

Economic and Social Council

Inland Transport Committee

21 August 2023

Working Party on the Transport of Dangerous Goods

Original: English

Joint Meeting of Experts on the Regulations annexed to the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) (ADN Safety Committee)

Forty-second session

Geneva, 21-25 August 2023

Item 3(b) of the provisional agenda

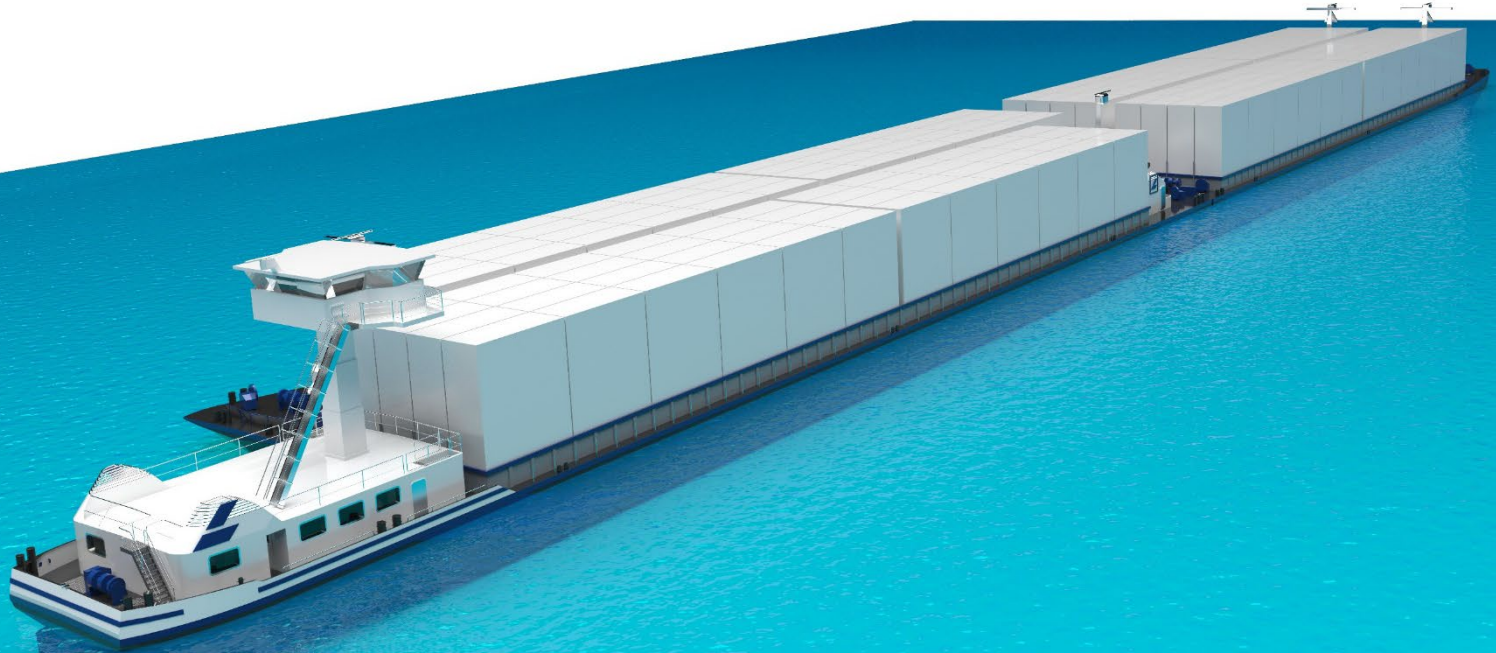
Implementation of the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN): special authorizations, derogations and equivalents

Request for a recommendation on the use of hydrogen fuel cells for the propulsion of the vessel "Rhenus Mannheim"

