation of the* ***N****avigation* ***A****ction programme* ***for Action***

Duration: 36 months: January 2024 – December 2026

Budget: 1.5 mln euro, 125 person months staff effort

Instrument: Horizon Europe Coordination and Support Action, Lump Sum

Project summary PLATINA4Action

Platform for policy action to boost green and connected inland waterway transport

The platform acts as catalyst, bringing together expertise, stakeholders and research in the field of European IWT, building on the PLATINA3 project.

Activities focus on:

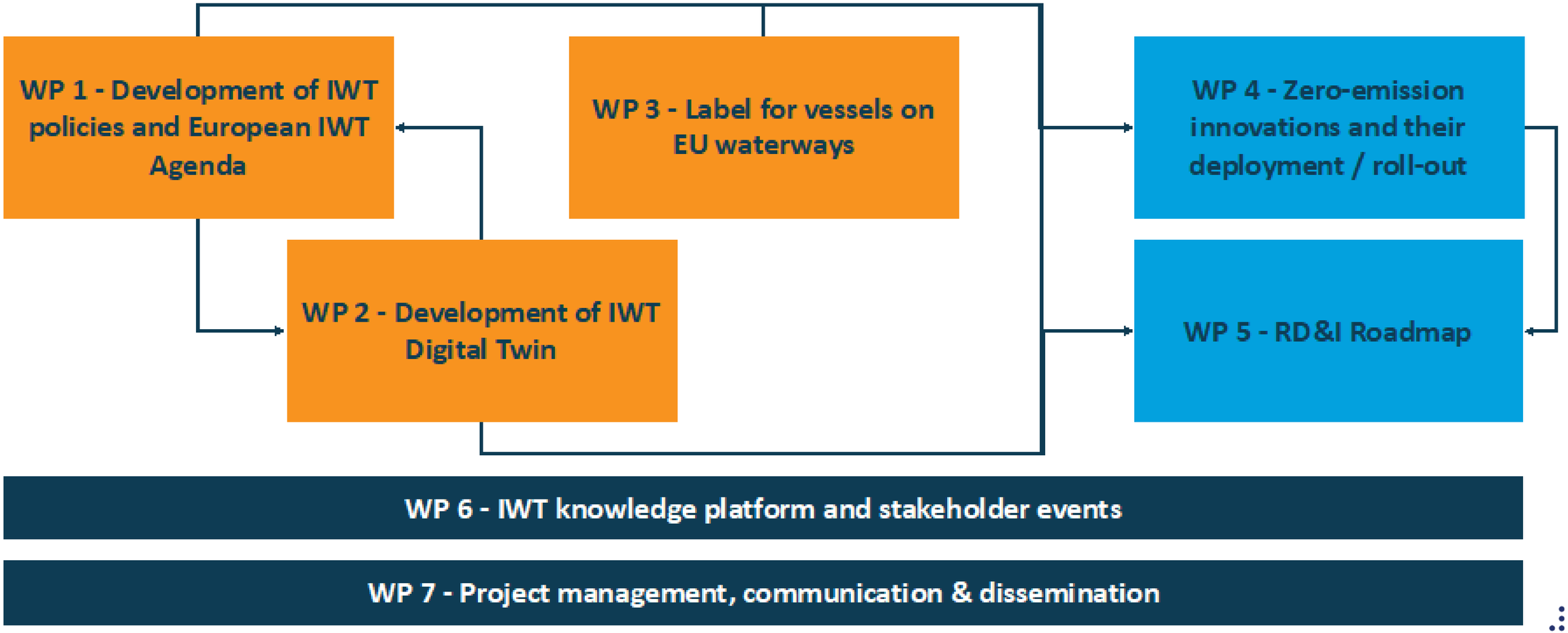
1) **Supporting and coordinating research and innovation activities** focussing on **green and connected IWT** to find synergies between parallel developments
2) **Impact** estimations of **NAIADES III actions** and supporting the **policy discussions** to achieve modal shift and zero-emission IWT
3) Updating of the **Strategic Research and Innovation Agenda** for IWT.

Close cooperation with DG MOVE and interaction with wide group of public and private stakeholders and experts.

Project objectives

- **Assess the impact of the NAIADES III actions** on emission reduction and modal shift and **develop additional policy recommendations** to accelerate the transition to zero-emission and digital IWT and to support the modal shift.
- Develop and demonstrate a **digital twin tool** capable of **evaluating the impact** of the NAIADES III actions and additional policy recommendations.
- Develop and validate a **European labelling system for green IWT vessels on EU waterways** aiming at achieving energy and emission reduction and ultimately zero-emission transport.
- Identification and analysis of **barriers and opportunities for the development of zero-emission and smart technologies and pilot actions** for **deployment** of selected breakthrough concepts.
- Develop an **RD&I roadmap** for technologies and policies achieving accelerated zero-emission and smart IWT their deployment.
- **Initiate and continue interaction** between policy makers, technology providers, experts, researchers, and IWT end-users.

Project structure



Project consortium

DST

WATERBORNE

Universiteit Antwerpen

viadonau

Expertise- en InnovatieCentrum Binnenvaart
EICB

PLATINA 4Action

WP1 Development of IWT policies and agenda

- **Policy evaluation:** Implementation of the 35 NAIADES-III actions and identifying gaps:
  - 1st report delivered November 2024, supporting the NAIADES Implementation Expert Group.
  - 2nd version under preparation for next NAIADES Implementation EG meeting 19 November.

- **Impact assessment:** additional policy actions will be analysed by means of the Digital Twin policy evaluation tool. First results on 19th of November.

- **Policy development, joint papers for**
  - EU Sustainable Transport Investment Plan
  - EU Industrial Waterborne and Port Strategies

7 April 2025

Statement by the inland waterways transport and ports sector on the **Sustainable Transport Investment Plan** (STIP)

Executive summary

Inland waterway transport (IWT) is a highly competitive and sustainable sector that plays a vital role in the various pillars of the Clean Industrial Deal. The IWT sector calls upon the Commission to include inland waterway transport in the upcoming European Maritime/Waterborne Industrial Strategy, the European Port Strategy and the Sustainable Transport Investment Plan. Recognized as a highly competitive, energy-efficient, safe, and sustainable alternative to other transport modes, inland waterway transport helps alleviate congestion on overloaded road and rail networks for both goods and passengers. Europe's new industrial future and circular economy depend heavily on IWT as carrier of the building blocks of the EU economy, including renewable fuels. Increasing cargo volumes on inland waterways can make a significant contribution to achieving the European Green Deal policy objectives.

A near-term transition to zero greenhouse gas (GHG) emissions in inland waterway transport is within reach through the widespread adoption of Hydrotreated Vegetable Oil (HVO). HVO as renewable drop-in fuel enables full decarbonisation and can be used immediately in existing and modern internal combustion engines to replace fossil diesel. Moreover, HVO is fully compatible with the current refuelling infrastructure. However, the shift is currently hindered by the inability to pass on the considerably higher price of HVO to customers, leading to competitive disadvantages compared to fossil fuel users.

In order to capitalise on the benefits and opportunities presented by HVO in the short term, it is essential to prioritise support for an annual supply of 1.6 million tons HVO for IWT at competitive pricing with diesel. This should be backed by a stable EU regulatory framework and coordinated efforts of EU Member States. This approach would deliver a viable business case to barge operators and represent a major step forward in the decarbonisation of IWT, aligning with the EU Green Deal and supporting the objectives of a modal shift.

Creating dependency on HVO as the sole energy source carries potential risks in terms of availability (demand competition from other modes and sectors) and price volatility. Consequently, **it is recommended that other alternative fuel solutions such as battery-electric propulsion, methanol and hydrogen be developed concurrently to mitigate these risks and ensure resilience.** The higher costs of these zero-emission energy solutions, both in terms of operation and capital, mean that **regulation complemented by funding will be key to overcoming implementation barriers**, ensuring legal certainty, fostering investment and expanding renewable fuel supply networks. A stable, technology-neutral regulatory framework combined with incentives for innovation is essential to achieving full decarbonisation and securing the long-term sustainability and resilience of inland navigation.

Statement inland waterways and ports sector on the STIP • April 2025 Page 1 of 12

13 May 2025

EU Industrial Waterborne and Port Strategies: Contribution of the Inland Waterway Transport and Port sector

Executive summary

Major centres of production and consumption are located along Europe's waterways. Rivers and canals are therefore vital to the competitiveness of the EU's basic industries, from SMEs to large corporations. Large volumes of goods, including steel, agricultural products, chemicals, oversized cargo, alternative fuels, construction materials and waste can be transported by inland waterways. Disruptions to this system have a significant impact on downstream supply chains, industrial production and even food security. As a safe and energy-efficient alternative, inland waterway transport relieves congested land networks while offering increased opportunities for sustainable tourism and recreation. Inland ports act as key transshipment nodes and gateways in this ecosystem, extending the reach of maritime trade into the heart of Europe, enabling multimodal logistics and hosting a wide range of industrial activities. Importantly, inland ports are also becoming hubs for renewable energy and the circular economy.

As such, **Inland Waterway Transport (IWT) and Ports** play a crucial role in achieving Europe's **climate neutrality, economic resilience and strategic autonomy** and are a competitive and crucial component of the Clean Industrial Deal and the Waterborne ecosystem.

This statement presents our sector's vision and concrete proposals for the upcoming industrial waterborne[1] and port strategies focusing on the **twin green and digital transition and achieving resilience while putting people at its core**. Aligned with the Competitiveness Compass goals – closing the innovation gap and developing a competitiveness roadmap in a rapidly changing environment –the sector advocates to reach these objectives with the following **key policy instruments:**

1. Fostering innovation from its inception phase to deployment across the value chain;

2. Pro-innovation regulation providing legal certainty to boost investment;

3. A funding and investment framework, which is stable, predictable, fit-for-purpose and easy-to-access in particular for SMEs.

The interplay between innovation and regulation is essential to ensure continued progress and encourage investment.

In order to achieve these ambitions, it is essential **to establish a robust, interconnected industrial ecosystem** that brings together the inland waterway sector, other waterborne industries, shipyards, equipment manufacturers, energy suppliers and ports. To reach Europe's industrial and climate objectives and maintain global leadership in the waterborne sector, it is vital to invest, support and strengthen this ecosystem, including the skilled and dedicated workforce at the heart of it.

Industrial Maritime and Port Strategies • May 2025 Page 1 of 12
Statement IWT and Ports sector

WP2 Development of Digital Twin

The Digital Twin (DT) enables **quantitatively simulating different policy scenarios and options** to assess the contributions on **modal share** by the NAIADES III measures and **emission reductions** and the **impacts for the various stakeholders** involved.

This WP is being developed in 3 stages:

- Development of KPIs that need to be quantified (along with the main scenarios that need to be analysed) -> completed, see report D2.1
- The further development of the DT -> report submitted August 2025 (D2.2)
- DT will be used to make the policy analysis (ongoing).

WP3 Label for vessels on EU Waterways

First action: updating state-of-play => completed, see report D3.1

Several papers prepared and discussions with EC Technical Common Expert Group and CCNR correspondence group.

Working towards a dashboard of different energy and emission performance indicators:

- Air pollutant emissions (NOx, PM, ..): grams per kWh
- GHG intensity of energy use: grams CO2e /MJ
- Carbon emissions after energy conversion: grams CO2e per kWh
- Energy Efficiency Design Index (EEDI): kWh per ton.kilometre
- Operational GHG emission performance: Grams CO2e per ton.kilometre

WP4 Zero-emission innovations and their deployment / roll-out

- First action “Stocktaking and subsequent selection of cases, initiatives, and good practices, considering results from other projects” -> completed, see report D4.1

Ongoing:

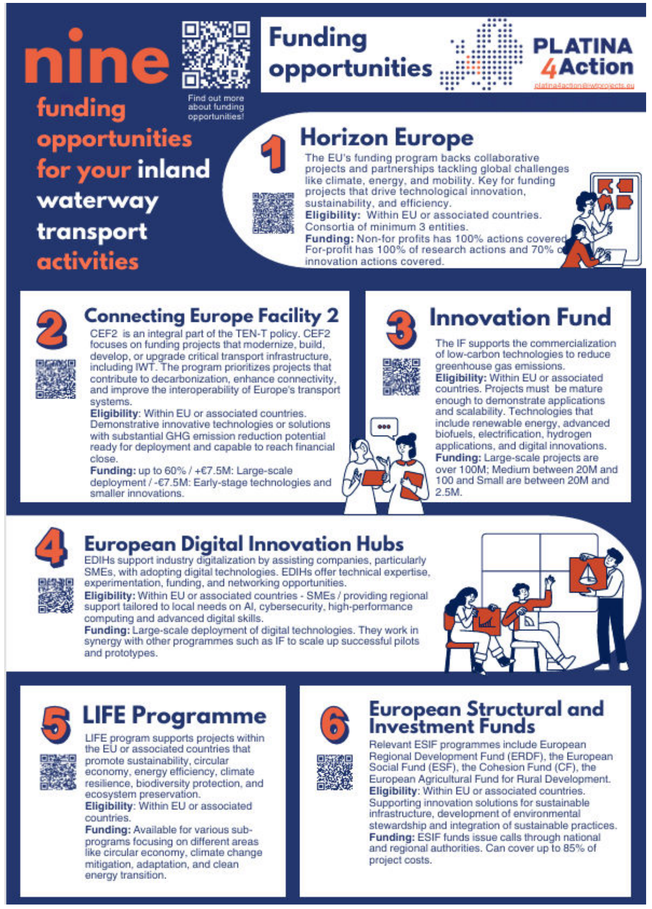
- TCO modelling and identification of financing requirements considering new business models and ownership models, including options for co-funding options.
- Identification and validation of barriers and possible actions to overcome them.

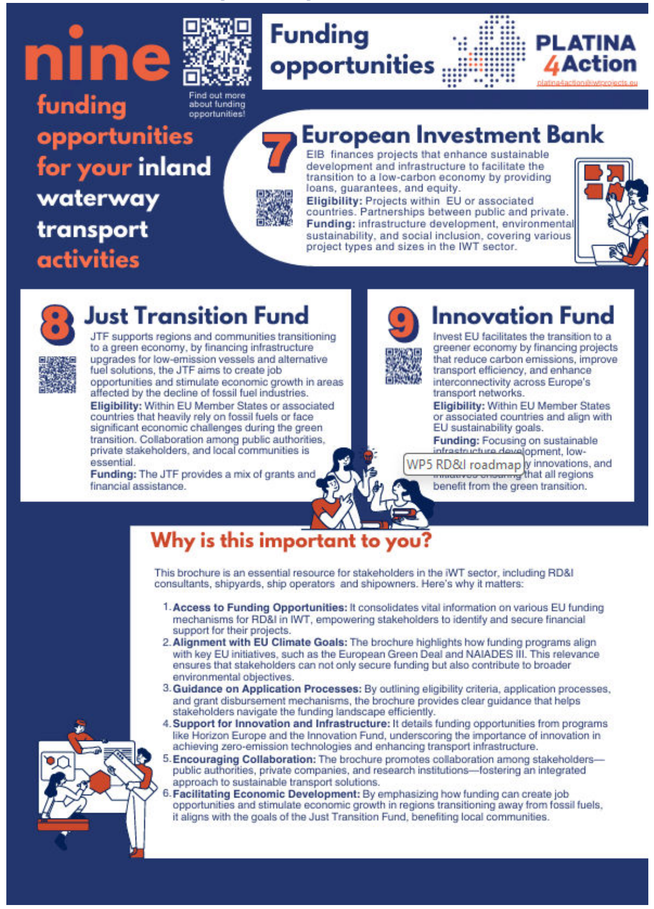
Planned for 2026:

- Elaboration of actions and required framework conditions for implementation => Action Plan
- Facilitating the development of a project proposal for deployment breakthrough making best use of existing financial instruments => Pilot Action

WP5 RD&I roadmap

- Overview on EU funding instruments available for RD&I and deployment in IWT





WP5 RD&I roadmap

Overview on EU funding instruments available for RD&I and deployment in IWT:

- Full report D5.1
- Short brochure (English)
- Long brochure (English)
- Long brochure (German)
- Long brochure (Dutch)

Input given to RD&I priorities for 2026 – 2027 (HEU calls)

2026: Comprehensive RD&I roadmap (public-private initiative), focused on the new MFF: Horizon Europe post 2027/ FP10, European Competitiveness Fund and Connecting Europe Facility

WP6 IWT knowledge platform & events

Providing a platform for collaboration and engagement among relevant stakeholders interested in the transition to zero-emissions, smart IWT, and modal shift to IWW.

Objectives:

- Transfer and consolidate knowledge in the IWT sector and fostering dialogue
- Input and feedback from stakeholders on the topics addressed in PLATINA4Action.

Achievement Strategy:

- Organizing Stage Events, Technology Transfer Workshops, and stakeholder consultations to facilitate information exchange with experts and stakeholders.
- By ensuring synergies with relevant projects to optimize resource use and enhance outcomes => dedicated platform for IWT RD&I projects.

Task 6.1 - Synergies between European projects

IWT Projects Cooperation Platform

- Launch Date: 4 February 2025 at the Waterborne Days in Brussels
- 44 Complementary Projects contributing to innovation in inland waterway transport

Collaborative Ecosystem

- Serves as a hub for European RD&I projects in Inland Waterway Transport with thematic subgroups

Shared Objectives & Benefits

- Facilitates knowledge exchange among project coordinators
- Encourages best practices and alignment of research goals
- Focus on zero-emission technologies, digitalization, climate resilience, and a skilled workforce

Overcoming Barriers & Policy Influence

- Joint recommendations for policy measures and further research needs
- Enhances visibility of innovative solutions to policymakers, industry, and stakeholders

Website: European IWT Projects Cooperation Platform https://iwtprojects.eu/

LinkedIn channel: https://linkedin.com/company/iwt-projects

Task 6.2 – Technology Transfer Workshops

Focus on knowledge transfer to regional barge operators on green and connected IWT:

- 1st TTW: 30 May 2024, Gorinchem, The Netherlands
- 2nd TTW: 4 December 2024, Antwerp
- 3rd TTW: 26 and 27 May 2025, Duisburg
- **4th TTW: 3 November 2025 in Budapest**

- 5th TTW: **4 June 2026 in Gorinchem**, back-to-back with 2026 Maritime Industry fair.

- All materials are made available on the PLATINA4Action website: presentations, video registrations, see the events page

PLATINA 4Action

Task 6.3 – Stage Events

- 1st Stage Event: 6 November 2024, Brussels
- **2nd Stage Event: 4 November 2025, Budapest**
- 3rd Stage Event: October 2026 presenting draft final results of PLATINA4Action
- All materials are made available on the PLATINA4Action website: presentations, video registrations, see the events page

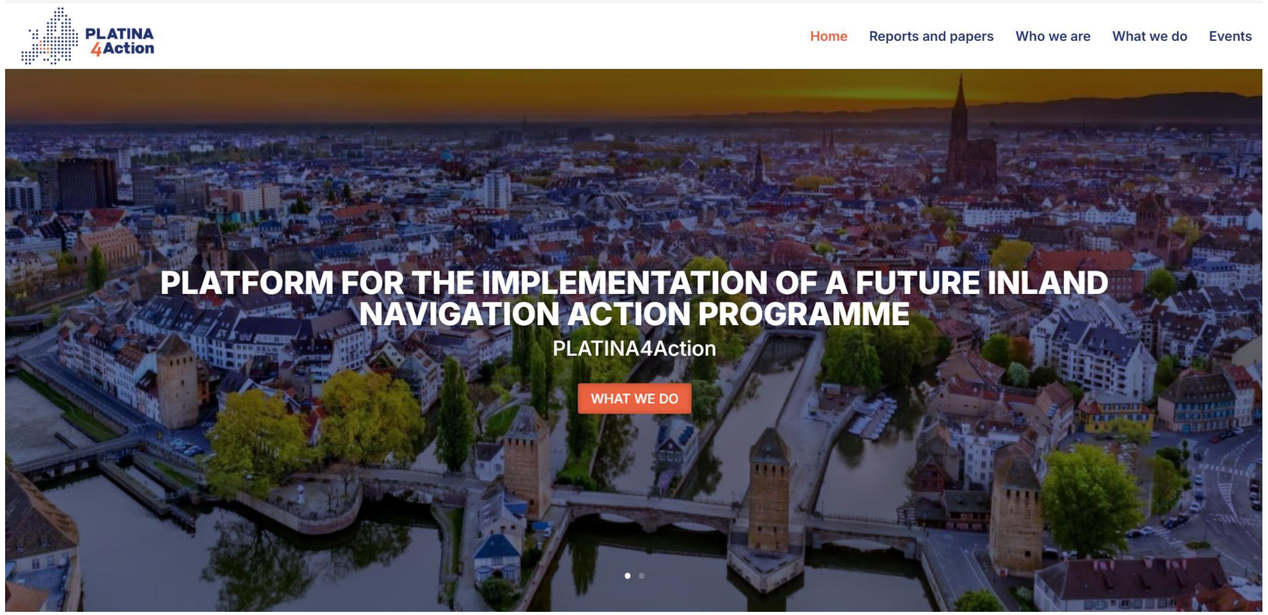
Project management and dissemination

- Mid-term review of project took place in August 2025
- Advisory board was established for peer-review on deliverables
- Communication and Exploitation strategy and instruments
- Website
- LinkedIn

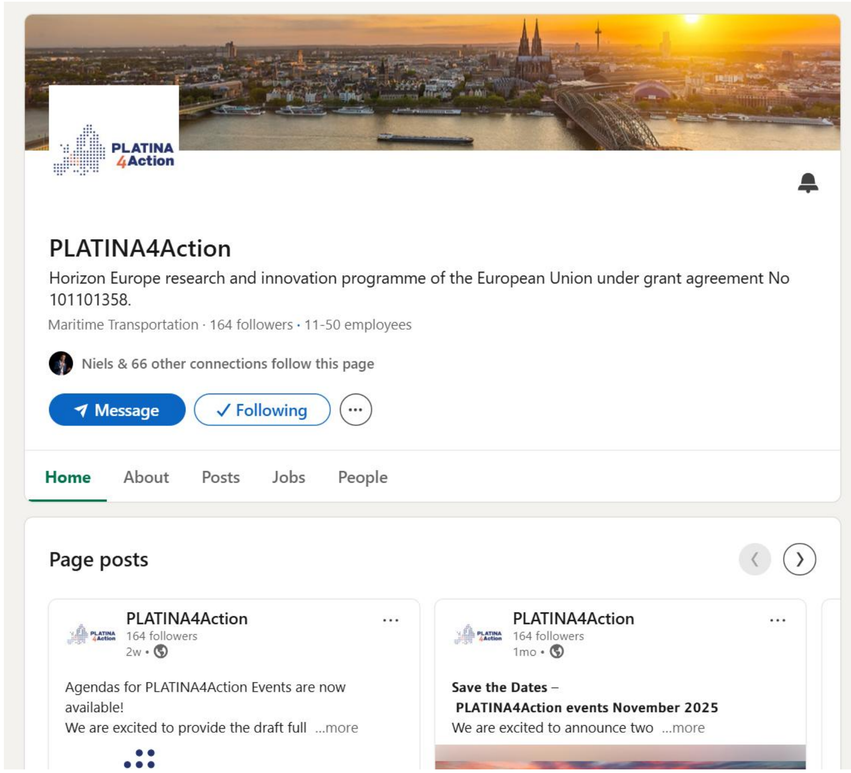
Get connected and stay tuned

Website: https://platina4action.iwtprojects.eu/

LinkedIn: https://www.linkedin.com/company/100895636



Platform for the implementation of the navigation action programme for action



Have a fruitful event!

Thank you for your attention

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This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137650.

synergetics

SYNERGETICS project results and decision support tool for vessel owners

SYNERGETICS | Synergies for Green Transformation of Inland and Coastal Shipping

4th Technology Transfer Workshop – Budapest, November 3, 2025

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synergetics

16 partners and two associated partners from eight countries teamed up to establish a landscape of Synergies.

The Coordinator is DST – Development Centre for Ship Technology and Transport Systems from Germany.

The project runs from January 2023, to June 2026.

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Retrofitting Challenges

- Time pressure to limit climate change
- Scalability of Drop-In solution HVO
- TRL / CRL / RRL of alternatives
- Complex and confusing market
- Maturity of technologies
- Financing of investments
- High costs of green energy/fuels
- Lack of supply infrastructure
- Regulatory uncertainty and gaps
- Lack of commitment of stakeholders

All out of reach of (small) shipowners...

