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# **Decarbonisation in EU Fisheries**

George White  
Hydrogen Systems Engineer




*14<sup>th</sup> June 2022*

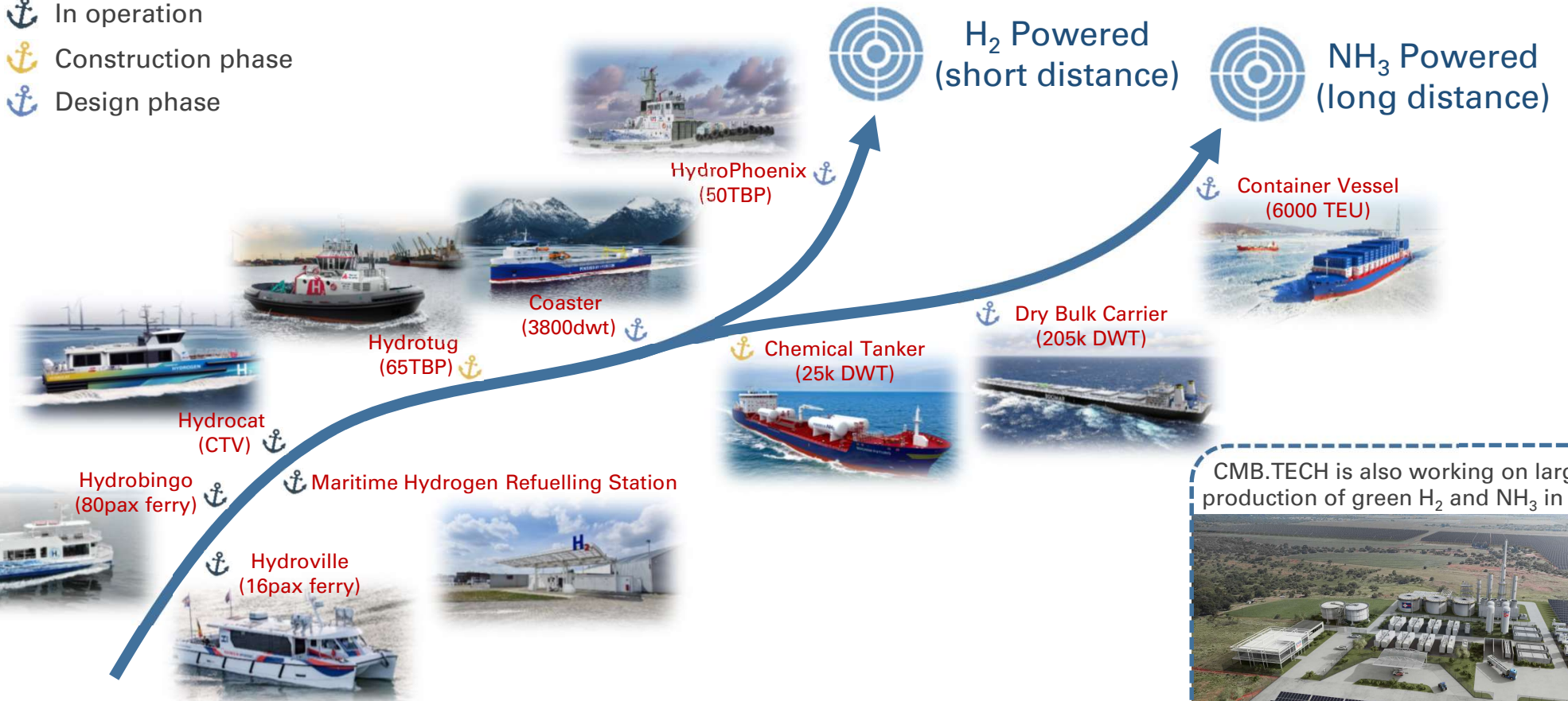
# CMB owns/operates 149 ships

- CMB was founded in 1895
- Headquartered in Antwerp
- 100% privately owned by Saverys family
- 320 shore-based staff and about 3200 seafarers
- The group consists of 4 divisions:
  - Bocimar: Dry cargo
  - Delphis: Container vessels
  - Bochem: Chemical tankers
  - CMB.TECH: Cleantech