Transmitted by the Government of the Netherlands

Together with Passion

Rhenus Hybrid Container Convoy



Operation area

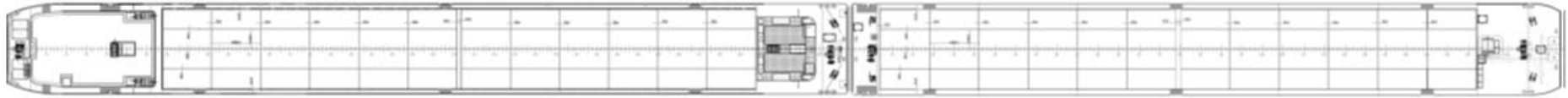


- Container line for Contargo between Rotterdam, Mannheim and Würth
- Fuel Cell and battery system for zero emission energy supply
- Noise reduction

Formation – Container convoy "Rhenus Mannheim I+II"

Motor vessel with one barge

- Deadweight up 4.799 to. at 2,90m draught



Motor vessel

- 105,00 m x 11,45 m
- 192 TEU

Barge

- 88,00 m x 11,45 m
- 192 TEU

Additional use with three barges

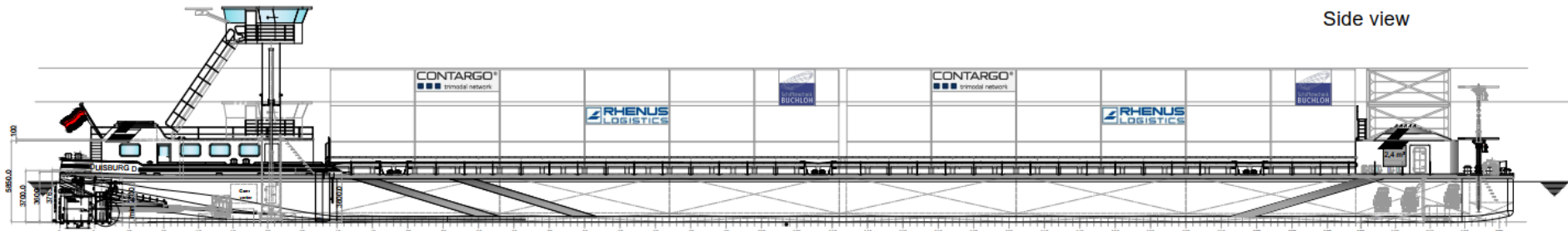
- Deadweight up 9.318 to. at 2,90m draught
- Flexible container capacity from 384 TEU bis 768 TEU
- Minimum draft scenario to maintain capacity at low water periods



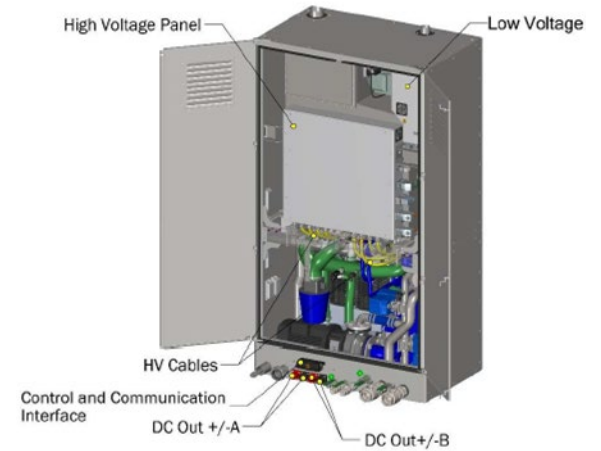
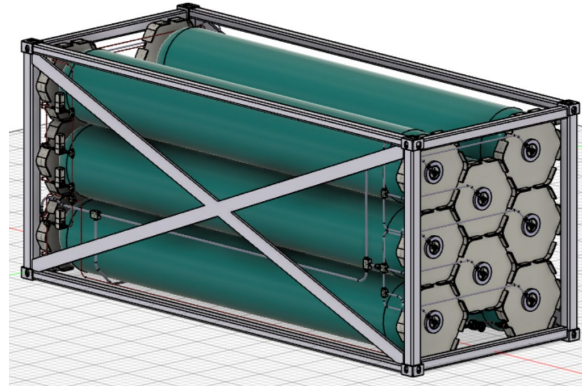
Formation – Container convoy "Rhenus Mannheim I+II"