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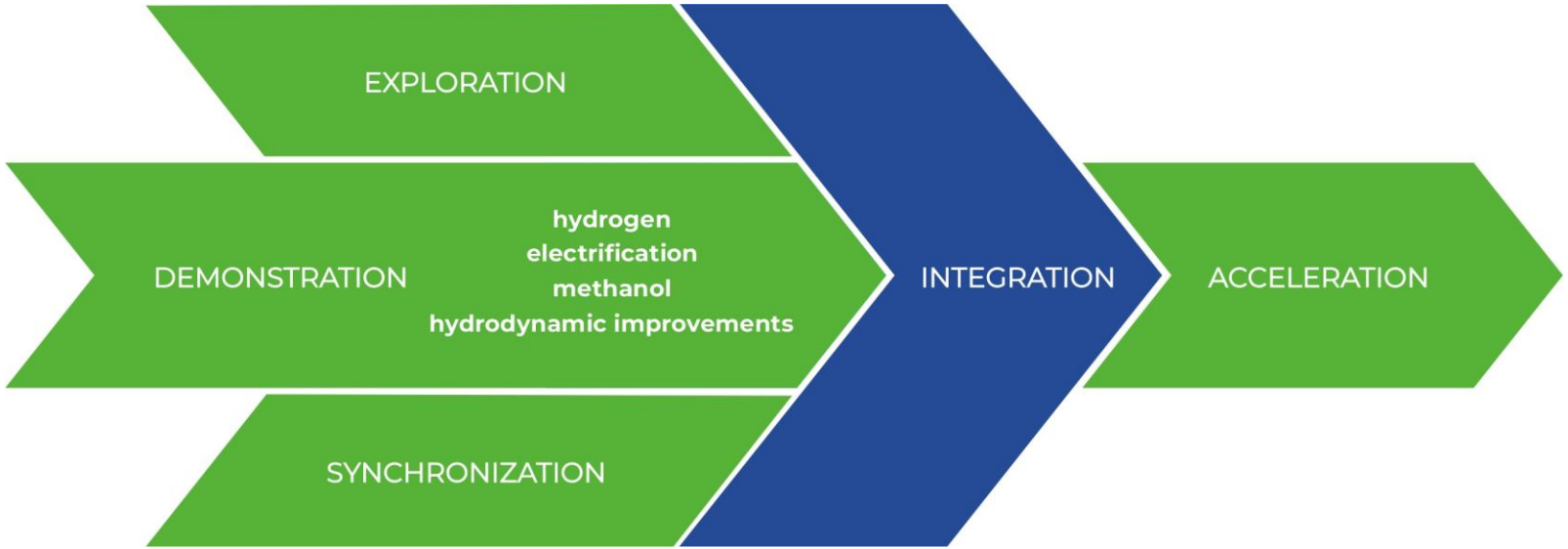
Structure



Check outputs:
www.synergetics-project.eu www.linkedin.com/company/synergetics-project
Greening of Inland and Coastal Ships in Europe by Means of Retrofitting: State of the Art and Scenarios

Funded by the Horizon Europe Programme of the European Union under grant agreement No 101096809
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Demonstration

Full scale

[Images: CMB.TECH / ZES]

Model scale

[Images: DST / ViaDonau]

System

[Images: ScandiNAOS / DST]

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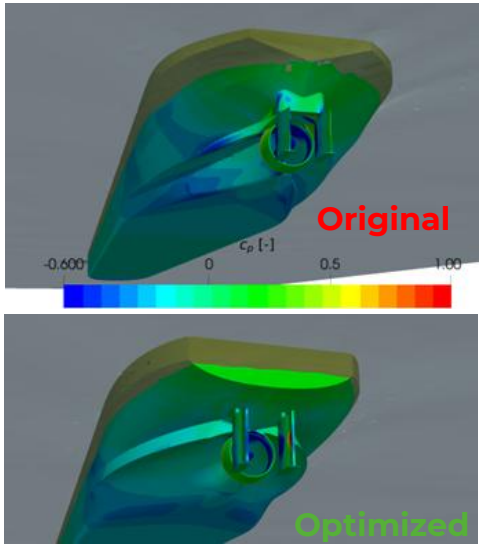
Demonstration: Aft-ship replacement

Rhenus / Ernst Kramer - ENI 04029360

- $L \times B \times T$: 105 m × 9.5 m × 3.2 m
- Age: 50 years
- Earlier retrofits
  - Extended from 85 to 105 m in 1985
  - Bow thruster added 1985
  - New 1170 kW engine in 2004
  - Side cells in 1993
  - Propeller duct in 1995
  - Car crane in 2004

- Reduction of the power demand by improved hydrodynamic efficiency
- Re-design of aft-ship including powertrain
- Reductions between 15% and 34%



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Demonstration: Aft-ship replacement

Deymann / Hirschhorn - ENI 04608410 (not part of SYNERGETICS)

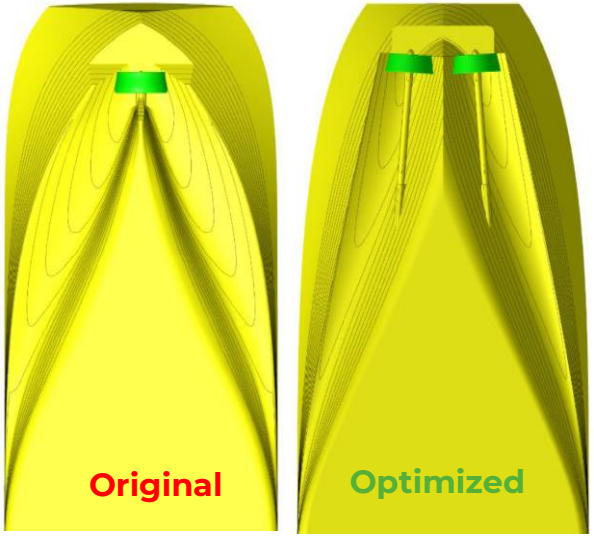
- *L* × *B* × *T*: 135 m × 11.45 m × 3.2 m
- Age: 25 years

DST

Numerische Untersuchungen von technischen Modernisierungsmaßnahmen an einem Hinterschiff

Bericht Nr. 2346
August 2022

- Supported by German state aid scheme
- Reduction of minimal draught by more than 20 cm
- Almost identical displacement
- Reduction of power demand by about 7%



Source: LinkedIn post of Concordia Damen 2025-10-24

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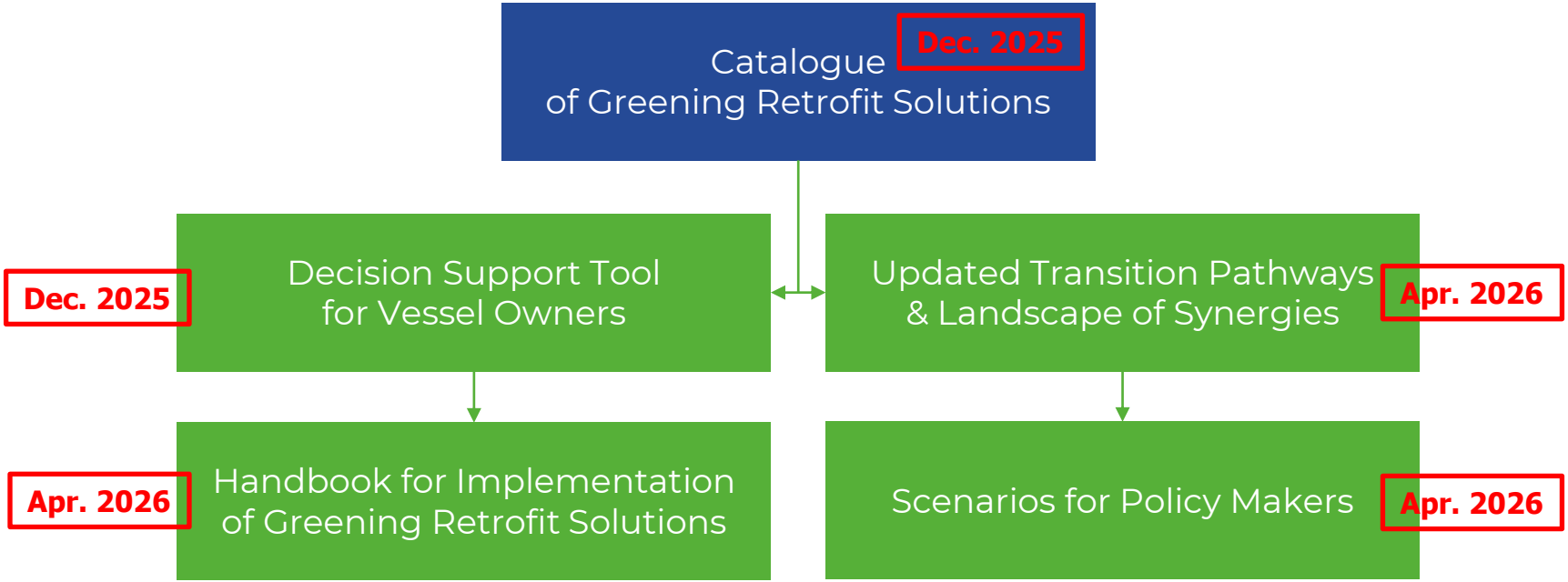
SYNERGETICS Tools



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DST

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Co-Funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Innovation Action SYNERGETICS

Decision Support Tool for Vessel Owners

http://157.90.157.167:8080

synergetics

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Thank you for your attention!

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Innovation Action **SYNERGETICS**

SYNERGETICS | Synergies for Green Transformation of Inland and Coastal Shipping

PLATINA4Action Technology Transfer Workshop, Budapest, 3 November 2025

Martin Quispel, SPB/EICB

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What is innovative?

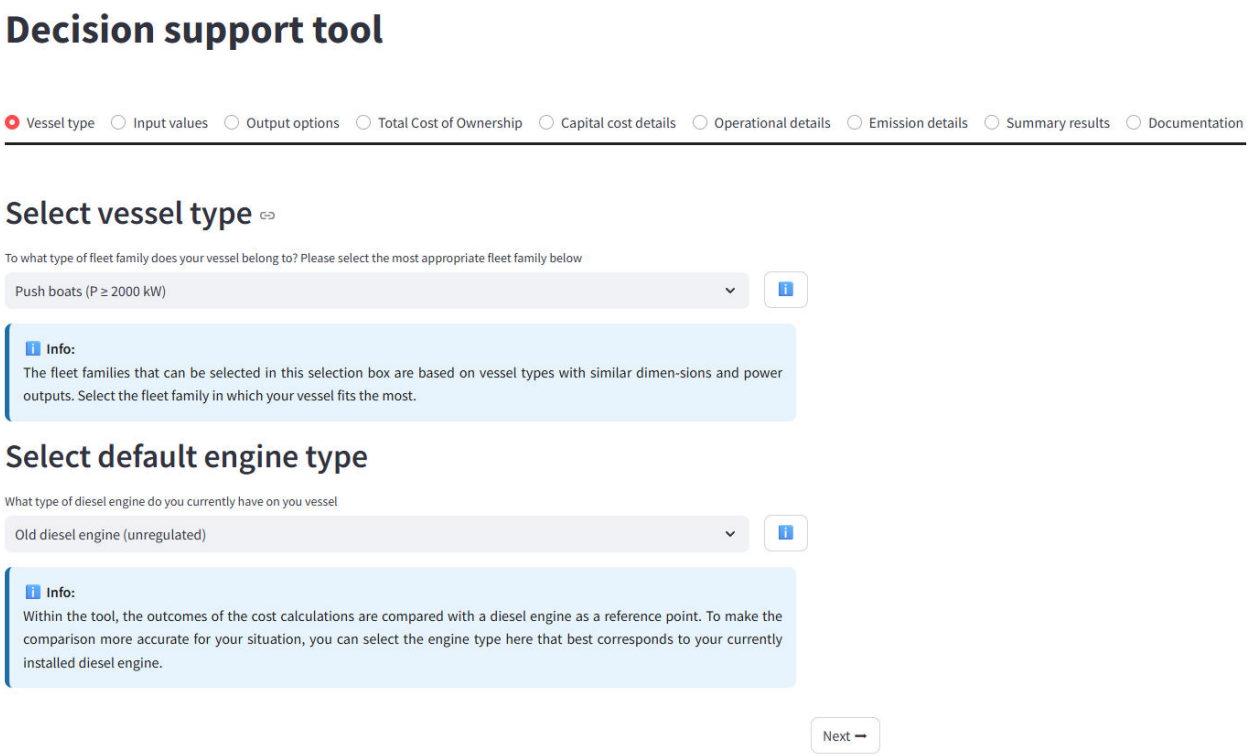
- Impact of **weight and dimensions** of energy convertor and energy storage
  - Does it fit on board?
  - What is the loss of payload and productivity?
- Impact of **bunker-time** for renewable energy
- Forecast for the **Total Cost of Ownership** and comparison with reference situation
  - Including impact on productivity of the vessel
  - Including expected energy cost development (OPEX)
  - Including choice when to do the investment and related capital cost (CAPEX)
- Updated estimated economic and environmental performance of different retrofit solutions

Fleet family options

- Motor vessels dry cargo
  - L ≥ 110 m
  - 80 m ≤ L < 110 m
  - L < 80 m
- Motor vessels liquid cargo
  - L ≥ 110 m
  - 80 m ≤ L < 110 m
- Push boats
  - P < 500 kW
  - 500 ≤ P < 2000 kW
  - P ≥ 2000 kW

- Coupled convoys
- Ferries
- Large cabin vessels
- Day trip and small cabin vessels

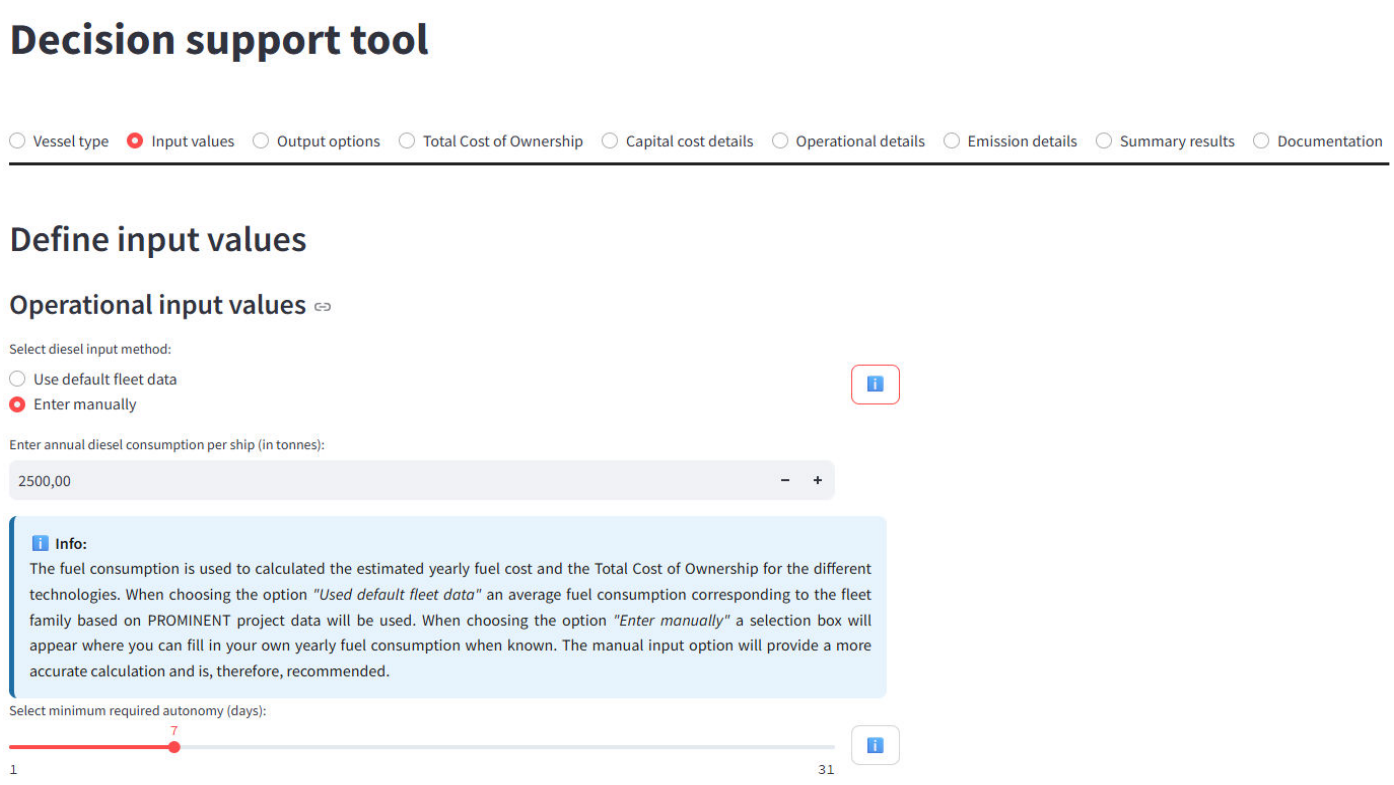
Fleet family options



Options for retrofit solutions

- SCR&DPF to reduce air pollutant emissions (NOx and PM)
- Engine renewal: New Stage V diesel engine
- HVO (renewable drop-in fuel)
- (Bio-)LNG fuel combustion engine
- Methanol single fuel or dual fuel combustion engine
- Hydrogen combustion engine (single fuel)
- Hydrogen Fuel Cell system, including battery
- Full battery electic
  - Swappable batteries
  - Fixed batteries

Operational input values



Additional input values

Additional input values

Select the desired Installed Power here (kW):

2800

100 5000

Average Installed Power: 3458 kW

The selected power (2800 kW) is lower than the average installed power for Push boats (P ≥ 2000 kW).

Select the interest rate of the Capital investment here [%]:

6

3 9

Default interest rate: 6 %

The selected interest rate matches the default value.

Select the depreciation Period of the capital investment here (Years):

20

15 25

Default depreciation period: 20 years

The selected depreciation period matches the default value.

Emission reduction filters

Emission requirements

Info:

Not all renewable technologies achieve the same emission reductions. Using the filters here, you can select the minimum emission reduction you would like to achieve compared to diesel emissions. By selecting an emission reduction value, the tool will filter out technologies that have a lower reduction than the chosen value. The tool includes three types of emissions: CO_2 equivalent (CO_2e, which includes carbon dioxide and methane emissions), NO_x, and Particulate Matter (PM).

Select the minimum desired CO_2e saving here (%)

0

0 100

Select the minimum desired NO_x saving here (%)

0

0 100

Select the minimum desired PM saving here (%)

0

0 100

Cost inputs

Cost input values

Yearly profit (€)

250000,00 − +

Yearly personnel costs (€)

350000,00 − +

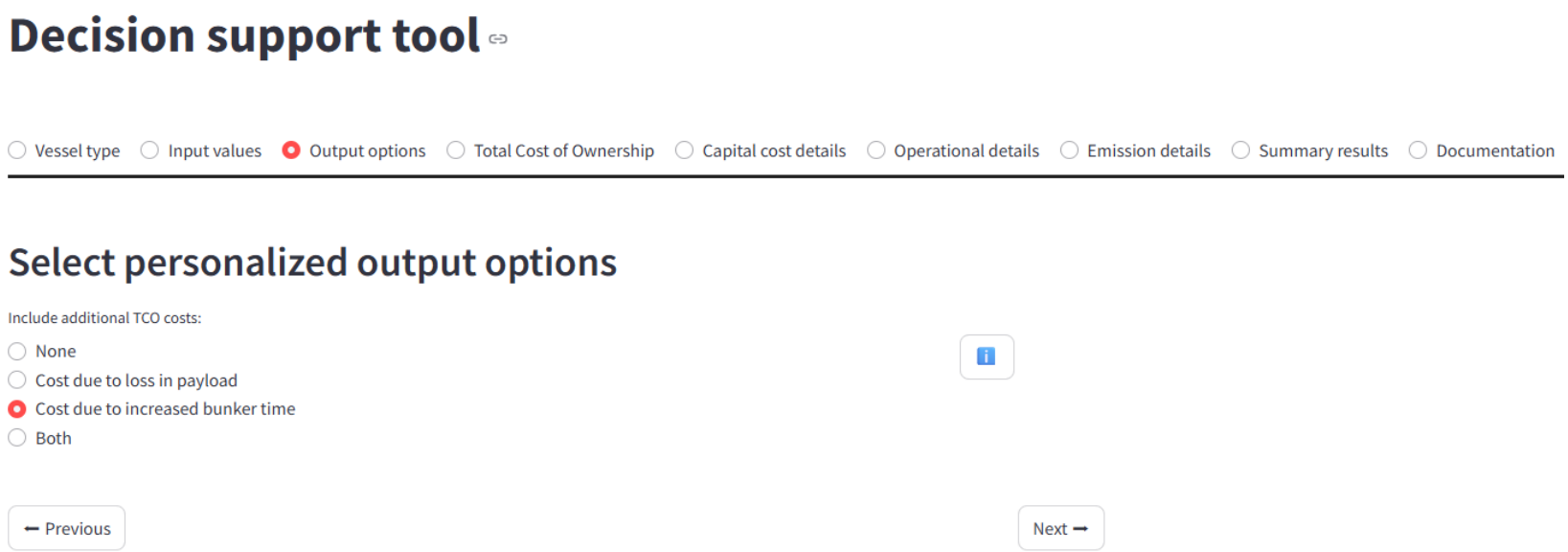
Yearly insurance costs (€)

100000,00 − +

CAPEX subsidies (if applicable) (€)

0 − +

Inputs for payload and bunker time impacts



Output results

- Total Cost of Ownership, compared
- CAPEX
- OPEX

- Emission reduction levels
  - CO2e WTW / TWT
  - NOx
  - PM

- Presentation in layers: ranked overall results, details, full data

- Output exports to MS Word, PDF, CSV file

Work in Progress - Next steps

- Validation and further refining the model
- Guidance and information boxes
- Versions in multiple languages: English, German, Dutch
- Integration of representative coastal vessels
- Publication of the tool end of 2025
- Further development and maintenance over the next years

Live demo

- Demo of Decision Support Tool (Beta version)

- Internet address: http://157.90.157.167:8080/

For further contact and questions:

- Martin Quispel, SPB/EICB
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Methanol,
a promising fuel for inland waterway propulsion systems?

4th Technology Transfer Workshop

November 3rd, 2025 • Malin

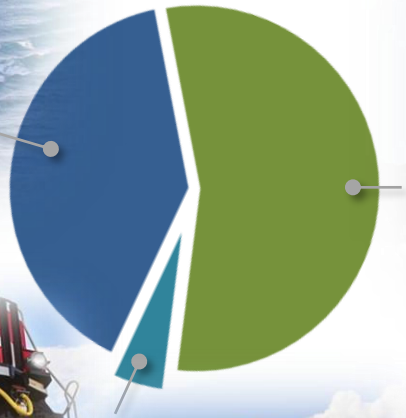
PLATINA 4Action

Content

- The LEC GmbH and the large engines
- Pathways towards decarbonization
- Methanol combustion concepts
- Methanol engine performance
- Summary and outlook

The LEC GmbH and the large engines

Application field



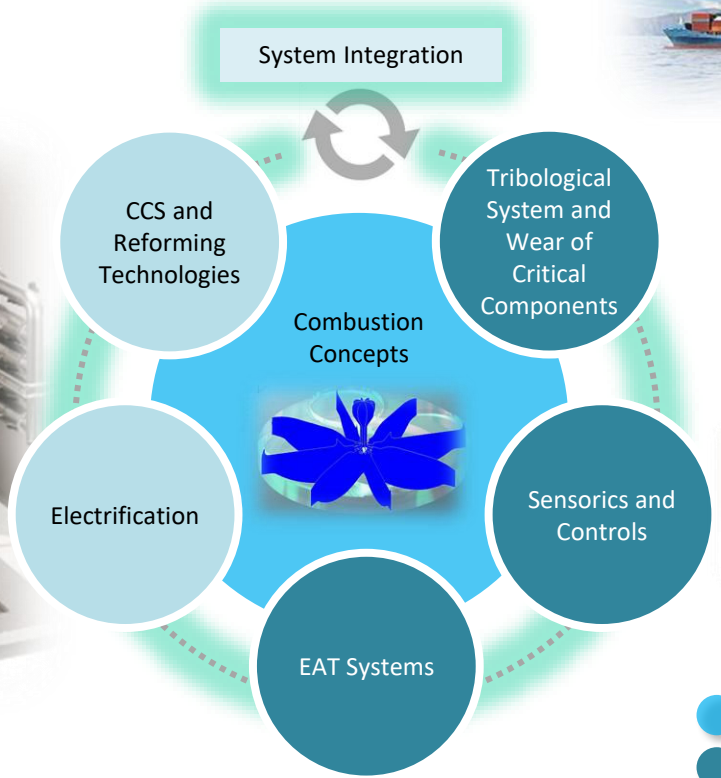
Transportation

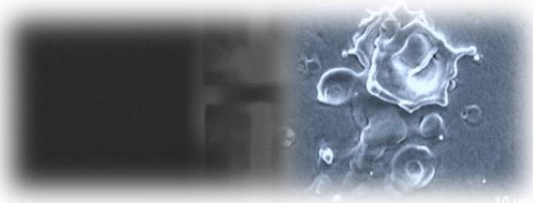
© Wabtec Corporation

Power generation

The LEC GmbH and the large engines

Research focus





- Key competence – comprehensive consideration at all levels
- Comprehensive consideration at certain levels
- Primarily at system level

The LEC GmbH and the large engines

Infrastructure

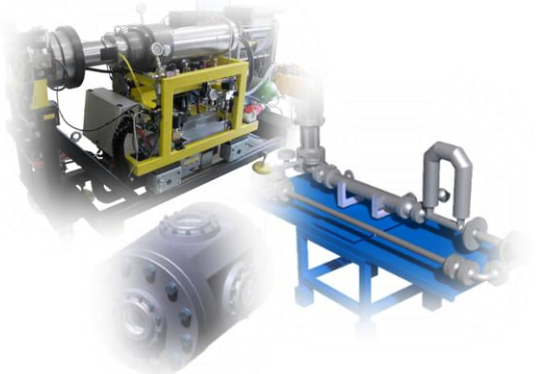
LEC Laboratory at the Graz University of Technology Campus

(Suitable for a wide range of fuels such as H_2, CO, MeOH, ammonia, etc. and all types of conventional fuels)

Test Rig Investigations → SCE Experiments → MCE Experiments → System Validation

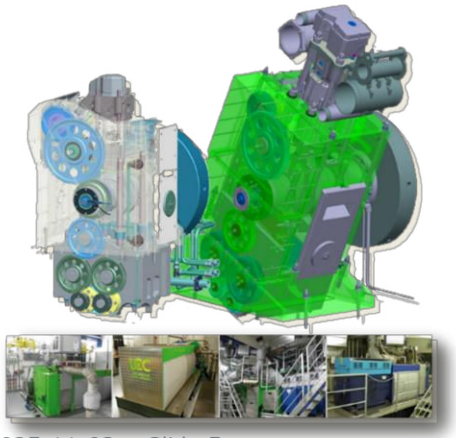
IIC Laboratory

(Injection, Ignition and Combustion)



3 SCE Test Beds

(up to 900 kW)

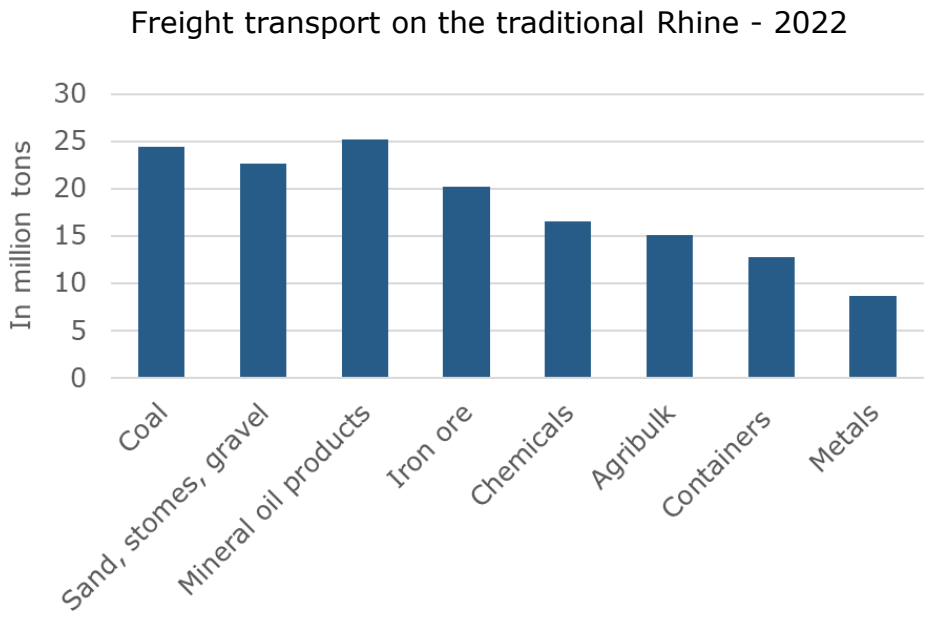


MCE and System Test Bed

(up to 3,500 kW)

