GREEN SHIPPING
Waddenzee

Green Shipping Waddenzee

Program Green Shipping Wadden sea

- **Duration mid 2020- mid 2024**
- **Total investment: € 26,1 mio**

Waddenfonds	€ 8 mio
Provinces	€ 2,6 mio
Others	€ 15,5 mio

(*Companies & Knowledge institutions*)

- **10 pilot projects**

GREEN SHIPPING
Waddenzee

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Ambition & Goals

Program Green Shipping Wadden Sea aims to make a 60% reduction in CO2 emissions possible for the Wadden Sea fleet by 2030.

Technical objectives:

- Accelerating innovations in the field of CO2-neutral and fossil-free shipping for the Wadden Sea fleet;
- Developing (port) facilities for low-emission and energy-neutral shipping

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Programmatic themes Green Shipping Wadden Sea

Fuel Cells	**Tank Infrastructure**	**Classification & Permits**	**Local H2 Production**	**Safety Regulations**

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Current projects PGSW

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Start with 15 Partners PGSW

Electric Ship Facilities
PORT OF DEN HELDER
PORT OF HARLINGEN
New Energy Coalition
Nedstack PEM FUEL CELLS
ENGIE
GRONINGEN SEAPORTS
inholland hogeschool
FME POWERED BY DUTCH TECHNOLOGY
CONOSHIP INTERNATIONAL
eekels | TBI
WADDUURZAAM
Bredenoord
BSC Bureau Scheepvaart Certificering
STONKEL ENGINEERING

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H2 Ecolution

- Waterstof brandstofcel: 45kw
- 4 carbon tanks 5 kg H2
- Electrical engines 2x50kw

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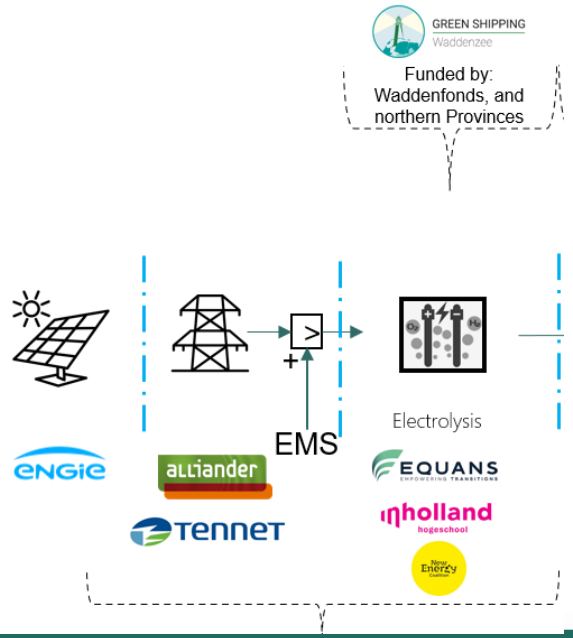
Electrolyzer H2 Production Den Helder



finco EQUANS EMPOWERING TRANSITIONS

*Joint venture in formation

- Purchase warranty
- Purchase tube trailers
- Investment Compression

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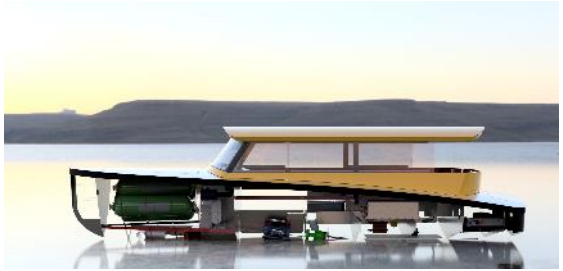
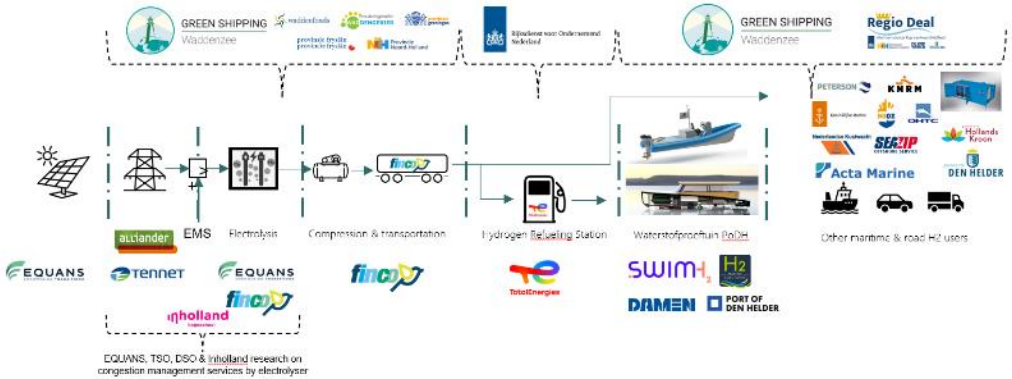
Proeftuin - Port of Den Helder