Motor vessel with one barge

- Wheelhouse and accommodation at the aft
- Flat bow form
- Engine room for energy production at the front
- Side height of both motor vessel and barge, 3,40m
- MV: Three-Rudder System, Flex tunnel, spud pole, 4-Channel bow thruster
- Barge: spud pole, Flettner rotor bow steering, 4-Channel bow thruster



Hybrid propulsion concept I

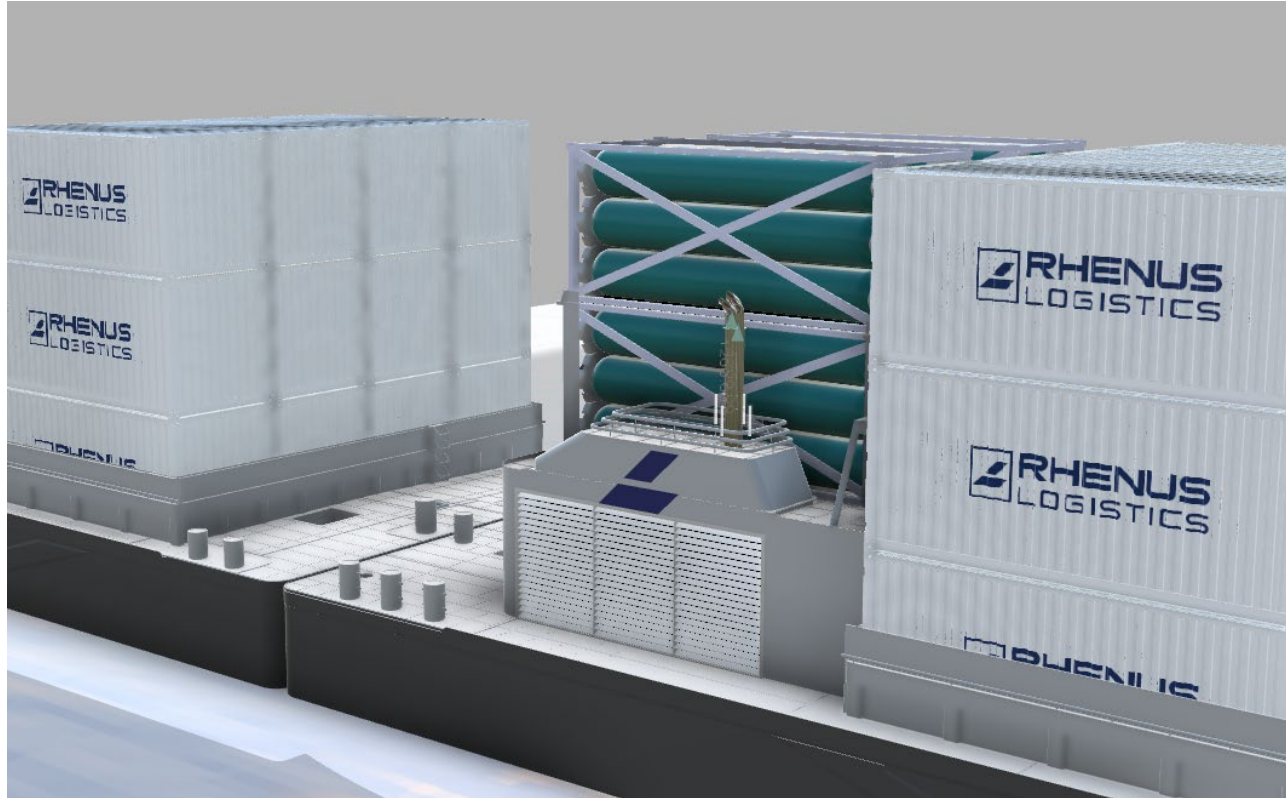


- 84x EST Floatech Octopus High Power Batteries
- Divided into two rooms
- 840 kWh Capacity

