

NEWSletter 1

June 2023



SYNERGETICS – Synergies for Green Transformation of Inland and Coastal Shipping – is an Innovation Action funded by the Horizon Europe programme of the EU. The total costs of the project are 7,162,920.68, whereby EU support amounts to 4,184,312.03 EUR.

Within a duration of 42 months, **SYNERGETICS** will respond to the Call "HORIZON-CL5-2022-

D5-01-04: Transformation of the existing fleet towards greener operations through retrofitting (ZEWT Partnership)".

SYNERGETICS kicked-off at DST- Development Centre for Ship Technology and Transport System in Duisburg on 8.2.2023.



1 | **SYNERGETICS** consortium at the kick-off meeting at DST in Duisburg.

What is **SYNERGETICS**?

The existing fleet operating on European inland waterways and in the respective coastal areas displays a great potential for greening, which can be unlocked by proper means of retrofit. Currently, different undertakings with respect to greening in the shipping sector as well as other sectors have been carried out or are ongoing. However, the solutions are not brought together in order to facilitate a roll out on a large scale.

This is the starting point of **SYNERGETICS**!

The project aims at bringing together the relevant knowledge from different sectors, in particular the waterborne one. This will be realized by creating synergies between the leading research institutions in the field of ship hydrodynamics and energy transition, innovation centres and shipping industry associations, ship-building industry, regulatory bodies, vessel owners, and technology providers, as well as between different European regions.

The goal is the provision of a consistent catalogue of developed and ready to deploy retrofit solutions which would facilitate and accelerate the green transformation of inland vessels and coastal ships.





What are the objectives?

The key objectives of **SYNERGETICS** are:

- demonstration of the potentials of retrofit technologies in greening the existing fleets by retrofitting four existing ships in the course of the project duration;
- demonstration of the potentials of hydro-dynamic improvements in greening of the existing fleets;
- demonstration of the value of digital assets in greening the existing fleets;
- integration of the knowledge on shipping decarbonisation and air-pollutant emission reduction technologies with experience gained in the pilot projects and in the demonstrations performed within **SYNERGETICS**, and establishment of the Catalogue of Greening Solutions;
- provision of up-to-date Scenarios to Policy-Makers and the Handbook to Vessel Owners for an accelerated greening of inland and coastal shipping;
- acceleration of the uptake of the greening retrofit solutions by streamlining regulatory procedures;
- propagation of the use of the Catalogue, the Scenarios, and the Handbook developed within **SYNERGETICS** beyond Western Europe.

What will be demonstrated?

In **SYNERGETICS** a number of demonstrations will be carried out relating to:

- hydrogen combustion in internal combustion engines;

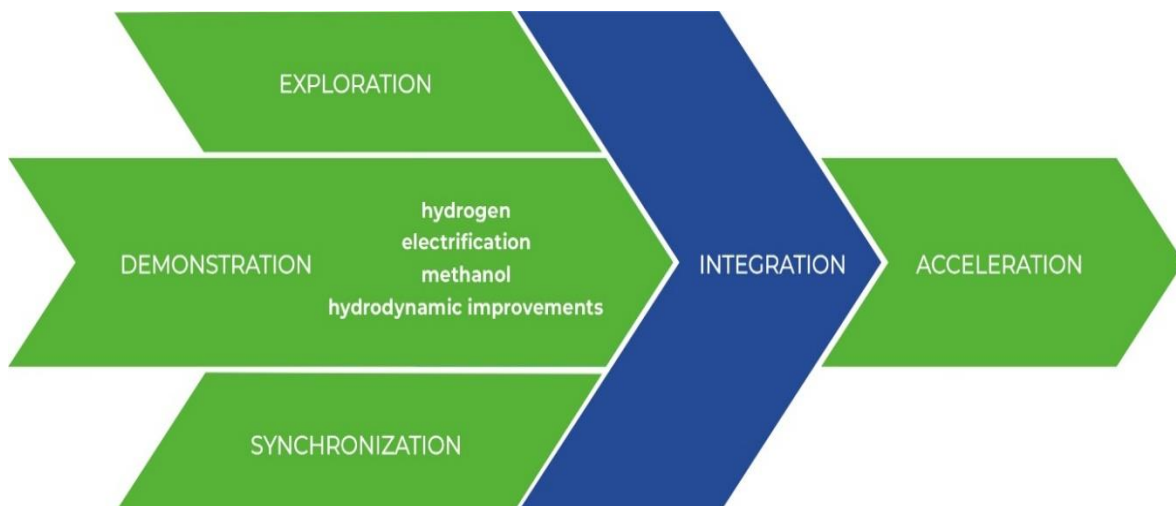
- methanol combustion in internal combustion engines;
- hydrodynamic improvements of the hull and the appendages;
- electrification of ships by means of hybridization of the main propulsion system;
- electrification of ships by means of development of power management system for hybrid propulsion and onboard energy storage.

