

Shore power supply for cabin vessels



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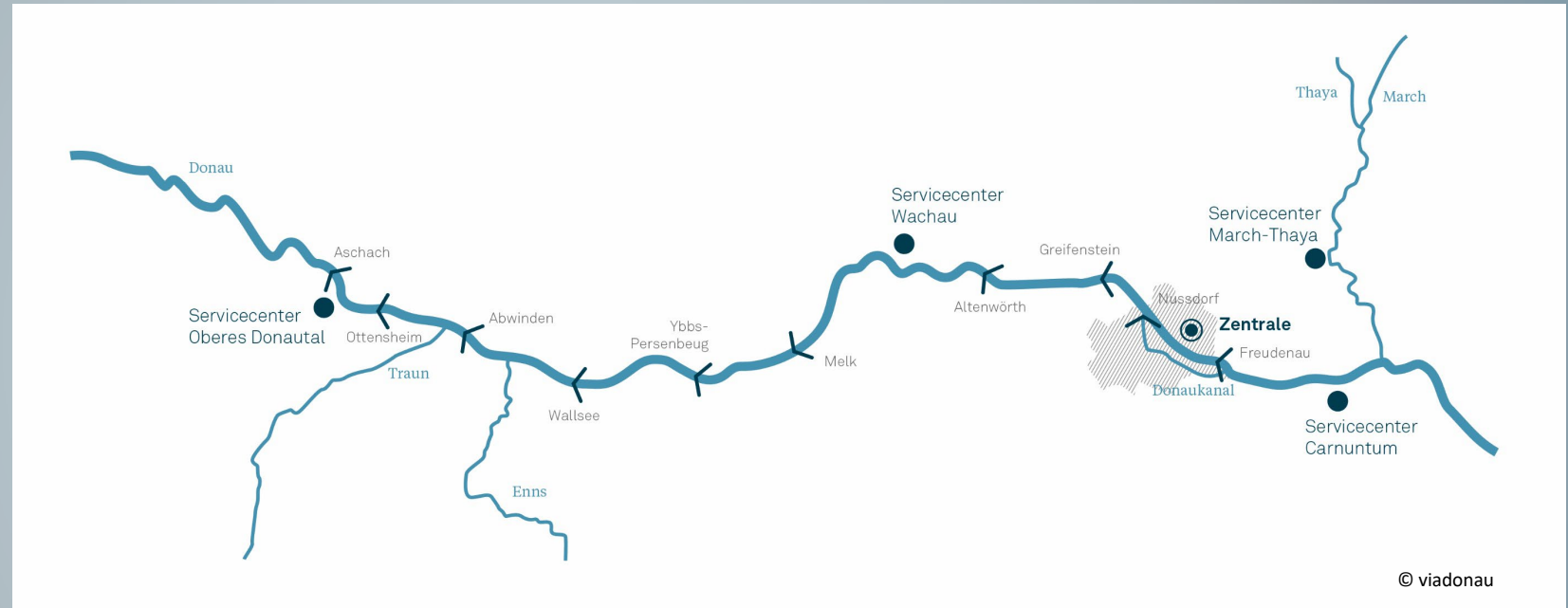
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via donau - Austrian Waterways Company Ltd.

- 350 km of waterway
- Locking 90,000 ships per year
- 300 km of flood protection dams
15,000 ha of real estate
- 500 km of towpaths 800 km of banks
- Operation of ship telematics (DORIS) with 23 stations



- **company owner:** BMK - Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology
- **founded** in 2005 (Waterways Act)
- about **270** employees
- **Corporate pillars:** environment, economy, safety and corporate governance

Shore power supply for cabin ships | General conditions and benefits

- Danube river cruise as a **growing industry**
- Cabin vessels at moorings have a **high consumption of fossil energy** due to the hotel operations on board (consumption approx. 900 kWh electricity per passenger cabin vessel for approx. 8 h berthing time, Stadtwerke Würzburg)
- **Shore power supply:** Powerlock plug-in devices, 1-2 on-board power supply systems with 400 A each per ship; system: supply lines, capacities, transformer stations, cables, terminals, etc.

