



synergetics

Innovation Action **SYNERGETICS**

SYNERGETICS | Synergies for Green Transformation of Inland and Coastal Shipping

Danube Ports Days | November 24, 2023



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

Funded by the Horizon Europe guarantee of the United Kingdom, under project No 10068310

Funded by the Swiss State Secretariat for Education, Research and Innovation



General information



Project number	101096809
Project title	Synergies for Green Transformation of Inland and Coastal Shipping
Project acronym	SYNERGETICS
Call	HORIZON-CL5-2022-D5-01
Topic	HORIZON-CL5-2022-D5-01-04
Type of action	HORIZON-IA
Project starting date	January 1 st , 2023
Project duration	42 months
Total eligible costs	EUR 5 321 955.05
Maximum grant amount	EUR 4 184 312.03
Total eligible costs of APs	EUR 1 840 965.63

Structure



- The SYNERGETICS consortium gathers 16 partners and two associated partners from eight countries which were selected with a purpose to take full advantage of concepts of Synergies.
- The project Coordinator is DST – Development Centre for Ship Technology and Transport Systems from Germany.

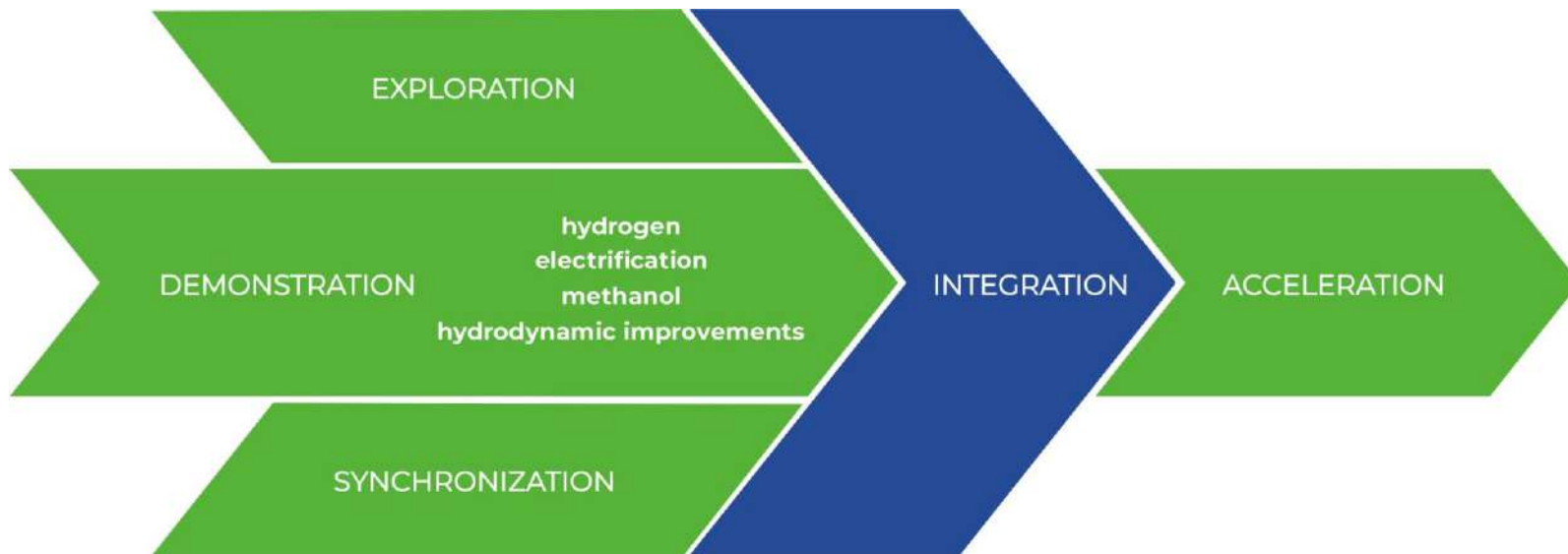
Synergies



- Synergy between the ongoing pilot and research projects and SYNERGETICS;
- Synergy between the innovation centres and research institutes;
- Synergy between the shipping industry, and the regulatory bodies and policy-makers;
- Synergy between the shipping industry and other (transport) industrial sectors;
- Synergy between the shipping industry and energy providers;
- Synergy between the shipping industries of Rhine/Seine and the Danube/Elbe regions.



