INCREASE YOUR H2IQ

hydrogen.energy.gov

The #H2IQ Hour

Today's Topic:
Energy Observer Laboratory Vessel Powered by Clean Hydrogen

This presentation is part of the monthly H2IQ hour to highlight hydrogen and fuel cell research, development, and demonstration (RD&D) activities including projects funded by U.S. Department of Energy's Hydrogen and Fuel Cell Technologies Office (HFTO) within the Office of Energy Efficiency and Renewable Energy (EERE).

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HOUSEKEEPING

This webinar is being recorded.

This webinar is being recorded and will be available on the H2IQ webinar archives.

Technical Issues:

- If you experience technical issues, please check your audio settings under the “Audio” tab.
- If you continue experiencing issues, direct message the host, Kyle Hlavacek

Questions?

- There will be a Q&A session at the end of the presentation
- To submit a question, please type it into the Q&A box; **do not** add questions to the Chat

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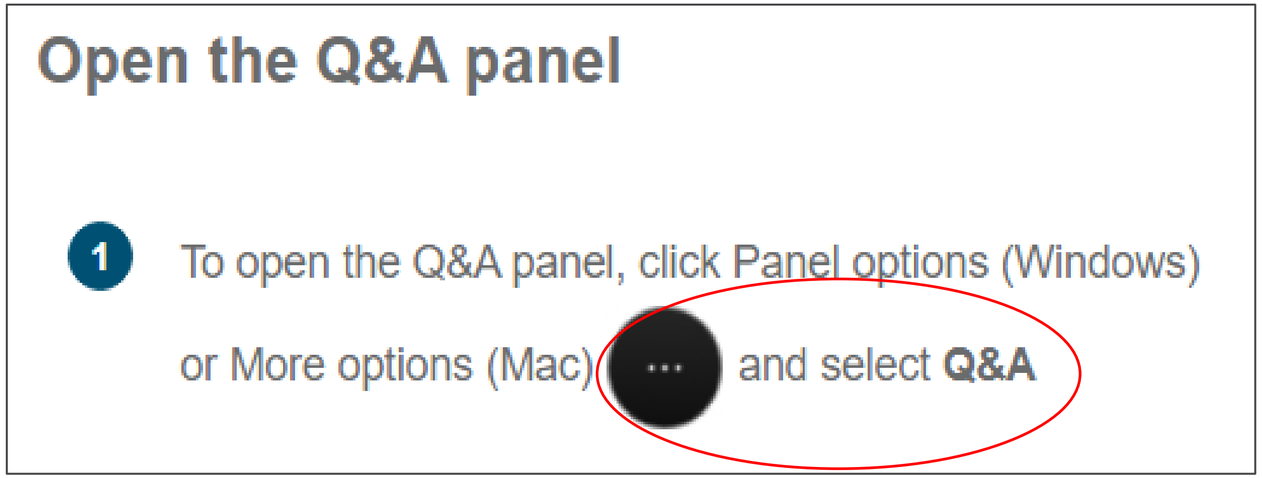
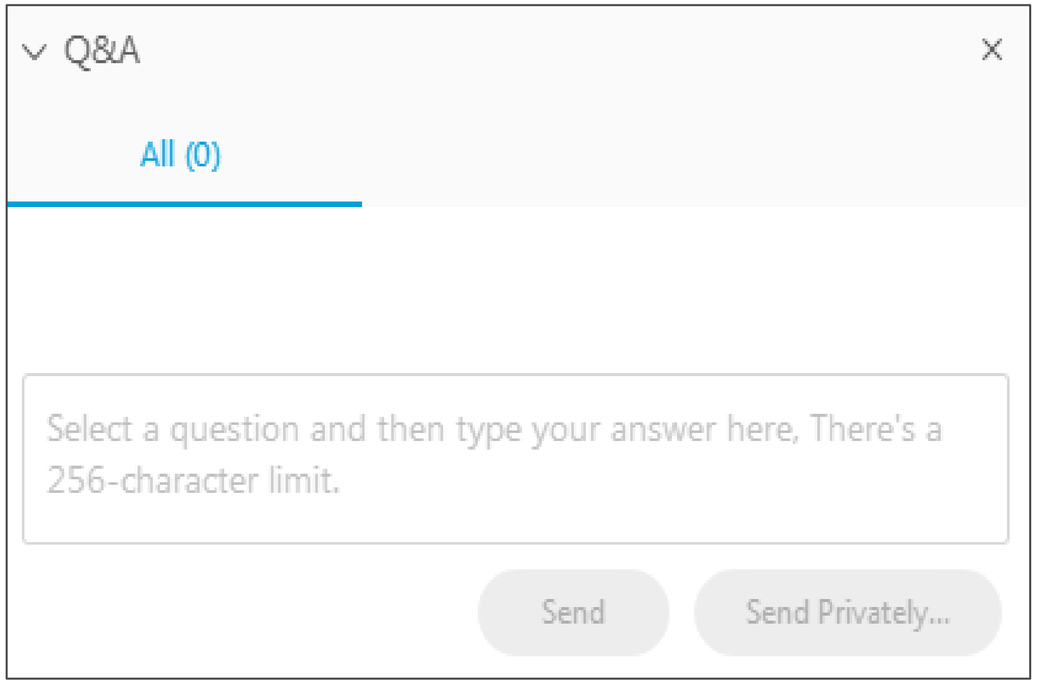
The #H2IQ Hour Q&A