- **Environmental benefits:** Reduction of pollutants, particulate matter and noise emissions as well as avoidance of CO2 (= future purchase of CO2 certificates).
- **Operational benefits:** Fuel savings, reduction of engine wear, optimisation of energy efficiency, less noise for passengers and neighbours, cost neutrality (target)
- **Image improvement:** making the service more attractive

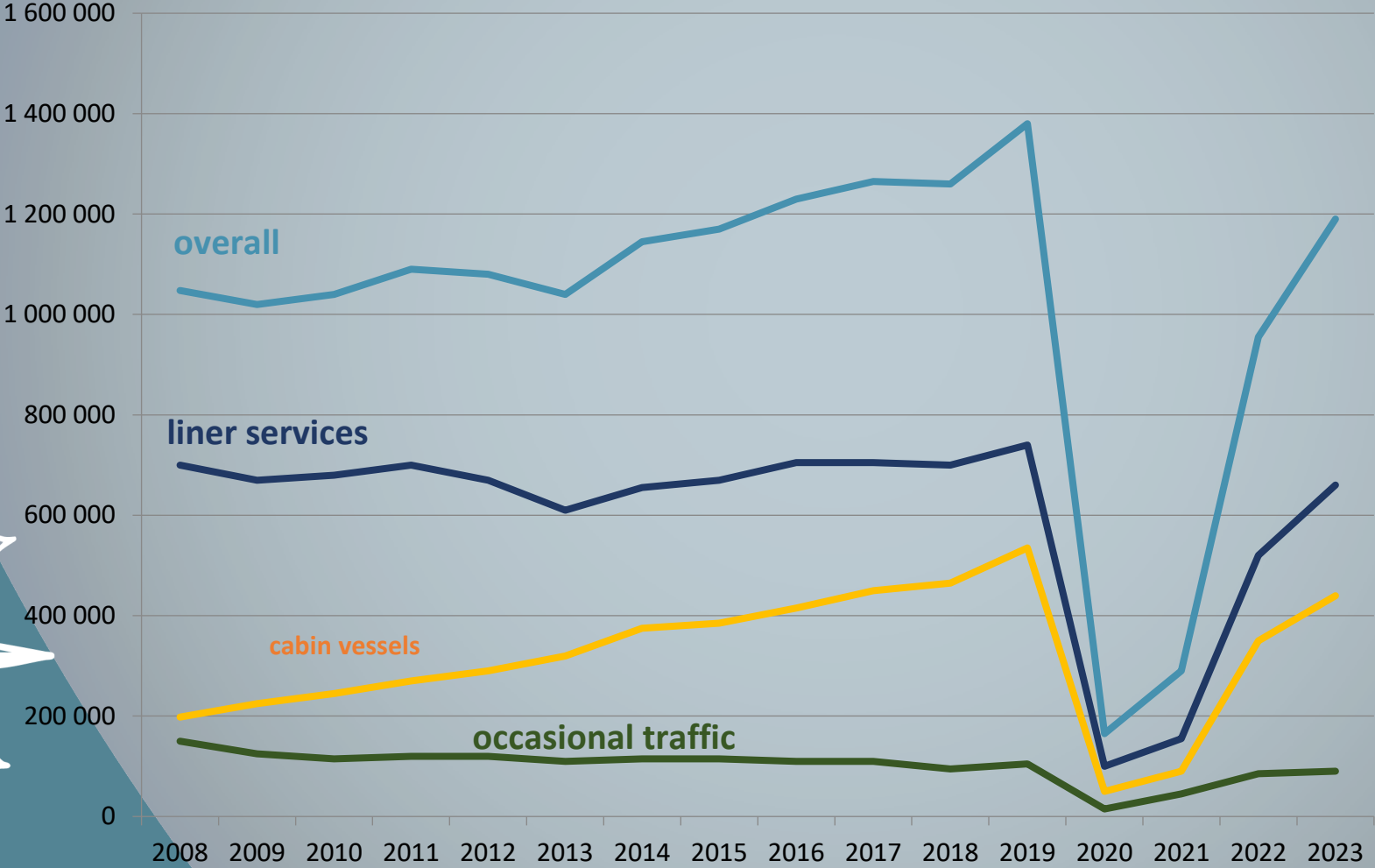


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Shore power supply for cabin ships | Passengers on the Austrian Danube 2008-2023 *

* includes estimates



+14 %
from 2008 to 2023

1.190.000 / 2023

660.000 / 2022

440.000 / 2023

+ 122 %
river cruises from 2008 to
2023

Shore power supply for cabin ships | political framework conditions

Replacing fossil fuels and optimising the use of energy is one of the most important tasks of our time in order to reduce the consequences of climate change.

