UNITROVE

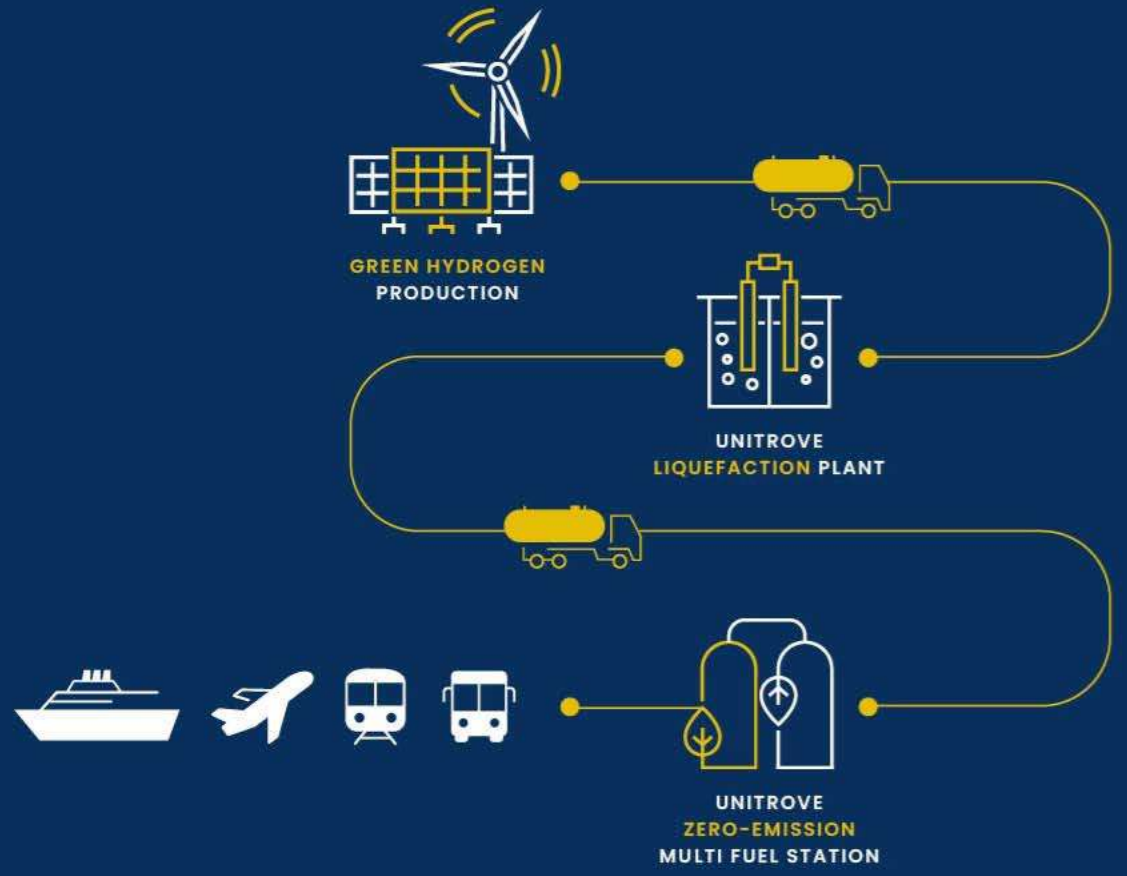
Kickstarting Zero-Emission Vessels

ShipZERO28

11 September 2023

UNITROVE

Our Vision



UNITROVE

The Shipowners' Challenges

01

A Global Problem

Air Pollution

Just a handful of ships on our oceans today produce more pollution than all the cars in the world.

1 Billion Tonnes of greenhouse gases are emitted each year by an industry that thrives on heavy fuel-oil.

Health Risks

International shipping is a hard-to-abate sector. It accounts for around 3% of annual global GHG emissions (one billion tonnes).