Activities

SYNERGETICS aims at establishing a catalogue of technical solutions for decarbonization and air-pollutant emission reduction of inland and coastal vessels by means of retrofit. The activities leading to the creation and utilization of the Catalogue are presented in Figure 2.

In the Work Package "Integration", the entire spectrum of available greening technologies, beyond the technologies used in the demonstrations is considered and brought together. This is achieved by creating synergies between the knowledge available from previous and ongoing research (Work Package "Exploration"), the experiences gained from pilot projects (Work Package "Synchronization") as well as the lessons learnt from the demonstrators (Work Package "Demonstration").

The Catalogue facilitates the acceleration of the transition towards greener operations by providing up-to-date Scenarios to policy makers, and the Handbook of greening solutions to vessel owners (in Work Package 5 "Acceleration").



2 | Interlinkage between the different activities of **SYNERGETICS**





SYNERGETICS recognizes that most of the initiatives for greening of the fleets come from the Western Europe in general and from the Rhine/Seine waterway network, in particular (when it comes to inland vessels). Therefore, to expand the use of the Catalogue of greening

retrofit solutions, and the associated Handbook and Scenarios throughout Europe, **SYNERGETICS** will reach out to the waterborne transport stakeholders in the Danube basin and the Adriatic Sea region using the networks of **SYNERGETICS** partners based in those areas.

Successful trials and delivery of viadonau pusher

The new pusher of viadonau performed its trials successfully on April 18th, 2023, in Erlenbach am Main in Germany. On April 27th, the vessel was officially delivered to the Austrian waterway management company via donau - Österreichische Wasserstraßen-Gesellschaft m.b.H. To be operated together with a lighter, the vessel will perform tasks relating to the marking of waterways and surveying of the Austrian Danube. The main dimensions are $L_{OA} = 22.15\text{ m}$, $B_{OA} = 5.60\text{ m}$, $T = 1.2\text{ m}$. The propulsion system comprises two drive trains with fixed pitch propellers in nozzles, reduction gears and two independent Scania DC09 313 A main engines with a maximum rated power of 257 kW at 2100 rpm each. The engines comply with the strictest emission standards in force today: EU Stage V, NRE-v-6. Improved efficiency is achieved through the installation of nozzles and an accurate fuel meter which can be used for energy-efficient sailing purposes. In addition, the heat of the exhaust gasses will be partially used for heating of the vessel. The vessel will be able to achieve close to zero emissions due to its ability to use drop-in renewable diesel fuel such as HVO. The genset and the main engines are approved for this purpose. viadonau will start respective pilot tests in 2023.

This vessel is one of the demonstrators of **SYNERGETICS**. A closer investigation will be undertaken aiming at a retrofit or newbuilt solution resulting in close to zero or zero emissions, which shall be applied in this vessel or its sister ship which is to be built in the coming years. The construction of the vessel was partly funded by the EU CEF project FAIRway works.



3 | **SYNERGETICS** demo vessel viadonau pusher moored in company port.

Over 100 pilots identified!

The Work Package 2, Synchronization, has a mission to connect **SYNERGETICS** to interesting pilots outside of the project. By learning from those and exchanging information, we ensure that the **SYNERGETICS** Catalogue, Decision Support Tool and Scenario's for policy makers do not only include lessons learned from the project-internal pilots, but instead built on knowledge generated by others.

In addition, by letting these pilots learn from **SYNERGETICS**, the project is also an enhancer of innovations. Furthermore, the project can offer links and act as networking platform to policy makers and regulators, offering a chance to discuss relevant issues, and include outcomes from other projects /pilots in the **SYNERGETICS** output. This can act as an extra roll-out channel for other projects/pilots.

The first step in this Work Pack

age 2 is the identification of interesting pilots and the involved organizations with whom synchronization might be useful. To accomplish this, the **SYNERGETICS** partners have been working on a pilot database that currently includes over 100 interesting pilots. In a next step, a shortlist of most interesting pilot projects, their involved organizations as well as topics for synchronization will be made. Once these are identified, they can be





contacted so the synchronization effort can start. To this effect, SYNERGETICS is working on setting up a working group where likeminded pilots can discuss relevant issues. This will both allow SYNERGETICS to integrate gathered knowledge in the project, and other projects/pilots to learn from each other. To support the set-up of this working group, discussions have already been held with projects RH2IWER and FLAGSHIPS, which develop hydrogen fuel cell systems and demonstrations for inland waterway vessels. It is now a realistic option to include at least a hydrogen-focussed sub-group in the working group, and others for other innovative applications might follow.

