BLUE FORUM

SWIM-H_2

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Introduction

SWIM

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SWIM

Vessel case study

Designed by swim

The world’s first Hydrogen-electric water taxi

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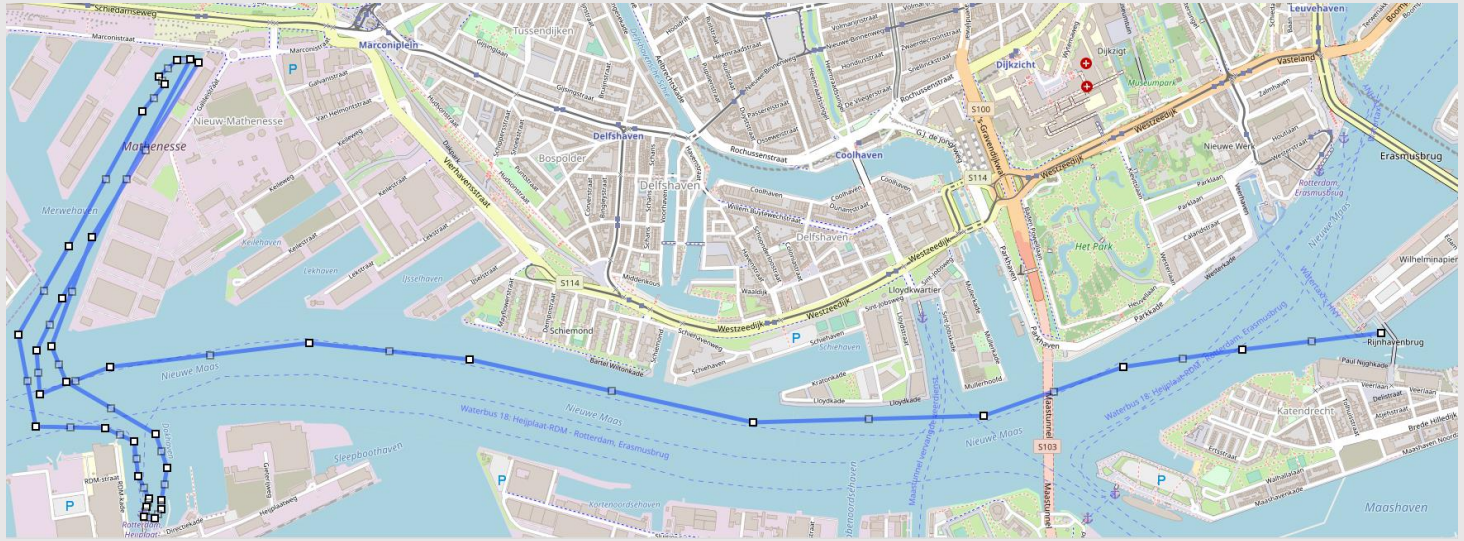
Our application