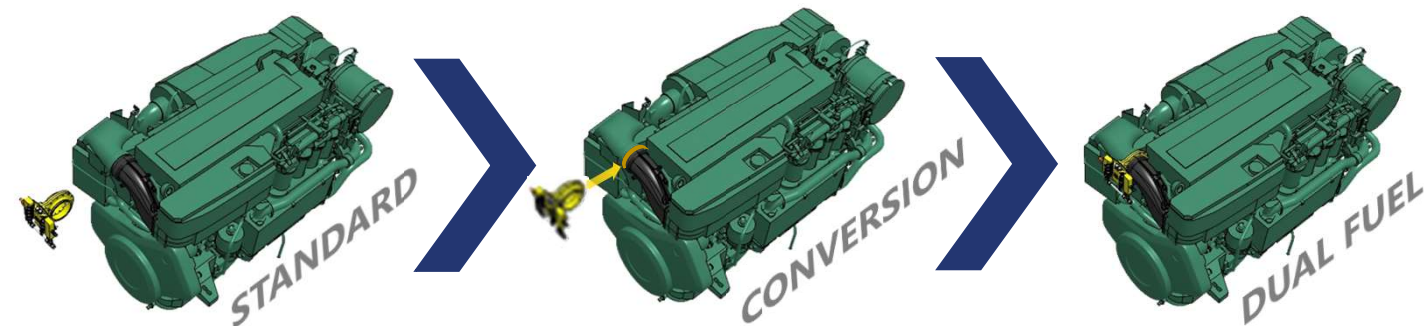
# Our Pathway Towards Zero Emission Shipping

-  In operation
-  Construction phase
-  Design phase



# H<sub>2</sub> Dual Fuel is a low CAPEX and flexible OPEX route

- By injecting hydrogen into the air inlet, less diesel will be required for the same power output, resulting in less CO<sub>2</sub>.
- Engine can run on 2 modes with a turn of a switch:
  - Diesel only
  - Dual fuel diesel-H<sub>2</sub>
- Besides the direct CO<sub>2</sub> savings, also NO<sub>x</sub> production is significantly reduced (resulting in less AdBlue)





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Reference Projects



## *Hydroville*

*Launched November 2017*

Hydroville is the first certified passenger shuttle that uses hydrogen to power a diesel engine.

# HydroBingo

*Delivered August 2021*

Shuttle (80pax) for the Japanese coastal waters. Powered with 2x 440kW hydrogen diesel combustion engines



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## ***HydroCat***

***Launched Q2 2022***

HydroCat is a dual fuel hydrogen powered Crew Transfer Vessel (CTV).