Events

SYNERGETICS was presented at the **Joint EU Smart Shipping & Logistics Platform event** in February 2023, during the Inland Navigation Week in Brussels in March 2023, on the occasion of Transport Logistic Fair in Munich in May 2023.

SYNERGETICS was also one of the projects featured during the **ECMAR** (European Council for Maritime Applied R&D) **Technology Day & Brokerage Event** in Brussels in May 2023.

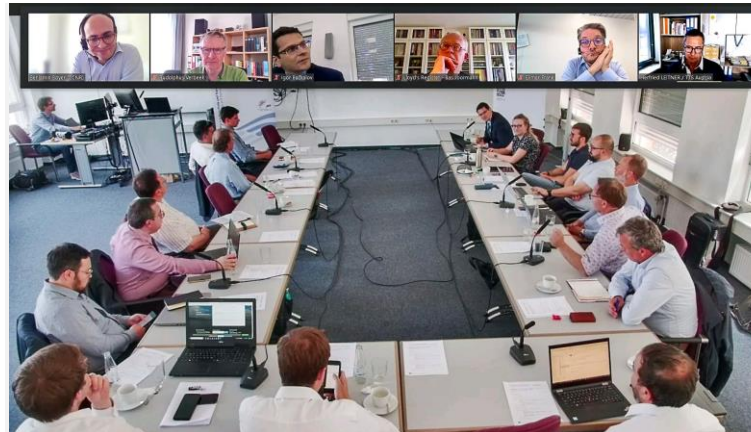
Save the date

SYNERGETICS at the Danube Ports Day 2023 in Vienna - November 23-24!

Get ready for an exhilarating event that will revolutionize the shipping industry along the Danube River! SYNERGETICS is thrilled to announce its prominent presence at the highly anticipated **Danube Ports Day 2023** in Vienna on November 23-24.

Workshop on the utilization of methanol and hydrogen in internal combustion engines

Within the scope of SYNERGETICS, DST-Development Centre for Ship Technology and Transport Systems organized a very successful workshop on the utilization of methanol and hydrogen in internal combustion engines, which took place in Duisburg on 13.6.2023.



4 | SYNERGETICS workshop on the utilization of methanol and hydrogen in internal combustion engines.

The event was performed in hybrid format to facilitate attendance of SYNERGETICS partners and Advisory Board members and hosted presentations from Koedood Marine Group/August Storm GmbH & Co. KG, ScandiNAOS AB, and CMB.TECH on technical aspects as well as Benjamin Boyer (CCNR) and Friederike Dahlke-Wallat (DST) on the regulatory developments taking place at CCNR and CESNI.

Lively discussions on retrofit options, regulatory pathways and decarbonization strategies for inland and coastal shipping complemented the presentations resulting in a fruitful and exciting day for the future of propulsion technology and power generation on board inland and coastal vessels of tomorrow.

This is only the first of a series of synergies-building events that will be organized within SYNERGETICS.

You will receive insights on the latest advancements of many concrete pilots like dual fuel combustion with hydrogen, methanol utilization in internal combustion and electrification of fleets, and these are only three of many other hard facts which you will encounter. Do not miss this unique opportunity to be part of a greener, more efficient shipping industry.

Stay tuned for further details and registration information, coming soon on LinkedIn and the official SYNERGETICS project website at www.synergetics-project.eu/.

Together, let us create a sustainable future for the Danube River and beyond.

See you in Vienna!





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DST – Entwicklungszentrum für Schiffstechnik und Transportsysteme e. V. (DE)

Partners:

SPB – Stichting Projecten Binnenvaart (NL)
Scandinaos AB (SE)
MARIN – Maritime Research Institute Netherlands (NL)
Viadonau – Österreichische Wasserstraßen-GmbH (AT)
TTS – Transport Trade Services GmbH (AT)
ZT Büro Anzböck Richard (AT)
EUFRAK – Euroconsults Berlin GmbH (DE)
CRS – Hrvatski Registar Brodova (HR)
OST – Ostschweizer Fachhochschule (CH)

Argo-Anleg GmbH (DE)
FPS – Future Proof Shipping (NL)
Mercurius Shipbuilding BV (NL)
ZES – Zero Emission Services (NL)
Compagnie Fluviale de Transport (FR)
Sogestran (FR)
Koedood Diesel Service BV (NL)
CMB – Revolve Technologies Ltd. (UK)



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