EU level:

- EU Green Deal und Sustainable and Smart Mobility Strategy
- "Regulation (EU) 2023/1804 of the European Parliament and of the Council (of 13 September 2023) on the deployment of alternative fuels infrastructure repealing Directive 2014/94/EU".
- Technical standards for inland navigation: European Committee for drawing up Standards in the field of Inland Navigation (CESNI), CEN, CENELEC

Federal level:

Part of the Government Programme of the Austrian Federal Government 2020 – 2024

Federal state level

- Part of the government programme of the municipal government in Vienna

→ Political commitment!



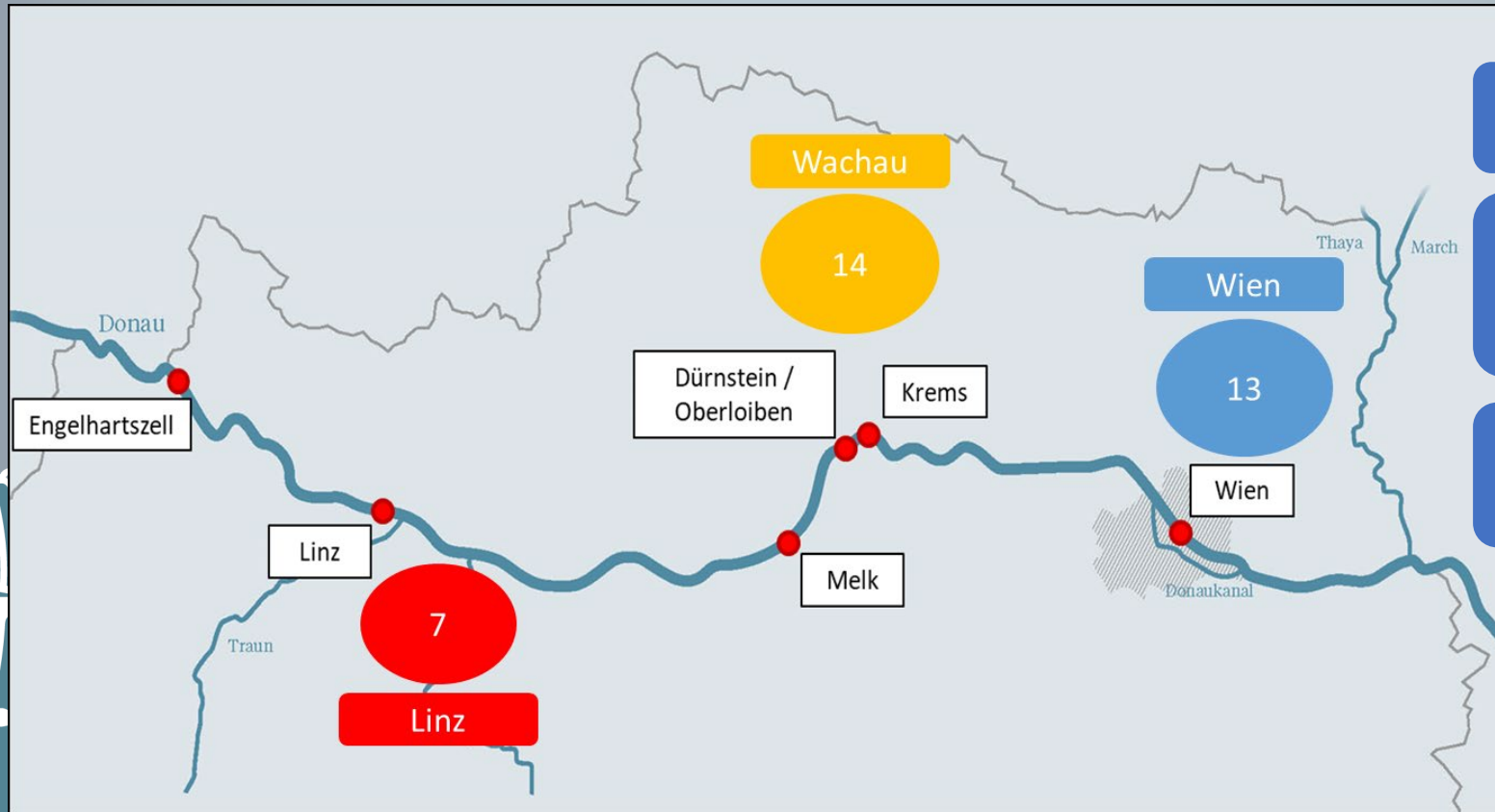
Shore power supply for cabin ships | Activities since 2019