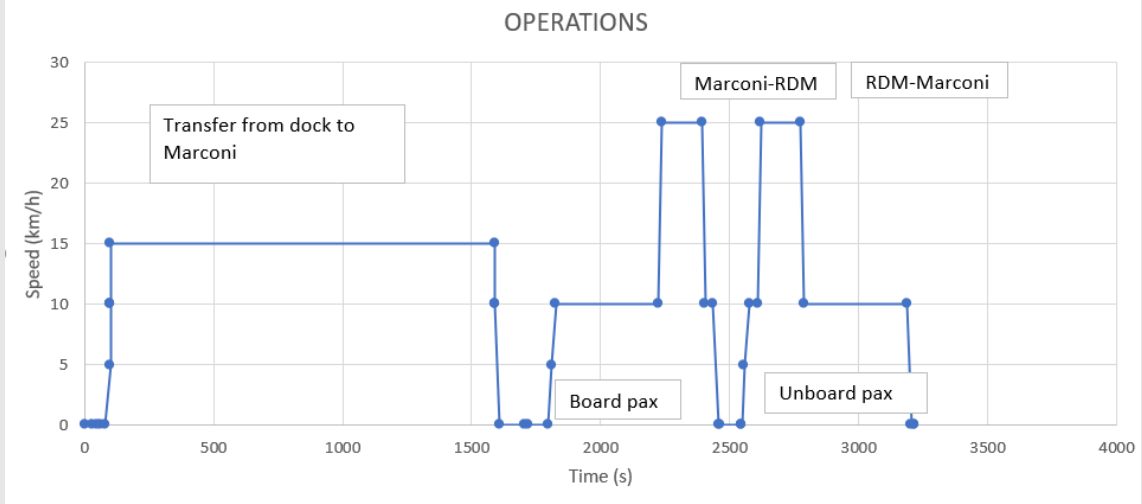
Daily operations as a water taxi

Mission profile



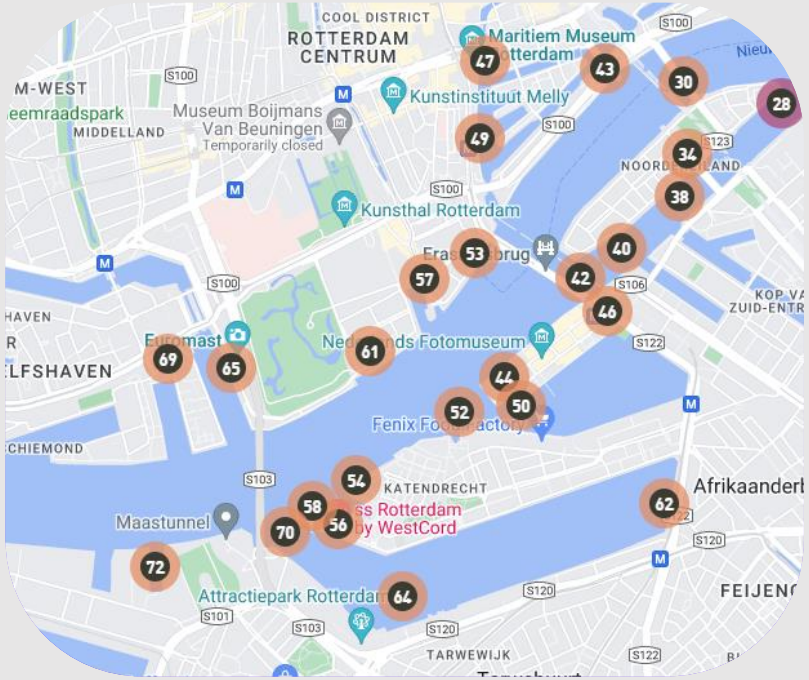
Working day operation: RDM – Marconi Rotterdam

Transfer from HQ to operation area:	6.2 km
RDM- Marconi distance:	2.1 km
Speed limit in Merwehaven:	10 km/h
No. of pax:	12



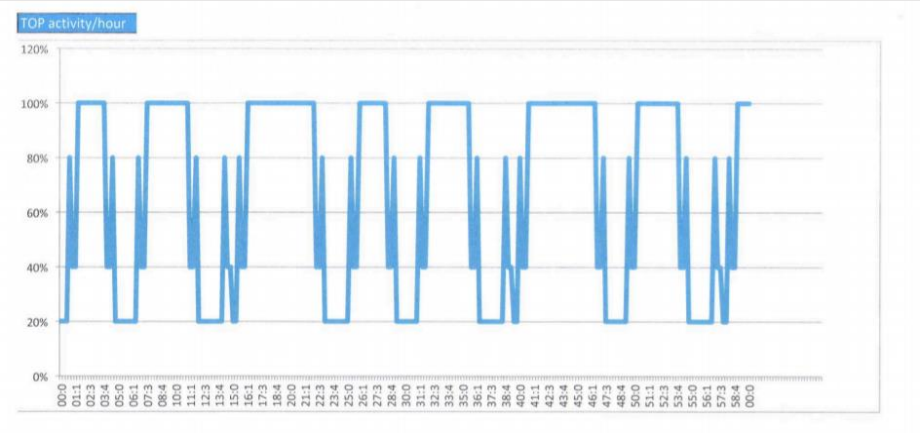
Mission profile

Weekend operation: Inner city taxi service Rotterdam



Mission profile is derived from current operation of hybrid vessel.