Please type your questions in the Q&A Box





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Energy Observer

Webinar DOE - 04/19/2024

An hydrogen vessel from the first idea to a 7-year Odyssey feedback

Main partners

Official partners

Institutionnal partners

Speaker

Victorien Erussard

Founder & CEO

Energy Observer


Brittany Ferries
NORMANDIE

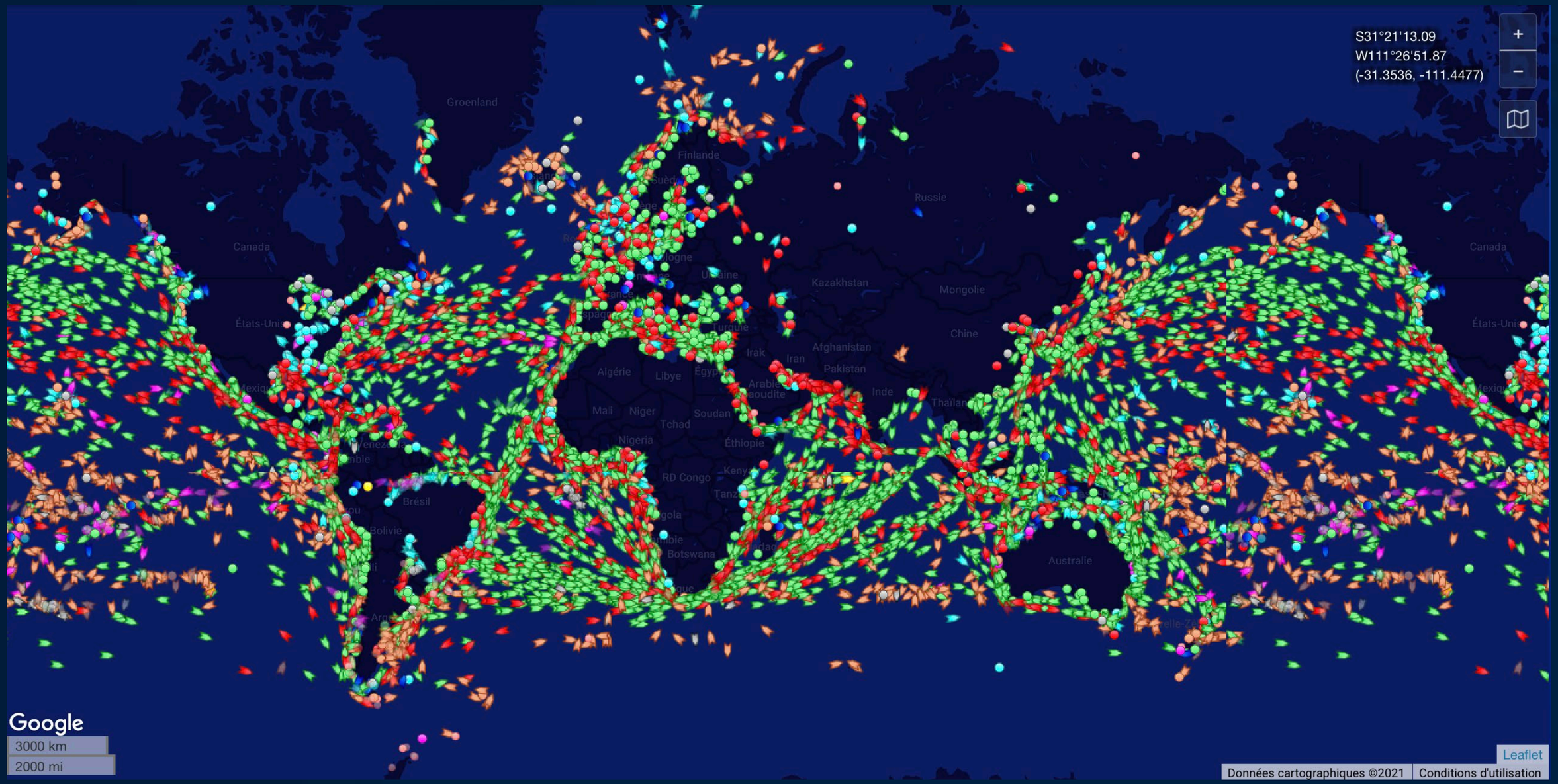

condor
FERRIES


LE DIAMANT


CÔTES DE BRETAGNE

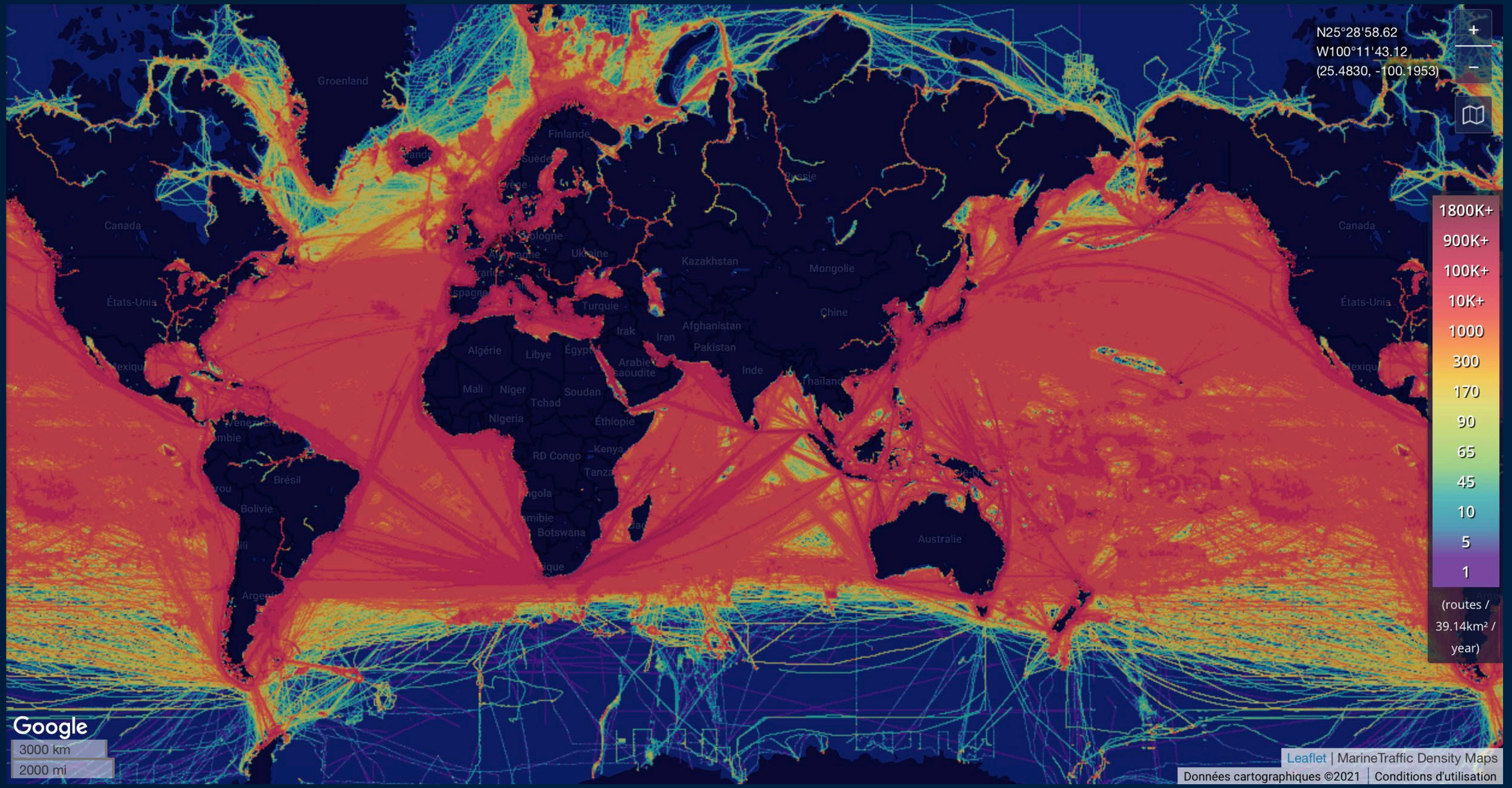
3% of the yearly CO2 emissions

100 000 merchant vessels



Source : Marine Traffic

10,7 billion tons of freight each year



Source : Marine Traffic


ENERGY OBSERVER
DELANCHY
Triangleinterim
TOYOTA
ACCOR
thélem
Air Liquide
GROUPE BPCE