Synergies



Full-scale Demonstrators



Image: CMB.TECH

H2-ICE



Image: Mercurius Shipping

CH3OH-ICE

Full-scale Demonstrators



Image: CFT

Electrification of the main propulsion plant

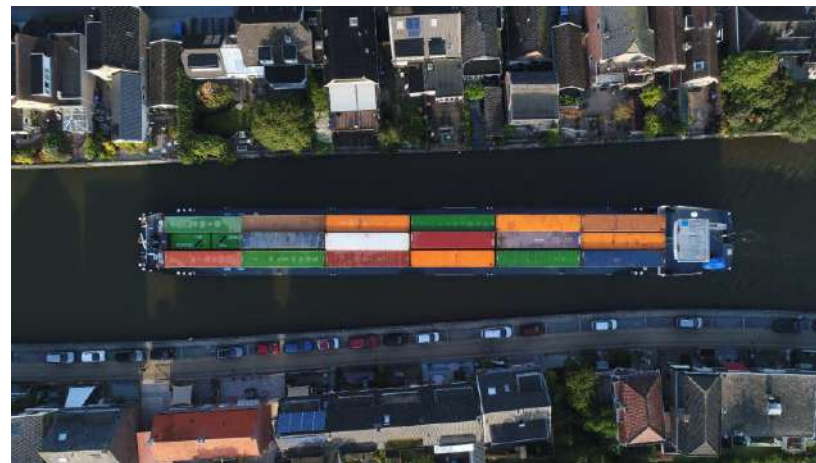


Image: Zero Emission Services

Battery-electric

Model-scale Demonstrators



Image: DST / Benjamin Friedhoff

Aft-ship replacement



Image: via donau / Johannes Zinner

Use of digital tools and virtual assets in finding the optimal greening solution

System Demonstrators



Image: ScandiNAOS

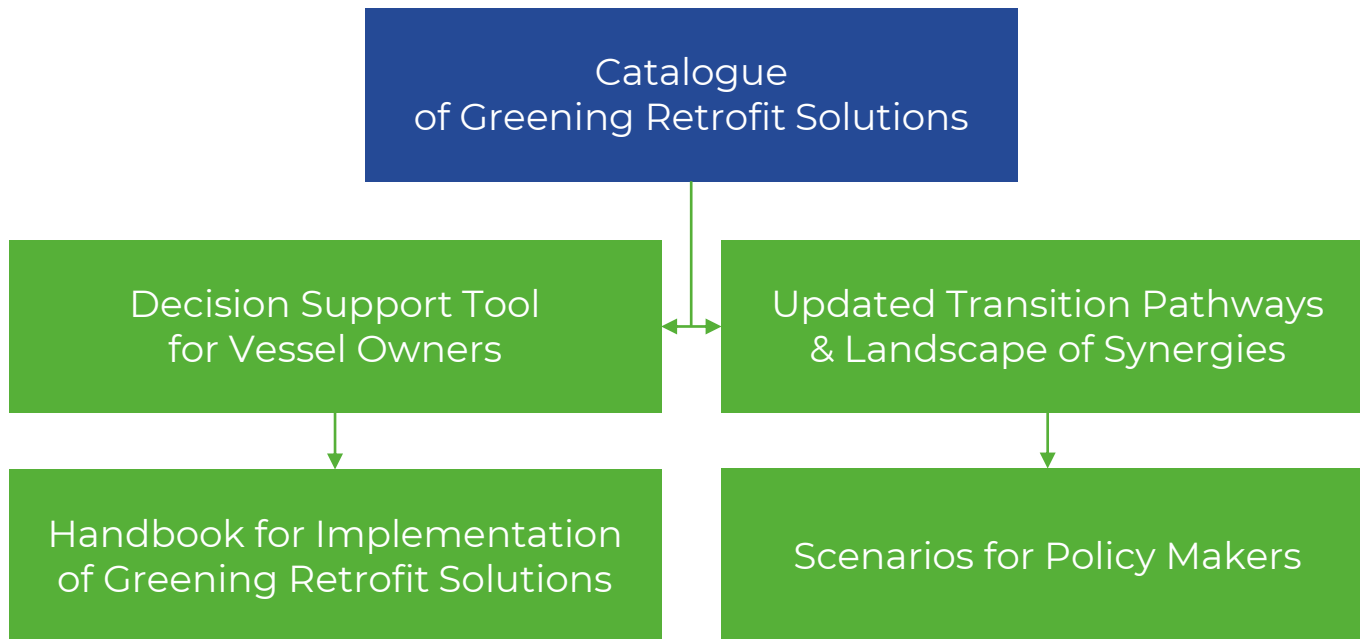
Comparison of a dual fuel methanol engine with a compression ignited methanol engine