PORT OF DEN HELDER

DAMEN



SWIMH2

H2 MARINE SOLUTIONS

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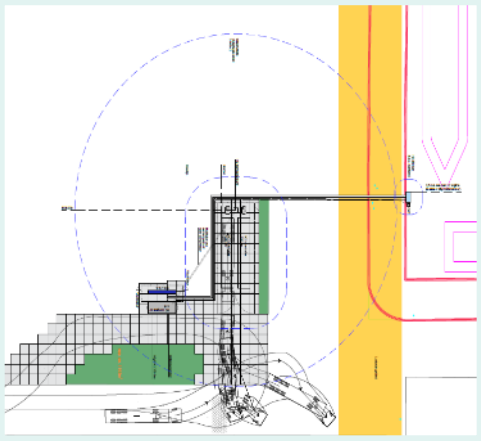
H2 TANKSTATION



- TotalEnergies is in de keten verantwoordelijk voor de realisatie van het H2 tankstation
- Tankstation voor zowel voertuigen als vaartuigen
- 350 bar
- Locatie: Kooyhaven
- Status: Voorbereiden vergunningsaanvraag

TotalEnergies

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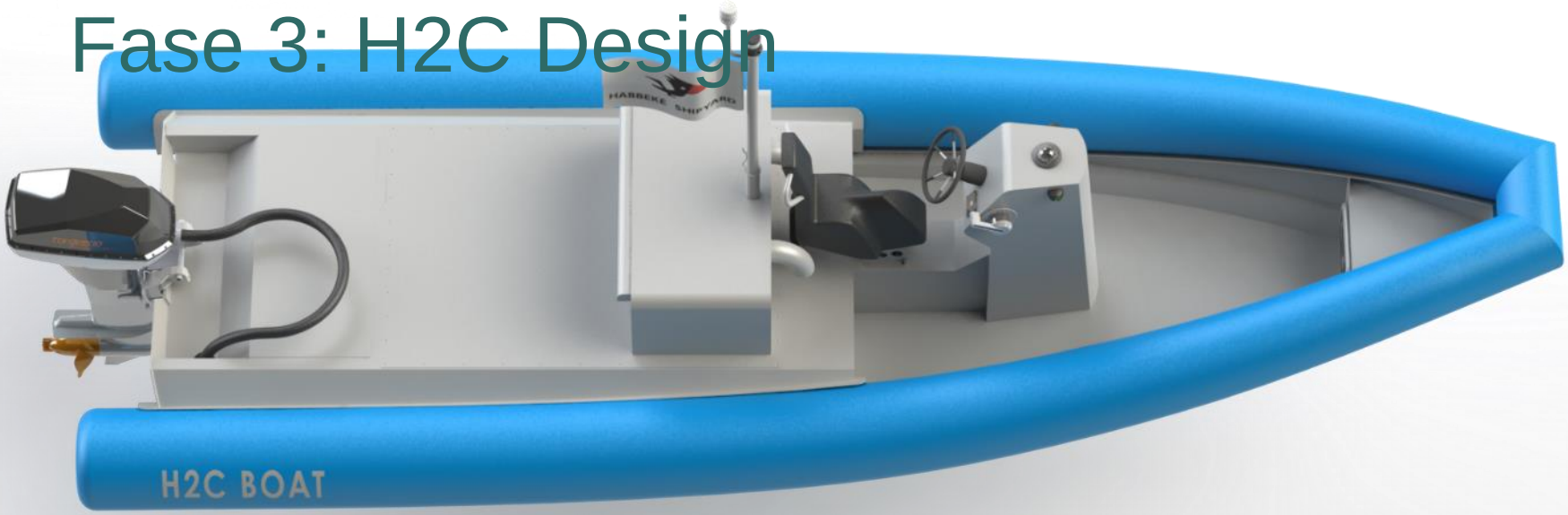
Fase 3: H2C Design