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Part of  
Antwerp

BEHYDRO

## ***Hydrotug***

***Delivery Q4 2022***

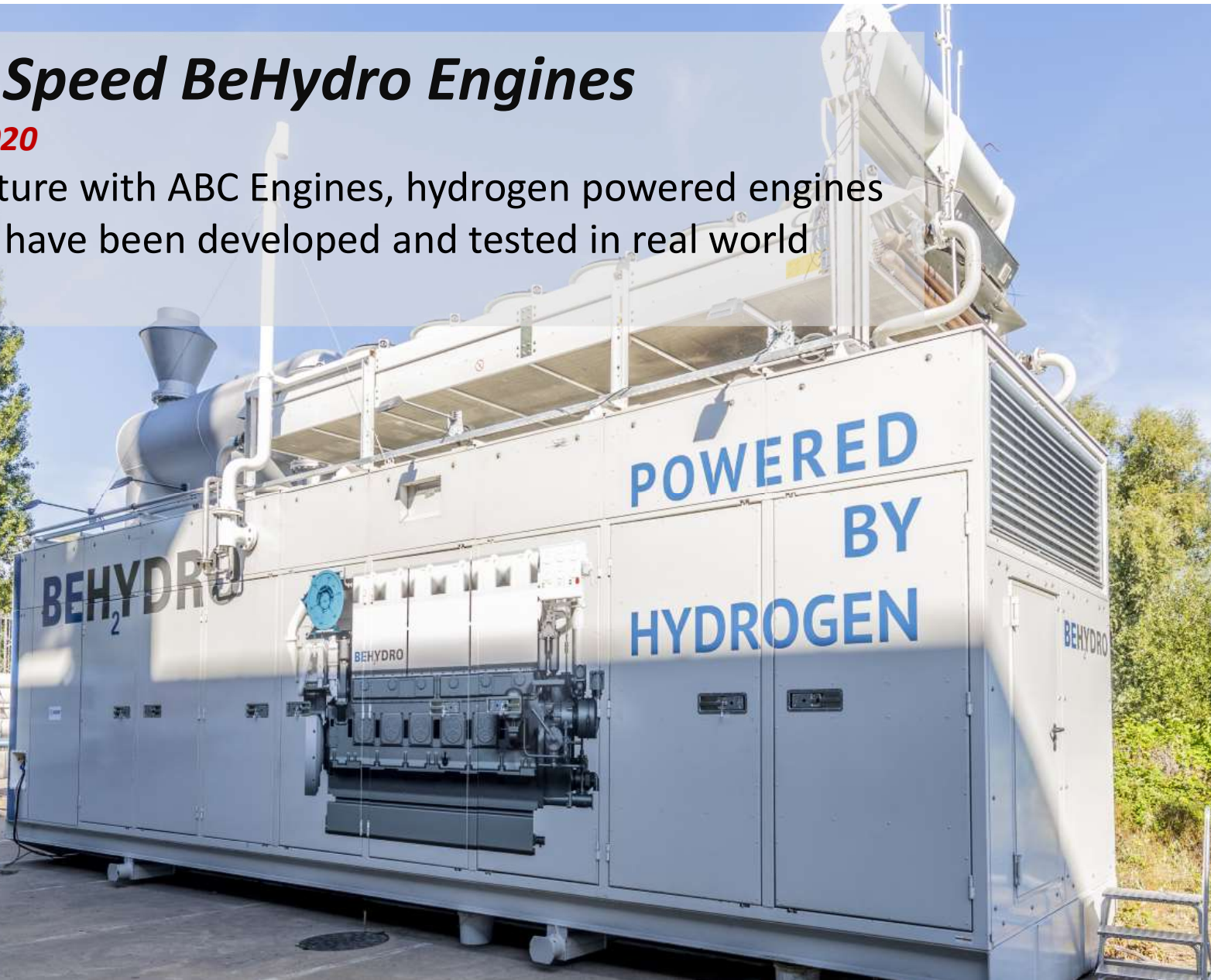
Hydrotug is a tractor tug built for the port of Antwerp. The vessel has 2x 2MW dual fuel H<sub>2</sub> - diesel engines and 400kg of H<sub>2</sub> storage.

# Medium Speed BeHydro Engines

*Launched Q3 2020*

In a Joint Venture with ABC Engines, hydrogen powered engines up to 2.7MW have been developed and tested in real world operation

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## *H<sub>2</sub> Straddle carrier*

*Delivery Q1 2022*

A Straddle Carrier will be retrofitted to run on dual fuel in Belgium.

# ***Multi model HRS***

***Opened to public since June 2021***

World's first hydrogen refuelling station with onsite green H<sub>2</sub> production which can be dispensed to trucks, cars, trailers and ships

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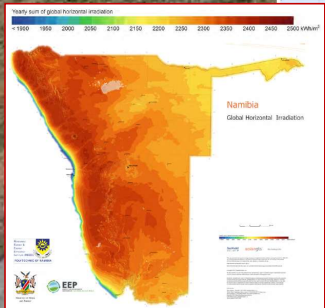
# PV2Fuel Namibia

*JV established – land plots secured*

Construction of Africa's first H2 refuelling station (4 MW electrolyser)

Construction of a 1,000,000 tonnes green NH3 factory, 800MW electrolyser plant and 1GW PV

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Click to see Project Video  
<https://vimeo.com/485871701/890d0fee8b>

# Mobile hydrogen refueller

*Commissioned October 2021*

500 bar tube trailer containing 950 kg of H<sub>2</sub> for mobile refuelling of marine and land-based applications



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Future Projects

## ***H2 4.200dwt coaster***

***Delivery 2023***

Co-development with Boeckmans 4.200dwt coaster vessel equipped with 2x MAN dual fuel H2 engines

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# NH3 Bulker

*Delivery China Q3 2023*

210.000 dwt bulker powered by dual fuel ammonia-diesel engine

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# NH3 6.000 TEU

*Delivery China Q4 2022*

6.000 TEU ice class 1A high reefer container ship powered by dual fuel ammonia-diesel engine

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## ***NH3 25.000 dwt chemical tanker***