- 4x 20ft H₂-Tanktainer
- 500kg H₂ @ 500bar

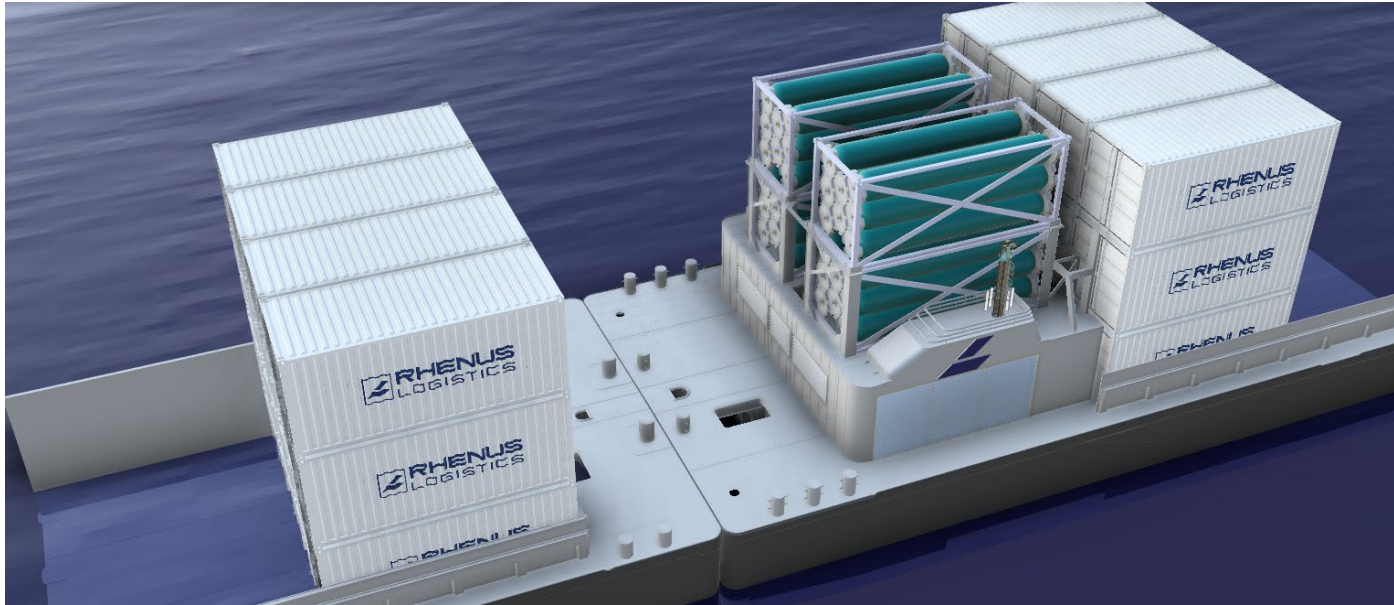
- 400 kW installed Power
- 2x 200 kW Ballard FCwave
- Preparation for 2 further FCwave