Milestones	2019	2020	2021	2022	2023	2024	2025
„Round Table “ – Federal Ministry for Climate Action	Dark Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
Feasibility studies	Light Blue	Dark Blue	Dark Blue	Light Blue	Light Blue	Light Blue	Light Blue
Implementation planning	Light Blue	Light Blue	Dark Blue	Dark Blue	Light Blue	Light Blue	Light Blue
Structural implementation	Light Blue	Light Blue	Light Blue	Light Blue	Dark Blue	Green	Green
Start: full operation	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue	Dark Blue	Dark Blue



Shore power supply for cabin ships | Feasibility studies

Minimum requirement per berth: 100 ship berths per year with a berthing time of more than 2 hours (assumption of the economic optima)



Ship berths (status 2021) Hots Spots for cabin vessels

Technical specification

Cost estimates and profitability forecasts

Operating and accounting concept



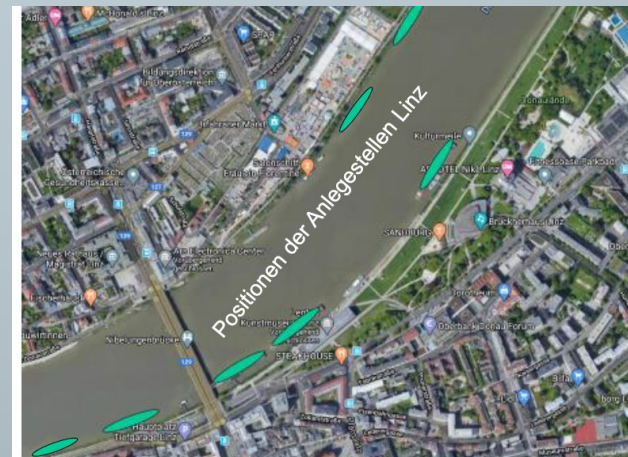
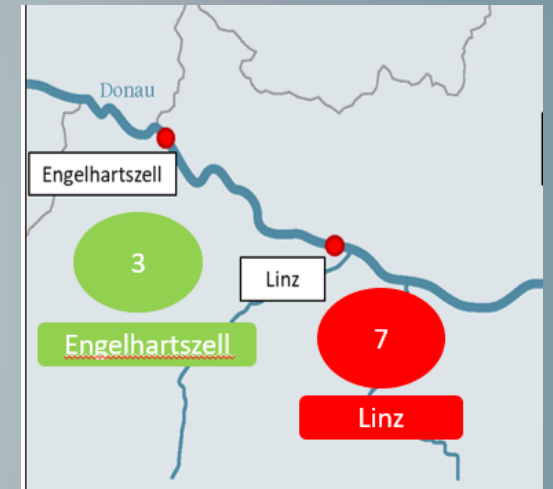
Shore power supply for cabin ships | Realisation

- **Working groups** and integration of private and public key players, definition of regional coordinators
- Realisation by **shore-side electricity operators** (regional energy suppliers and grid operators)
- Shore-side electricity operators: **Project organisation**, financier, technical planning, official procedures, construction realisation, operation in cooperation with the shore-side operators
- EU: **CO financing through the CEF (Connection Europe Facility)** funding programme, funding rate in Austria 50%, support from viadonau;
- In addition: Federal funding for climate and environmental protection projects (Kommunal Kredit Public Consulting) and state subsidies
- **Administrative procedures:** Austrian shipping law, Austrian water law, energy law Austria, Austrian natur conservation law etc.



