



Felleskjøpet

Sammen tar vi vare på jorda, dyra og framtida

Together, we take care of the soil, animals and the future

Project Greenbulk

- Worlds first Zero Emissions Bulk Carrier



Felleskjøpet

Greenbulk - Project



Background

- Aging short sea fleet - “caused by us”
- No or few plans for investments in new ships
 - No focus on reducing emissions
- The Technology and Know-how was available
- Cargo Owners needed to take charge to speed up The Green Change within shipping
 - Felleskjøpet and Heidelberg together
- Grain East-West - Stone and Gravel West-East
- Making a foundation for a ship on a regular route

Final implementation Q4 2025

Aim of the Project

- Get into operation the Worlds first Zero Emission Bulk Carrier
 - Show that Zero Emission is possible
- Hopefully making the Snowball turning for fleet renewal

Main activities of the Project

- Study of Cargo Owners Supply Chains
- Develop suitable long term transport system
 - Tender for Zero Emission Ship - 15 y
 - Tender for Zero Emission Fuel – 5-10 y
 - Finding the best combination Ship/Fuel
- Financially support – Pilot-E, Enova, Nox Fund
 - Develop long term contracts
 - Building and start operation

Project participants

Cargo Owner - Felleskjøpet Agri
Cargo Owner - Heidelberg Materials
Ship Owner - Egil Ulvan Rederi
Ship Design - Norwegian Ship Design Company
H2 Supplier – GreenH
H2 Containers – Umoe Advanced Composites
Project Management – DNV GL

Results

The Ship - With Orca
Establishing production of Hydrogen – port on route

Next steps

- Seeking cost reducing possibilities – reducing risk
- Follow up on Contract of Difference H2 vs Diesel
- Business Case – Go or No-Go from Cargo Owners
- Signing of contracts – Ship, H2 Supplier, JV Cargo Owners
 - Signing of contracts Shipyards hopefully Q3 2023