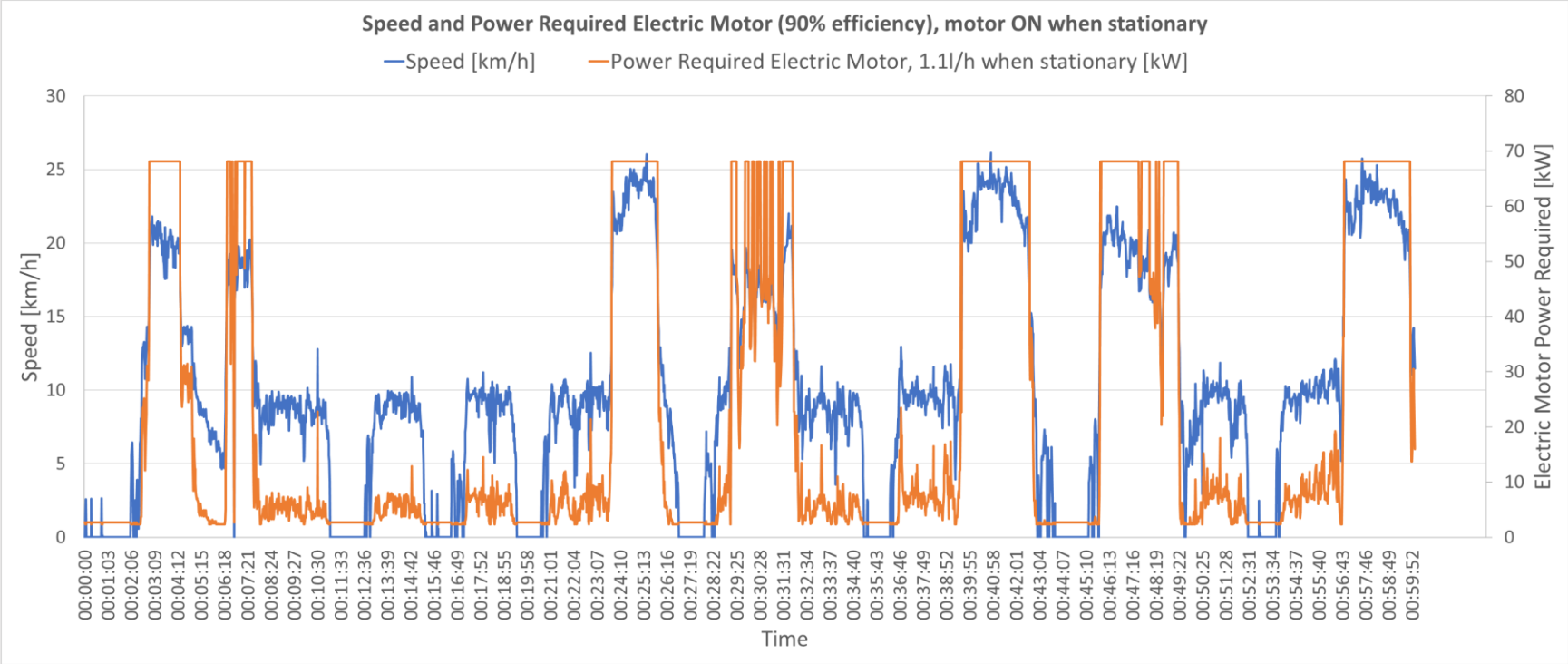
<u>Worst case:</u> Trips of 360 seconds @ cruise speed
For around 6hr per day continuously



Mission profile

Weekend operation: Inner city taxi service Rotterdam

Experimental measurements and analysis based on reference vessel *PHW* to define weekend power and speed profile.