Upper Austria | Realisation 2023/2024 | Shore power supply for cabin ships

- Shore power supply by regional energy supplier: **LINZ AG**
- **Engelhartzell 3** and **Linz 5 (7)** plants, 1100 KW capacity each
- **Full operation 2024**, investment: EUR 5.8 million
- Cooperation with berth operator, **connection obligation** via mooring conditions
- Remote monitoring and control (0/24)



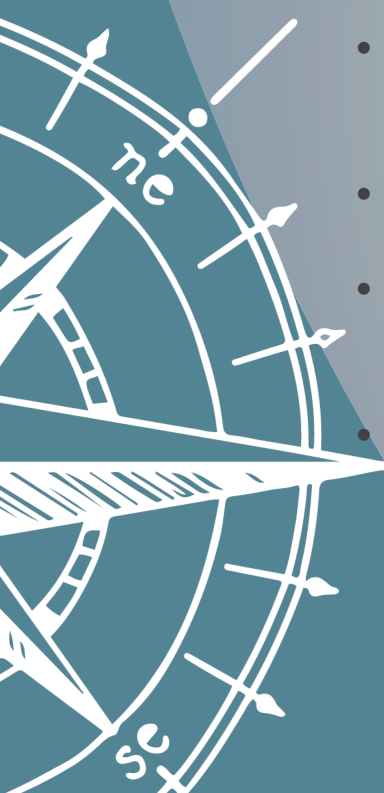
LINZ AG
STROM




Co-financed by the Connecting Europe
Facility of the European Union

Upper Austria | Lessons learnt | Shore power supply for cabin ships

- **Users** (shipping companies, ship crews) accept shore power systems and rate them very positively (182 cabin vessels)
- **Floods** (June, September 2024) do not result in any operational disadvantages, the systems are in continuous operation and can be utilised
- **Experience from the field of e-mobility could be applied** (planning, implementation, operation, etc.)
- **Standardised access card in Upper Austria and Lower Austria**
- Challenges posed by **transformer stations (site development)** in the Linz urban area
- High neighbourhood interest



LINZ AG
STROM

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Lower Austria | Realisation 2023/24 | Shore power supply for cabin ships

- Shore-side electricity by regional energy supplier: **EVN** (Energie-Versorgung-Niederösterreich)
- **Melk:** 5 terminals; **Krems:** 6 terminals; total investment: EUR 2.2 million
- Landing stage operator (contracts, connection obligation via mooring conditions, billing)
- Service hotline, spot checks
- **Standardised access card in Upper Austria and Lower Austria**



© EVN




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Lower Austria | lessons learned | Shore power supply for cabin ships

- Shore power supply **rated positively**, operation works well
- **Development of transformer locations** is difficult (cable solutions)
- Terminals unevenly utilised, therefore **not all berths equipped** (focussing on profitable locations)
- **EU subsidies essential** (= investments)



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Vienna - Developments (1) | Shore power supply for cabin vessels

- Shore power from regional energy supplier: **Wien Energie GmbH**
- **Locations:** Reichsbrücke-Handelskai (8 terminals) and Freudenau (4 terminals) Winterhafen – Freudenau
- Compliance with international technical standards (Powerlock system)
- **Start of pilot operation planned for the end of 2025** ✓
- Green electricity, **contribution of expertise from electromobility** (operation of > 2500 charging points in Vienna), cityscape
- **Emission reductions** (CO₂ [up to 6500 t CO₂eq/a], NO_x, SO₂, PM10, 2.5)
- **Noise reduction** of up to 40 dB at night



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Vienna - Developments (2) | Shore power supply for cabin vessels

Reichsbrücke

- Use in the high season
- Approx. **20 ships** moored at the same time in the high season
- Up to **3 ships moored at the same time** per berth
- Average mooring time of 23 hours
- **Construction phase concept 2025** -> Ongoing operations remain in place



shipsatsea.de

Hafen Freudenau

- Use in the low season (winter harbour)
- A total of up to **23 ships moored** at the same time
- **5-6 ships in parallel per berth**
- Average mooring time - permanent occupancy in winter
- **Construction phase concept for summer 2025**



diepresse.com

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Landstromversorgung | Öffentliche Länden | Güterschiffe