3 renewable energy sources

solar | wind | hydropower

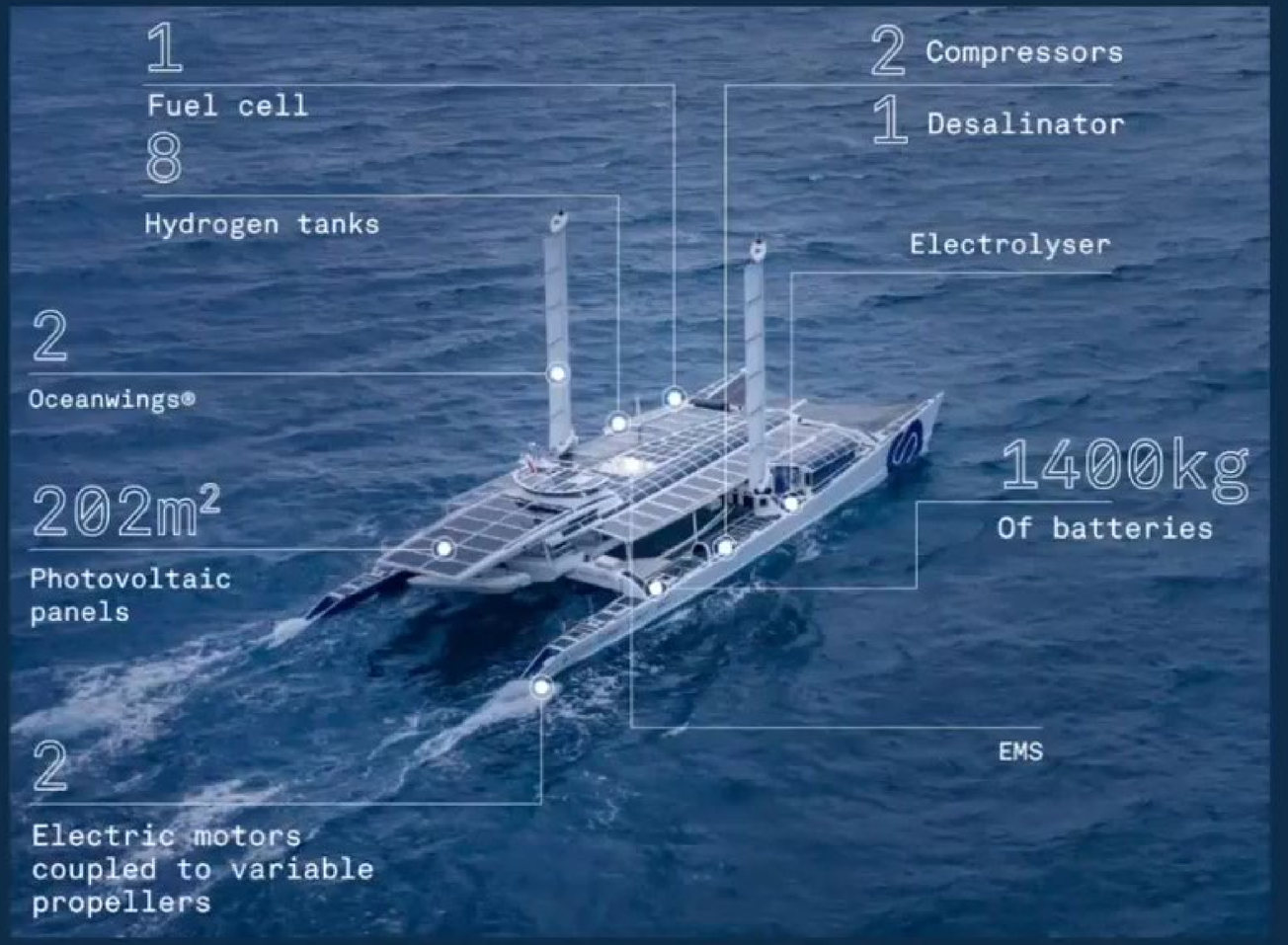
1 complete hydrogen production line

sea water → (desalination) → wild water → (purification) → deionized water → (electrolysis compression) → H_2 → (fuel cell conversion) → electricity heat

2 complementary storage systems

Short terms storage 106kWh li-on battery stack

Long-term storage thanks to 8 tanks 64 KG of H_2



Speaker

Luc Bourserie

Onboard system engineer

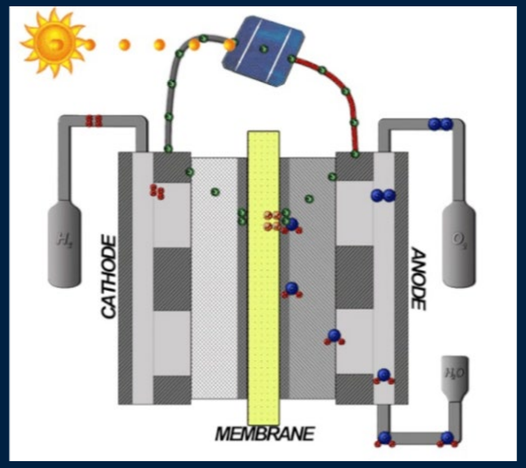