400,000 Premature deaths + **14 million** cases of childhood asthma yearly

The Shipowner’s Perspective

External pressures are mounting

International Maritime Organization (IMO)

- Net-zero “by or around 2050” (MEPC 80 GHG strategy)

CoZEV Agreement

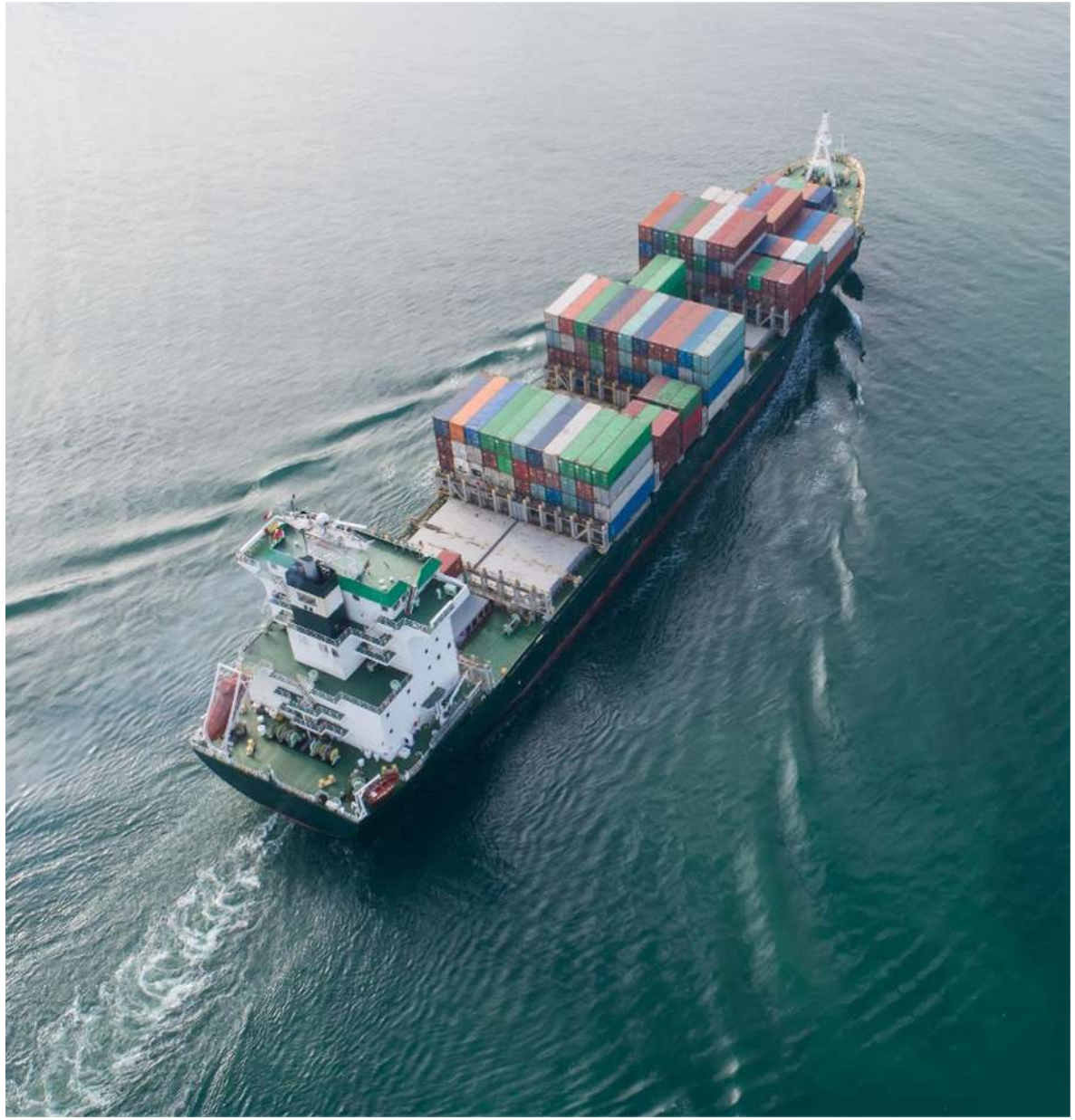
- Cargo owners pledge to be net-zero by 2040 (including Amazon, Ikea, Unilever)

Poseidon Principles

- Private banks and ship insurance companies taking steps for responsible financing and insurance of ships

Lack of infrastructure for clean fuels

Ship-owners are increasingly under pressure to make the transition to clean fuels. However, without the necessary infrastructure in place, this transition cannot happen.