Image: Future Proof Shipping

Development of power and energy management system for fuel cells and hydrogen powered ships

SYNERGETICS Tools



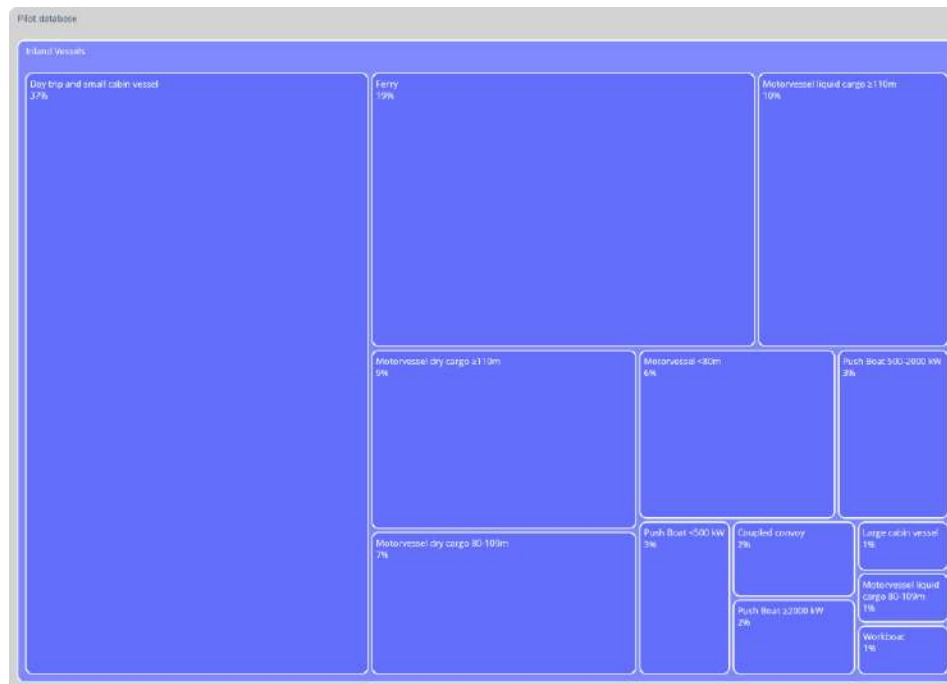
Synchronization



- The database of greening pilots (“The Pilot database”).
- The Pilot database comprises 115 inland vessels and 50 coastal pilots.
- Pilots performed in period 2008–2026.
- Identification of trends in greening of ships:
 - Types of inland vessels (fleet families) used in pilot projects
 - Retrofit vs. newbuild
 - Innovative greening technologies (electrification, alternative fuels, energy-efficiency)
 - Evolution over time, etc.
- Analysis of the observed trends.