Energy Observer

The choice of hydrogen as energy vector

Good mass-based energy density
Important for mobility

1kWhe
<->
12.5 kg of Li-ion batteries
<->
1.7kg of H_2 system

Can be produced on-board from water and electricity



→ Less social and environmental impact than batteries

Key technical challenges in the design and development

Challenge of using sea water for electrolysis

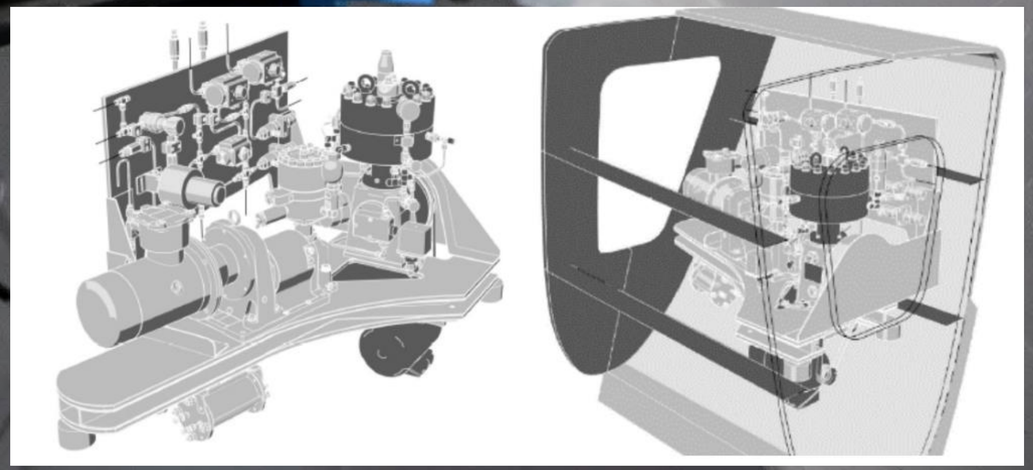
Important considerations in selecting the different hydrogen systems

