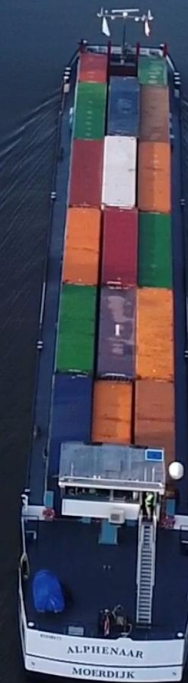




Funded by  
the European Union  
NextGenerationEU



# ZERO EMISSION SERVICES



Powering clean corridors.



ZERO  
EMISSION  
SERVICES

# SUSTAINABILITY IS NECESSARY.....

## Inland Shipping in EU

Good for...

**122 Billion** tkm

**10.000** inland vessels

Responsible for (!)

**6.1M** ton CO2 emissions

**Nox, SOx, PM** emissions

Policy goals...

**2030** 40-50% reduction

**2050** climate neutral



**ZERO  
EMISSION  
SERVICES**

**ZES**

# **MISSION**

**“100% emission-free inland shipping sector.”**

**By creating a network of green shipping routes, electric inland vessels can sail silently, clean and emission-free.**

# Zero Emission Services

All-in energy concept  
for zero-emission  
inland shipping



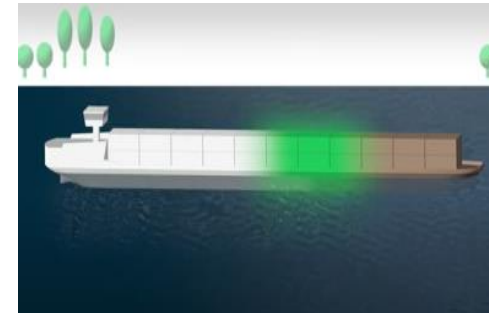
Exchangeable energy containers



Charging infrastructure & grid balancing



Pay per use business model



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Alphen ad Rijn

62 km

Moerdijk



## Alphenaar – Generation 1.0

- LOA 90 m
- Breadth 10.5 m
- Capacity 104 TEU

- Main engine Oswald 2x544hp
- Bow thruster Veth-Jet 1x650hp

- Built in 2019
- Owner/operator CCT Moerdijk

- Sails daily on electricity as per September 4<sup>th</sup> '21
- Alphen a/d Rijn and Moerdijk

- Uses 2 ZESpacks generation 1.0 for a roundtrip

# Focus on simplicity and standardization

## Docking Station 2.0 – The e-hub opportunity



Generation 1.0 docking  
CCT Alpherium



5x Docking Station 2.0 in order



- Implementing important lessons learned**
- Double docking connection
  - 2 MVA grid connection
  - 2 x 2,9 MWh ZESpacks
  - Max. 3 hrs charging
  - 15 x 20 m footprint
  - Megawatt Charging System (MCS) connector
  - Handling with crane or reach stacker

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# ZES swapping network secures customer's energy supply

## Charging infrastructure roadmap



### Q4 '24 – H1 '25 Development focus

- Alphen a/d Rijn (2021 live)
- Alblasserdam (Q4 2024 live)
- 's-Hertogenbosch (Q4 2024 live)
- Rotterdam city
- Maasvlakte
- Moerdijk
- Bergambacht
- Utrecht
- Nijmegen

### Traction & ongoing research (Tier 1)

- Across important inland waterways

### Cross-border development (Tier 1)

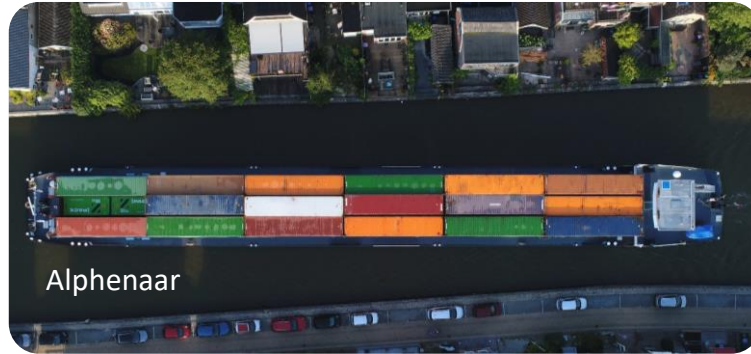
- Antwerpen
- Gent
- Duisburg



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# Electricity hub development

Opportunities for terminals and other logistic locations



Energy locally produced and stored



Energy locally used



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# Vessels with ZES-technology

## And promising vessel types



### Factors influencing cost-effectiveness

- New versus existing vessel
  - Electric vs conventional drivetrain
- Operational profile
  - Sailing route
  - Cargo type
- Vessel size
  - From CEMT class IV



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**Powering clean corridors.**

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