THE NORWEIGAN SHIP DESIGN COMPANY
AND EGIL ULVAN REDERI PRESENTS

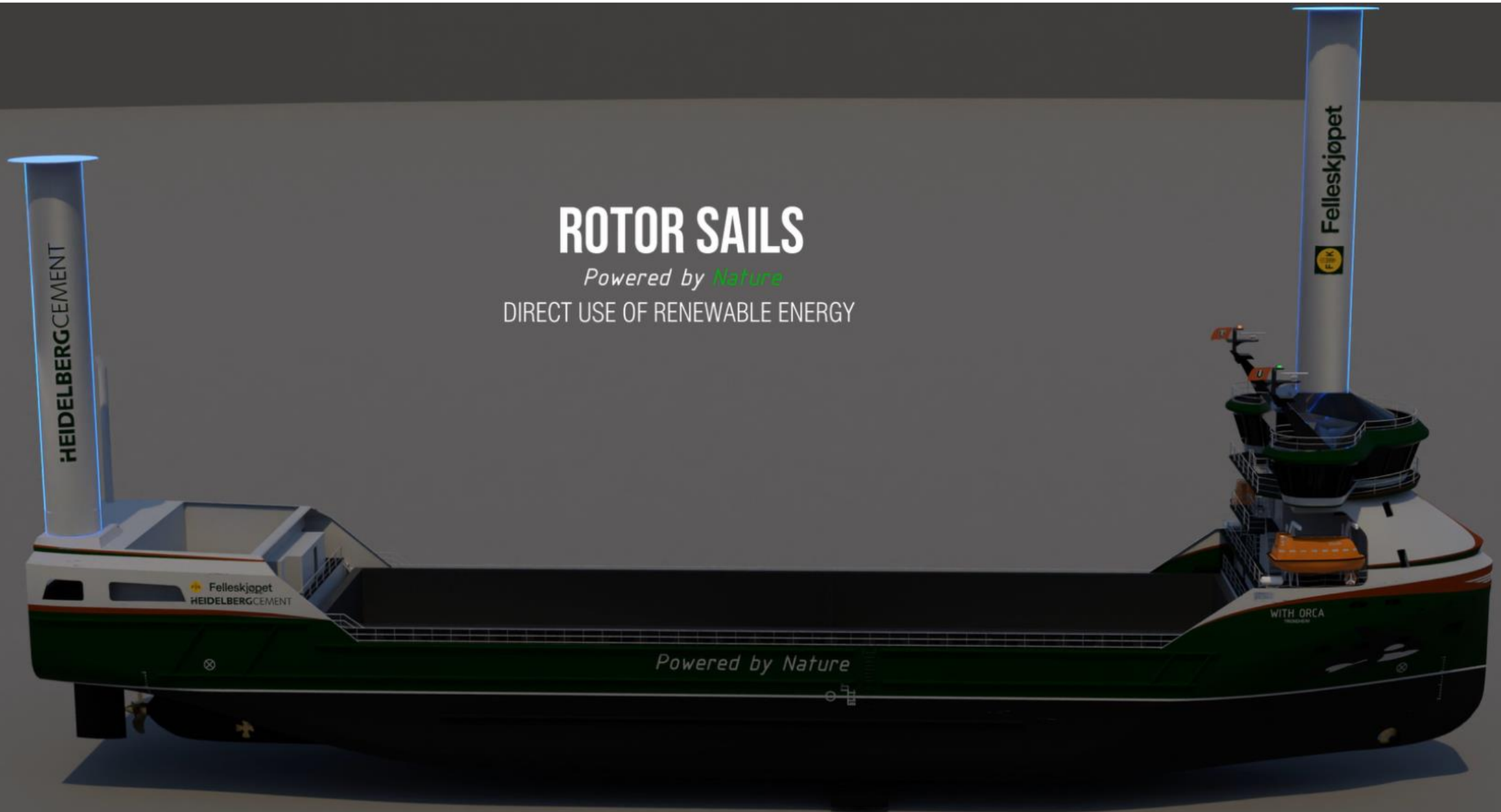
WITH ORCA

Powered by Nature

ROTOR SAILS

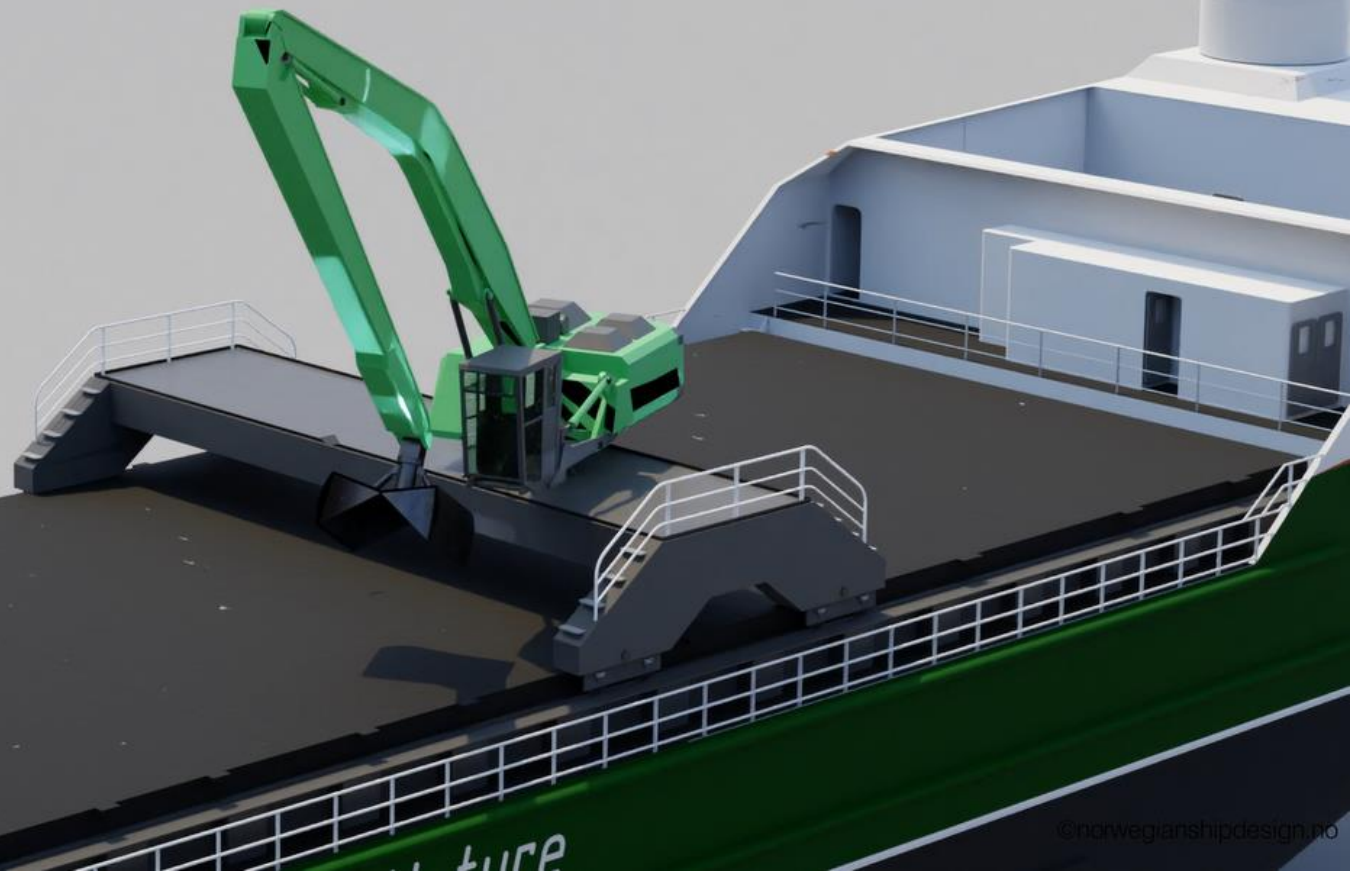
Powered by *Nature*

DIRECT USE OF RENEWABLE ENERGY



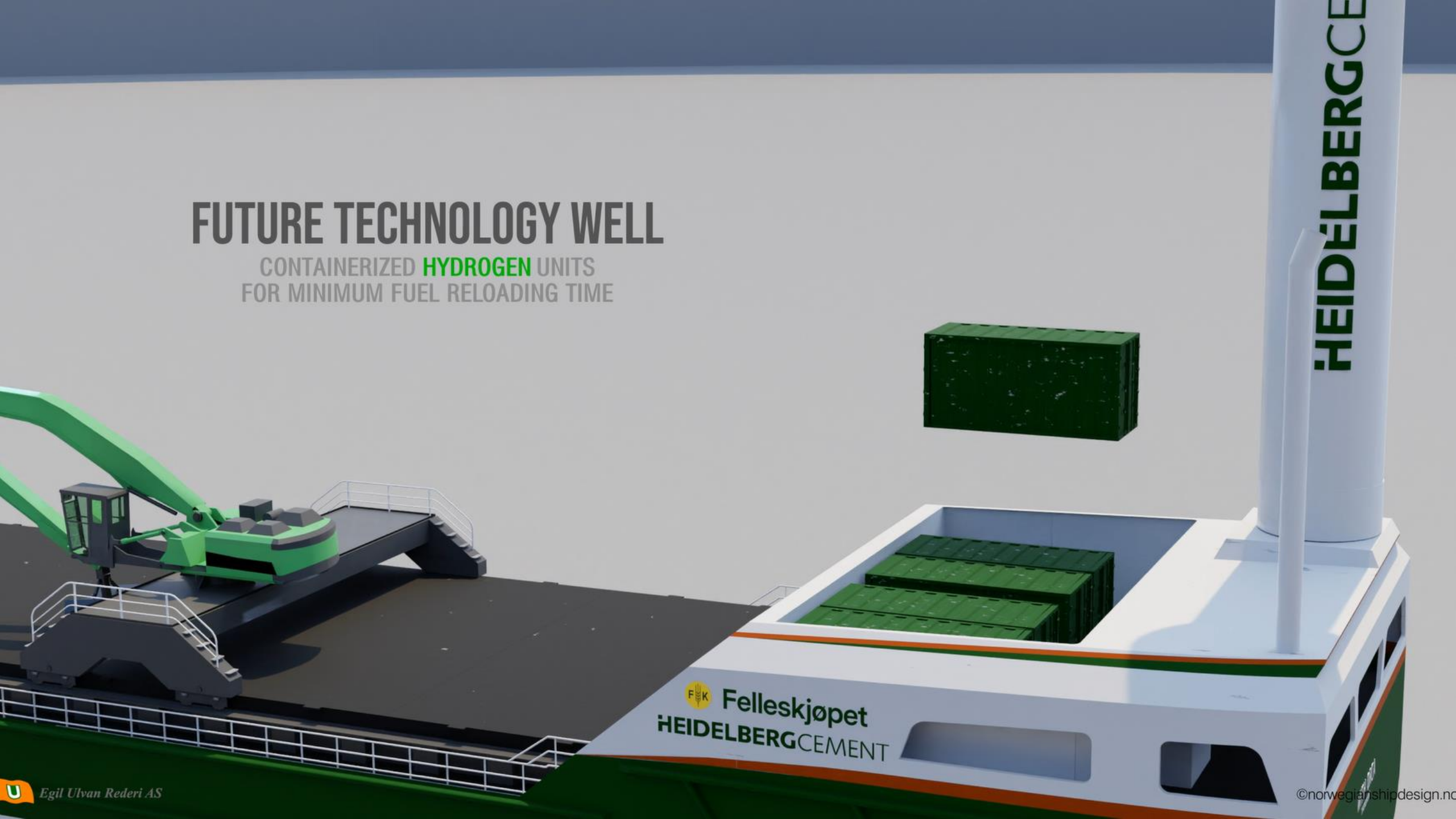
DECK EXCAVATOR

FOR SELF UNLOADING OF BULK CARGO
AND FOR H2 CONTAINER SWAP OPERATIONS



FUTURE TECHNOLOGY WELL

CONTAINERIZED **HYDROGEN** UNITS
FOR MINIMUM FUEL RELOADING TIME





POWER SYSTEM

LOW ENERGY CONCEPT WITH A HIGHLY FLEXIBLE POWER SYSTEM
HYDROGEN COMBUSTION ENGINE AND **FUEL CELL** POWER PLANT
BATTERY SYSTEM AND ADVANCED **ENERGY RECOVERY** SYSTEMS

WITH ORCA

Powered by *Nature*

Designed for Max. Sailing Performance.

APPROVAL IN PRINCIPLE BY **LLOYD'S REGISTER**

PRELIMINARY APPROVAL BY **NORWEGIAN MARITIME AUTHORITY**

MAIN DIMENSIONS

LENGTH OVERALL	93.20 M
BREADTH MAX.	17.10 M
DEADWEIGHT CAPACITY	~5750 T
HOLD VOLUME	~6750 M3

FEATURES

HYDROGEN COMBUSTION ENGINE
FUEL CELLS AND BATTERY SYSTEM
ADVANCED ENERGY RECOVERY SYSTEM
2x ROTOR SAILS





Felleskjøpet



**Heidelberg
Materials**