nel

H Series

Proton Exchange Membrane (PEM)
Hydrogen Generation Systems

Using a former racing catamaran : an integration challenge



To develop solutions to overcome challenges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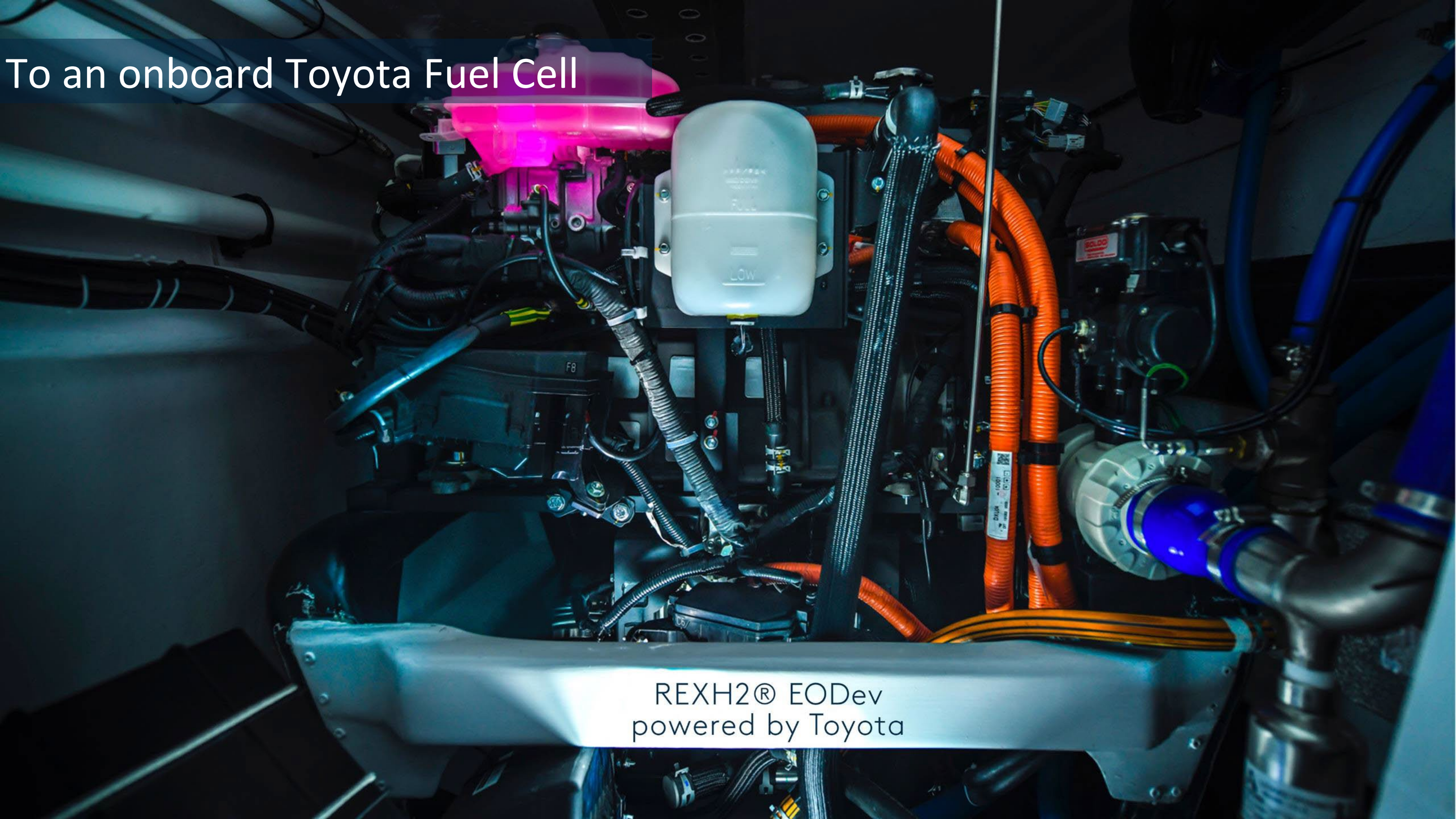
How did the hydrogen systems perform ?