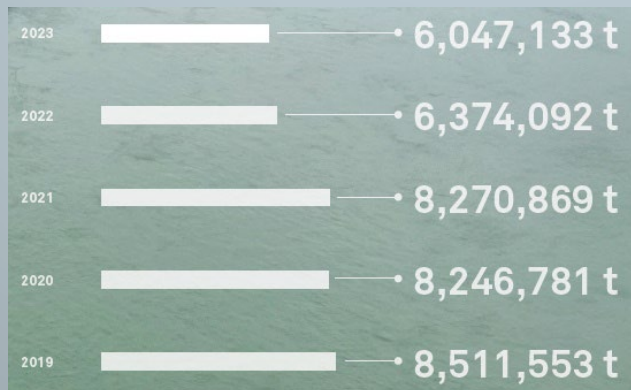
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- **Locations:** Linz, Wildungsmauer, Brigittenau, 2 systems each
- **Pilot operation since 2023**, free of charge, data collection, 3x 63 A / terminal
- **Planned locations:** Aschach, Krems, Vienna-Krieau, Vienna-Lagerhausländer II
- **'Connection obligation'** in accordance with waterway traffic regulations



Development of transported goods volumes in Austria 2020-2023 in tonnes



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International aspects - shore power supply for cabin ships

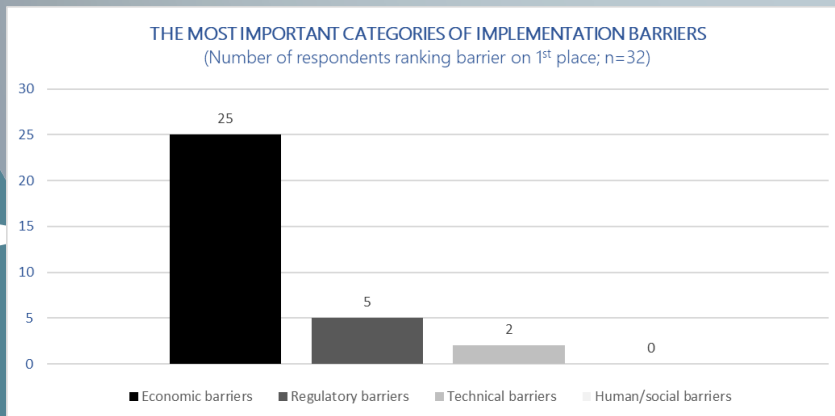
viadonau supported coordination | 'Danube Region Strategy' (INTERREG) | for possible project submissions (CEF), September 2023

Land	Standorte	Status – Landstromanlagen
Germany	Würzburg	operating
Germany	Bayernhafen (Bamberg, Regensburg, Passau etc.)	operating
Austria	Ennshafen - Winterhafen	In realisation, CEF-funding
Austria	Engelhartzell, Linz, Melk, Krems	operating
Austria	Wien – Handelskai und Hafen Freudenau	In realisation operation 2025
Slovakia	Bratislava	No known activities
Hungary	Budapest	No known activities
Croatia	Vukovar	No known activities
Serbia	Belgrad (EXPO 2027)	In planning
Romania		No known activities