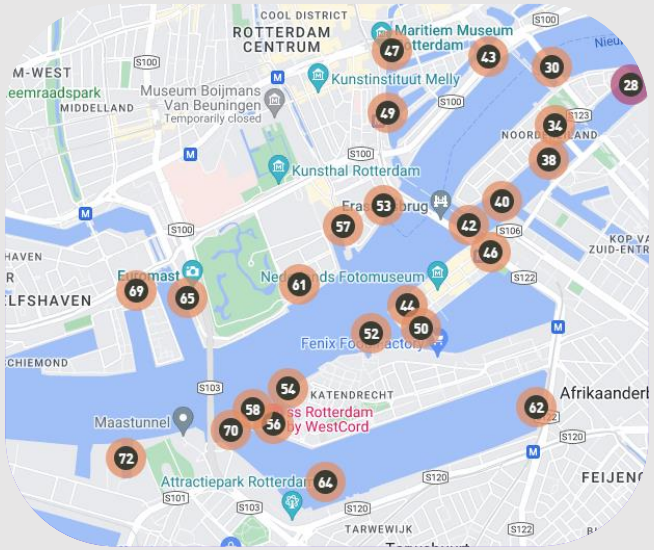


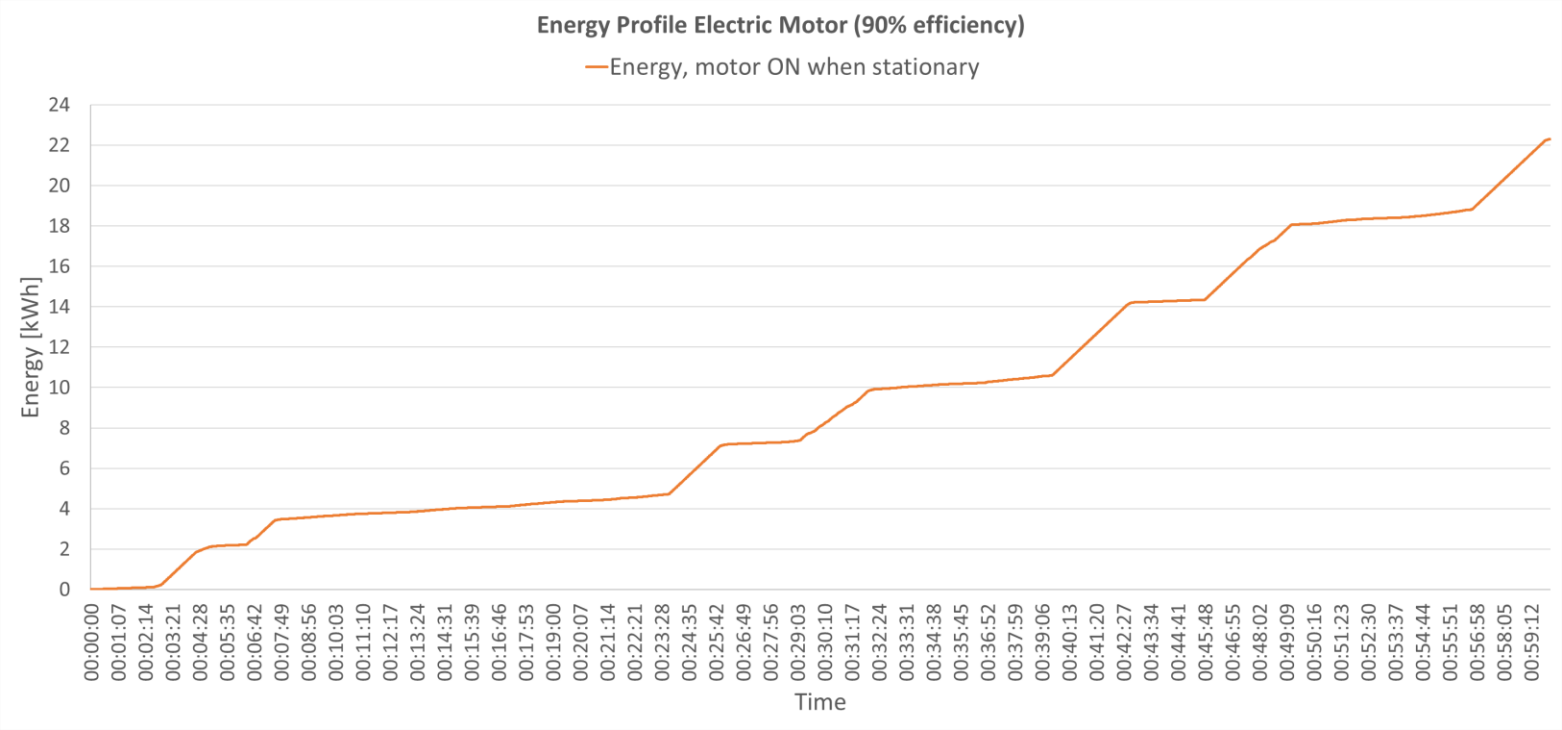
Measured power and speed profile PHW (converted to electric)

Mission profile

Weekend operation: Inner city taxi service Rotterdam

30 kW continuous net power from fuel cell system will be sufficient to supply average power demand of vessel.