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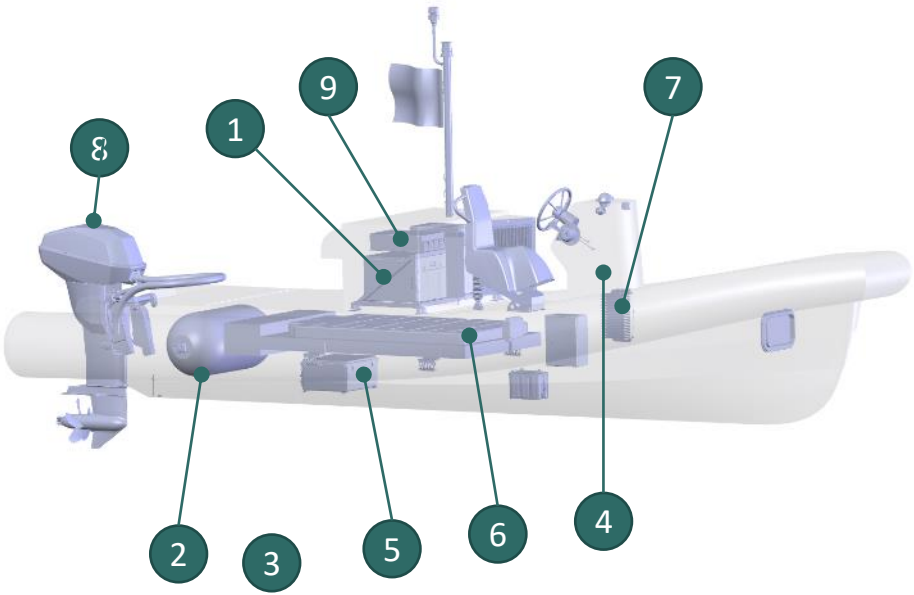
Pos	Component	Type	Spec	#	Supplier
	Hydrogen System				
1	Fuel Cell System	FCM804	4kW	2	Intelligent Energy
2	Fuel Tank	Ref. I	76L; 700bar	1	Hexagon
3	H2 Equipment (valves, regulators)				Swagelok
	Electrical System				
4	Control unit (PLC)			1	
5	SMU	Large		1	Torqeedo
6	Battery	i8	40kWh	1	Torqeedo
7	Shore Power Charging Unit	3.3kW / 220V	3.3kW / 230V	1	Torqeedo
8	Motor	DB 50	60kW Piek	1	Torqeedo
9	DC/DC Converters	Comet	4kW	2	Tame-Power