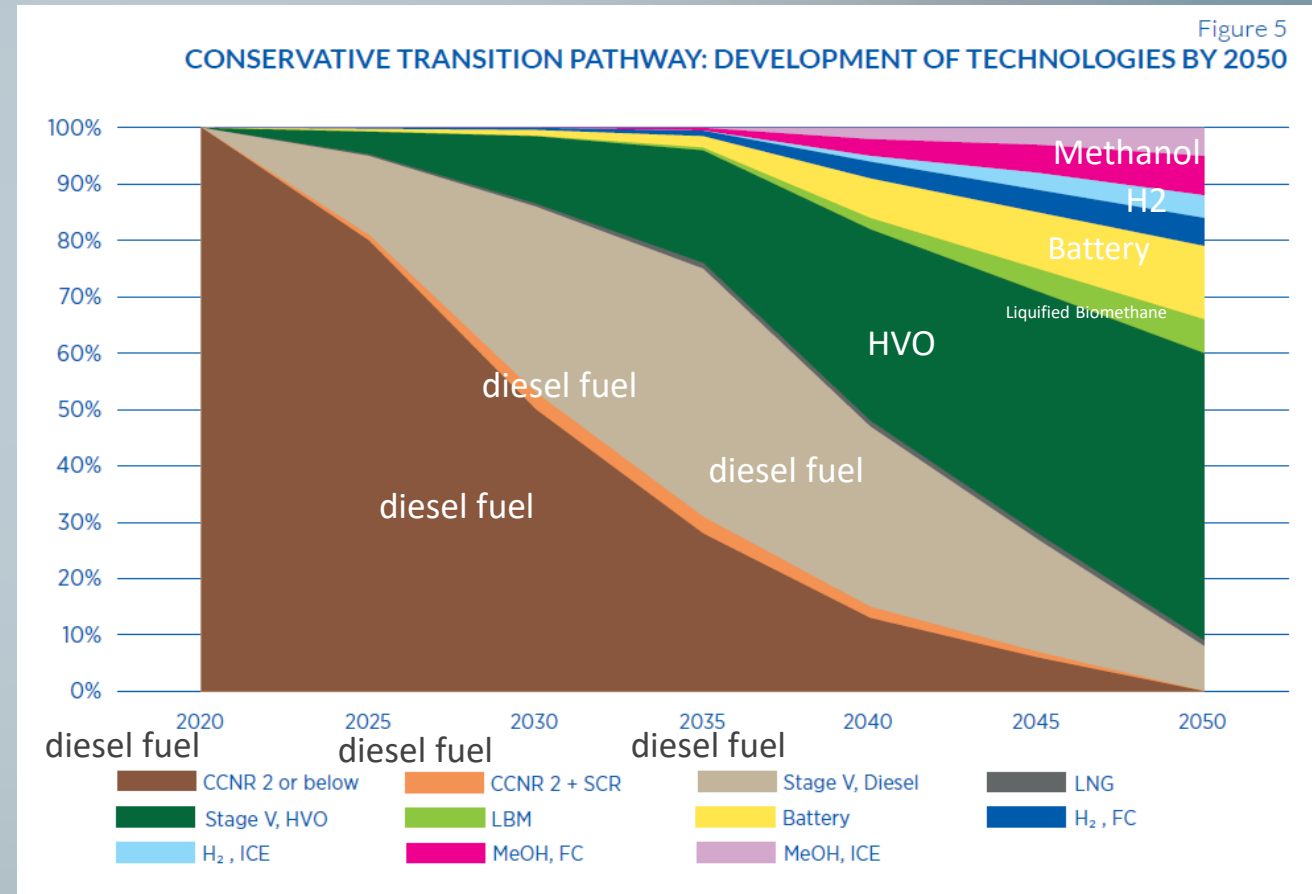
2024 | CEF Transport |
next call for proposals |
deadline 2025-01-21 |
cohesion countries

Greening inland navigation | Decarbonisation

- CCNR (Central Commission for the Navigation of the Rhine) roadmap for reducing emissions in inland navigation by 2050
- **Biogenic fuels clear alternative**
- Measures: Cost reduction of technological solutions/fuels
- Measure: Create/expand financial incentives/subsidies.
- **HVO is already being tested by viadonau**



Survey, viadonau, 2024



CCNR, 2022 | <https://roadmap.ccr-zkr.org>

Greening inland navigation | viadonau pilot phase | HVO 100

- Push boat viadonau 'Bad Deutsch-Altenburg' (500 kW power)
- Test operation for new diesel engines, Sept 2023 - December 2024
- Hydrogenated vegetable oil (HVO)
- Fuel quantity: 12,000 litres of HVO

Outcome

- **Savings of approx. 37 tonnes of CO2** (equivalent to CO2 from 122,000 car km with petrol operation)
- **Very good engine compatibility** / reliability (change/mixing of HVO and diesel possible)
- Higher costs (fuel)



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HVO

- mixable with fossil diesel
- durable, long storage times
- no dangerous goods
- stable at low temperatures



Greening inland navigation | application of building technology | example viadonau headquarters

- **Connection between building and ship technology** (thermal bridges, statics, etc.)
- **Passive house and plus-energy house standard** (PV systems, water heat pumps, electrochromic windows, building services, etc.)
- **Research project** on energy generation from organic matter (fertiliser processing and fuel cell) → No sewage water and residues
- *****
- E-mobility, blackout protection as side effects
- Flexible work opportunities in an innovative, sustainable building



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Thank you for your attention

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