***Delivery China 2023-2024***

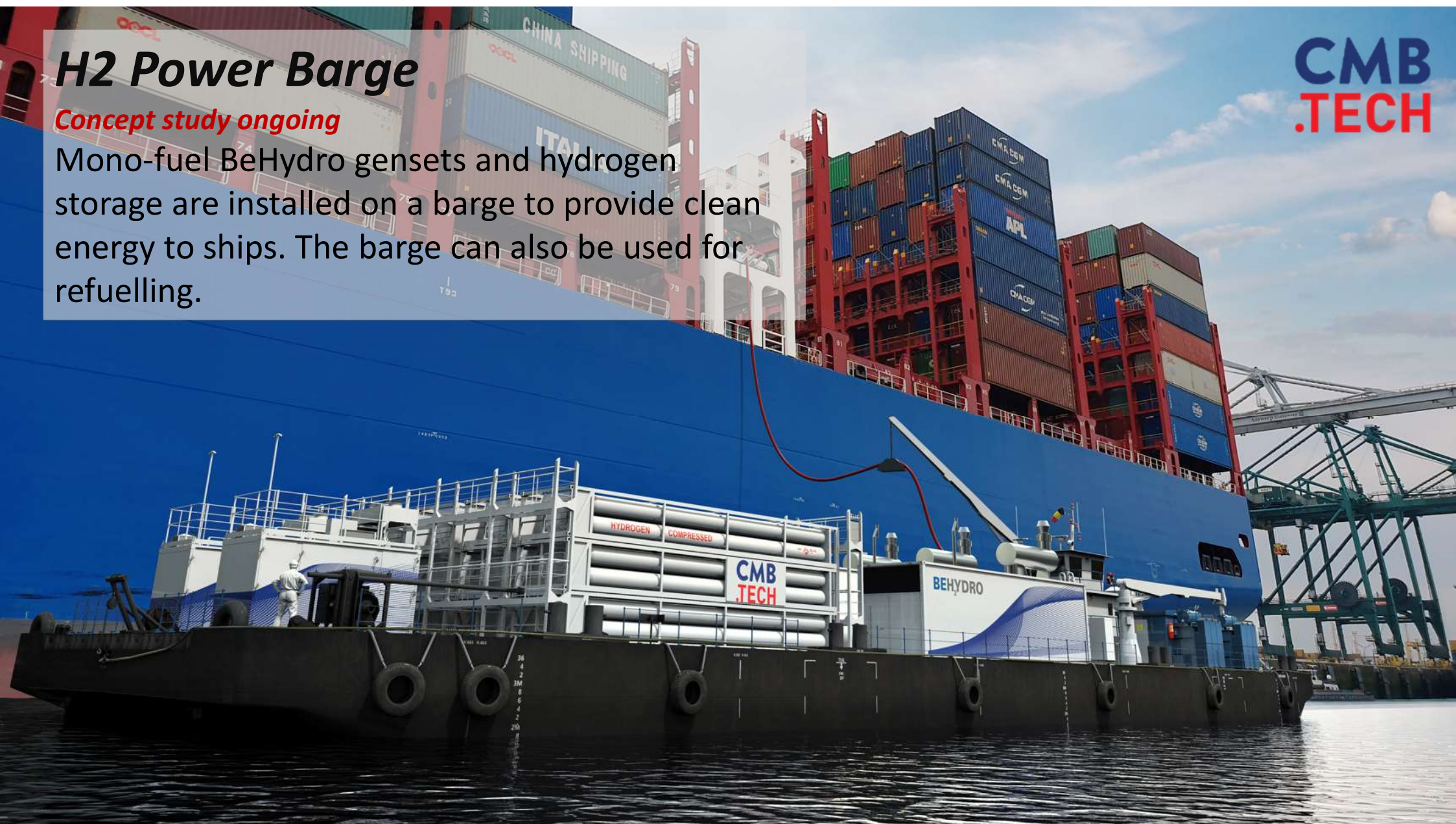
25.000 dwt chemical tanker powered by dual-fuel ammonia-diesel engine

# H2 Power Barge

*Concept study ongoing*

Mono-fuel BeHydro gensets and hydrogen storage are installed on a barge to provide clean energy to ships. The barge can also be used for refuelling.

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