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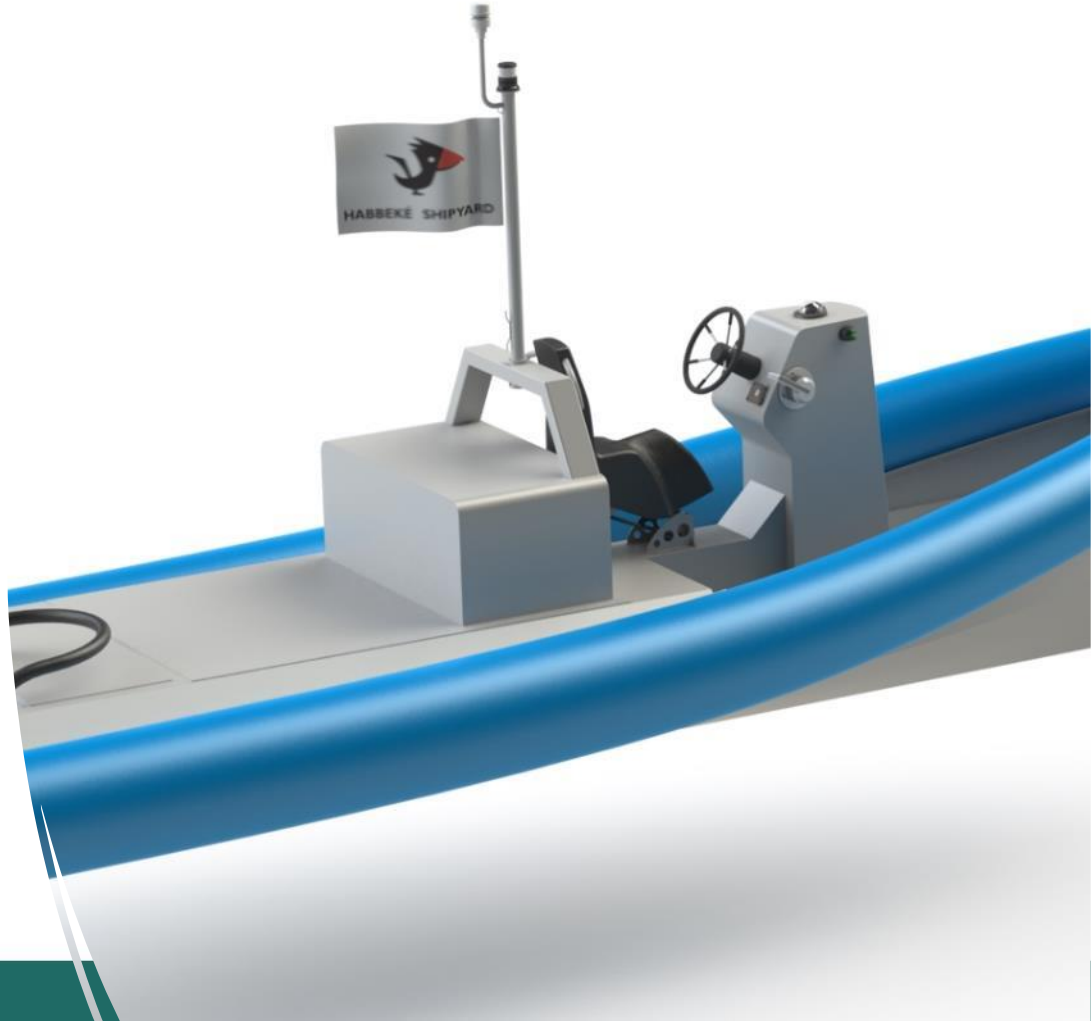
Specifications

Length overall (LOA)	6.8	m
Weight (Operational)	1100	kg
Power	50	kW
Capacity Battery	40	kWh
Capcity H2	51	kWh
Maximum speed	20	kts
Sailing time	6	hrs
	50	min at 20 kts
	05:30	hrs at 6.5 kts