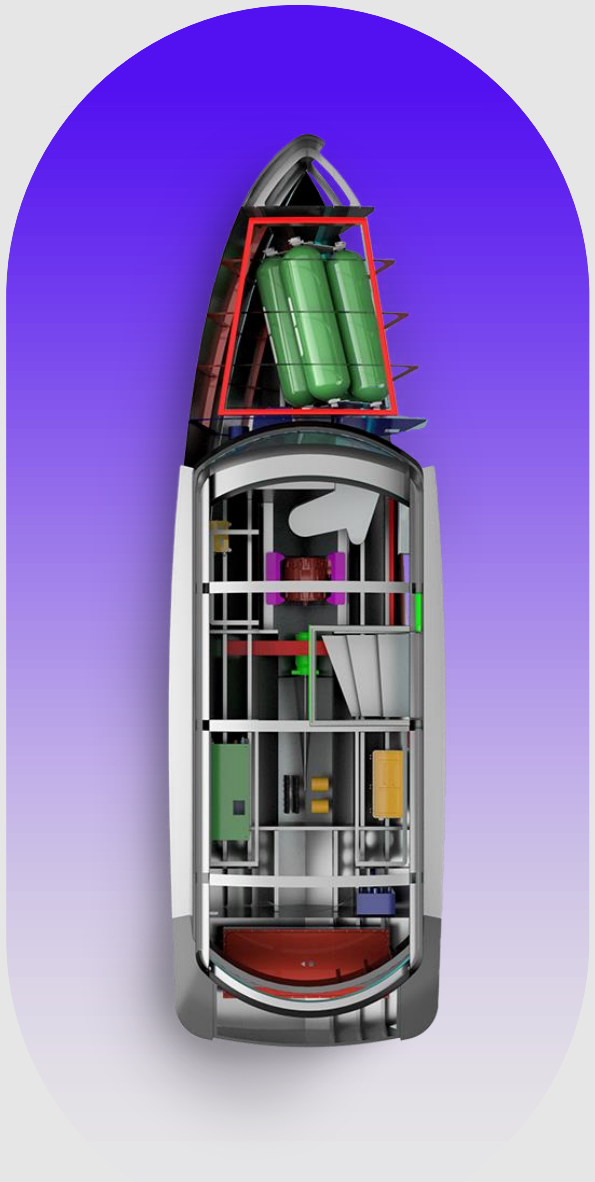
Measured power and speed profile PHW (converted to electric)