Fuel cell system



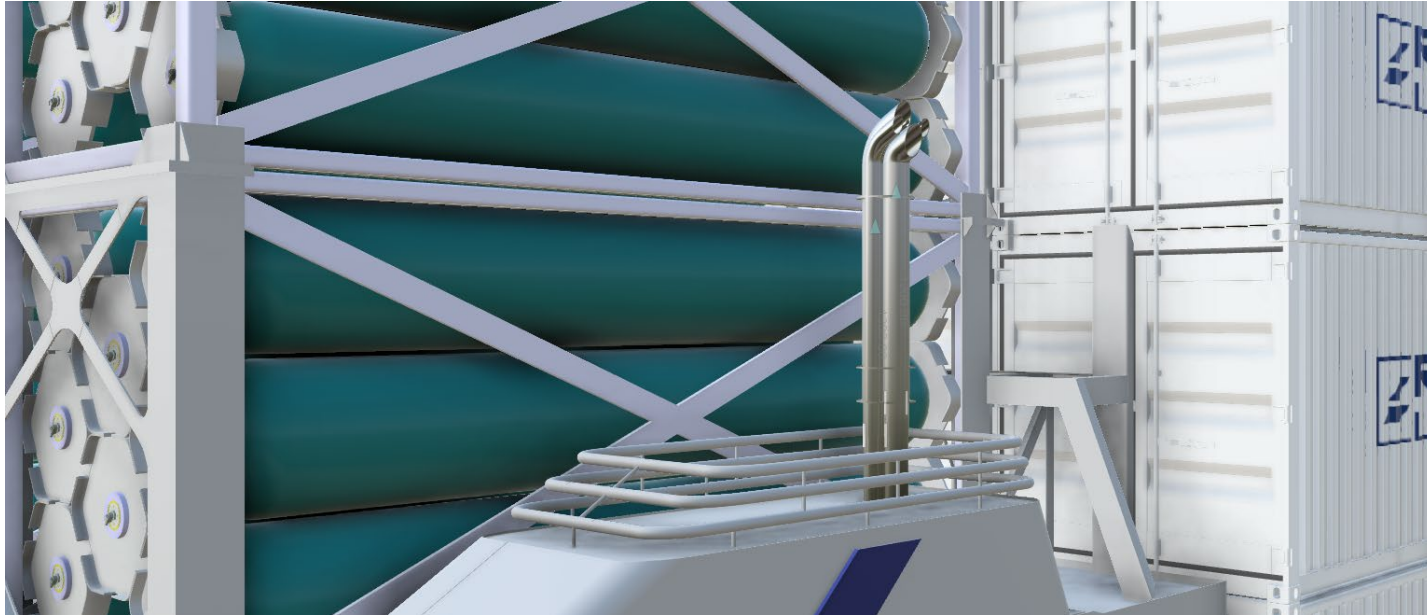
- ZKR Recommendation
- Space for the fuel cell

Fuel cell system



- Four H2 Container
- H2 gas control line above deck

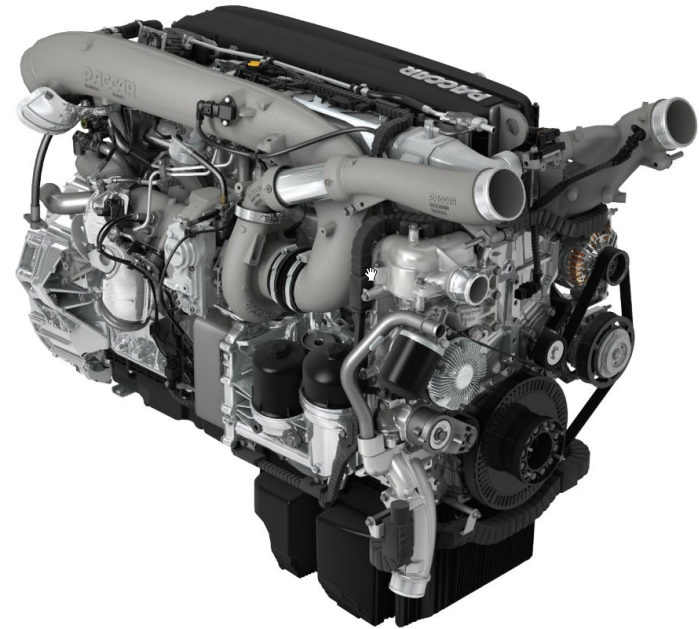
Fuel cell system



- **Vent-Mast**
- **Fire protection system**

Fall-back energy converter

- **Vink Diesel PACCAR MX-13 Euro VI**
- **Stamford Generator**
- **Constant RPM, high efficiency**



Together with Passion

Since 1912