Pathways towards decarbonization

Transport demand



In total 155.5 million tons transported on the traditional Rhine in 2022

https://safety4sea.com/

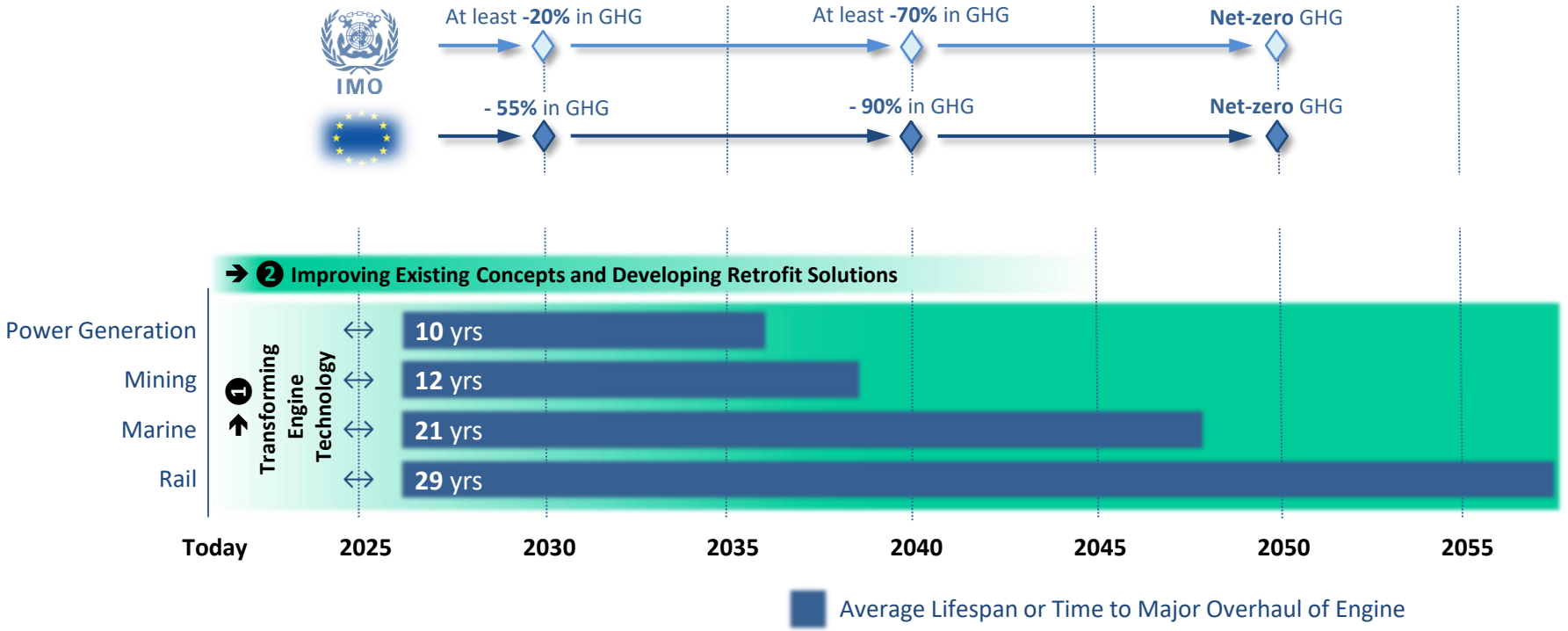
Inland shipping accounts for about 2% of the total GHG emissions from inland transport globally

***Source**: Annual Report 2023 Inland Navigation in Europe – Market Observation | 2023*

***Source**: United Nations adopts landmark global decarbonization strategy in transport by road, rail and inland waterway | 2024*

Pathways towards decarbonization

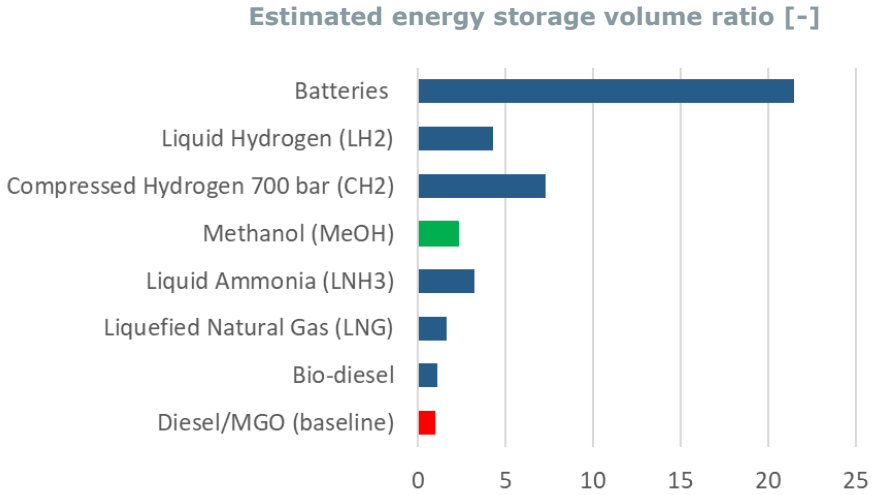
Engine Lifespan vs. Climate Targets



Pathways towards decarbonization

Energy density vs. storage capacity

https://www.highperformancebattery.ch/de/anwendungen/binnenschiffahrt.php



1 Fossil Fuels

+ CC Post-combustion

Direct Use

2 Biofuels

Direct Use

3 Green Electricity

Batteries

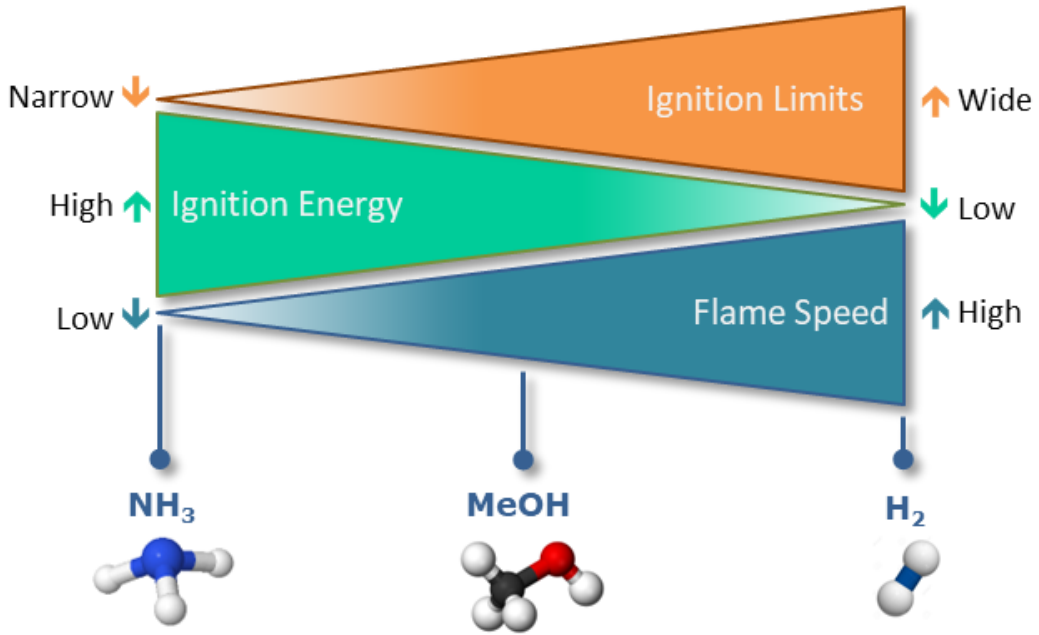
E-fuels (PtX)

Direct Use

Source: Wimmer, A. et al.: "Pathways to the Decarbonization of Oceangoing Vessels – From Hydrogen Engines to On-board Carbon Capture Concepts ", in: in: Lenz, H. P. (ed.): 46. Internationales Wiener Motorensymposium.

Pathways towards decarbonization

Green E-fuels | fuel properties and combustion characteristics



Pathways towards decarbonization

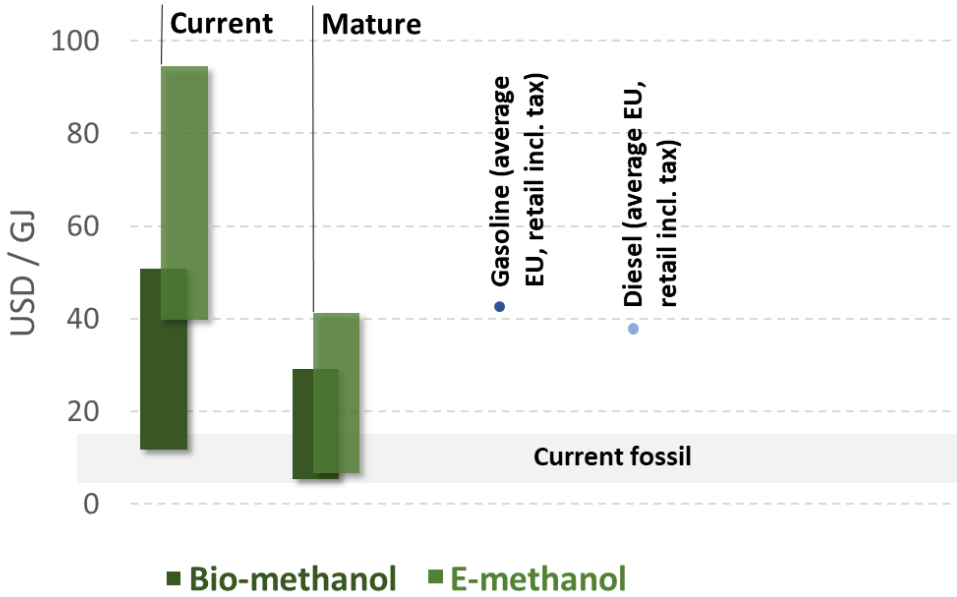
Methanol – a green e-fuel with high potential

Methanol properties:

- Renewable e-fuel, widely used in the chemical industry and could be produced cost-efficiently in the future
- Benefits compared to other e-fuels
  - Fuel storage
  - Global availability
  - Safety requirements

Scenario for the methanol price

Bio-methanol / E-methanol



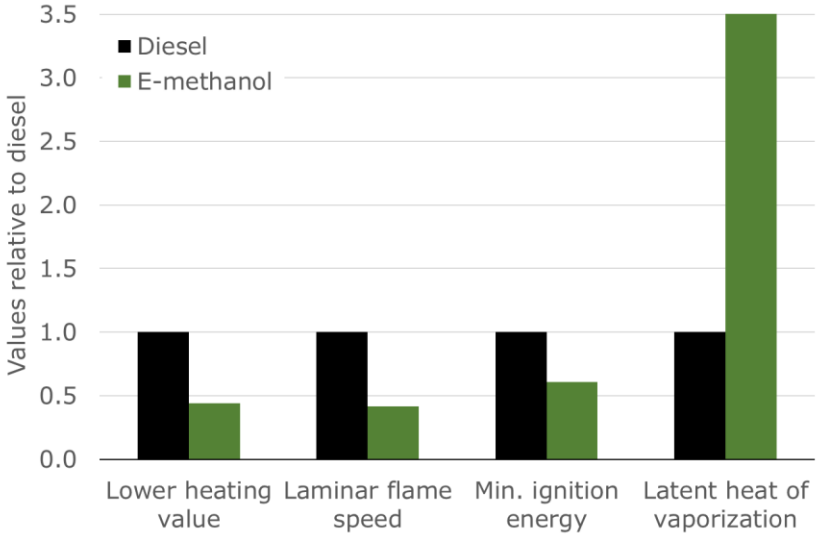
Source: www.IRENA.org

Pathways towards decarbonization

Methanol – a green e-fuel with high potential

Methanol properties:

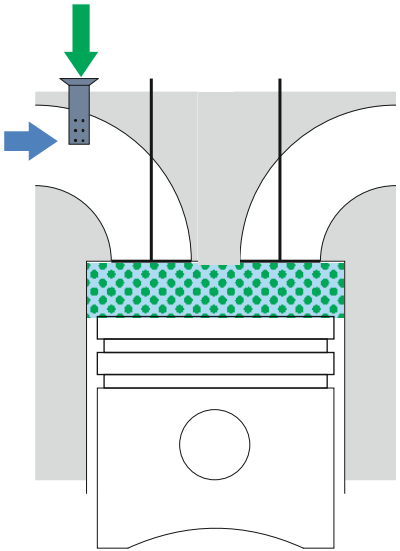
- Renewable e-fuel, widely used in the chemical industry and could be produced cost-efficiently in the future
- Benefits compared to other e-fuels
  - Fuel storage
  - Global availability
  - Safety requirements
- Favorable knock resistance compared to gasoline
  → Well-suited for premixed combustion
- Lower heating value, high latent heat and incomplete combustion process
  → Challenging for mixture formation
  → High methanol and formaldehyde emission



Methanol combustion concepts

Fuel admission

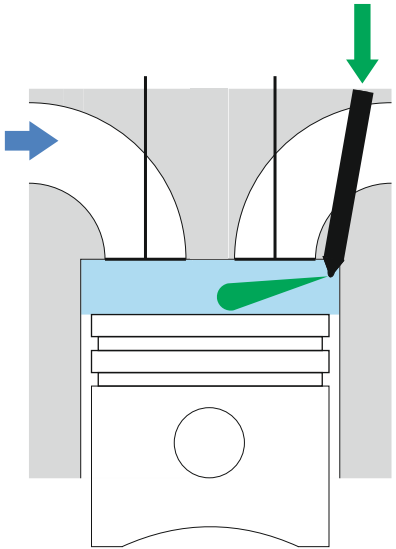
Port **F**uel **I**njection
PFI



Methanol rail pressure:

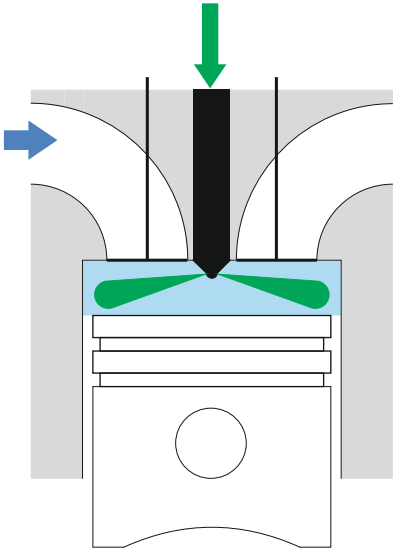
10-50 bar

Low **P**ressure **D**irect **I**njection
LPDI



50-100 bar

High **P**ressure **D**irect **I**njection
HPDI



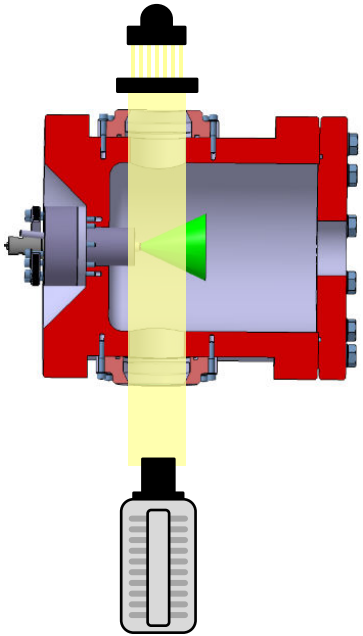
600-1200 bar

Air Methanol

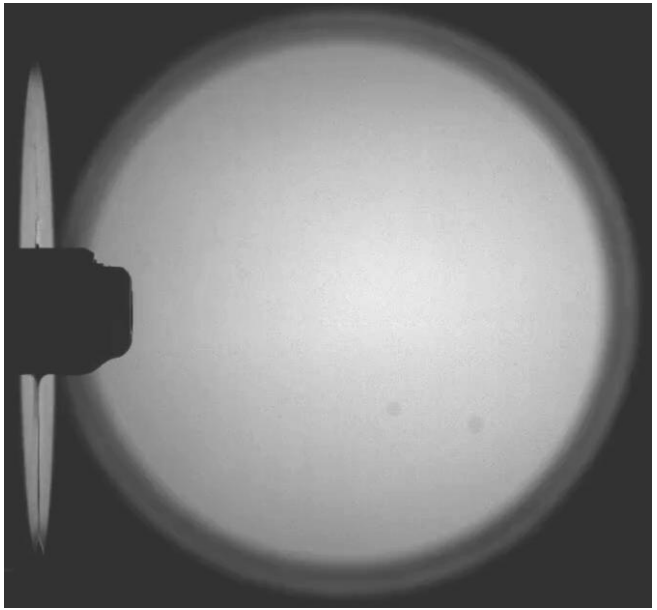
Methanol combustion concepts

Fuel admission

Spray chamber investigation



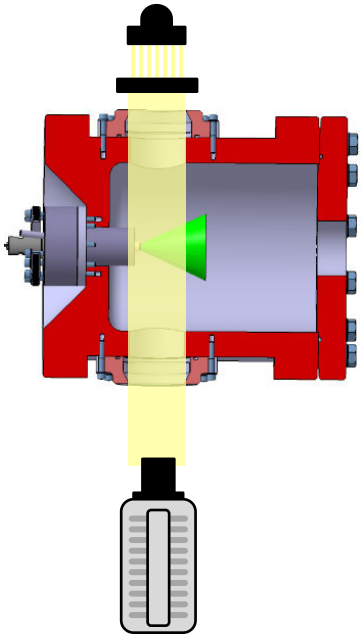
Spray imaging



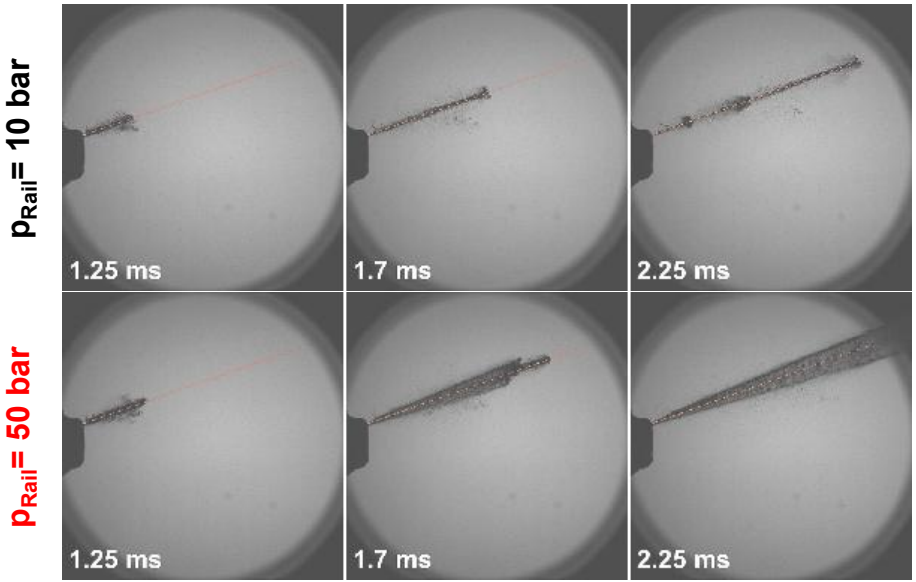
Methanol combustion concepts

Fuel admission

Spray chamber investigation



Liquid Spray

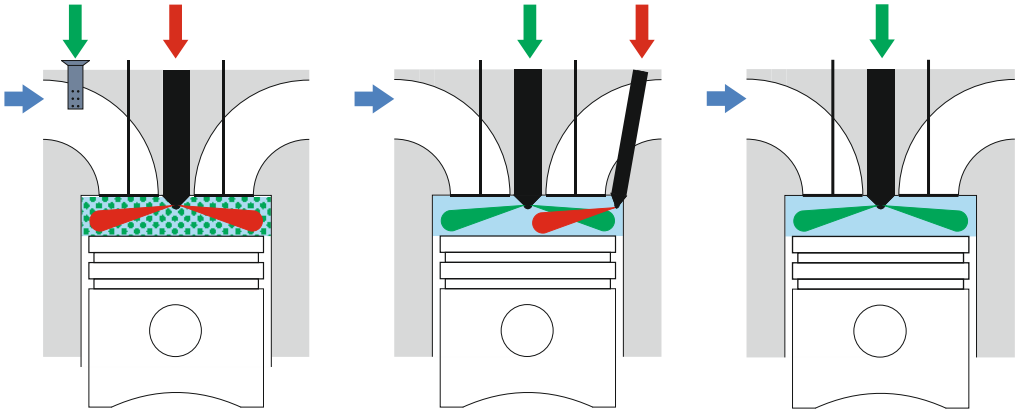


→ **Higher rail pressure leads to higher air entrainment and smaller spray droplets**

Methanol combustion concepts

Ignition process

CI combustion concepts



Low-pressure

High-pressure

Autoignition of the diesel fuel

Autoignition of methanol spray

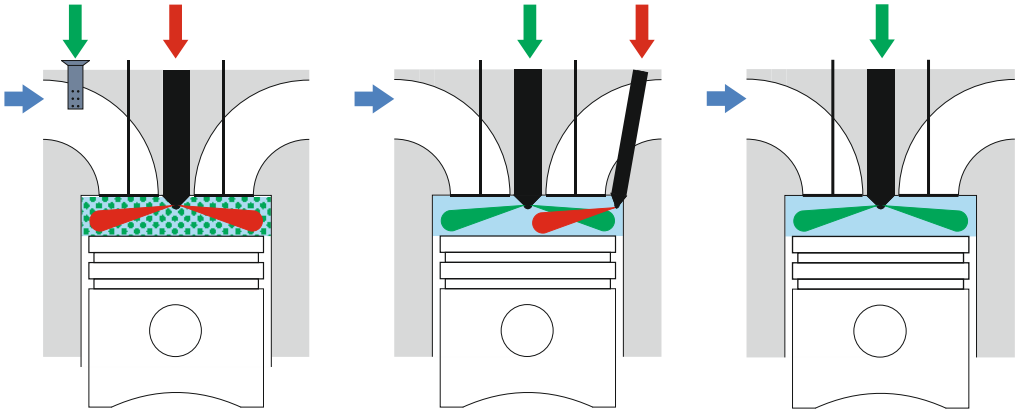
Very challenging to reach autoignition conditions for methanol

Air Diesel Methanol

Methanol combustion concepts

Ignition process

CI combustion concepts



Low-pressure

High-pressure

Autoignition of the diesel fuel

Autoignition of methanol spray

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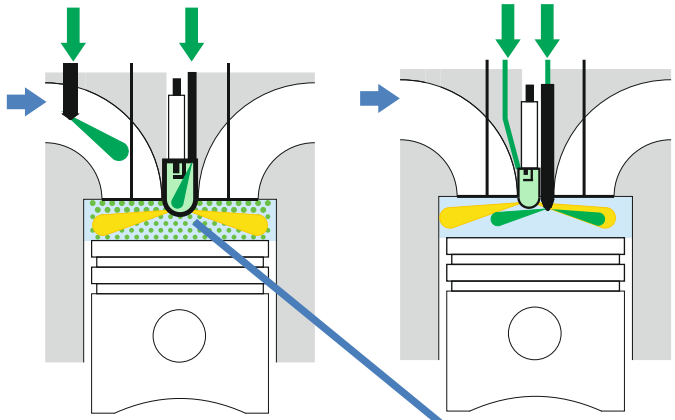
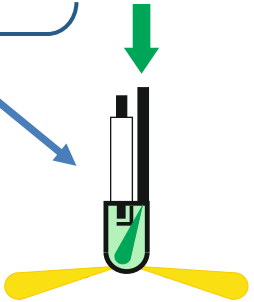
SI combustion concepts



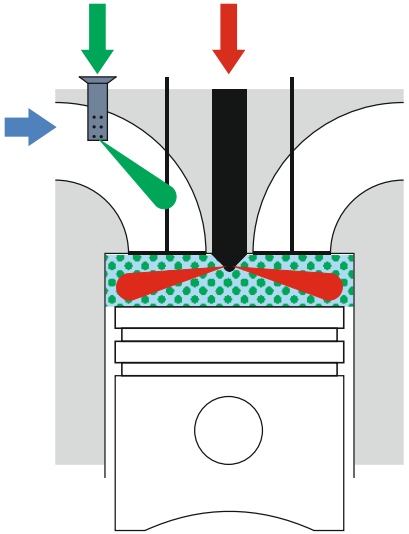
Spark plug in combination with Pre-chamber system

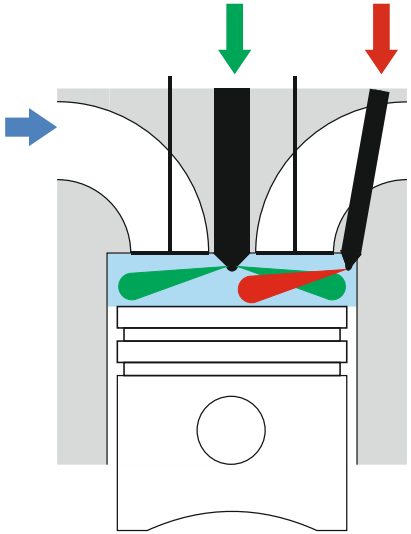


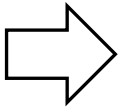
Air Diesel Methanol

Methanol combustion concepts

Fuel admission and ignition process for marine applications







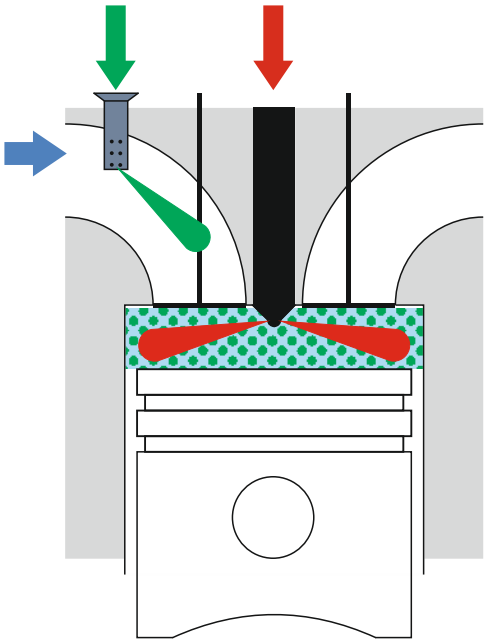
Low pressure dual fuel
≤ 50 bar

High pressure dual fuel
< 1000 bar

Air Diesel Methanol

Methanol combustion concepts

Low pressure methanol dual fuel concept



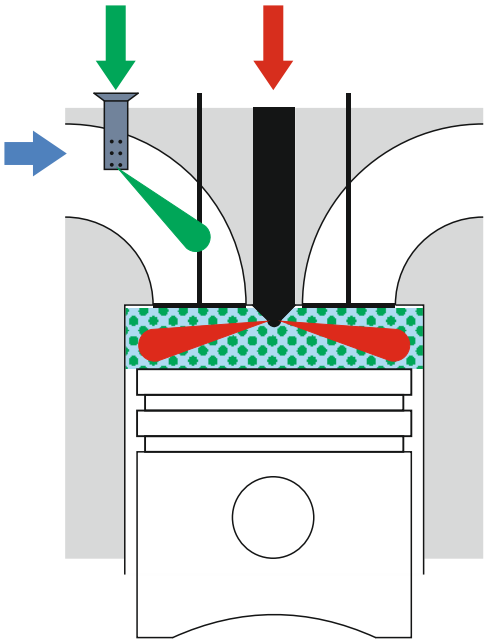
Combustion concept characteristics

- Mainly a pre-mixed combustion process
- Minor hardware adjustments to serial production engine
  → Particularly well-suited for retrofit solutions
- Port fuel injection ≤ 50 bar