p gevormd van unieke partners

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KOEDOOD
MARINE GROUP

watersportverbond

HABBEKÉ SHIPYARD
HOORN - HOLLAND - HABBEKE.NL

torqeedo

TU Delft

Sailing Innovation Centre
The Hague

Intelligent Energy

HyFly

de stille boot
EXPERTS IN ELEKTRISCH VAREN

SWIM

Vessel

Designed by the swim consortium

The world’s first Hydrogen-electric water taxi

SWIMH_2

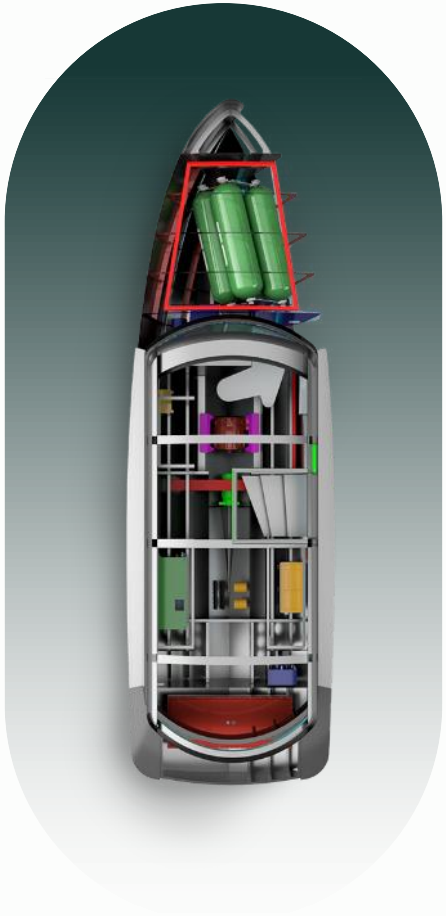
GREEN SHIPPING
Waddenzee

Design

Hydrogen-electric drivetrain

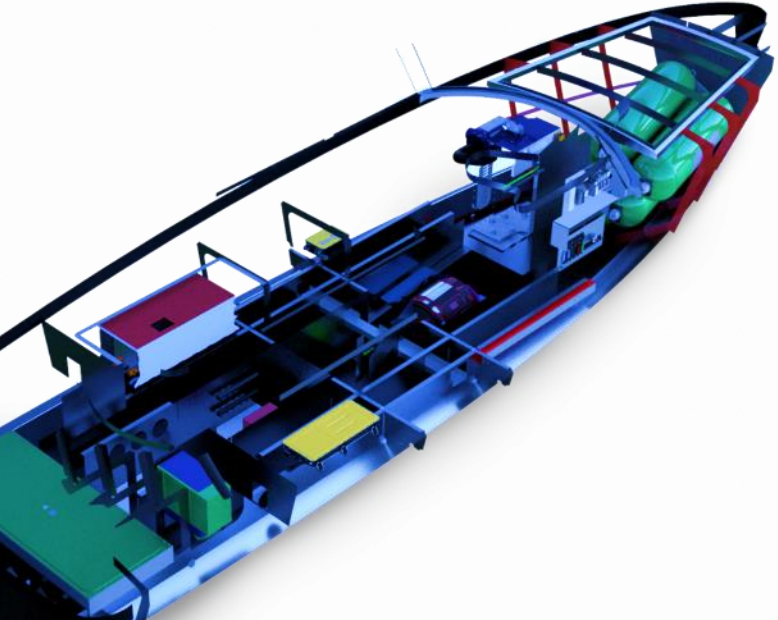
Clean & durable

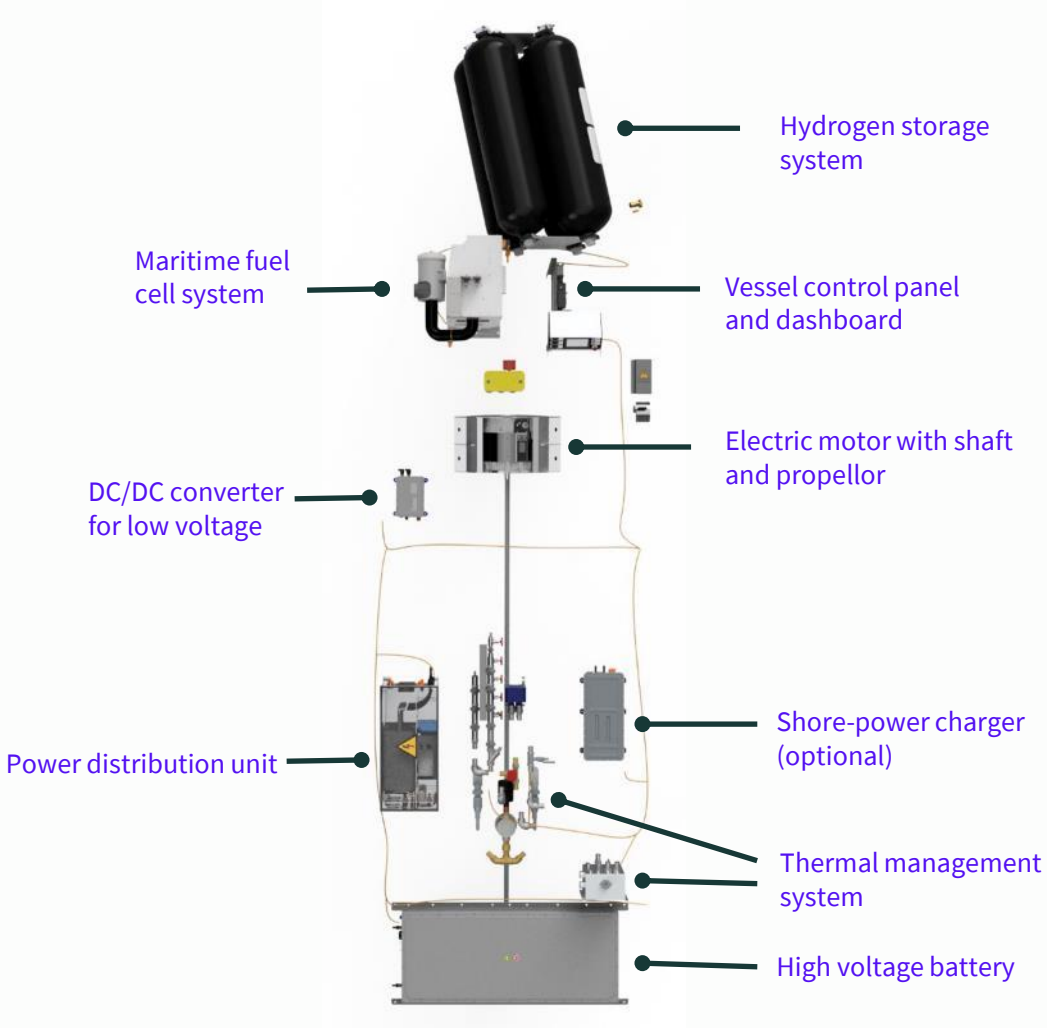
Dimensions	Length:	8.8 m
	Width:	2.7 m
	Draft:	60 cm
Capacity	12 passengers	
Battery Specs	Capacity:	33kWh
	Output:	50kW
	DC voltage650V	
Fuel cell specs	Capacity:	45kW
	H2 storage:	14 kg
	Endurance:	9 hours (cruising speed)
Perfomance	Cruising speed:	16 km/h (8.8 knots)
	Max speed:	25 km/h (13 knots)
	Motor power:	95kW