Design

Hydrogen-electric drivetrain

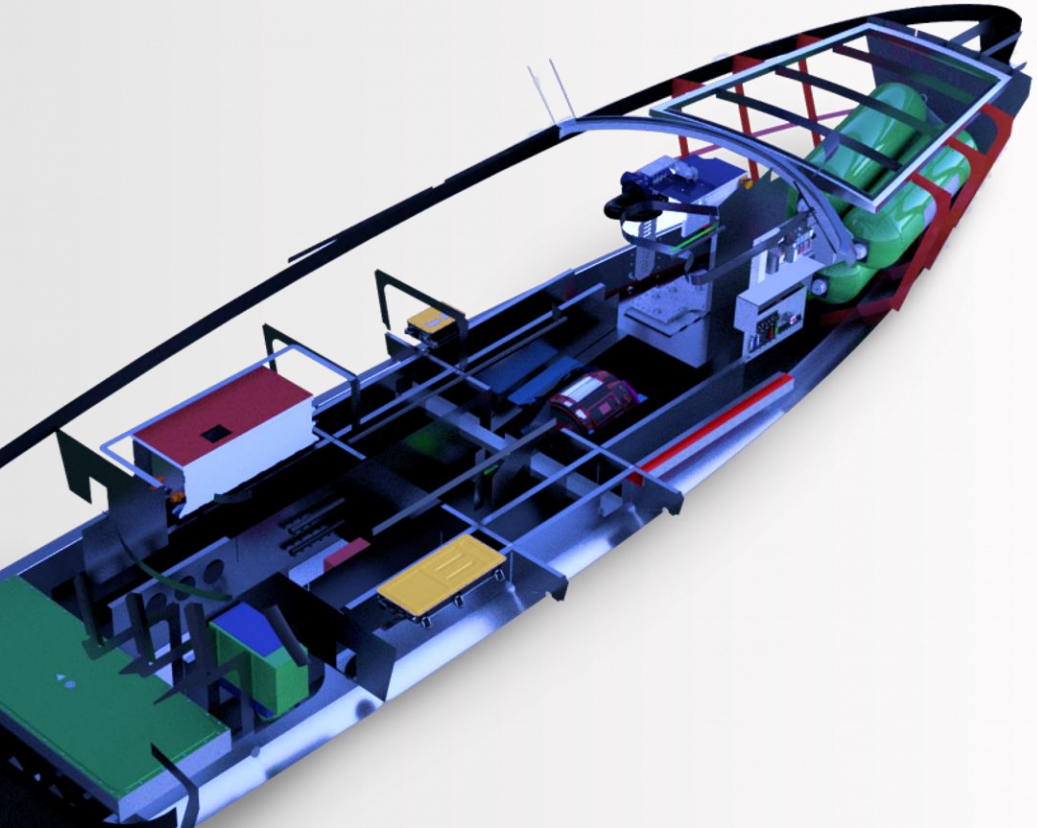
Clean & durable

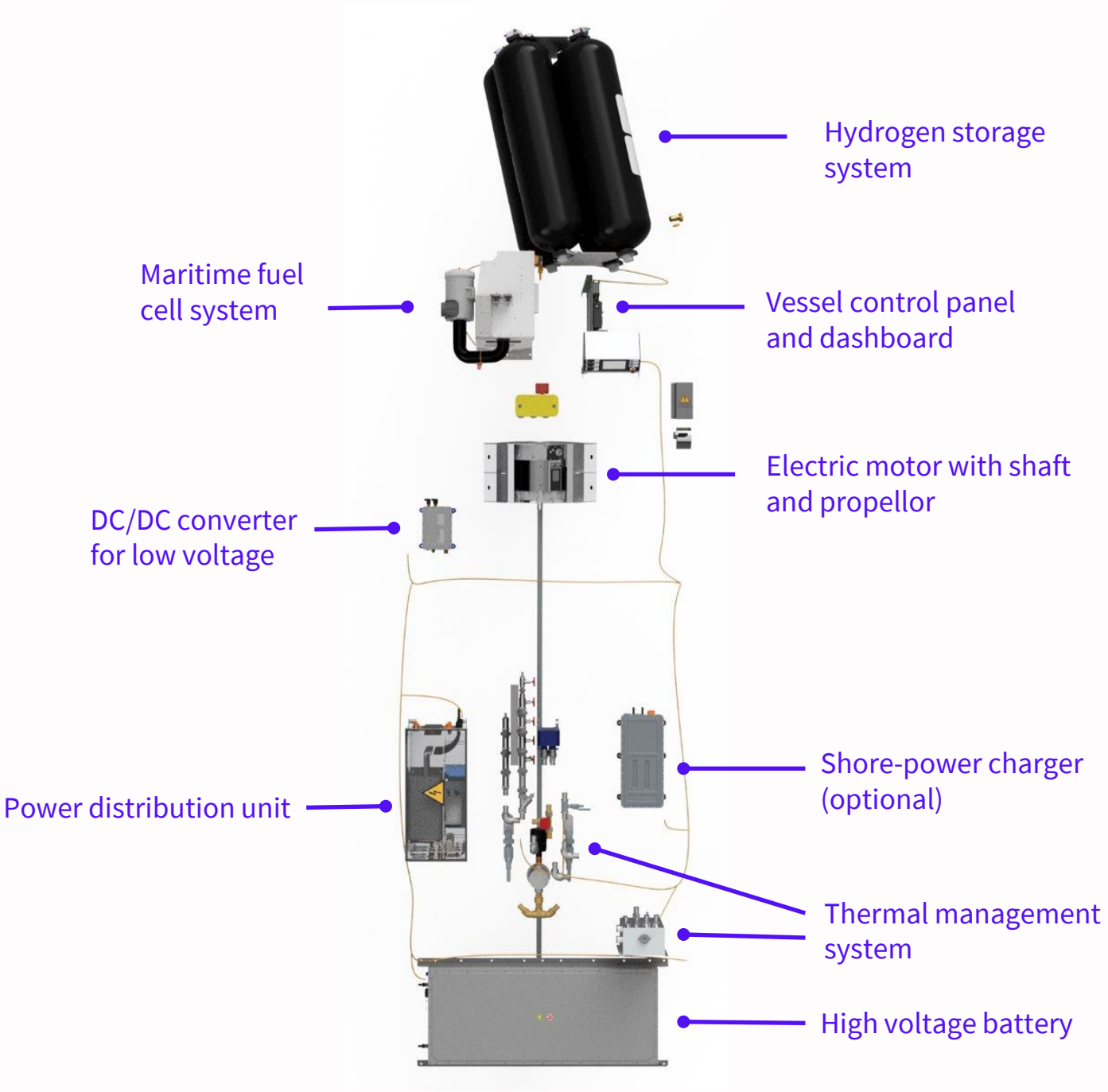
Dimensions	Length:	8.8 m
	Width:	2.7 m
	Draft:	60 cm
Capacity	12 passengers	
Battery Specs	Capacity:	33kWh
	Output:	50kW
	DC voltage	650V
Fuel cell specs	Capacity:	45kW
	H2 storage:	14 kg
	Endurance:	9 hours (cruising speed)
Perfomance	Cruising speed:	16 km/h (8.8 knots)
	Max speed:	25 km/h (13 knots)
	Motor power:	95kW