Air Diesel Methanol

Methanol combustion concepts

Low pressure methanol dual fuel concept



Combustion concept characteristics

- Mainly a pre-mixed combustion process
- Minor hardware adjustments to serial production engine
  → Particularly well-suited for retrofit solutions
- Port fuel injection ≤ 50 bar

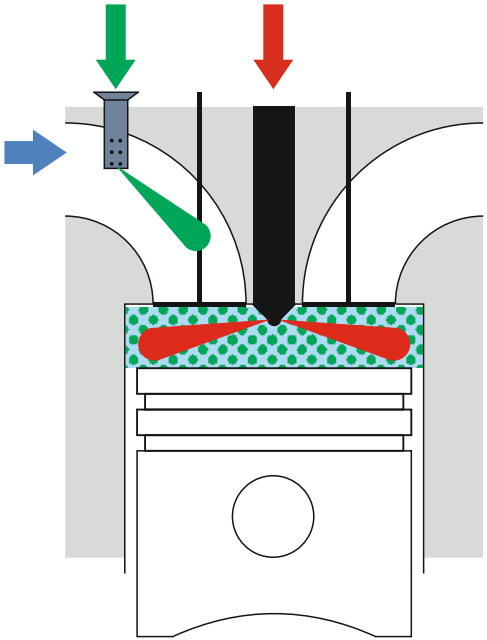
Challenges

- Mixture formation and incomplete combustion
  → High unburned methanol fraction in the exhaust
- Boost pressure control is needed
- Ignition process of the pilot diesel fuel
- Unstable combustion and combustion anomalies at low energetic diesel fractions

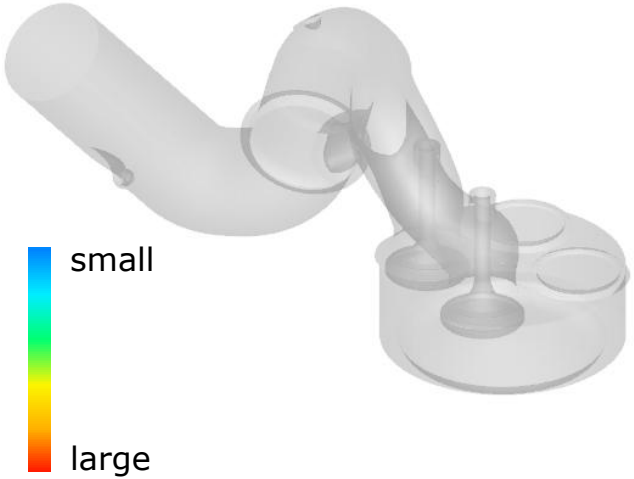
Air Diesel Methanol

Methanol combustion concepts

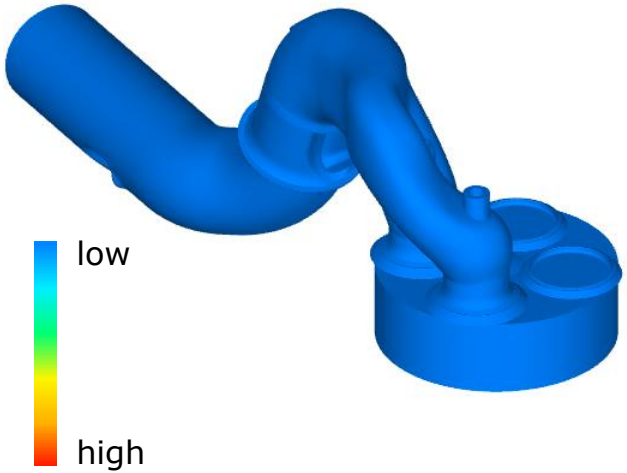
Low pressure methanol dual fuel concept



Spray droplet diameter

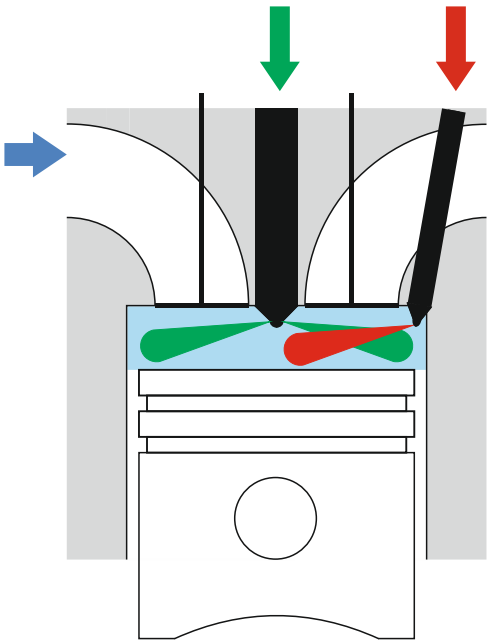


Wall film mass



Methanol combustion concepts

High pressure methanol dual fuel concept



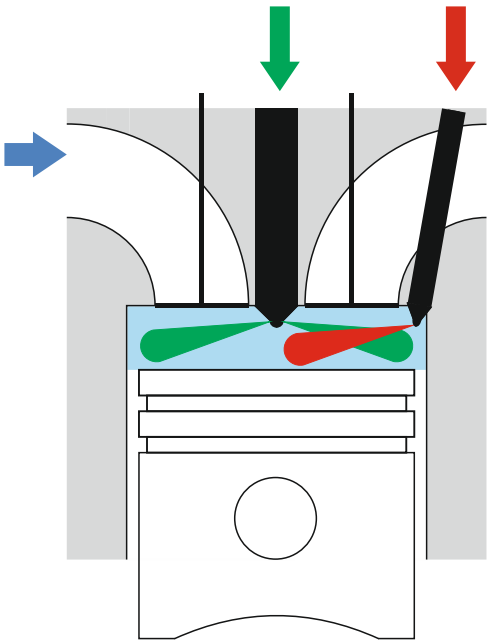
Combustion concept characteristic

- Mixing controlled combustion process (diesel-like)
- Integration of a high-pressure methanol and a diesel (pilot) injector
  → New cylinder head is needed
- Implementation of a high-pressure methanol pump system
- High effort required for retrofit solutions
  → Concept for a new engine

Air Diesel Methanol

Methanol combustion concepts

High pressure methanol dual fuel concept



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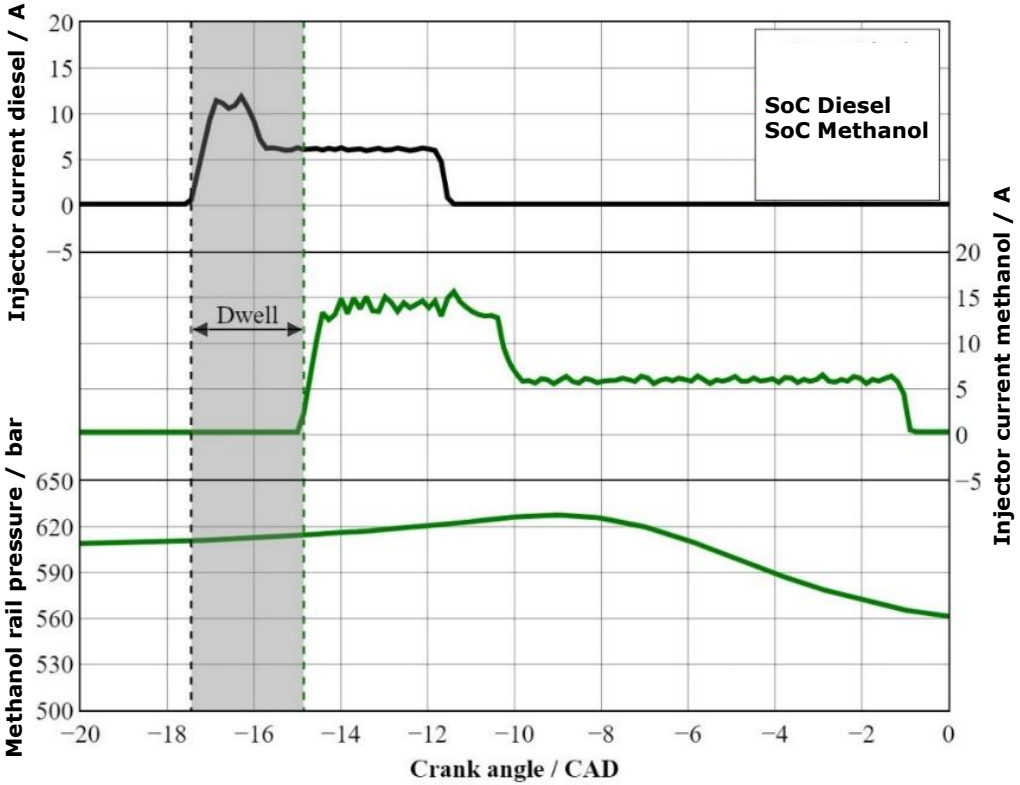
Challenges

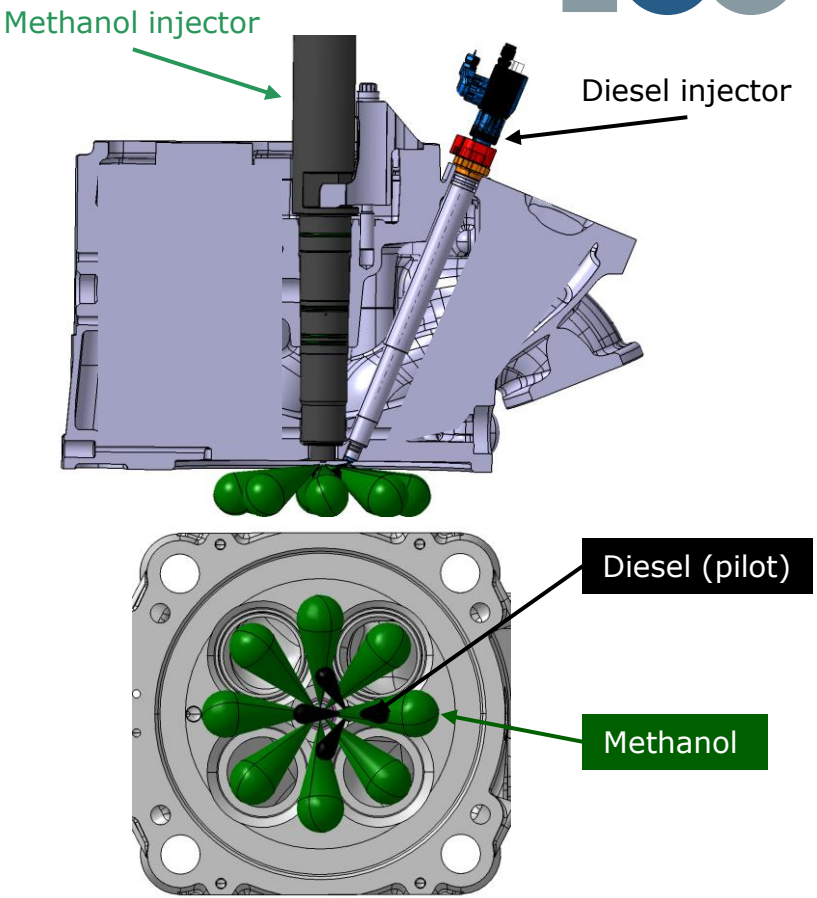
- High system complexity
- More safety requirements needed
- Higher NOX emissions

Air Diesel Methanol

Methanol combustion concepts

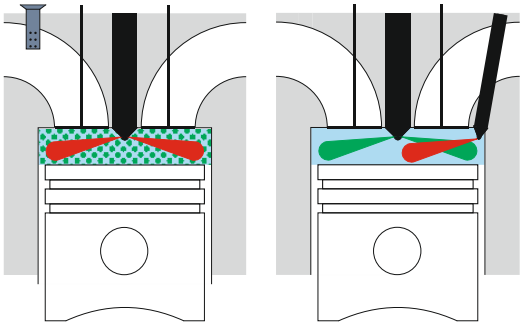
High pressure methanol dual fuel concept



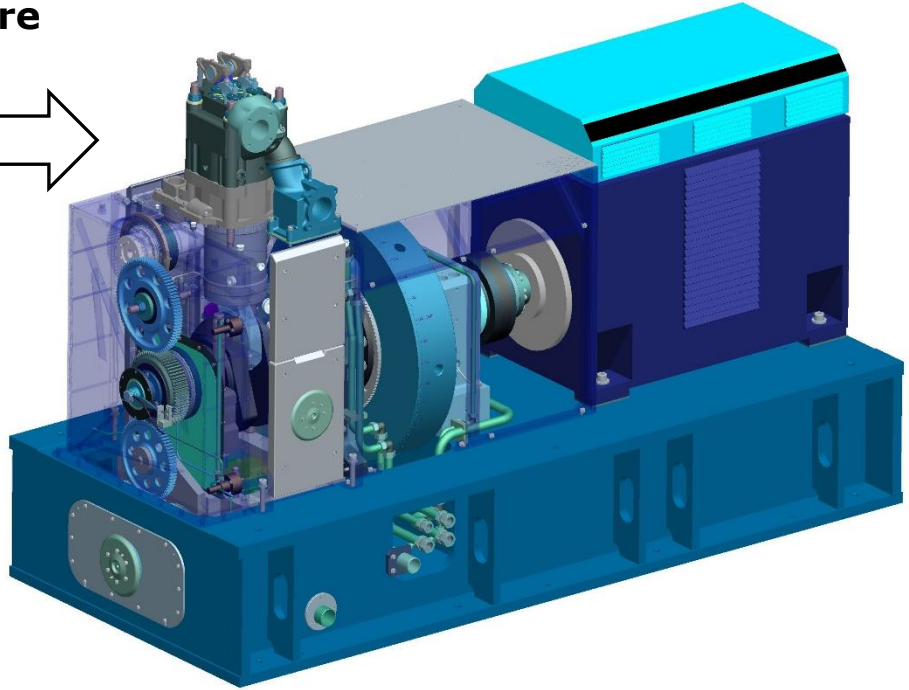


Methanol engine performance

Investigation on a single-cylinder research engine



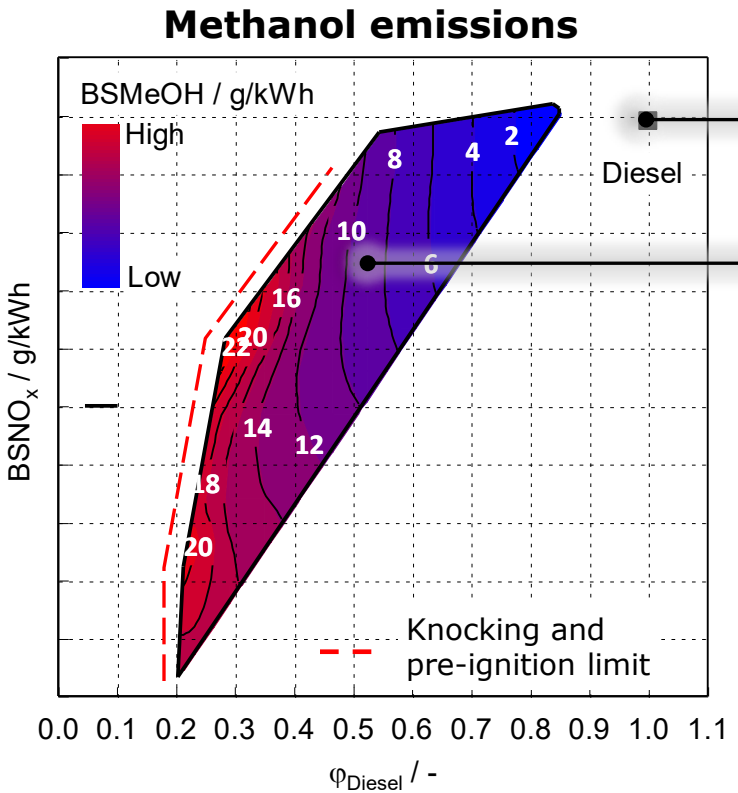
Both concepts were Implemented

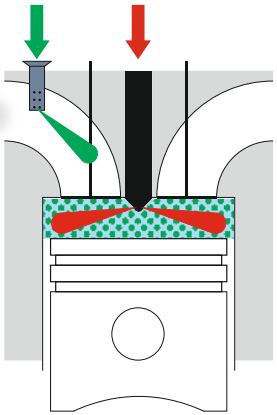


Engine specifications	
Engine speed [1/min]	750 - 995
Displacement per cyl. [dm³]	≈15.7
Compression ratio [-]	17:1
Valve timing	Early IVC
Charge air	Provided by external compressors

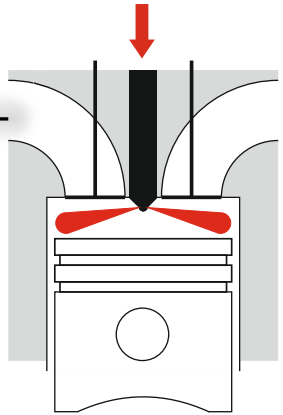
Methanol engine performance

Measurement results – energetic diesel fraction variation





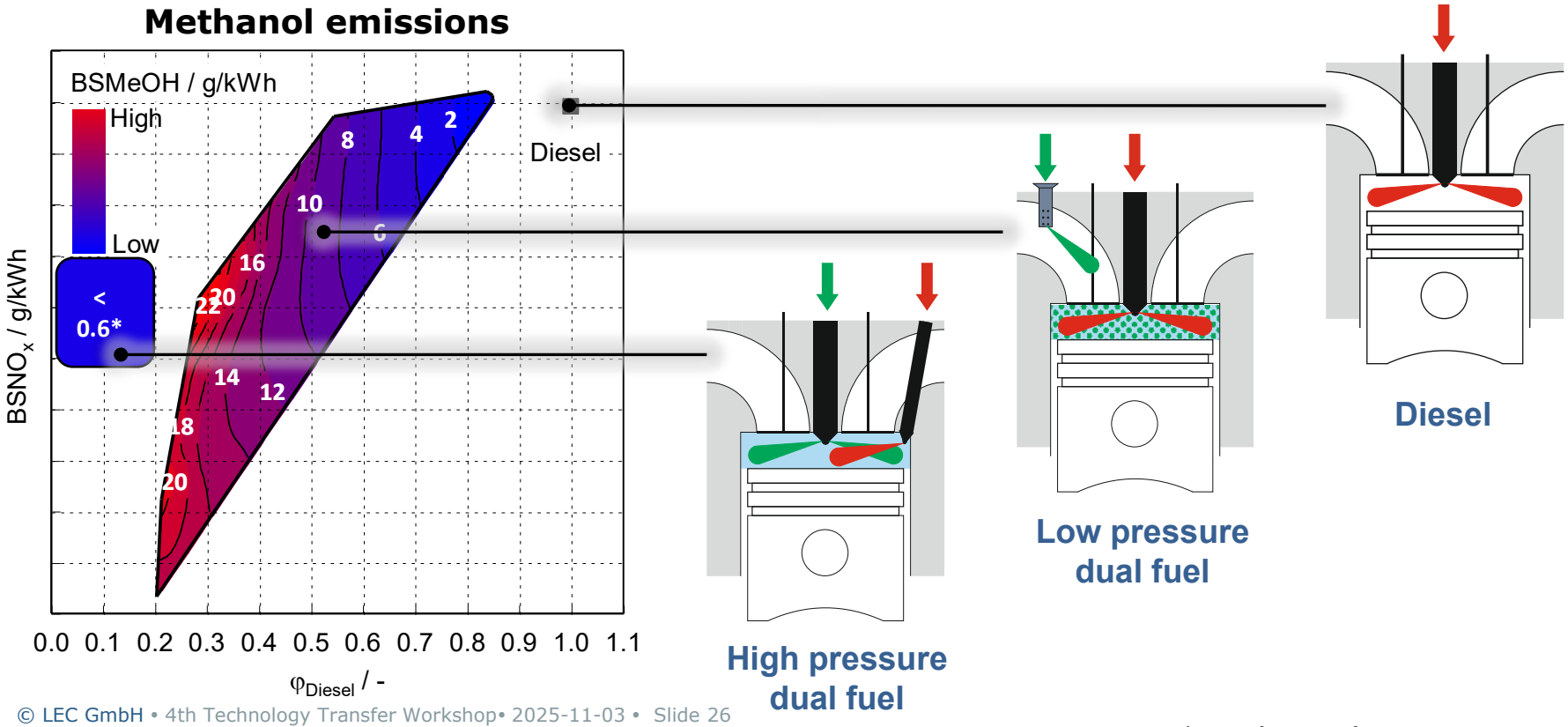
Low pressure dual fuel



Diesel

Methanol engine performance

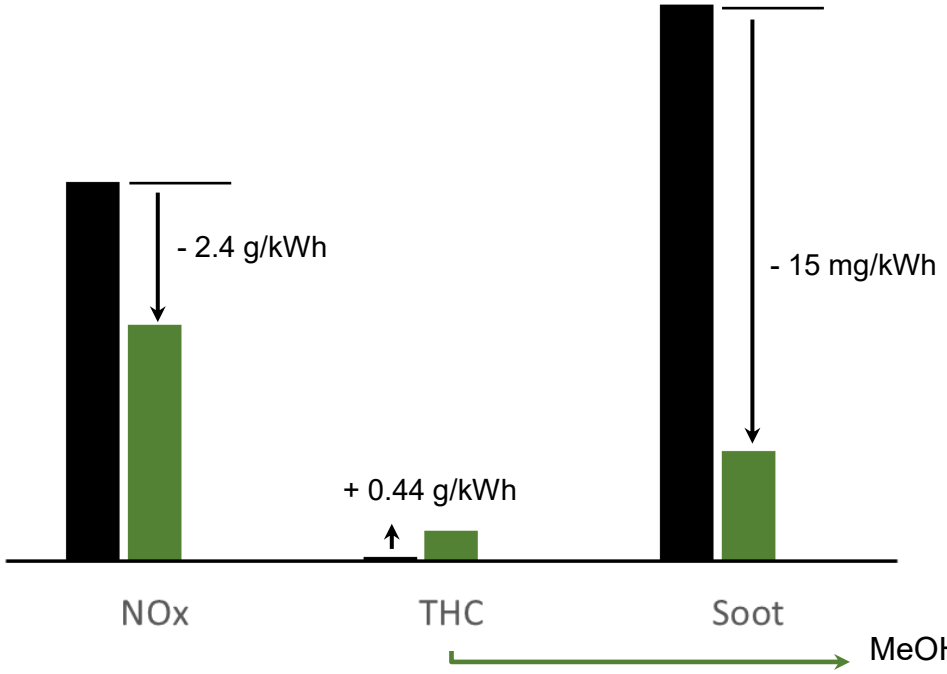
Measurement results – energetic diesel fraction variation

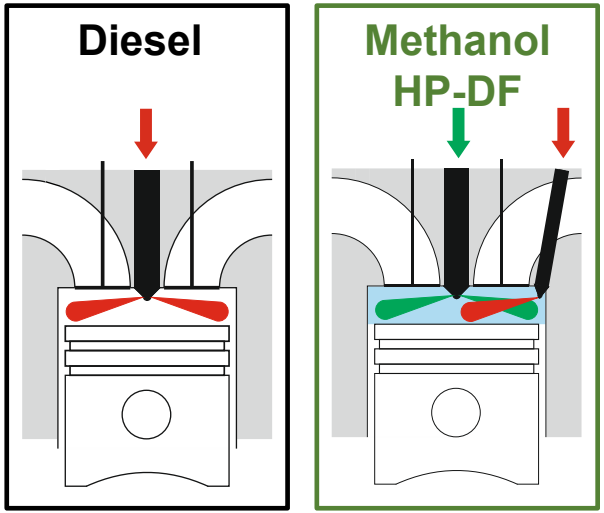


*evaluated operation range

Methanol engine performance

Emissions and exhaust aftertreatment systems

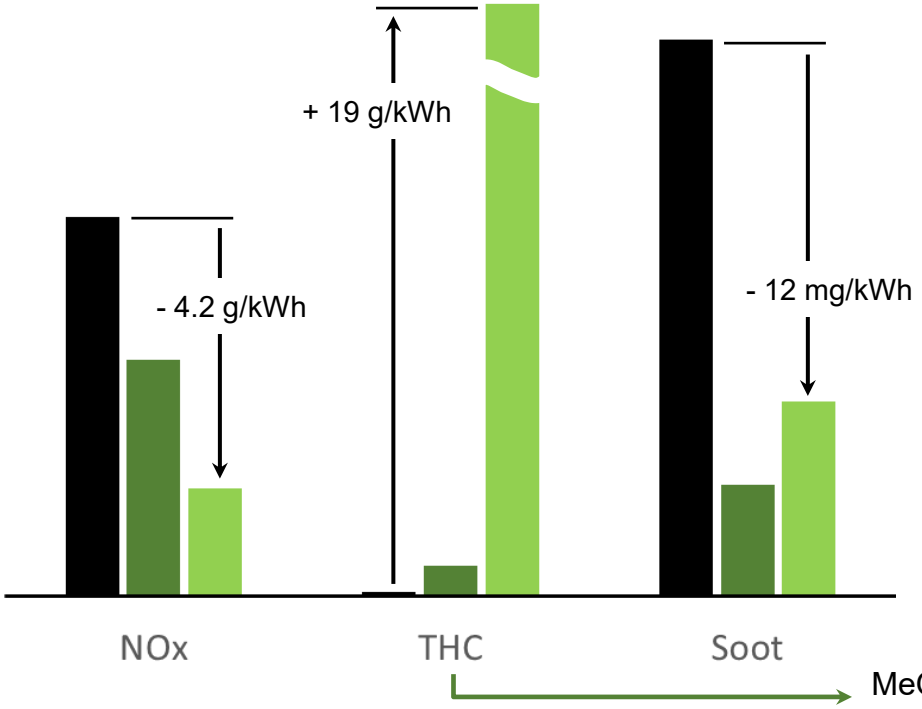


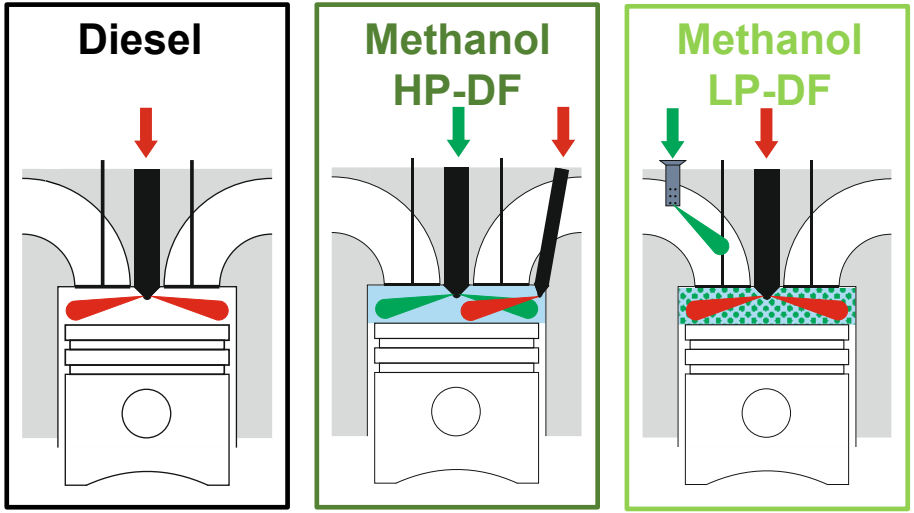


LP-DF…Low Pressure Dual Fuel
HP-DF…High Pressure Dual Fuel

Methanol engine performance

Emissions and exhaust aftertreatment systems





LP-DF…Low Pressure Dual Fuel
HP-DF…High Pressure Dual Fuel

Summary and Outlook

- In the **marine market** in particular, **methanol** will play an **important role** in the decarbonization of propulsion systems
- The **diesel-methanol dual fuel** concept is particularly **well-suited for retrofit** solutions

Summary and Outlook

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Low-pressure methanol dual fuel concept

- Attractive choice for retrofit solutions
- Challenges in mixture formation and combustion process

High-pressure methanol dual fuel concept

- Engine performance similar to a diesel engines
- High effort for retrofit solutions → more relevant for new engines
- Complex system

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High-pressure methanol dual fuel concept

- Engine performance similar to a diesel engines
- High effort for retrofit solutions → more relevant for new engines
- Complex system

Emissions

- Reduction of NO_X and soot emissions compared to diesel engines
- High methanol and formaldehyde emissions
  → new layout of exhaust aftertreatment systems

Thank you for your attention!