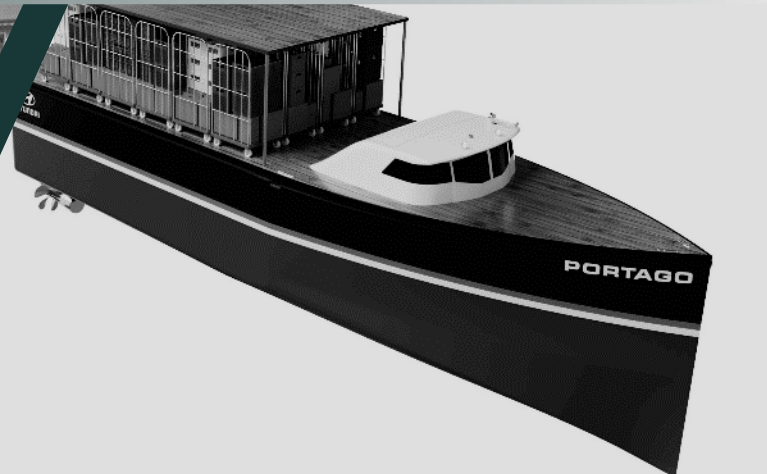
Product

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





Fit for mission: new & retrofit



SWIM-H_2

Drivetrain towards:

Fuel cell specs	Power output:	n*150kW (stackable)
	H2 storage:	500kg
Perfomance	Motor power:	1-2MW
	Endurance:	Multiple days
Application	Energy source:	Multiple energy sources stackable in hybrid system
	Compliance:	ESTRIN compliant

SWIM

Questions or interested?
Reach out to us today!

Designed by the swim consortium

Johan Schonebaum
johan@flying-fish.tech
06-39126169

Levien Bareman
levien@flying-fish.tech
06-37226860

Maarten Fonteijn
info@swimh2.com
06-19311015

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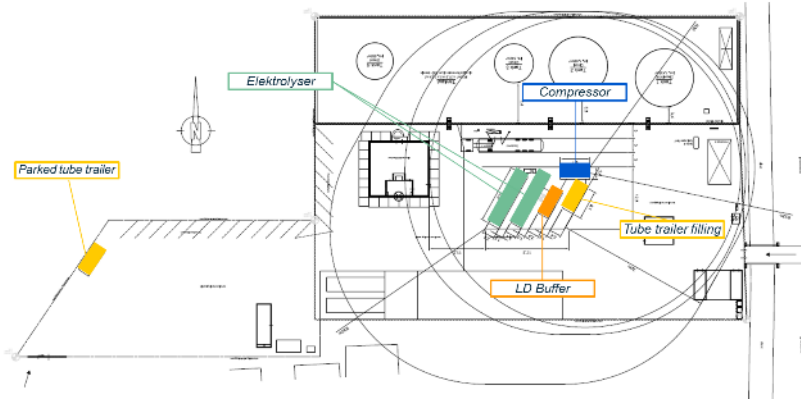
Zonnepark & Elektrolyser