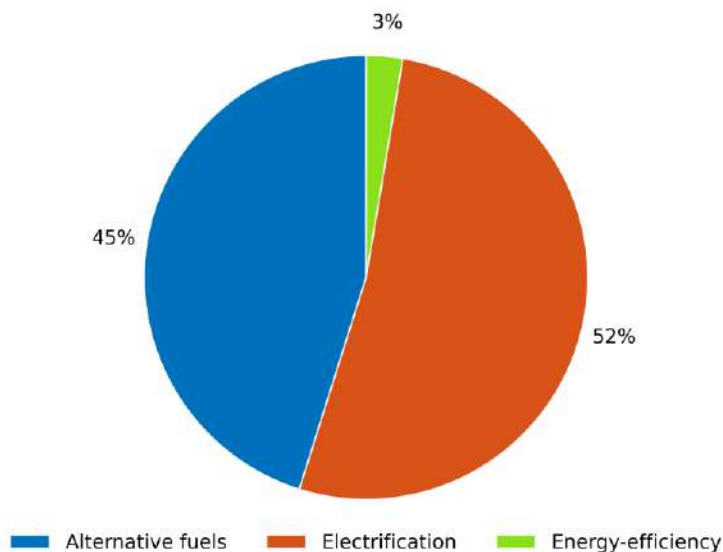
Synchronization



Types of inland vessels in the Pilot database

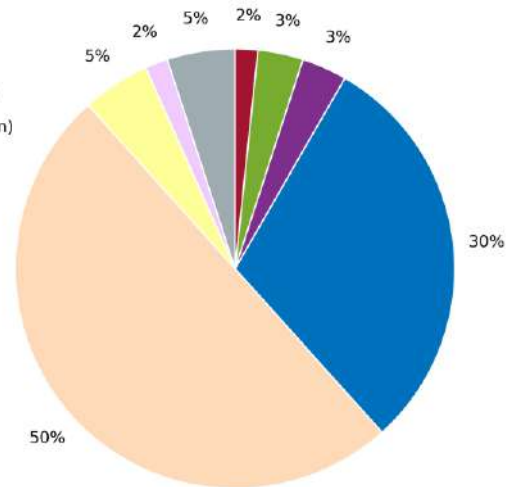
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Synchronization



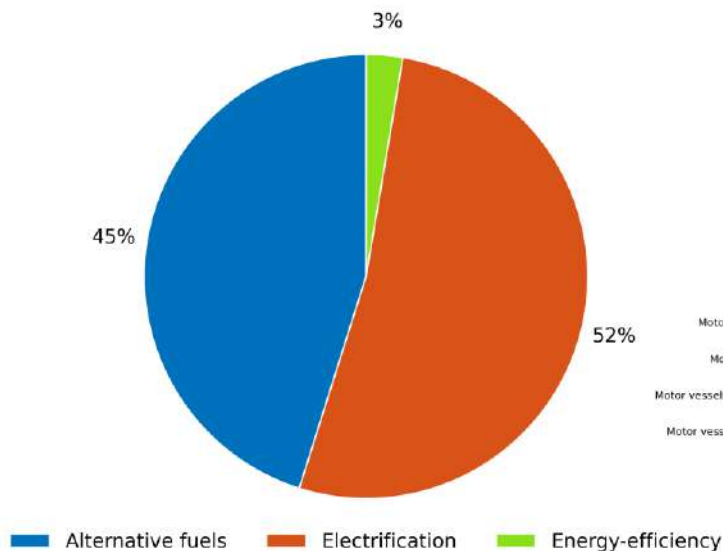
Innovative technologies used in greening pilots on inland vessels