Product

- Complete marine propulsion system
- Emission free and silent operation
- Designed to meet Port of Rotterdam regulatory framework





Realization

Assembly & Integration of the water taxi

Hull production @ Alumax Boats, Meppel

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Test setup in workshop

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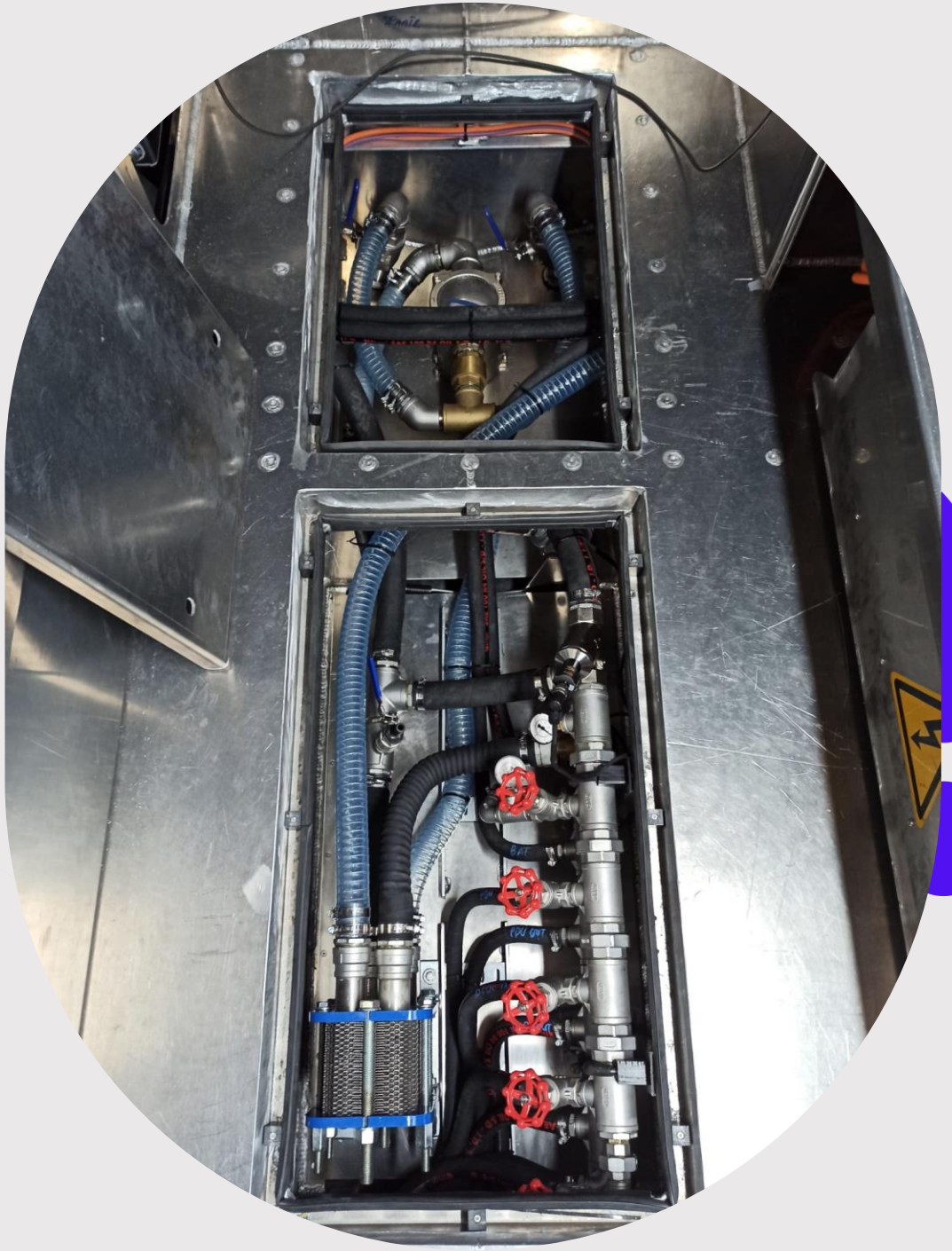