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www.lec.at

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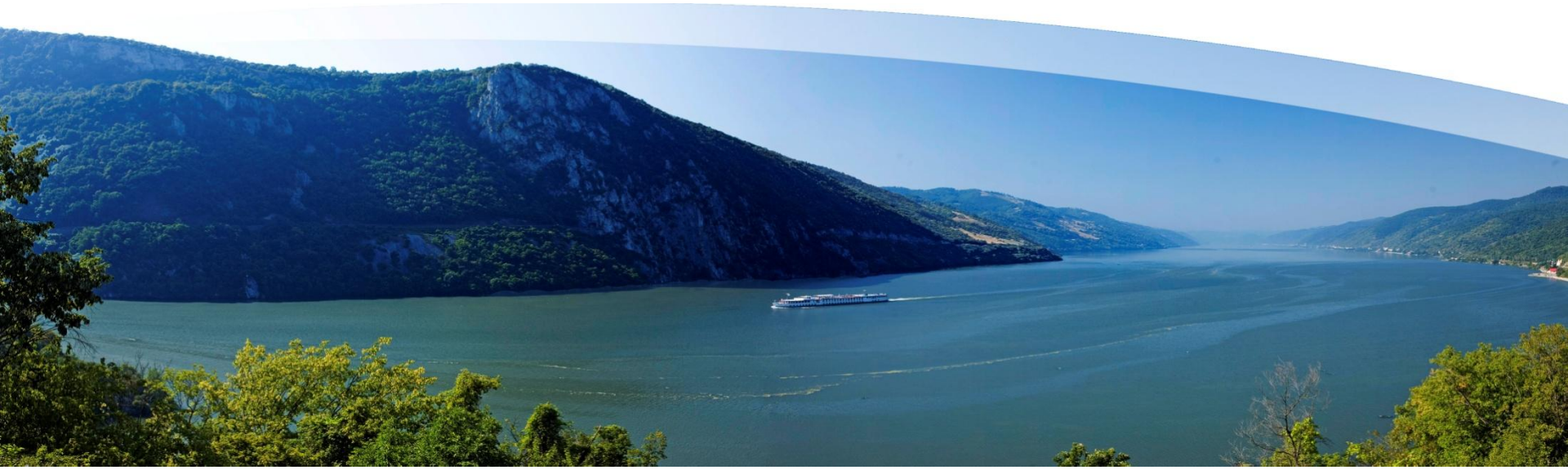
Federal Ministry Republic of Austria Climate Action, Environment Energy, Mobility, Innovation and Technology
Federal Ministry Republic of Austria Labour and Economy
Das Land Steiermark
SFG NEUES DENKEN. NEUES FÖRDERN.
LAND TIROL
Tirol STANDORTAGENTUR TIROL
LAND SALZBURG
INNOVATION SALZBURG

Actions towards zero-emission Danube fleet

Gert-Jan Muilerman (viadonau) & Manfred Seitz (Danube Commission) |
3 November 2025 | Technology Transfer Workshop PLATINA4Action



Purpose of DC/ PA1a process towards zero-emission Danube fleet

- Analysis and identification of current challenges and opportunities within the sector
- Evaluation of the potential of near zero-emission technologies by stakeholders
- Definition of short-term and mid-term goals for the Danube waterway transport
- Outlining key areas for action and propose strategies to overcome existing obstacles and achieve policy targets
- For the time being the roadmap focuses on cargo transport only, as this segment seems to be faced by the most persistent challenges
- Passenger transport and its pathway to zero-emission sailing will be included at a later stage

Vision and long-term policy goals

European Green Deal

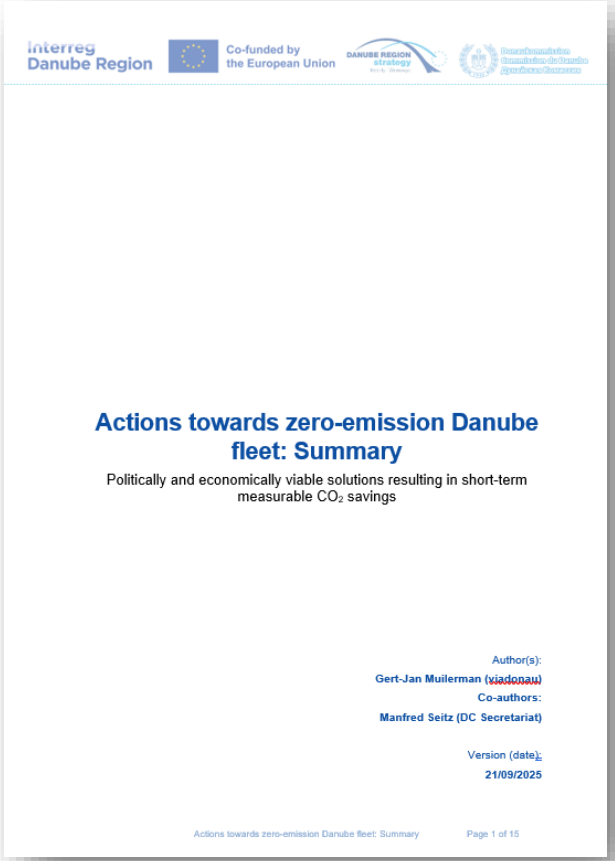
- Broader EU strategy: achieve climate neutrality by 2050
- Objective for the transport sector: reduce greenhouse gas (GHG) emissions by 90% by 2050/proposed new milestone in 2024: cut GHG emissions by 90% by 2040 (baseline 1990)

Renewable Energy Directive (RED III)

- Part of the EU‘s “Fit for 55“ programme
- Binding targets for the transport sector: 14,5% GHG intensity reduction in transport fuels by 2030 (compared to 2020), at least 29% renewable energy share

Actions towards zero-emission Danube fleet

- Summary report developed by PA1a and Danube Commission
- On the basis of workshops with industry and Member State representatives in Budapest on 8/10/2024 and 12/05/2025
- The document outlines strategic actions to achieve GHG reductions and emphasizes pragmatic steps that consider current fleet conditions and economic realities in the Danube region.



Current status

Current Danube Fleet (estimation)

Vessel type (motorized units)	Estimated number (active fleet)
Passenger vessels	200
Push boats <500 kW (incl. tugs)	300
Push boats 500 - 2000 kW (incl. tugs)	350
Push boats >= 2000 kW (incl. tugs)	25
MCV Dry >=110 m	100
MCV liquid >= 110 m	5
MCV Dry 80 - 109 m	250
MCV liquid 80 - 109 m	40
Motor vessels <80 m	120
Total	**1,390**

Table 1: Danube fleet: Estimated number of motorized units
[Source: own calculations based on statistics of Danube Commission and PROMINENT project]

Estimation of GHG emissions of the Danube cargo fleet

- Estimation of the total CO_2 emissions from Danube cargo vessels: **1.6 million tons of CO_2/year**
- Diesel consumption of 513 mln litres/year or 430,000 tons/year
- Basis for the estimation: definition of vessel types and operational profiles, values and modelling tools to assess fuel consumption and emission outputs provided by projects such as PROMINENT

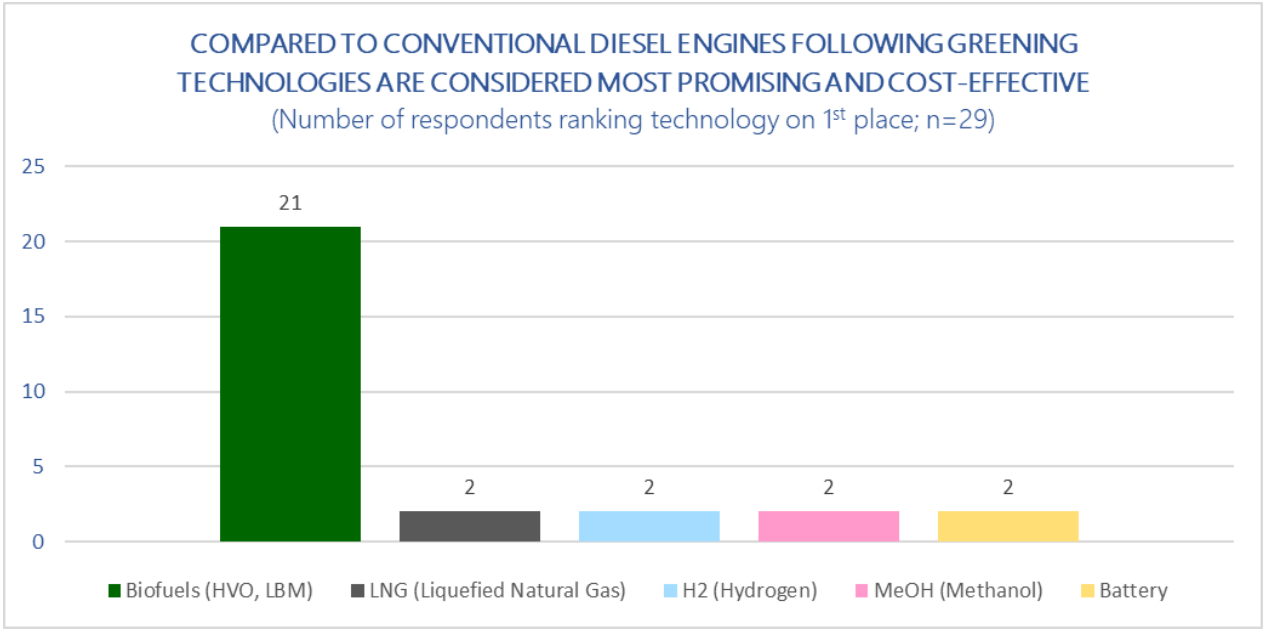
Transition pathways for Danube navigation by 2030 and 2050

Pathways for Danube navigation

- Stakeholder consultations within Danube workshops: in total 55 respondents
- By 2050, the 55 respondents expect that 64% of engines and fuel types used on the Danube waterway will be either CCNR Stage 2 or Stage V, powered by diesel or drop-in biofuels.
- As market circumstances and subsidies in Western Europe accelerate the adoption of zero-emission ships, the fleet composition is expected to shift by 2030. **The older ships being replaced in Western-Europe will likely find their way into the Danube fleet, as in the last decades since the opening of the Main-Danube corridor in 1992.**
- This relative “modernization” could be supplemented by drop-in HVO fuels, as new owners are unlikely to invest in costly retrofits that far exceed the value of the vessel.

Pathways for Danube navigation

A clear majority of the sector representatives participating (21 out of 29 respondents) in the DC/PA1a workshop in Budapest on October 8, 2024 identified **HVO as the most promising & cost-effective alternative fuel**



Ranking of most promising and cost-effective alternative fuels [Source: PA1a EUSDR, 2024]

Pathways for Danube navigation

- HVO:
  - Immediate GHG reduction option for inland shipping
  - Compatible with diesel engines but needs NO_x/PM after-treatment
  - Faces challenges with lubricity, higher price, limited sustainable supply, and competition from other transport modes e.g. aviation
- Other fuels:
  - Hydrogen, methanol, ammonia require major infrastructure and vessel investments
  - Swappable battery containers are a flexible option but limited by sparse container terminal networks in the Danube Region

Implementation barriers

Barriers towards zero-emission Danube fleet

- **Economic Constraints**
  - *No viable business case*: High cost of green fuels (CAPEX and OPEX) and technologies with no ability to pass on costs to cargo customers
  - *Limited access to finance*: Few financial institutions specialize in IWT, and fleet owners, especially in the cargo sector, lack equity to invest in retrofits or new vessels.
  - *Slow fleet renewal (cargo)*: Engines and hulls in use in the cargo sector last for decades; without regulation, most are retained and refurbished rather than replaced.

Barriers towards zero-emission Danube fleet

- **Regulatory Gaps**
  - Existing emission regulations do not affect the legacy fleet.
  - RED III is practically not applied to Danube navigation by the Member States and no regulatory mechanism ensures renewable fuel availability for IWT.
  - National tax and subsidy regimes are inconsistent, distorting fuel market dynamics and competitiveness.

Barriers towards zero-emission Danube fleet

- **Technical Barriers**
  - *Fuel infrastructure*: While diesel refuelling is well-established, there is a lack of infrastructure for hydrogen, methanol, or battery-electric systems. Furthermore, cargo and passenger shipping have established separate supply chains. Mutual benefit of establishing infrastructure is therefore not guaranteed.
  - *Fuel availability*: Estimated need for HVO by 2030 is 500,000 to 600,000 tonnes annually for both cargo and passenger vessels on the Danube; securing this at competitive prices will require major policy and industry coordination.
  - *Market dynamics*: Biofuel supply is constrained by competing demand from other sectors. Production is not currently sufficient for wide IWT adoption.

Policy strategies towards a greener Danube fleet

Short-term policy strategy for drop-in fuels as a ready solution

- HVO (Hydrotreated Vegetable Oil) ready to use short-term solution
- Roll-out of HVO
  - reliable annual supply of ca. 430,000 tons of certified HVO needed for competitive pricing
- Regulation as key driver for the roll-out of HVO
  - → Stable regulatory framework and coordinated approach
  - Financial support for ramping up the HVO production in the Danube states
  - Coordinated implementation of REDIII in the area of IWT
  - Harmonized taxation of HVO and HVO blends, as further crucial elements

Mid-term policy strategy for zero-emission technologies beyond drop-in fuels

- Other green fuelling solutions shall be developed further in parallel to mitigate risks regarding availability and price and to achieve higher resilience.
- Regulation has historically been main driver of transformation in IWT
- To successfully implement alternatives beyond drop-in fuels, the current market failures must be urgently addressed through:
  - A predictable and pro-innovation regulatory framework that provides legal certainty and equals conditions for all
  - A goal-based and technology-neutral approach
  - Funding and support for technological advancements beyond drop-in solutions, making other renewable energy solutions more efficient and cost-effective over time.

Actions towards zero-emission Danube fleet

a) Safeguard coordinated roll-out of alternative fuels between EU Member States around inland waterway transport

b) Use the potential of AFIF for roll out of alternative refuelling infrastructure (Alternative Fuels Infrastructure Facility)

c) Ensure active state aid implementation by Member States

d) Investigate ETS-2 opt-in for inland navigation

e) Harmonise and improve taxation regime ensuring competitive pricing for renewable fuels

f) Amend NRMM Regulation to include methanol and hydrogen as reference fuels for certification of combustion engines

g) Create RTD and innovation funding opportunities that ensure SME-friendly access

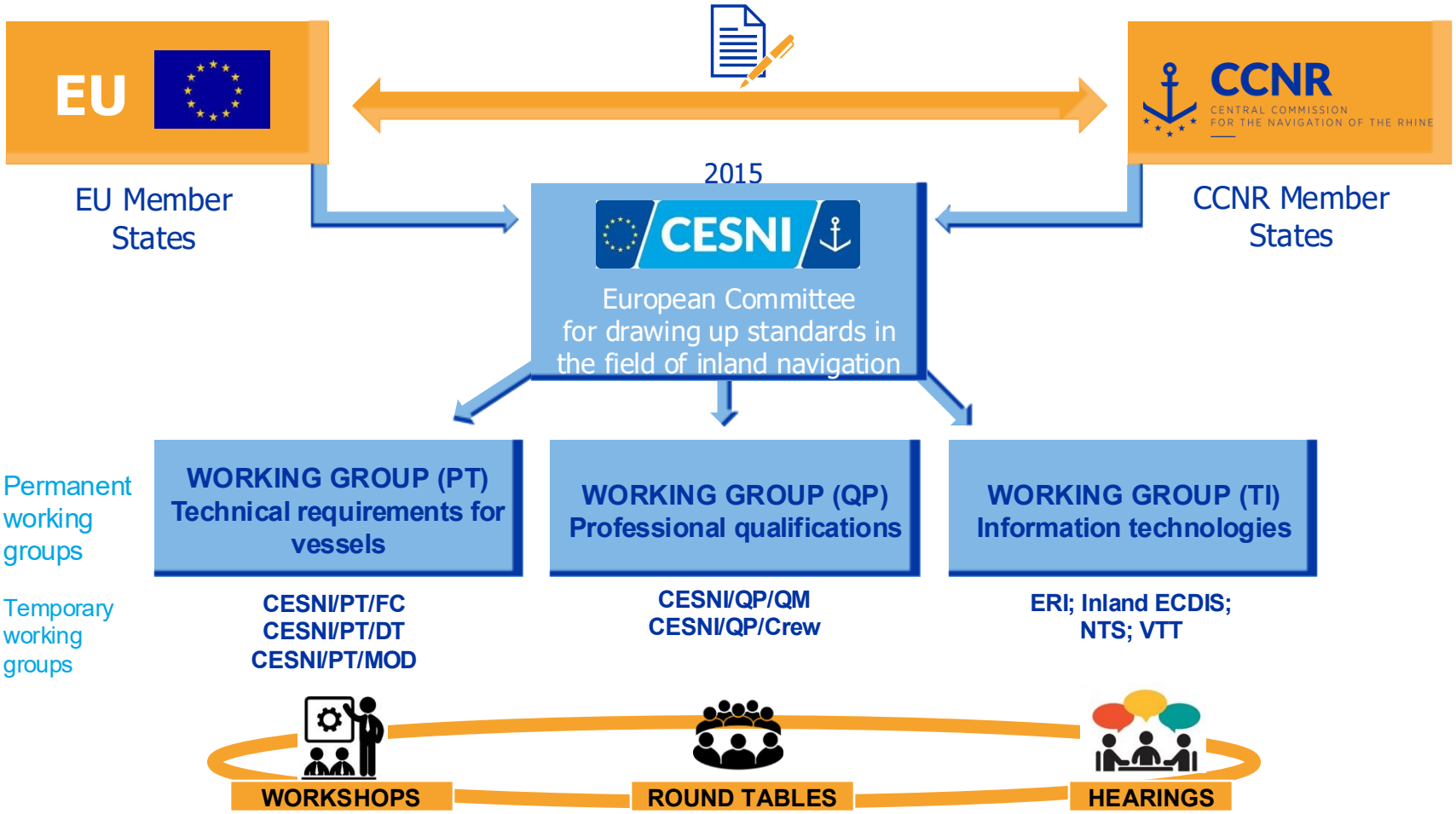
h) Create dedicated IWT investment Fund

PRESENTATION OF THE RELEVANT ACTIVITIES OF CESNI/TI IN THE FIELD OF DIGITALIZATION

03/11/2025

Raphaël Le Guillou, Administrator CESNI/TI

01 CESNI overview


EU
CCNR
CENTRAL COMMISSION FOR THE NAVIGATION OF THE RHINE
EU Member States
CCNR Member States
2015
CESNI
European Committee for drawing up standards in the field of inland navigation
Permanent working groups
Temporary working groups
WORKING GROUP (PT)
Technical requirements for vessels
WORKING GROUP (QP)
Professional qualifications
WORKING GROUP (TI)
Information technologies
CESNI/PT/FC
CESNI/PT/DT
CESNI/PT/MOD
CESNI/QP/QM
CESNI/QP/Crew
ERI; Inland ECDIS;
NTS; VTT
WORKSHOPS
ROUND TABLES
HEARINGS

The role of CESNI in the field of digitalization

- **Develop and update ES-RIS, the CESNI standard in the field of River Information services**
  - With experts from Member states, sector, manufacturers etc.
  - CCNR, EC and other bodies may refer to it

- **Publish guidance documents to raise awareness or facilitate ES-RIS's implementation**
  - cyber security in inland ports
  - AIS installation guidelines
  - Guidelines on personal data transmitted in the context of RIS

- **Monitor, support and contribute to many initiatives all around Europe**
  - CESNI/TI follows the pilot projects and helps to learn lessons from these projects
  - CESNI eventually proposes targeted follow-up actions, when the technology is mature enough, and when harmonisation is needed

02 Focus on ES-RIS

European Standard for River Information Services

- **ES-RIS contains 7 parts**
  - Part 0 – Definitions, Abbreviations and (external) References
  - Parts I and V – inland ECDIS
  - Parts II and VI – Vessel Tracking and Tracing (AIS)
  - Part III – Notices to Skippers
  - Part IV – Electronic Reporting International

European Standard for River Information Services

- **A new edition of ES-RIS every second year**
  - ES-RIS 2025/1 is the latest adopted edition
  - Next edition ES-RIS 2027/1 is to be adopted in October 2026
  - Synchronous with ES-TRIN

- **Enforcement through national and international regulation**

- **The revised EU RIS directive will make direct reference to the latest adopted edition of ES-RIS**

03

CESNI/TI status report

November 2025

CESNI/TI Status Report

- **TGAIN**
  - ES-TRIN works on type-approved TGAIN (incl. monitoring of presence in the wheelhouse)
  - ES-RIS works on the visualization of TGAIN on inland ECDIS
  - CESNI/QP works on training brochure for the TGAIN
- **Use of XML for all ERI messages (instead of UN/EDIFACT)**
- **Standardisation of AIS AtoN and ASM**
- **AIS installation guidelines**
- **CESNI RIS guidelines**
- **Follow pilot projects on intention sharing etc.**

THANK YOU FOR YOUR ATTENTION

CESNI.EU

Raphaël Le Guillou

RIS Corridor Management Execution²

Mario Kaufmann, viadonau

PLATINA4Action 4th Technology transfer Workshop

3rd November 2025, Budapest / Online

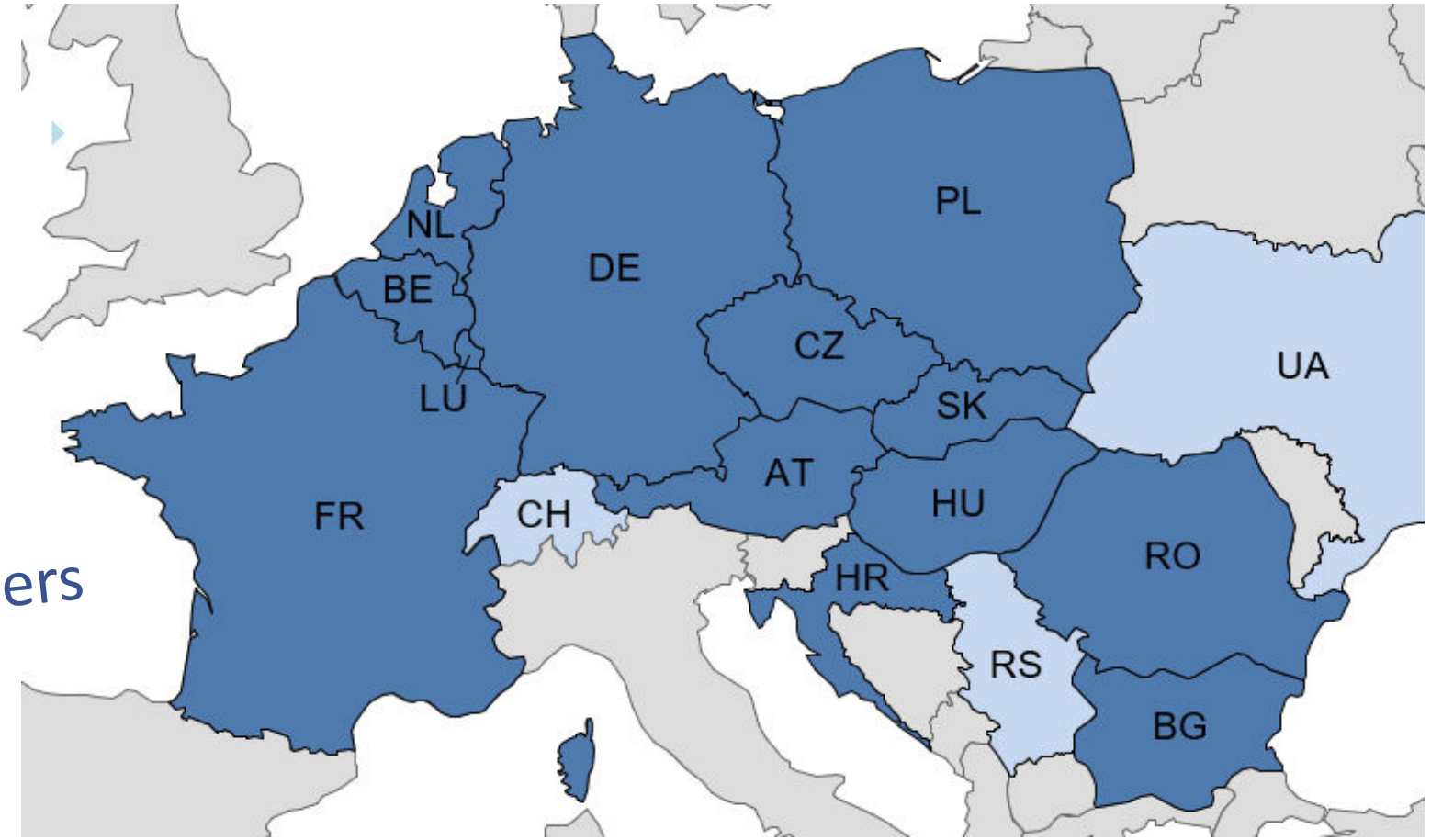
Co-funded by the European Union

Scope

Further enhancement of RIS enabled Corridor Management along European waterways!