Zonnepark Oostoever

- ~ 3 MWp
- 80% van de zon direct door elektrolyser geconsumeerd
- ~ 40.000 kg H2

Status

✓ Vergunning, subsidie en netaansluiting
- Q4 2023 netaansluiting, Q1 2024 vermogen
- Equans en FinCo werken naar investeringsbesluit toe



Elektrolyser (Gulf bunkering)

- ~ 1 MW
- 104.000 kg groene H2 per jaar
- Tube trailer vulpunt

Status

✓ Subsidie, QRA akkoord, netaansluiting aangevraagd
- Vergunningstraject opstarten
- Equans & FinCo werken naar investeringsbesluit toe

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Hydrogen for shore power

GRONINGEN SEAPORTS
PORT OF DEN HELDER
PORT OF HARLINGEN
Bredenoord
eekels | TBI
Nedstack
PEM FUEL CELLS

GREEN SHIPPING
Waddenzee

Development Maritime Methanol Systems

BSC
Bureau Scheepvaart Certificering

CONOSHIP
INTERNATIONAL

STOKKEL ENGINEERING

Electric
Ship
Facilities

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Sailing Cruise – Brown Fleet (conversion)

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New Projects PGSW

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18 Potential Partners

ChemCom industries

Pronk Maritiem

MARINE SERVICE NOORD
Taking care of maritime piping.

BUREAU VERITAS

NG SHIPYARDS

fincop

SWIM-H2

H2 MARINE SOLUTIONS

NIESTERN // SANDER

SANDFIRDEN TECHNICS

SPAANSEN

bbz

GOUDEN VLOOT

Maritieme Academie Harlingen

DAMEN

MEROMAR SEAFOODS

BAGGERBEDRIJF DE BOER
DUTCH DREDGING

GREEN SHIPPING
Waddenzee

Crane ship & Dredger ship

GREEN SHIPPING
Waddenzee

Fossil free Shrimp cutter (conversion)

GREEN SHIPPING
Waddenzee

Cutter (new construction)

GREEN SHIPPING
Waddenzee

Krukel (Conversion) of the Rijksrederij

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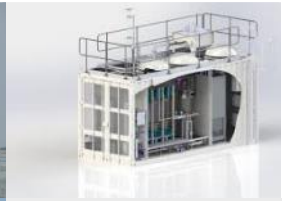
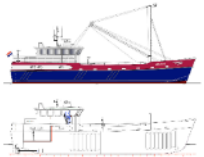
Waddenzee

IMPACT PGSW

Rollout: (TRL 9 e.v.)	Recreation Ships	Fishing Ships	Service Ships	Sustainable Infrastructure
				
				

GREEN SHIPPING Waddenzee

Bredenoord

BSC Bureau Scheepvaart Certificering

STOKKEL ENGINEERING

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engie

GRONINGEN SEAPORTS

inholland hogeschool

NG SHIPYARDS

CONOSHIP INTERNATIONAL

eekels | TBI

MARINE SERVICE NOORD Taking care of maritime piping.

BUREAU VERITAS 1828

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SWIM-H2

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Maritieme Academie Harlingen

DAMEN

MEROMAR SEAFOODS

BAGGERBEDRIJF DE BOER DUTCH DREDGING

PROGRAMMA GREEN SHIPPING WADDENZEE WORDT MEDE GEFINANCIERD DOOR

waddenfonds

investeringskader WADDENGEBIED

provincie groningen

provinsje fryslân
provincie fryslân

Provincie Noord-Holland

PROGRAMMA COÖRDINATOR

FME POWERED BY DUTCH TECHNOLOGY

WWW.GREENSHIPPINGWADDENZEE.NL

Program Green Shipping Waddenzee

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GREEN SHIPPING
Waddenzee

GREEN SHIPPING

Waddenzee

Provincie Noord-Holland

provinsje fryslân
provincie fryslân

provincie groningen

waddenfonds

investeringskader WADDENGEBIED

Regio Deal
Maritiem cluster Kop van Noord-Holland