Integration of Power Distribution Unit and Thermal Management System

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Installation of dashboard, safety systems and vessel control unit

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Commissioning of high voltage powertrain

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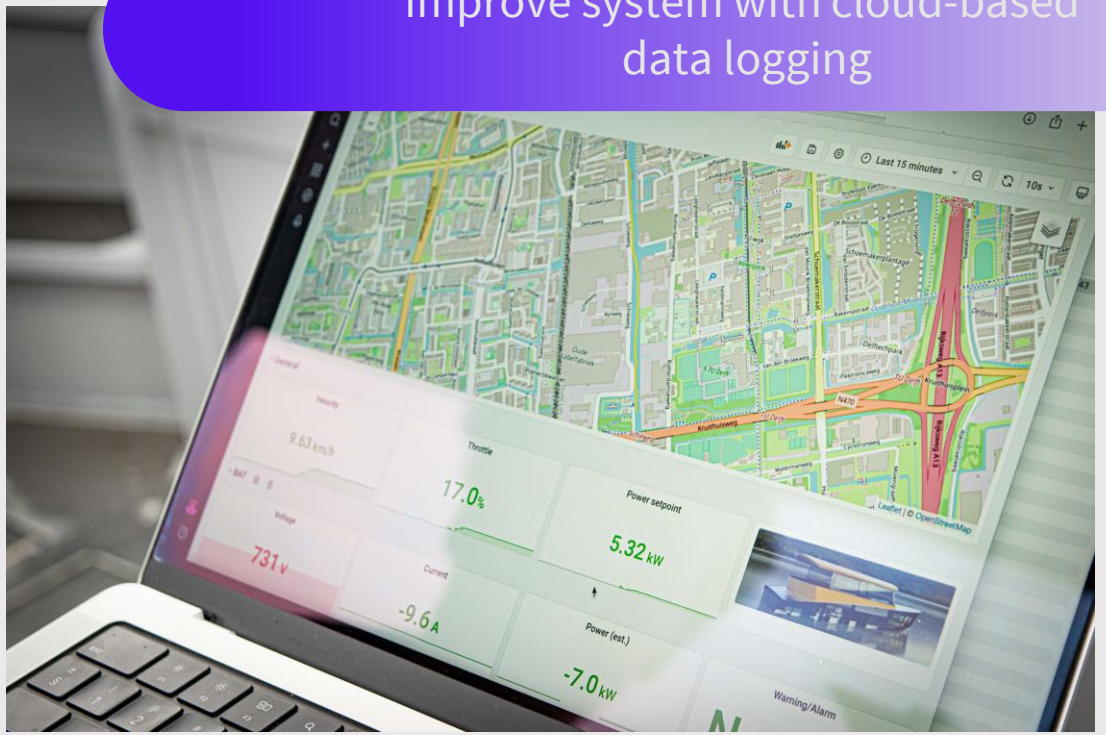
Testing

Sailing tests in Rotterdam

Improve system with cloud-based data logging



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Next steps

Ecosystem development & commercial applications

Current solution for refuelling

1. No pump, no moving parts or electricity required: filling by pressure equalization
2. Robust system, easily installed and mobile
3. 3 to 6 bundles connected at the same time: easy and safe to operate

This will allow us to learn about hydrogen operations and support regulatory trajectories to break the waves for other initiatives

SWIM timeline; speeding towards transition

June	15 June	- Max. 6 months	December	2023
Start test sailing	**Certification**	**Test sailing & development**	**GERS online?**	**Plain sailing**
Currently developing the safety plan and drawings and finalising negotiations on hydrogen supply, sponsors and location	Watertaxi is scheduled to be certified this week	Tests are carried out to learn functionalities, fueling operations, closely working together with local authorities DCMR, VRR and PoR Watertaxi operations are being prepared for transporting public	PoR aims to have **permanent bunkering** facility operational STC Group vessel will be the second customer for Green Energy Refueling Station (GERS)	Additional opportunities include: • Den Helder (Project Zephyros) • Amsterdam (Portago Marine) • Hamburg (Watertaxi)

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Development of hydrogen infrastructure for maritime application in Rotterdam

Green Energy Refuelling Station (GERS) *by Port of Rotterdam*

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Start emission-free sailing on hydrogen **today!**

Ready for orders now!

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