CEF2 funded
02/2023-03/2028

20 Partners
from 13 Countries
and 3 Coop. Partners



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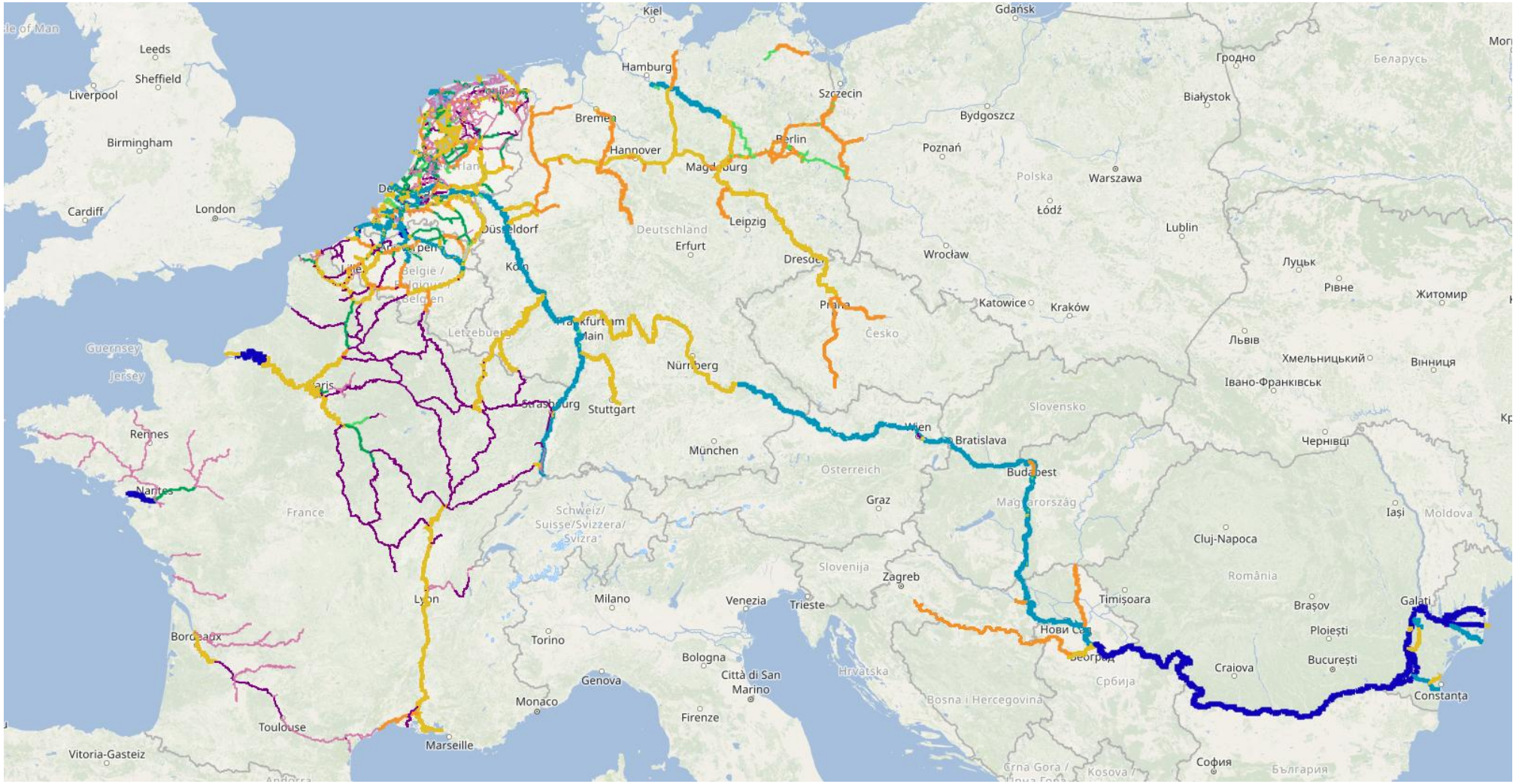
Covered Waterway Network



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Objectives

WP1 **Project Management**	WP2 **Assessment**	WP3 **EuRIS Evolution**	WP4 **Electronic Reporting**	WP5 **Horizontal Activities**
Project Start 1.1	EuRIS Assessment 2.1	EuRIS Coordination 3.1	El.Rep. Coordination 4.1	Reference Data Management 5.1
Project Coordination 1.2	El.Rep. Assessment 2.2	Techn. EuRIS Development 3.2	Techn. Evolution of El.Rep. 4.2	Other international RIS Topics 5.2
Stakeholder Management 1.3	European Initiatives 2.3	Geogr. EuRIS Extension 3.3	Reporting only once 4.3	Other national RIS Topics 5.3
Project Closure 1.4		EuRIS Arrangements 3.4	El.Rep. Arrangements 4.4	RIS Technical Services Evolution 5.4

Co-funded by the European Union

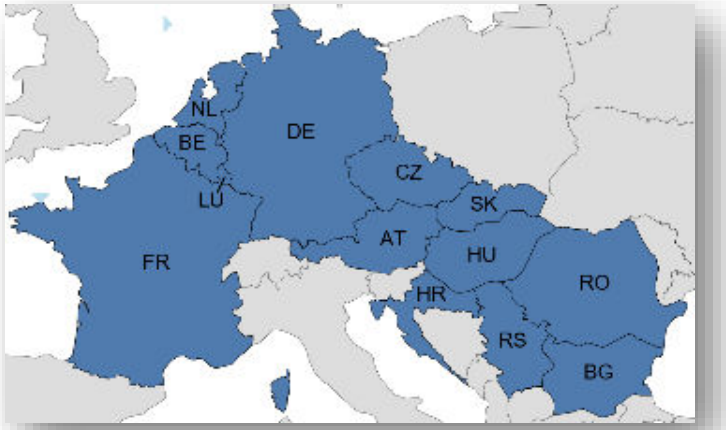
EuRIS

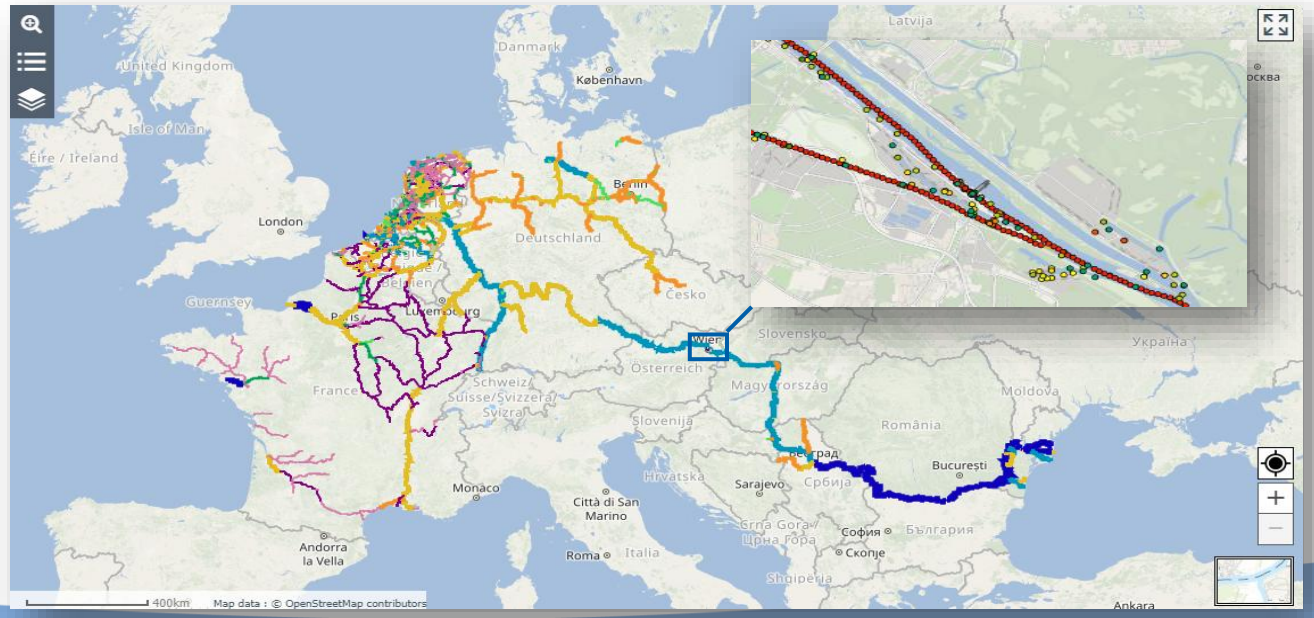
European RIS Platform

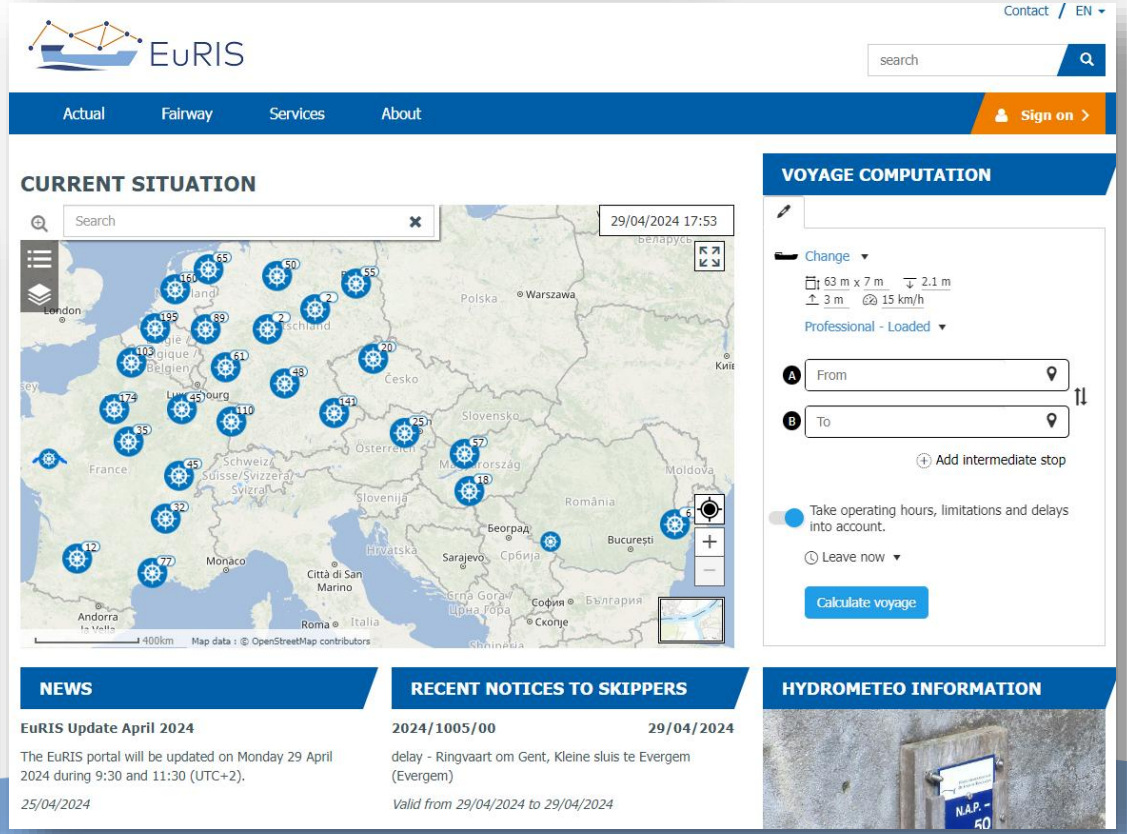
Co-funded by
the European Union

EuRIS system

- Joint operation by 13 countries (soon more)
- Gathers fairway-, infrastructure- and traffic-related data from national data sources
- Single point of access for the users







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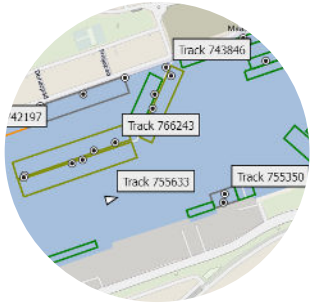
Data

- 27.500 km Waterways
- 271.429 Objects
- 12.000 vessel tracks (average)
- 1.857 Notices to Skippers



11.400 berths (areas)

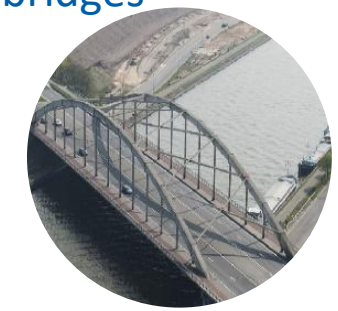
3.900 berths (only as points)

1.300 iENC maps

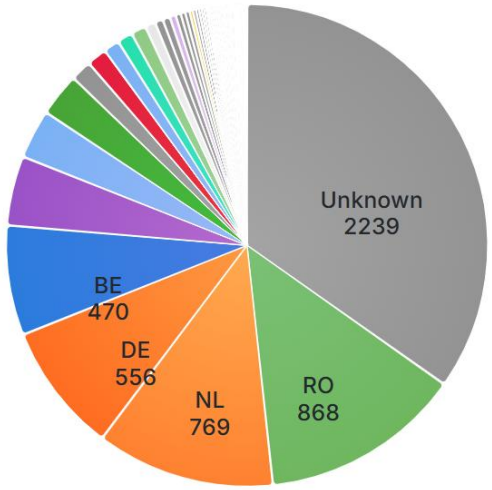
- 1.199 water levels
- 186 discharge measurements
- 96 actual vertical clearances
- 74 actual least sounded depth

2.900 lock complexes

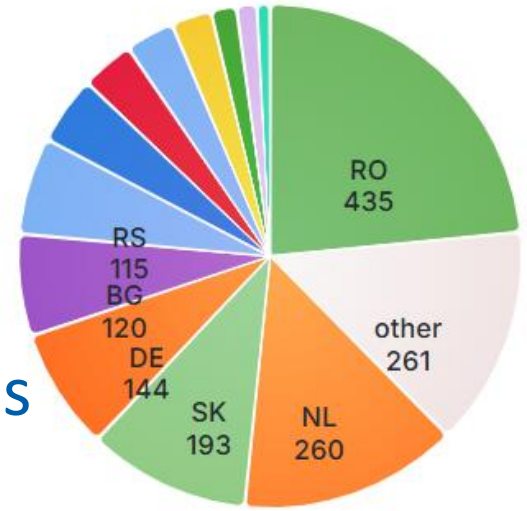
9.500 bridges



Usage

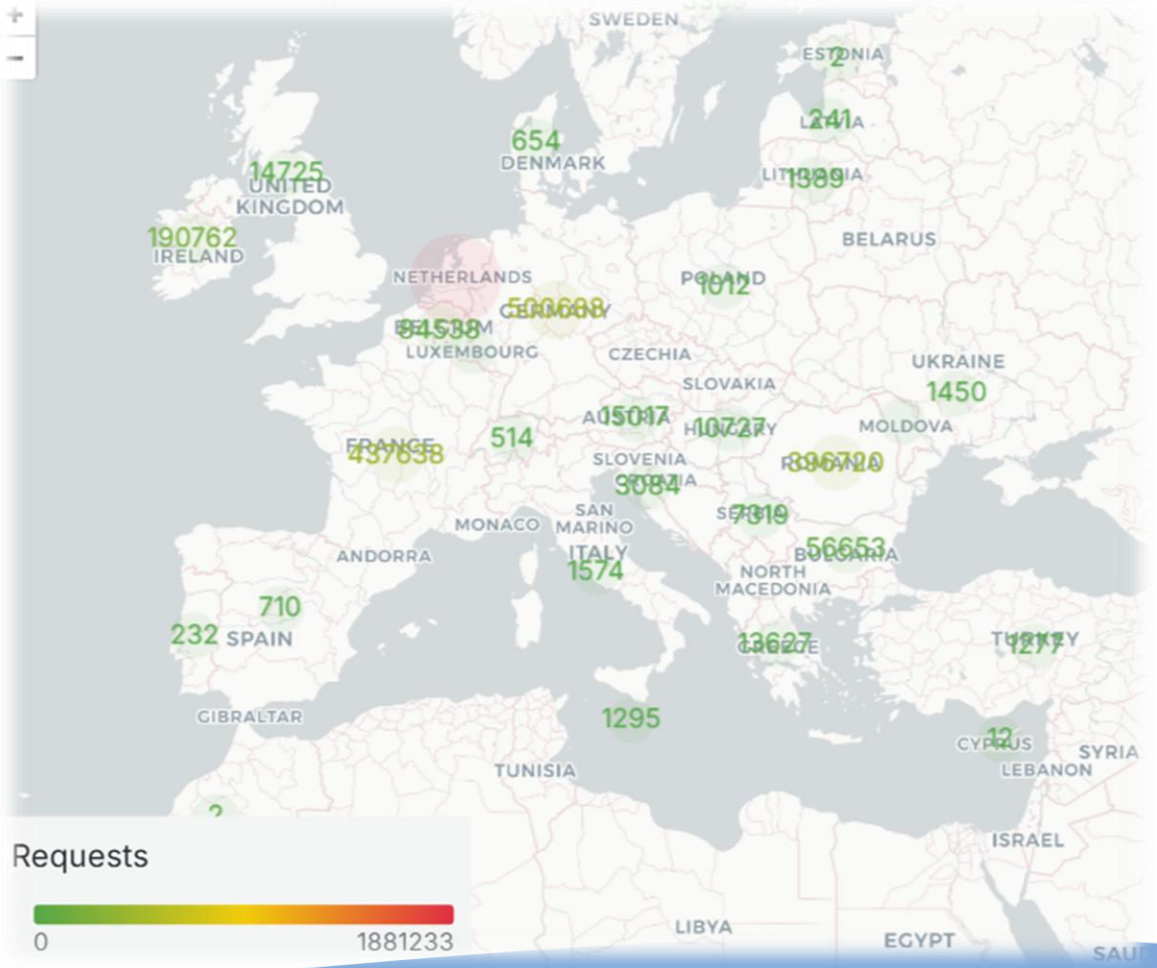


6.190 registered users



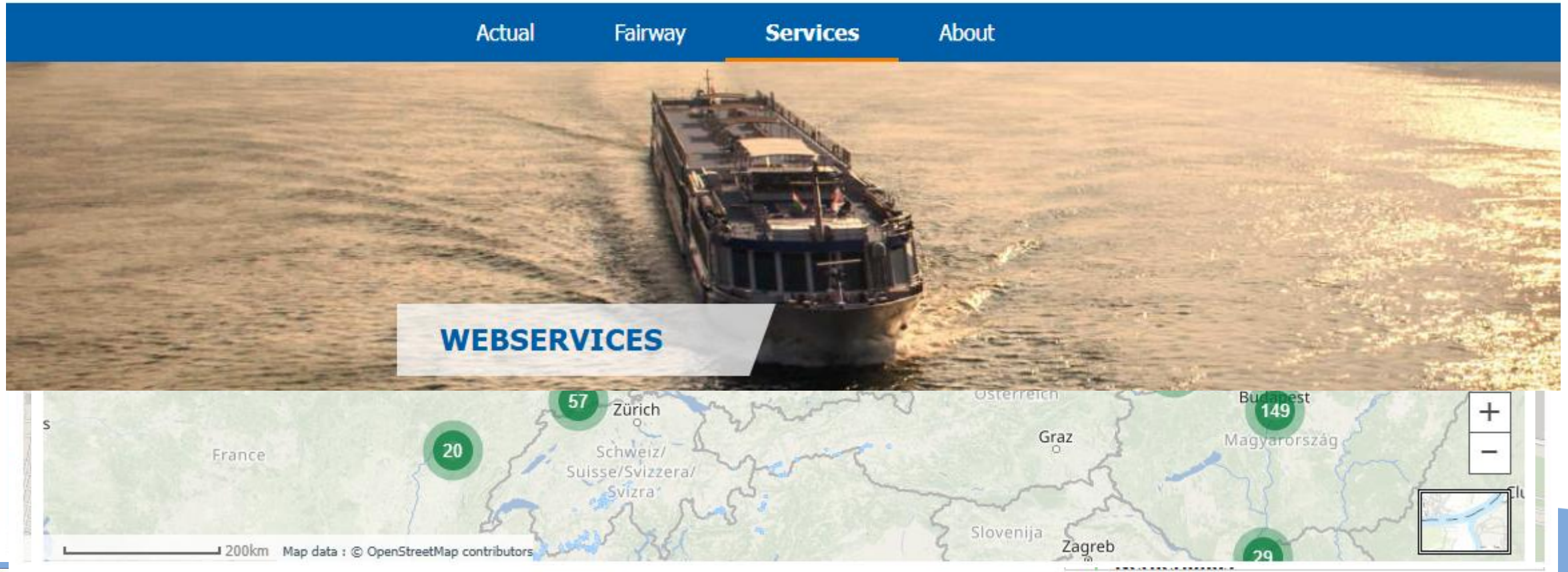
1.840 vessels claimed

4,2 million data requests / 24h



I ACTUAL TRAFFIC IMAGE

EuRIS



To use EuRIS

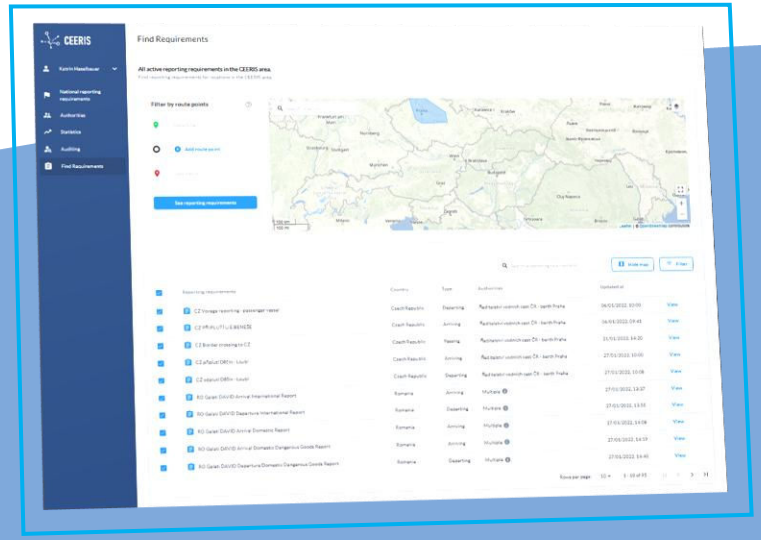
www.eurisportal.eu

- Public information available directly
- Vessel specific information after registration

CEERIS

Central & Eastern European Reporting Information System

Your Platform for Reporting-Only-Once

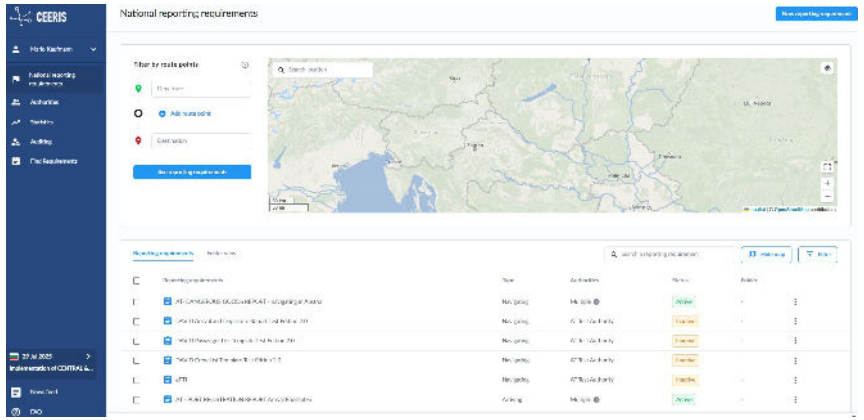


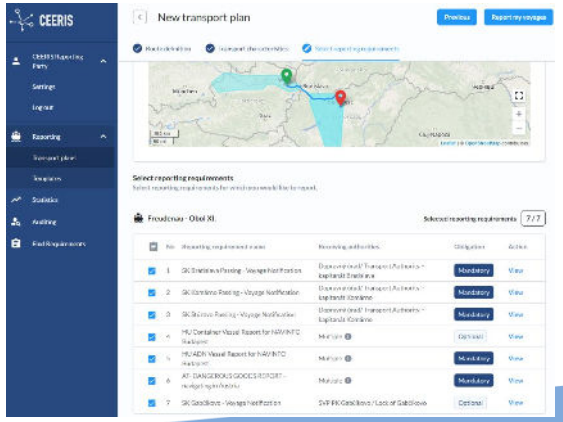
Co-funded by the European Union

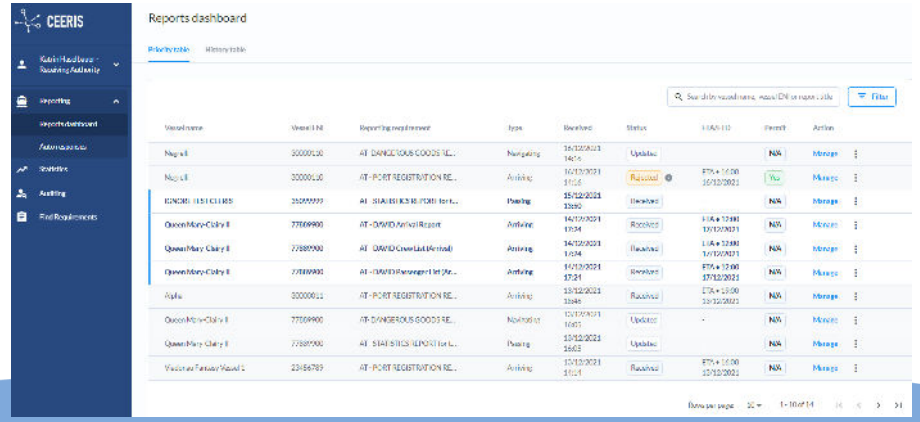
What is CEERIS?