Compressor membranes

Tank valves ageing

To an onboard Toyota Fuel Cell



Lessons learnt from operating hydrogen technologies on a global voyage

Experiences that led to an industrial certified marine fuel cell

HYNOVA 40

Bluegame HSV American magic

Fountaine Pajot Samana 59

Speaker

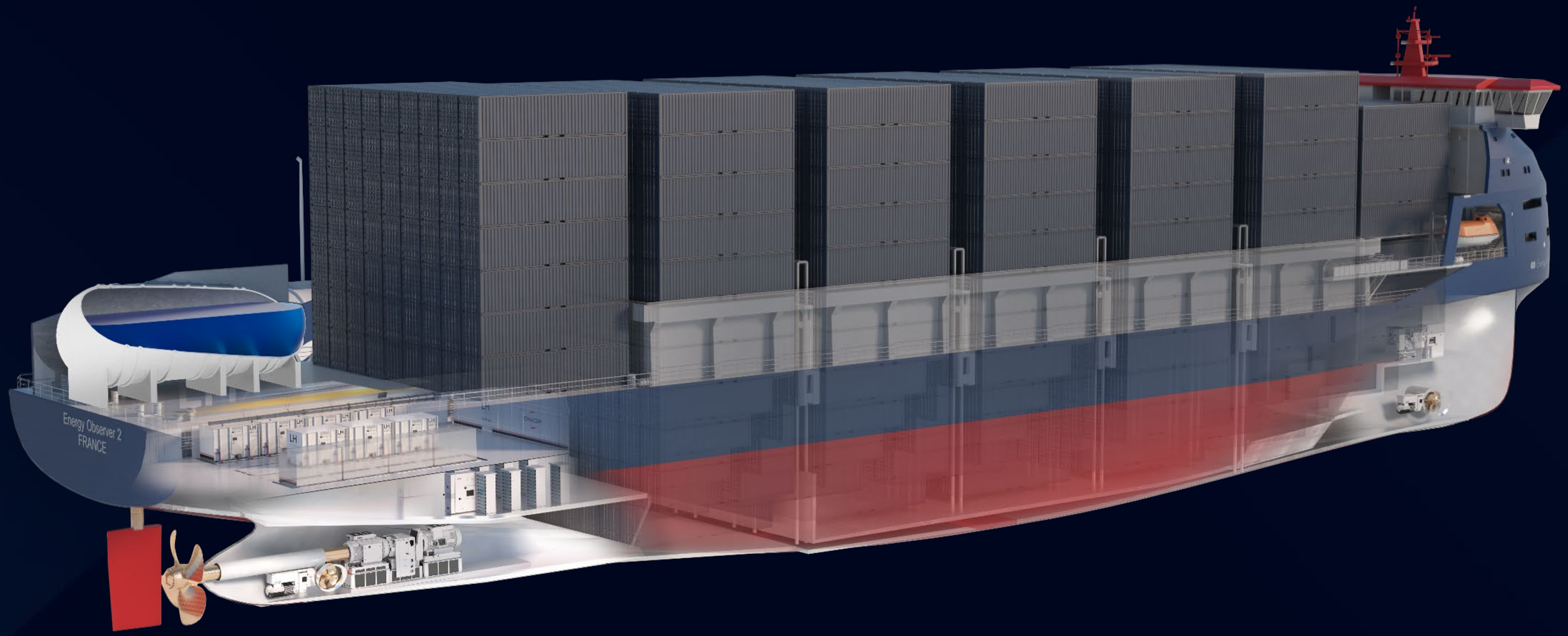
Victorien Erussard

Founder & CEO

Energy Observer

Energy Observer 2

Energy Observer 2




Power Generator
EODev
LH2
Fuel Cell Room
4.4 MW
Energy Observer 2
EODev
400 kW

Speaker