- Motor vessels ($L < 80$ m)
- Motor vessels dry cargo ($80 \text{ m} \leq L < 109$ m)
- Motor vessels liquid cargo ($80 \text{ m} \leq L < 109$ m)
- Motor vessels dry cargo ($L \geq 110$ m)
- Motor vessels liquid cargo ($L \geq 110$ m)
- Day trip and small cabin vessels
- Ferries
- Large cabin vessels
- Coupled convoys
- Push boats ($P < 500$ kW)
- Push boats ($500 \leq P < 2000$ kW)
- Push boats ($P \geq 2000$ kW)
- Workboats

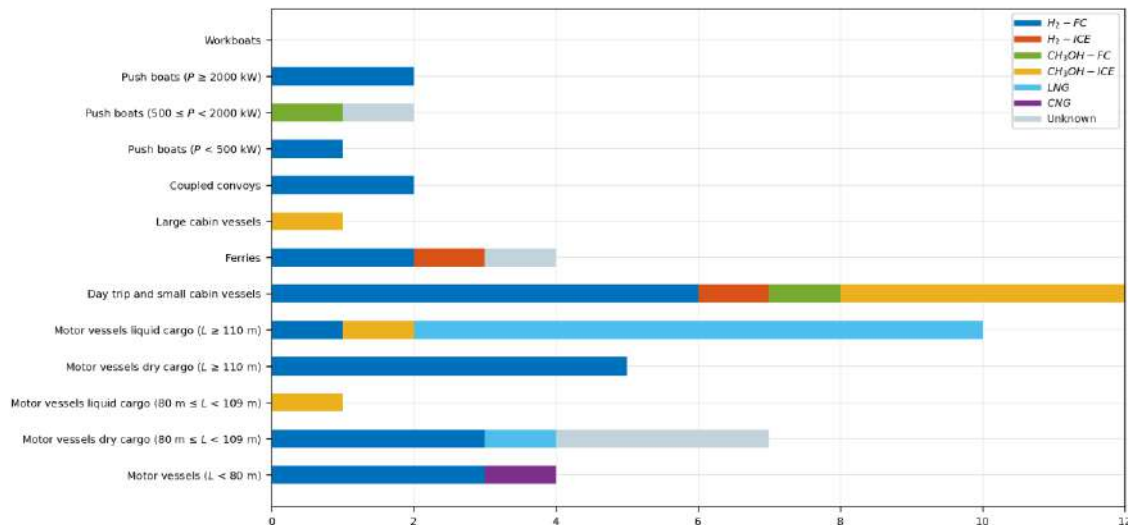


Electrification pilots on inland vessels; breakdown by ship type

Synchronization



Innovative technologies used in greening pilots on inland vessels



Alternative fuels pilots on inland vessels

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Exploration



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Danube Transnational Programme
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FACT SHEET N° 1
GAS AND GAS-ELECTRIC PROPULSION

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FACT SHEET N° 2
DIESEL-ELECTRIC PROPULSION

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FACT SHEET N° 3
AFTER-TREATMENT

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FACT SHEET N° 4
FUEL CELL PROPULSION

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FACT SHEET N° 5
BATTERY ELECTRIC PROPULSION

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FACT SHEET N° 6
DROP-IN FUELS

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FACT SHEET N° 7

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FACT SHEET N° 8
ENERGY EFFICIENT NAVIGATION

Interreg April 2020



Green and efficient Danube fleet
"Tugs modernisation & greening of Danube inland waterborne sector and strengthening its competitiveness"

Model State Aid scheme for modernisation of IWT fleet

Version: 1.0
 Date: 30/04/2020
 FINAL

Project co-funded by European Union Funds (ERDF, IFIA)





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The logo for 'synergetics' is displayed in a blue and green font. A white circular arrow surrounds the text, pointing clockwise. The background of the entire slide is a photograph of a harbor with several barges and industrial structures.

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Thank you for your attention!



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