Flexible Common Electronic Reporting System:

- Reporting only once → Reduction of reporting burdens
- Overview on Reporting Requirements along route for specific transport
- Reporting by Vessel Operators or their Agents
- Customised provision of transport reports to Receiving Authorities







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Main User groups

- National ERI Admins
  - Configuration of reporting requirements and receiving authorities

- Reporting Parties
  - Creation, submission and management of electronic transport reports
  - Receiving of responses from authorities

- Receiving Authorities
  - Receiving of electronic reports by different means (dashboard, e-mail, API)

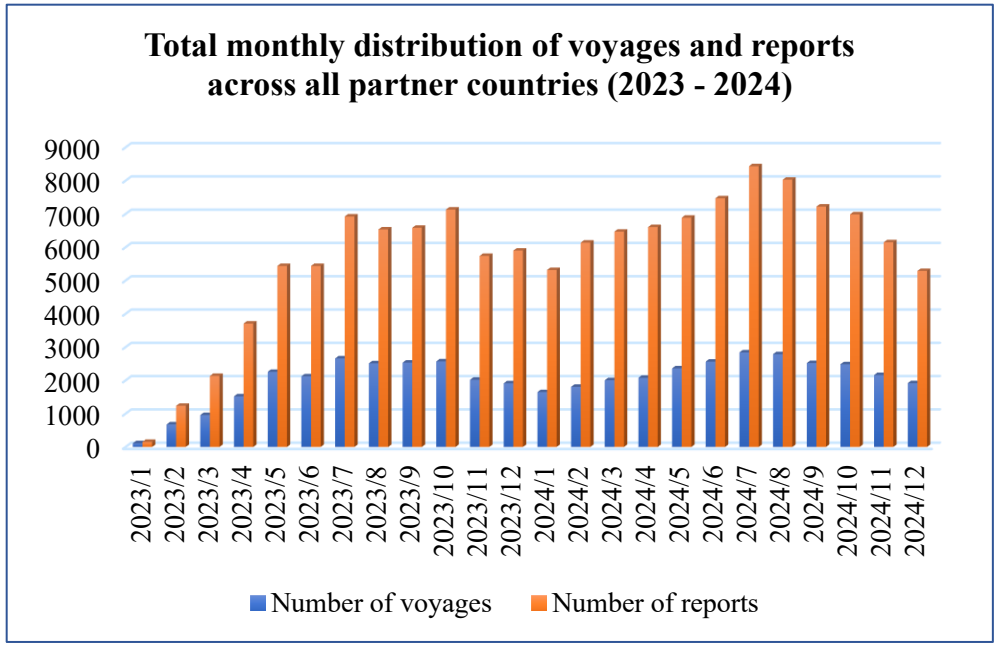
CEERIS Status and Usage

From 01/23 to 05/2025:

63.000 reported transports

198.000 reports to authorities

Ø 3 reports per transport



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CEERIS Status and Usage

Extended towards:

- DE-LU-CH by the end of 2026
- PL beginning of 2028
- UA in the queue

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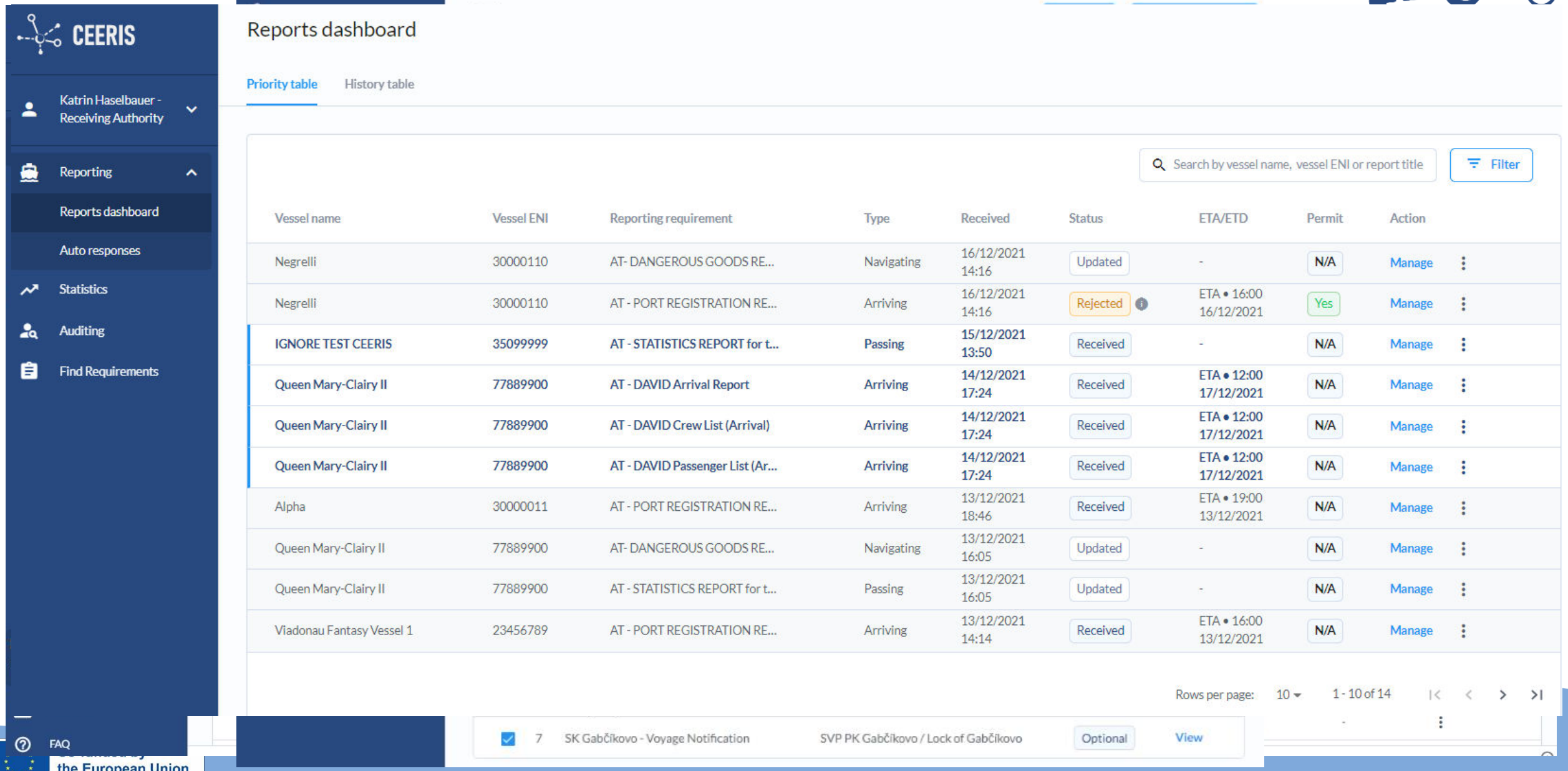
Impressions



the European Union

To use CEERIS

www.ceeris.eu

- Landing page provides overview on covered reporting requirements per countries
- Additional reporting requirements will be covered step by step

COMEX 2

EuRIS

CEERIS

Mario Kaufmann

mario.kaufmann@viadonau.org

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AVIS Project: objectives, main outcomes, and further activities

PLATINA4Action

4th Technology Transfer Workshop

Thematic session 2 – Digitalization in IWT

Funded by the European Union

Introduction

- **Main Objective:** to analyse how **EU Space Data** can be used for **Automated Vessels on European IWW**. In order to do this analysis, a prototype will be defined, design and implemented and will be used in pilots´ demonstrations in different EU IWW important corridors.
- More **specifically**:
  - Define minimum requirements in technical, operational & regulatory terms to guarantee safe & secure navigation for automated vessels in different levels of automation on European IWW.
  - Demonstrate & validate the findings by means of several pilots, making use of EU Space data from Galileo, EGNOS & Copernicus.
- Those activities are expected to:
  - contribute to the NAIADES III objectives for the development, demonstration and deployment of automated shipping concepts.
  - contribute to EU Framework for IWW and Automated vessels.
  - contribute to the standardisation work within relevant IWW standardisation bodies.

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Project Team

- Consortium partners:
  - **GMV**: experience in GNSS, Copernicus, prototypes development, pilots´ execution, standardization
  - **WSV**: expertise on IWW navigation and operation
  - **RSOE**: expertise on IWW transport and river information services
  - **HAC**: expertise on IWW transport and inland ship design
  - **TRESCO**: expertise on Inland Navigation systems
  - **BM**: knowledge on autonomous and IWW transport, Standards and regulations, and RIS
  - **EY**: knowledge on downstream space applications in the field of IWW and on communication and outreach activities
  - **GMV-RO**: expertise on GNSS, IWW and all aspects related to Low Danube pilot

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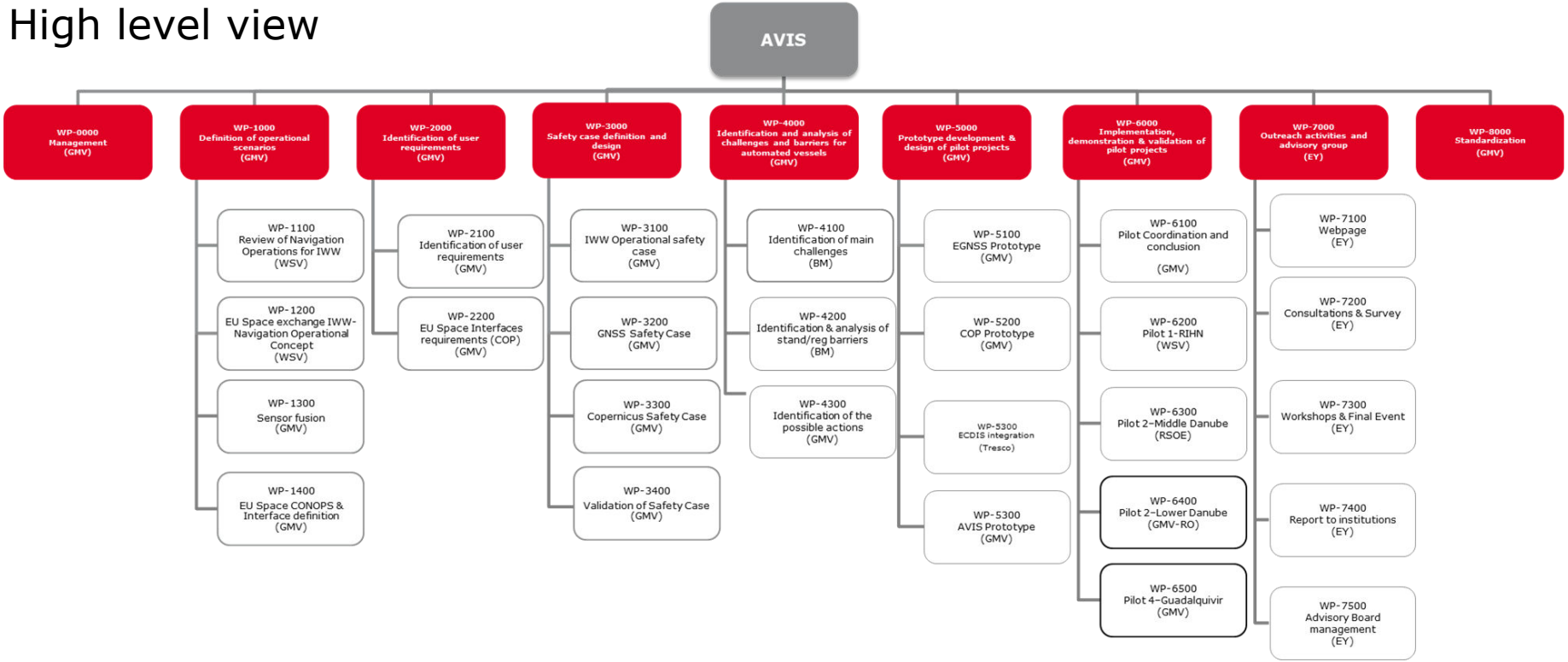
Overview of the Planning

- **Work Packages:**

High level view



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Wide Range of Activities:

AVIS project gathers a **diverse variety of activities**:

- Activities related to **operational aspects**, mainly identified in WP1000
- **Technical** activities, mainly related to WPs 2000-5000
- **Pilots**, mainly identified in WP6000
- **Awareness** activities, mainly identified in WP7000
- **Standardization** activities, mainly identified in WP8000
- **Stakeholders' involvement**, mainly identified in WP7000 but also linked to other WPs

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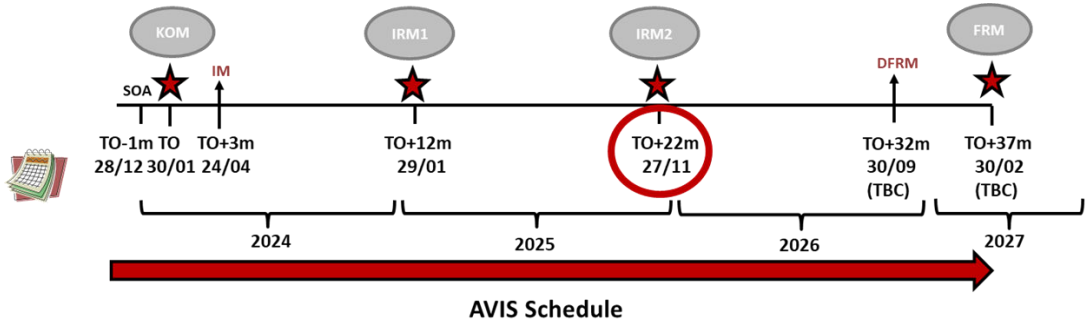
Overview of the Planning

Reviews & Milestones:

- **T0: KOM date (30/01/24)**

Review / Milestone Name	Acronym	Date	Objective(s)
Start of Activities	SOA	T0-1m	Start of the performance of the contract (the day of entry into force of the contract)
Kick-Off Meeting	KOM	T0	- to authorize the start of project activities by EC. - to clarify and settle open points and details of the study to be undertaken
Inception Meeting	IM	T0+3m	- to discuss, modify or approve by the Commission the Inception Report, taking into account the comments of the kick-off meeting mentioned above.
Intermediate report 1 meeting	IRM1	T0+12m	- to discuss, modify or approve by the Commission the Intermediate Report 1
Intermediate report 2 meeting	IRM2	T0+22m	- to discuss, modify or approve by the Commission the Intermediate Report 2
Draft final report meeting	DFRM	T0+32m	- to discuss, modify or approve by the Commission the Final Report Draft
Final report meeting	FRM	T0+37m	- to discuss, modify or approve by the Commission the Final Report



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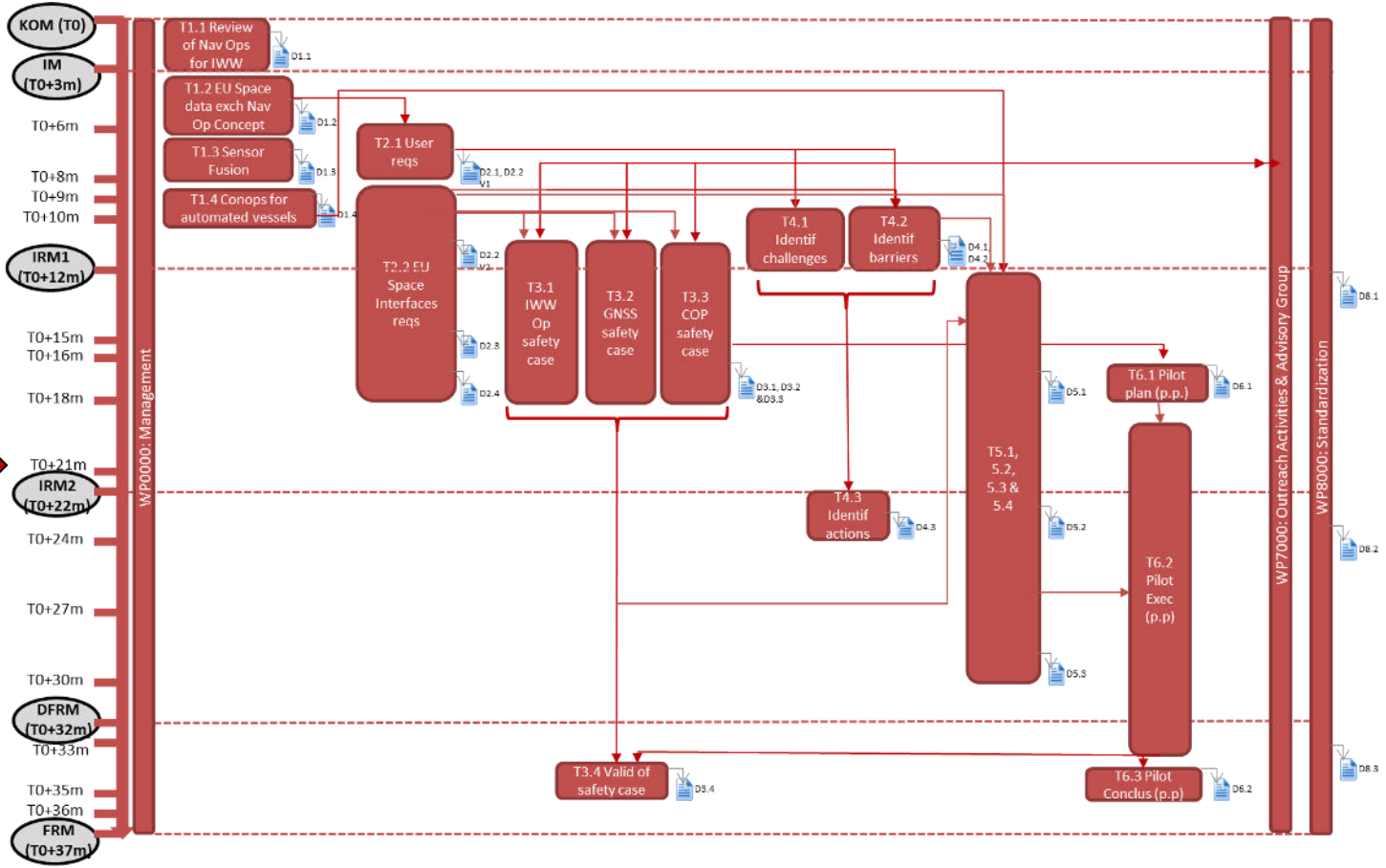
Overview of the Planning

- **Study Logic & Schedule:**

HERE WE ARE



p.p = per pil

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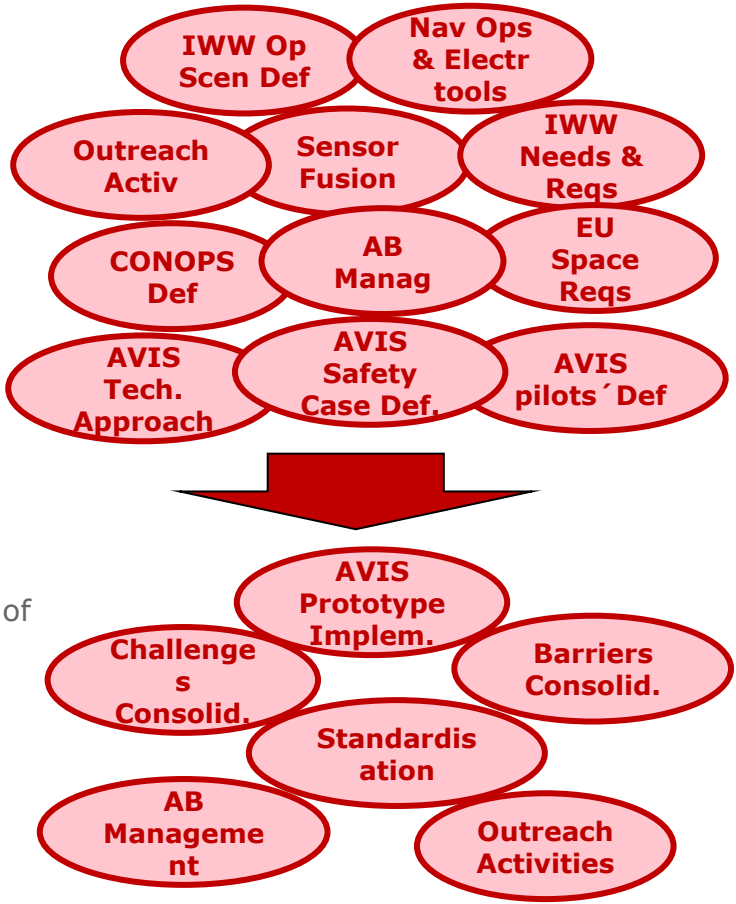
Summary of Developed & under-development Activities

Main AVIS Activities already developed:

- Definition of IWW **Operational Scenarios**
- **Navigation operations** & electronic tools to support IWW operations
- Identification of potential **Sensor fusion**
- **IWW needs & User Requirements** for Automated Navigation
- EU Space **interfaces Requirements**
- EU Space **CONOPS** and Interface definition
- **Safety Case** Definition (pending final approval)
- **Pilots´ Plan** high level definition (pending final approval)
- **AVIS Technical Approach** (pending final approval)



Main AVIS Activities under development:

- **AVIS prototype** implementation
- Consolidation of identified **challenges** for safe operations & resilience of Automated Navigation
- Consolidation of Identification & analysis of **standardisation/regulation barriers**
- **Standardisation**: CESNI PNT & I-MSR WG involvement & Standard Draft Doc. for min reqs for automated vessels & EU Space Data
- **Outreach** Activities: Workshops, Consultations, webpage, linkedin…
- **AB management**

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AVIS: Further Activities

- **AVIS Prototype Implementation**
  - Expected to end implementation for pilots by 01/26
- **AVIS Pilots**
  - To be performed along 2026
  - Preliminary dates:
    - Guadalquivir: 03/26
    - Lower Danube: 05/26
    - Rhine: 09/26
    - Middle Danube: 10/26
- **AVIS Standadization**
  - CESNI PNT & I-MSR WG participation
  - Preparation of next 2 versions of the Standard Draft Document for minimum requirements for automated vessels & EU Space Data
- **AVIS Outreach**
  - Consultations
  - Worskshops
  - Final Event (Hungary, preliminarily end 2026/beginning 2027)

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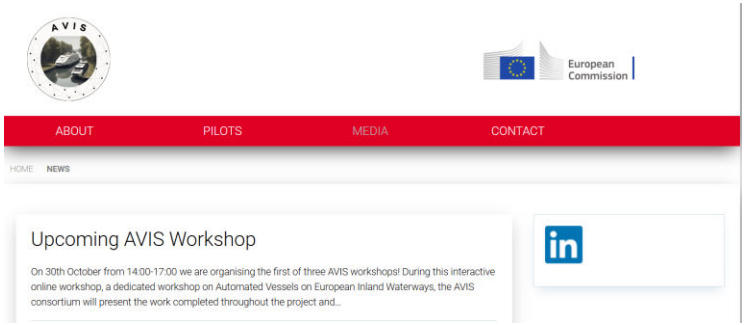
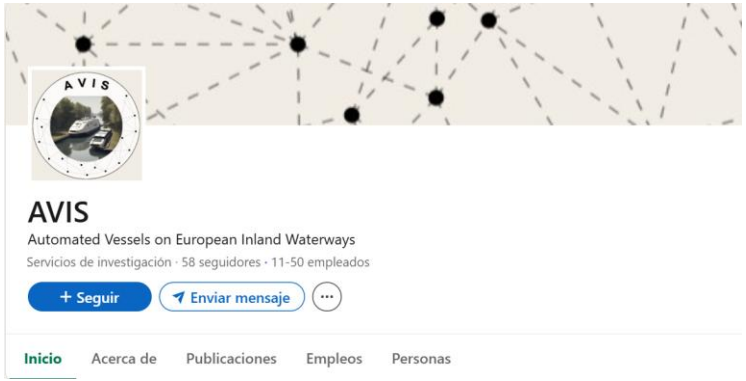
Stay tuned on AVIS progress

Website of the project: https://avisproject.gmv.com/



LinkedIn: https://www.linkedin.com/company/avisproject



Funded by the European Union

Thank you!

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INNOVATING SOLUTIONS

Funded by
the European Union

Digitalisation in Inland Waterway Transport

Identifying Regulatory Challenges & Opportunities through MultiRELOAD

MultiRELOAD

Erwin van der Linden

Regulatory Affairs Coordinator, EGTC Rhine-Alpine
Technology Transfer Workshop Platina4Action
3rd of November 2025, Budapest

Port Solutions for Efficient, Effective & Sustainable Multimodality

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

- MultiRELOAD demonstrates how automation, AI, and predictive tools can make inland ports smarter and greener.
- Duration: 2022–2025 (2026) | 22 partners | 9 countries
- Innovation Areas: Smart Logistics – Digital Nodes – Business Models & Regulation
- 7 Demonstrators in Duisburg, Vienna, Basel
- Targets: +5% modal shift to rail/IWT | +20% efficiency | –10% cost

Why digitalisation in inland ports is key to modal shift

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

- 75% of inland freight in Europe still travels by road.
- Inland ports can unlock modal shift – but space, cost, and labour constraints limit capacity.
- Digitalisation is the *“fourth mode”*: improving efficiency **without new infrastructure**.
- MultiRELOAD supports EU **Green Deal**, **Fit for 55**, and **NAIADES III** strategies.

Turning terminals into intelligent multimodal systems

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

- Focus on **automation, predictive maintenance, AI-based optimisation**.
- Demonstrators B1–B3 improve efficiency, reliability, and sustainability.
- Three-layer approach tested: Terminal → Node → Corridor integration.
- Results in average **handling capacity increase**: 18–25%.
- Digitalisation at terminal level is a precondition for integrated corridor management and zero-emission operations.

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

Example of demonstrations (click)

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

Demonstrators B1–B3 Key Results

- B1 – **Automated Load Detection:** +20% faster processing, 98% accuracy, improved safety.
- B2 – **Predictive Maintenance**: –15% downtime, –10% energy use, +92% uptime.
- B3 – **AI Container Simulation**: –12% unproductive moves, +15% yard capacity, +5% throughput.

TRL7-8 level means replication with limited adaptation

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

Demo	Innovation	Key Results (from D6.4)	Lessons / Barriers
B1 – Automated Load Detection	Cameras, LIDAR & OCR detect wagon and container IDs in real time; data integrated in digital twin.	+20% faster processing at gates; 98% identification accuracy; improved worker safety.	**Integration into TOS systems complex; requires unified data standards (EDIFACT/eFTI).**
B2 – Predictive Maintenance	IoT sensors monitor cranes & reach stackers; predictive dashboard for condition-based service.	–15% downtime; –10% energy use per crane; 8–10% maintenance cost savings; 70% energy saved per cycle.	**High initial cost, uncertainty over liability for AI recommendations.**
B3 – Predictive Container Positioning	AI-driven simulation optimises stacking & reshuffling; “digital twin playground” for terminals.	–12% unproductive moves; +15% yard capacity; +5% overall throughput; improved traffic flow.	**Data quality & historical completeness essential; privacy of operational KPIs still sensitive.**

What terminal operators and authorities said

- Main benefits perceived: faster processing (57%), higher throughput (29%), lower energy use (21%).
- Predictive maintenance most trusted innovation (by 92% of users).
- AI planning recognized as useful but underused (70%) due to missing skills and uncertain ROI.
- Barriers: integration complexity (50%), investment cost (50%), skills gap (29%).

Legal & governance barriers for digital ports

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

70% of surveyed operators indicated willingness to adopt if regulatory & funding support increase, but:

- No harmonised data standards across terminals (XML, EDIFACT, CSV).
- Liability for AI-driven decisions unclear.
- Data ownership & competition law limit sharing.
- eFTI & RIS provide basis but rollout uneven.
- Regulatory sandboxes needed for AI pilots.

→ **Absence of harmonised standards is a bigger barrier than legal prohibitions.**

Pathways for replication and scale-up (2025–2030)

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

- Short term (2025–27): final validation KPIs, complete business models.
- Mid term (2027–30): replicate B1–B3 in 10–12 terminals, integrate with **RhinePorts Information System (RPIS) 2.0**
- Long term (2030+): link with **European Mobility Data Space (EMDS)** & **Digital Corridor Management (DCM)**.
- Expected corridor impact: +20% efficiency | –10% cost | –20% CO_2.