Beatrice Cordiano

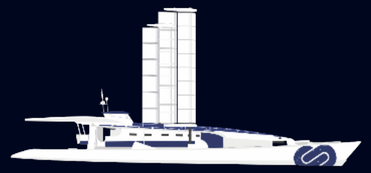
Onboard Energy expert

Energy Observer

7 years of science and adventure

45
Visited countries

64 000
Nautical miles



88
stopovers

17
Events with our exhibition

Venice

2018

St-Petersburg

2019

Spitsbergen

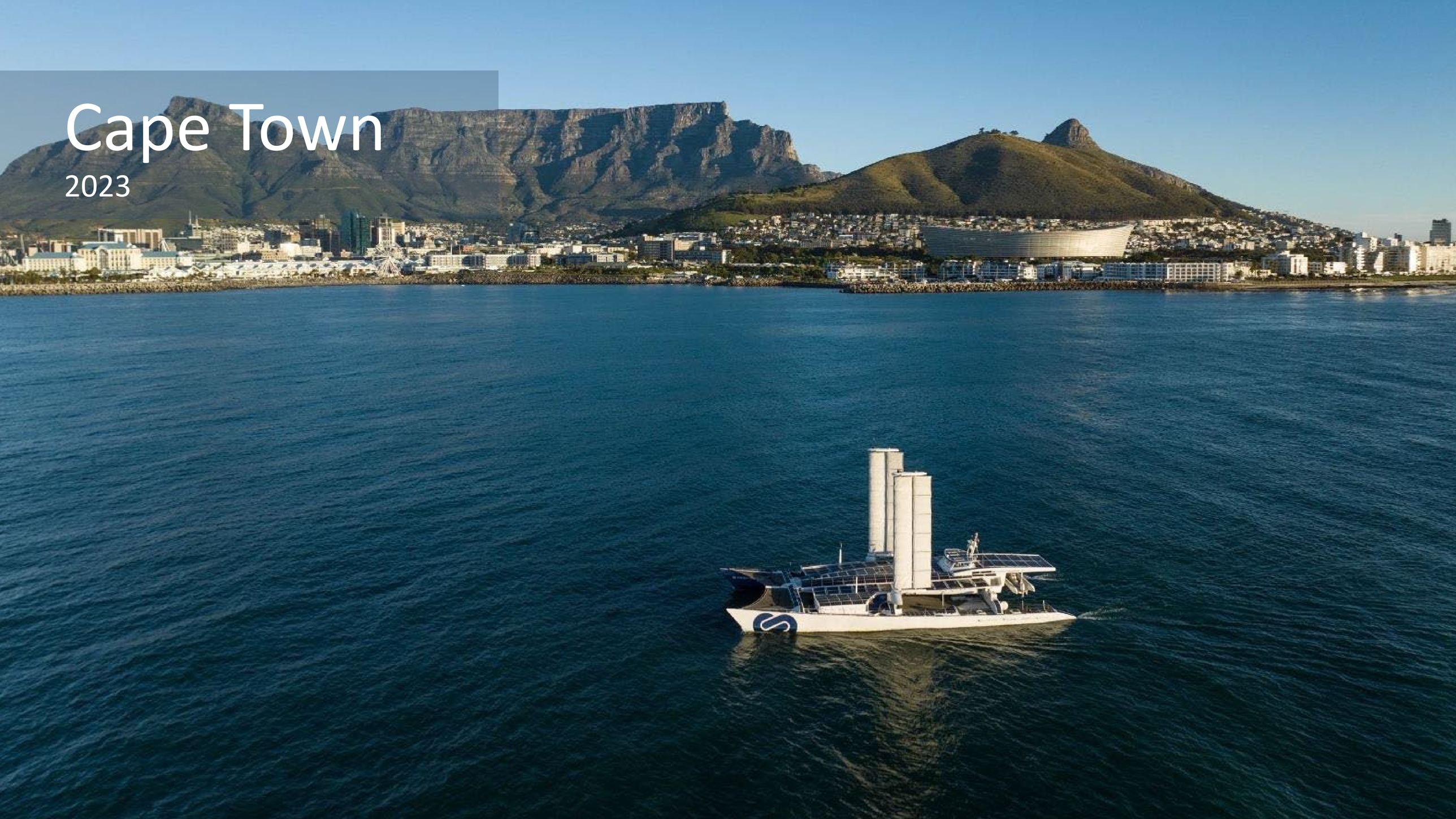
2019

San Francisco

2021

Cape Town

2023



NYC

2024

Learning curve and trouble shooting

Power management and navigation strategy

Quiet operation and proximity to marine biodiversity

Thank you!