Linking MultiRELOAD to the EU digital transport ecosystem

MultiRELOAD
PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

- **DLTF & FEDeRATED:** data-sharing architecture alignment.
- **eFTI:** paperless freight data exchange – basis for terminal interoperability.
- **RIS Directive (recast 2023):** digital services integration for inland navigation.
- **ALICE Physical Internet Roadmap:** interoperability and visibility across supply chains.
- **ETP & EMDS:** next steps for integration and governance alignment.

From pilots to policy – three questions

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PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

- How can regulation accelerate digitalisation?
- Should EU corridors develop joint data standards?
- Which incentives make AI mainstream in IWT?

MultiRELOAD

PORT SOLUTIONS FOR SUSTAINABLE MOBILITY

Thank you for your attention!

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Funded by the European Union

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PLATINA 4Action

Digitalisation Vision Inland Navigation Europe (DiVINE)

project detailed overview from the barge operator's perspective

3rd November 2025

Henk van Laar

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137650.


HANZESTAD

BUREAU TELEMATICA BINNENVAART

the Blue Road

Vision and R&D programme

INLAND WATERWAY TRANSPORT 3.0

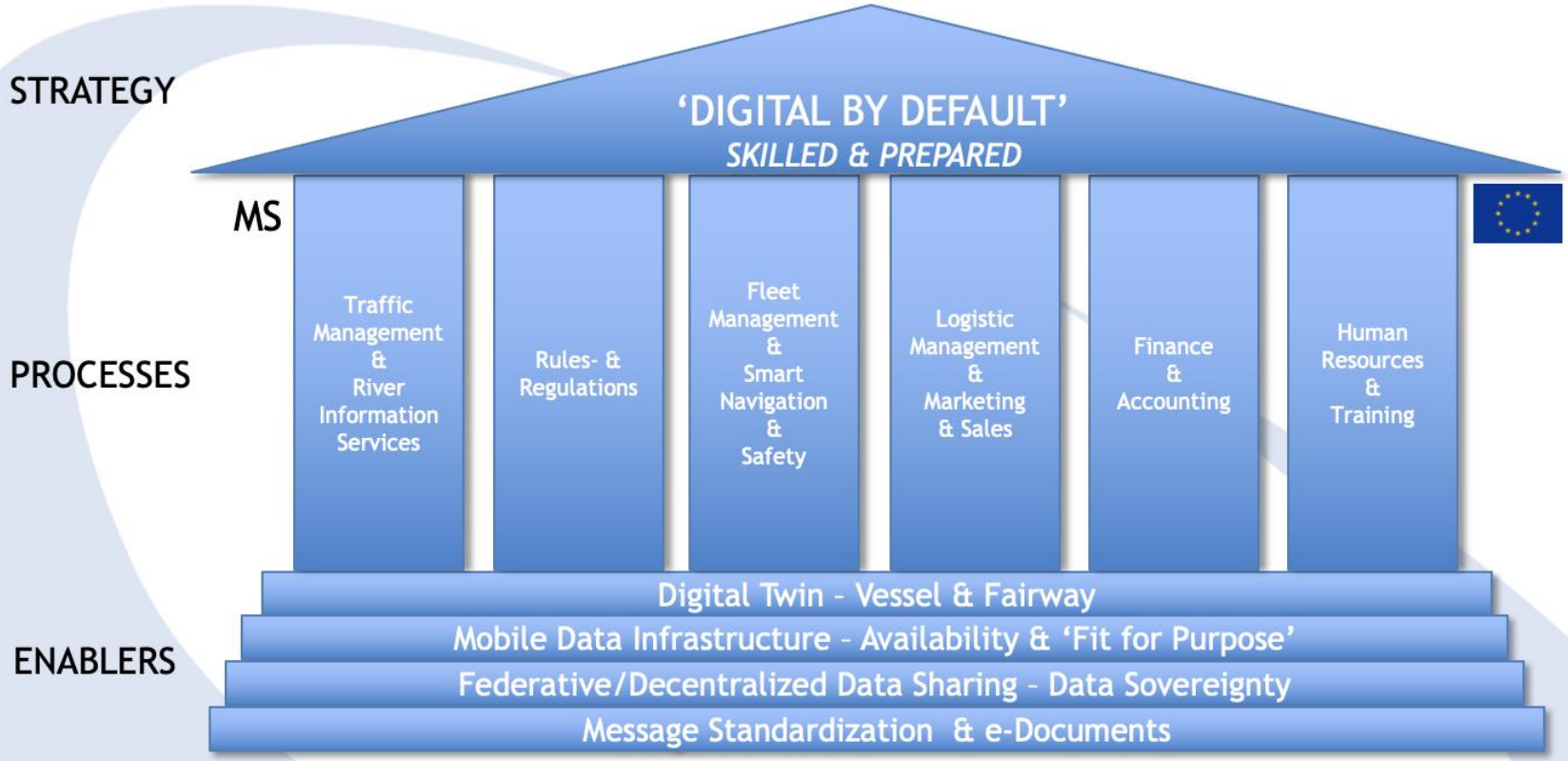
THE INTERNET OF SHIPS

Henk van Laar, October 2015

Drawn up by Bureau Telematica Binnenvaart

Bureau Telematica Binnenvaart

House of IWT Digital Excellence



the Blue Road
duurzaam vervoer over water

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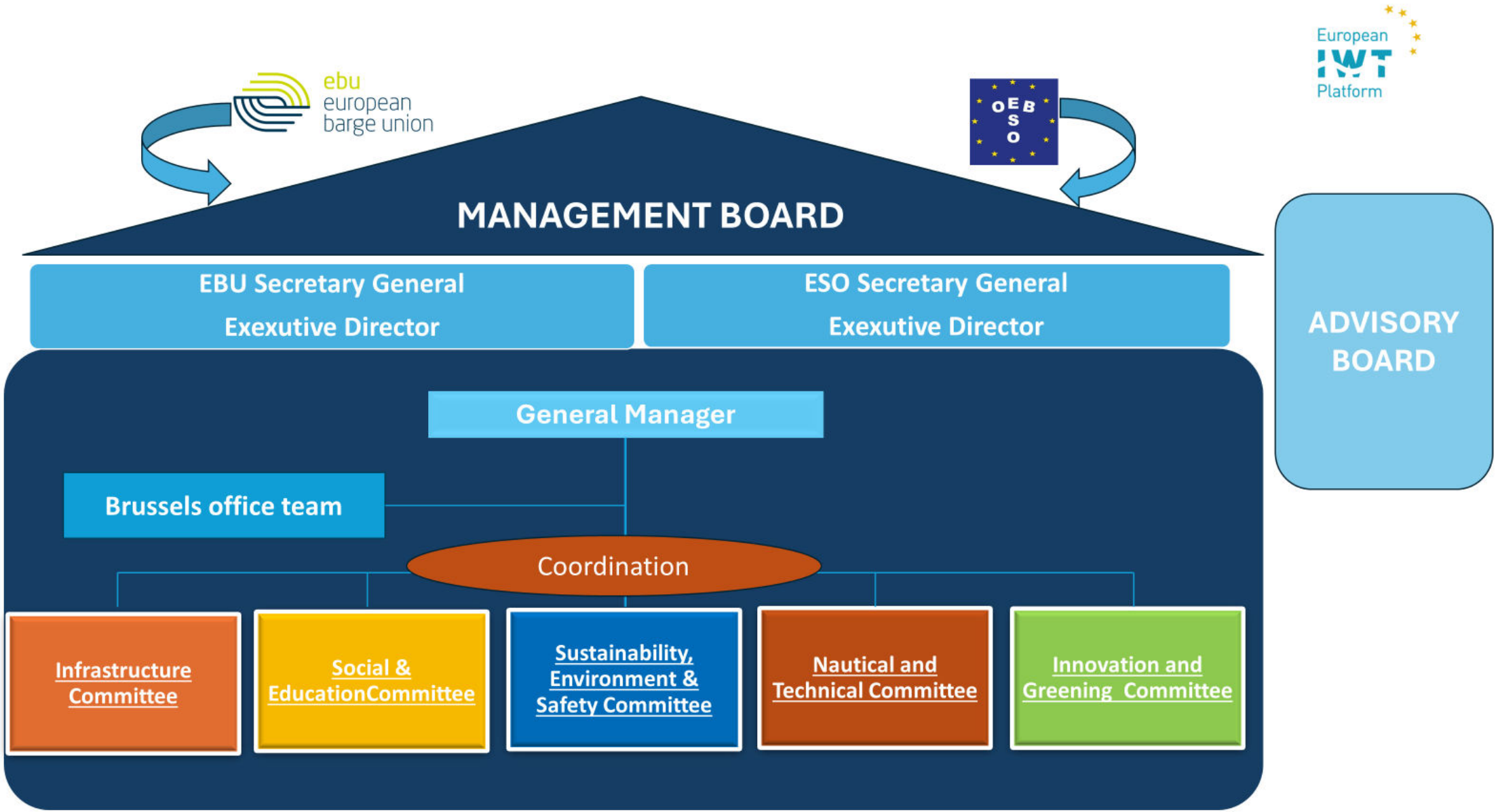
European
IWT
Platform

IWTP Governance Structure



Key Functions and Activities of the IWT Platform

1. Representation and Advocacy:

- Operates from Brussels, engaging in EU-level discussions and policy formulation.
- Influences IWT sector contributions through interactions with EU, regional, and national governance.

2. Project Development and Implementation:

- Development and implementation of strategic EU Funded Projects and own initiatives
  - Aiming to enhance the sustainability safety, and efficiency of inland navigation

3. Stakeholder Engagement:

- Involves a diverse range of stakeholders, including:
  - Ship owners and operators
  - Cargo interests
  - Infrastructure providers
  - Crew members
  - Industry associations
  - Environmental organizations

4. Value Chain Approach:

- Promotes collaboration across the entire value chain to tackle challenges and create opportunities.

5. Think-and-Do Tank:

- Represents IWT sector interests in Europe.
- Enhances inland navigation's role in the transport market.
- Contributes to EU transport policy and project implementation.

Operational Objectives

1. Greening and Innovation:

- Reduce environmental impact and improve efficiency.

2. Safety and Environmental Protection:

- Implement best practices and adhere to safety standards.

3. Education, Training, and Working Conditions:

- Ensure a skilled workforce with improved training and conditions.

4. Nautical and Technical Aspects:

- Optimize navigation and operational performance.

5. Better Financing of Waterways:

- Secure funding for waterway maintenance and development.

7. Technical Safety Requirements:

- Promote and adhere to stringent safety standards.

8. Competence of Inland Skippers:

- Enhance skipper training and professional development.

9. Workforce Transition Support:

- Provide early retirement pensions and vocational training for transitioning workers.

10. Stakeholder Engagement:

- Ensure project relevance through broad stakeholder input.

11. Consultation and Coordination:

- Involve social partners and coordinate with Member States.

12. Transparency and Accountability:

- Maintain transparency through yearly reports and external audits.

Ref. Ares(2024)4754556 - 02/07/2024

EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR MOBILITY AND TRANSPORT

MOVE - Mobility and Transport
Ports and Inland Navigation

European Commission

Call for tenders EC-MOVE/2024/OP/0044

Implementation of the digitalisation vision for inland waterway transport as part of the European Green Deal Open procedure

TENDER SPECIFICATIONS

EU Inland Water Transport Digitalisation Vision

By 2035, with the aim of achieving safe, seamless and sustainable inland navigation, inland waterway transport in the European Union is a competitive, resilient, attractive, innovative connected, cyber secure and digital by default mode of transport for freight and passengers which is fully harnessing the potential of digital technologies and emerging solutions, thereby allowing effective data-sharing between all parties of the chain, thus enabling seamless integration with other modes of transport as well as automation, by embracing the latest digital achievements and contributing to a better functioning of the Inland waterway single market. IWT will be part of the concept of Physical Internet. It will help overall time efficient, sustainable transport flows and support other modes to decongest.

Key Objectives

Smart Administration:

- Unified policies, digital single window, paperless freight, smart traffic management, and EU regulations for automation and crewing

Smart Vessels:

- Increased automation and remote operations, coexisting safely with conventional vessels

Smart Infrastructure:

- 24/7 automated, remotely operated infrastructure, with digital traffic guidance

Smart Data:

- Fully digital communication, standardized data exchange, integrated into the EU Mobility Data Space and single window systems

European Commission

DiVINE – supporting the implementation of the Digitalisation vision for the IWT by 2035

DiVINE

Digitalisation Vision Inland Navigation Europe

2. CONSORTIUM PARTNERS

European IWT Platform

The European Inland Waterway Transport Platform is the **lead** organization of the consortium.

ECORYS

1948
Danube Commission

Expertise- en InnovatieCentrum Binnenvaart
EICB

viadonau

Circle Group

1. PRESENTATION OF THE PROJECT OBJECTIVE

General objective

The project should develop closer **public-private cooperation** in IWT and facilitate the implementation of the **IWT Digitalisation Vision** across all navigable EU river basins.

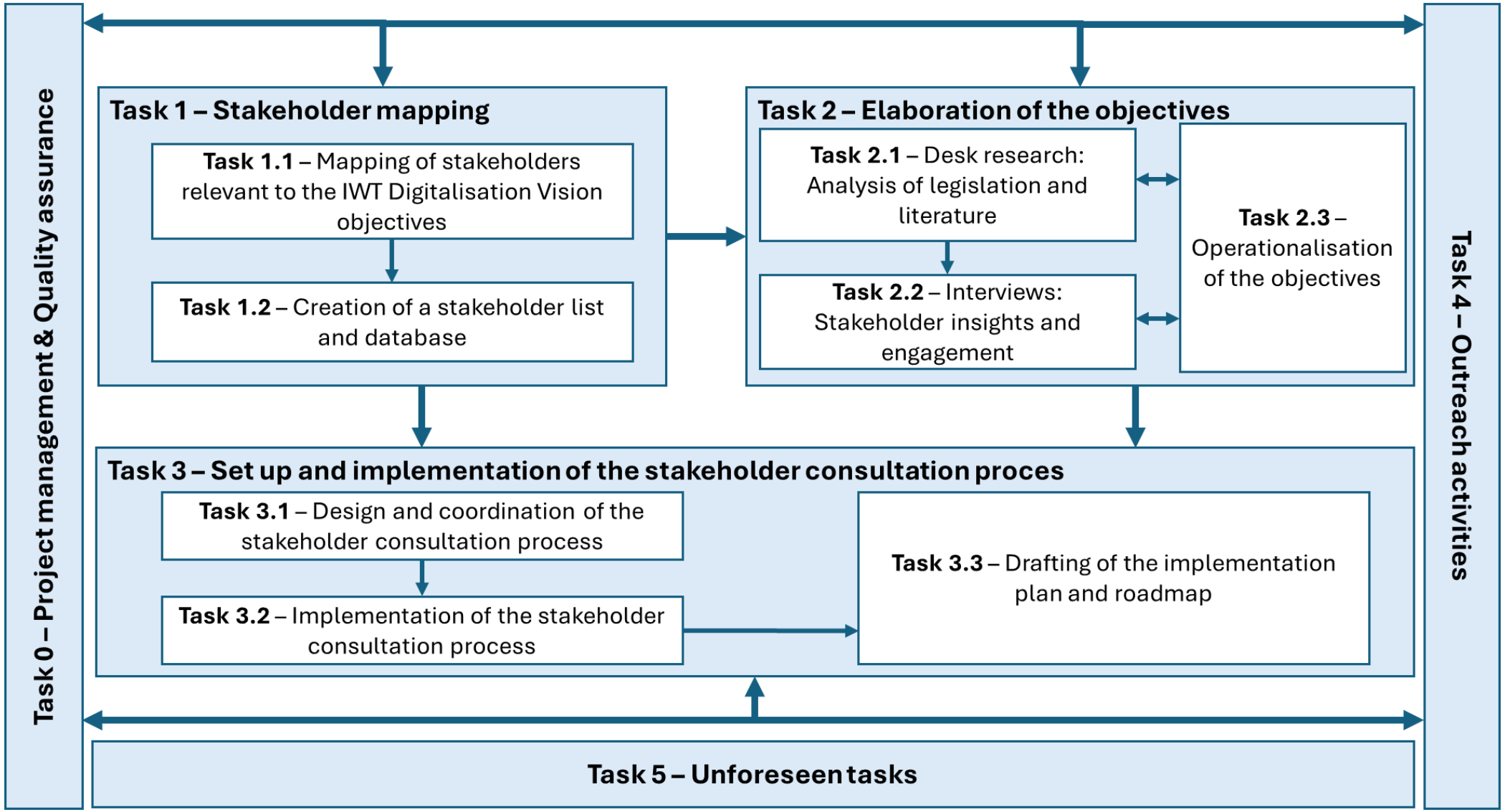
Specific objectives

1. **Phase 1**: Stakeholder Mapping
2. **Phase 2**: Desk research, one-to-one interviews and elaborate and refine the objectives of the vision.
3. **Phase 3**: Stakeholder consultation process

- Discuss the role and commitment of stakeholders to the IWT Digitalisation Vision
- Develop a clear roadmap with required actions and responsibilities to ensure implementation by 2035

DiVINE
Digitalisation Vision Inland Navigation Europe

3. STRUCTURE OF THE PROJECT



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Thank you!

Questions?

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137650.

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Summary and closing remarks

& info European IWT Projects Cooperation Platform

Technology Transfer Workshop
Budapest - 3 November 2025
Martin Quispel, SPB/EICB

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137650.

IWT Projects Cooperation Platform

Objectives, Benefits, Scope, Projects and Activities

IWT projects

Cooperation Platform RD&I projects for IWT

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137650.

Bringing together EU RD&I projects for IWT

- **Creating synergies with cooperation platform:**
  - **More impact** by means of consolidated / joint statements and recommendations for RD&I and policy measures
  - **Increased visibility** to the community and stakeholders
  - **More efficient and effective execution of projects** in terms of impact, stakeholder engagement, dissemination
  - **Facilitating meetings and document exchange platform** to learning from each other to increase the knowledge base
- Follow-up of **“Joint EU Smart Shipping & Logistics Platform”**, organised by the NOVIMOVE project until May 2024
- **Hosted by PLATINA4Action project** to provide a secretariat function at least until December 2026
- **TEAMS site, website and LinkedIn channel are active and operational**

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IWT projects

Cooperation Platform RD&I projects for IWT

“Synergies between European projects”

- Launch Date: 4 February 2025 at the Waterborne Days in Brussels
- 44 Complementary Projects contributing to innovation in inland waterway transport
- Serves as a hub in a network of European RD&I projects in Inland Waterway Transport
- Facilitates knowledge exchange among project coordinators
- Joint recommendations for policy measures and further research needs
- Enhances visibility of innovative solutions to policymakers, industry, and stakeholders
- Central website: **https://iwtprojects.eu**

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IWT projects
Cooperation Platform RD&I projects for IWT

European IWT Projects Cooperation Platform

The Inland Waterway Transport (IWT) Projects Cooperation Platform is a dedicated initiative designed to enhance the efficiency, visibility, and impact of Research, Development, and Innovation (RD&I) projects in IWT. By fostering collaboration among stakeholders and facilitating knowledge exchange, the platform aims to drive innovation, strengthen market uptake of new technologies, and influence policy to support the growth and sustainability of IWT.

PROJECTS CONTACT

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IWT projects

Cooperation Platform RD&I projects for IWT

Key Benefits of the Platform

- **Optimized Project Execution**: The platform ensures that RD&I projects are carried out more effectively through improved stakeholder engagement, streamlined dissemination, and impactful communication strategies.
- **Knowledge Sharing**: A space for exchanging documents and insights, enabling participants to learn from each other and increase the collective knowledge base on inland waterway transport innovation.
- **Amplified Impact**: By issuing joint statements and recommendations, the platform provides a consolidated voice to advocate for future RD&I needs and policy changes that address market barriers and support technology adoption.
- **Increased Visibility**: Through online channels such as a dedicated website and LinkedIn, the platform helps projects gain greater recognition and outreach within the IWT community and beyond.

Objectives

The IWT Projects Cooperation Platform aims to:

- **Enable Synergies**: Create connections between ongoing projects, particularly in technical areas, by providing a comprehensive overview of European Union-funded projects and mapping commonalities and gaps across themes, market segments, and geographical scopes.
- **Facilitate Thematic Focus Groups**: Organize task forces on key themes such as zero-emission innovations, offering a forum for discussing barriers, best practices, and feedback from RD&I efforts.
- **Support Event Planning and Stakeholder Involvement**: Coordinate joint consultations and engagement with relevant stakeholders, maintaining an up-to-date list of key players and events related to IWT.
- **Boost Dissemination and Exploitation**: Enhance the visibility and impact of project results through joint events like “IWT RD&I Projects Week” and shared communication channels, including a platform website and social media presence.

Scope

The platform primarily focuses on RD&I projects funded by the European programme Horizon Europe, covering areas such as Zero Emission Waterborne Transport (ZEWT), logistics, human resources, digitalisation, clean hydrogen, and battery technologies. Additionally, it includes other EU-supported initiatives like Connecting Europe Facility, Innovation Fund, INTERREG, and LIFE projects, as well as nationally funded RD&I projects with substantial budgets.

By providing an efficient cooperation environment for these projects, the IWT Projects Cooperation Platform aims to accelerate the transition towards greener and more efficient inland waterway transport solutions.

List of involved projects (44):

1S4IWT
AEGIS
AENEAS
AUTOBARGE
AUTOFLEX
AUTOSHIP
AVIS
BOOSTLOG
CLARION
CLEVER
COMEX2
CRISTAL
CURRENT DIRECT
ENTRANCE
FAIRWAY DANUBE II
FASTWATER
FLAGSHIPS
FLEETFOR55
FOREMAST
FOR-FREIGHT
GRIP
INNOWATR
ISTS
IWETT
IW-NET
LASTING
MAGPIE
MOSES
MULTIRELOAD
NOVIMOVE
PATH2ZERO
PIONEERS
PLATINA3
PLATINA4ACTION
PLOTO
RENEW
RESHIP
RH2IWER
SEAMLESS
SEASTARS
SETO
ST4W
SYNERGETICS
WISTAR

PLATINA 4Action

IWT projects
Cooperation Platform RD&I projects for IWT

Example project tile:

Synergetics

Project details

Project Full Name	Synergies for Green Transformation of Inland and Coastal Shipping
Goal	Matching retrofit solutions for greening of the fleet with ship type, dimensions and operational profiles.
Status	Ongoing
Categories	(Zero-)Emissions

More information

Cordis Link	https://cordis.europa.eu/project/id/101096809
Website Link	https://www.synergetics-project.eu

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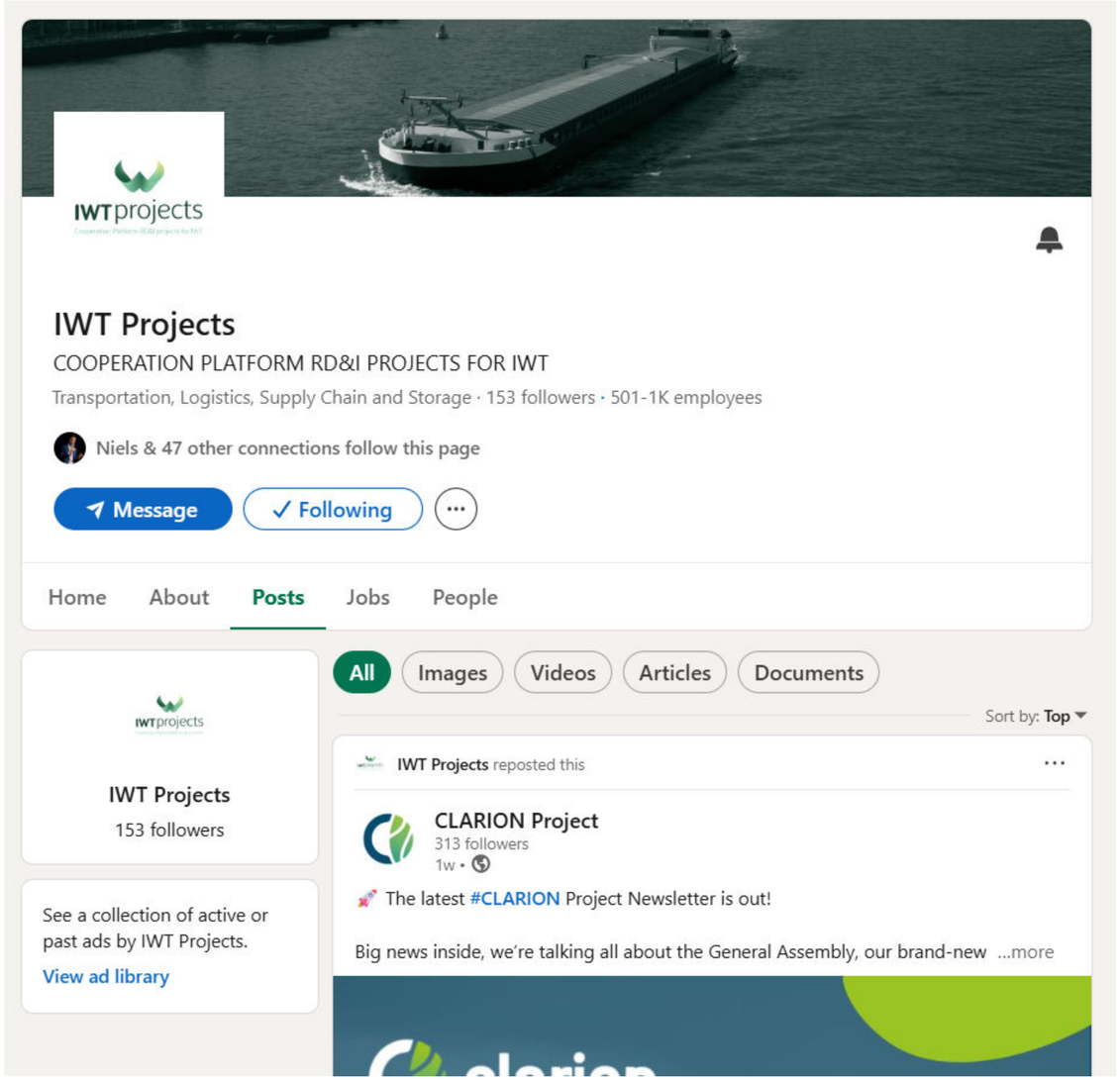
IWT projects
Cooperation Platform RD&I projects for IWT

LinkedIn channel: https://linkedin.com/company/iwt-projects



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IWT projects
Cooperation Platform RD&I projects for IWT

Summary of the days' discussions

Thematic session 1: Steps towards decarbonisation and emission reductions in IWT

Thematic session 2: Digitalisation in IWT

Thank you for your participation!

Ir. Martin Quispel (MSc.)

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This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101137650.