The Shipowner's Concerns in the Race to Zero

01

Fear of being left behind

02

Bans, taxes & cancel culture

03

Backing the wrong fuel

04

Buying dud technology

05

Paying too much money

06

Failing to execute

07

Delivering no impact

UNITROVE

Reinventing Infrastructure

02

World's First Liquid Hydrogen Bunkering Facility

Launched at the UN COP 26

2021

World's First Liquid Hydrogen Bunkering Facility

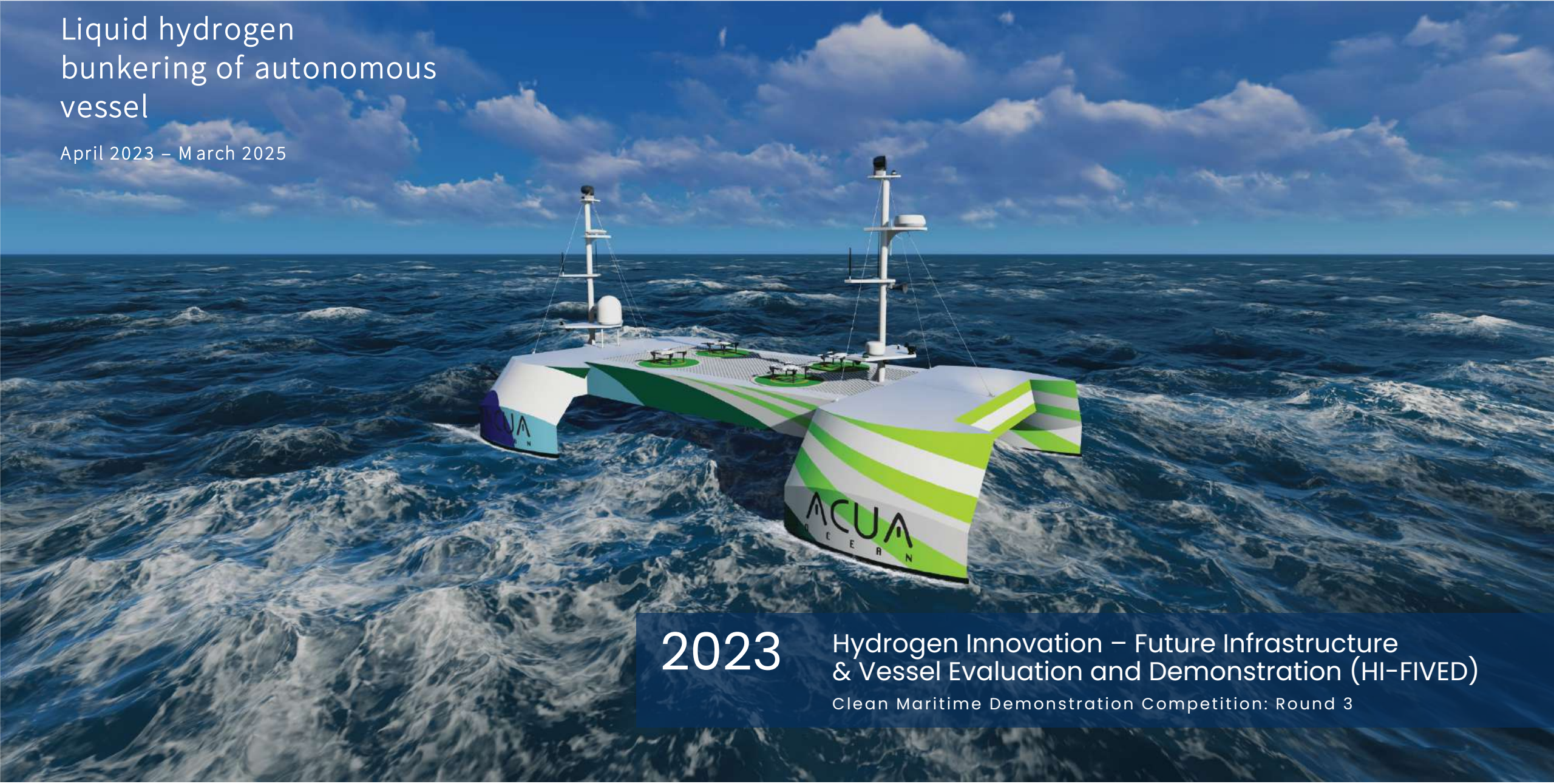
Showcased at the UN COP26 in Glasgow

HIAB
MoffETT
HARDSTAFF TRAFFIC
BARRIER SERVICES
KINGSTON-ON-SOAR
NOTTINGHAM
Telephone
0115 9832300
COMMERCIAL
BODY SPECIALISTS

NITROGEN, REFRIGERATED LIQUID
22
1977
UNITROVE
UNITROVE

Liquid hydrogen bunkering of autonomous vessel

April 2023 – March 2025



2023

Hydrogen Innovation – Future Infrastructure & Vessel Evaluation and Demonstration (HI-FIVED)

Clean Maritime Demonstration Competition: Round 3

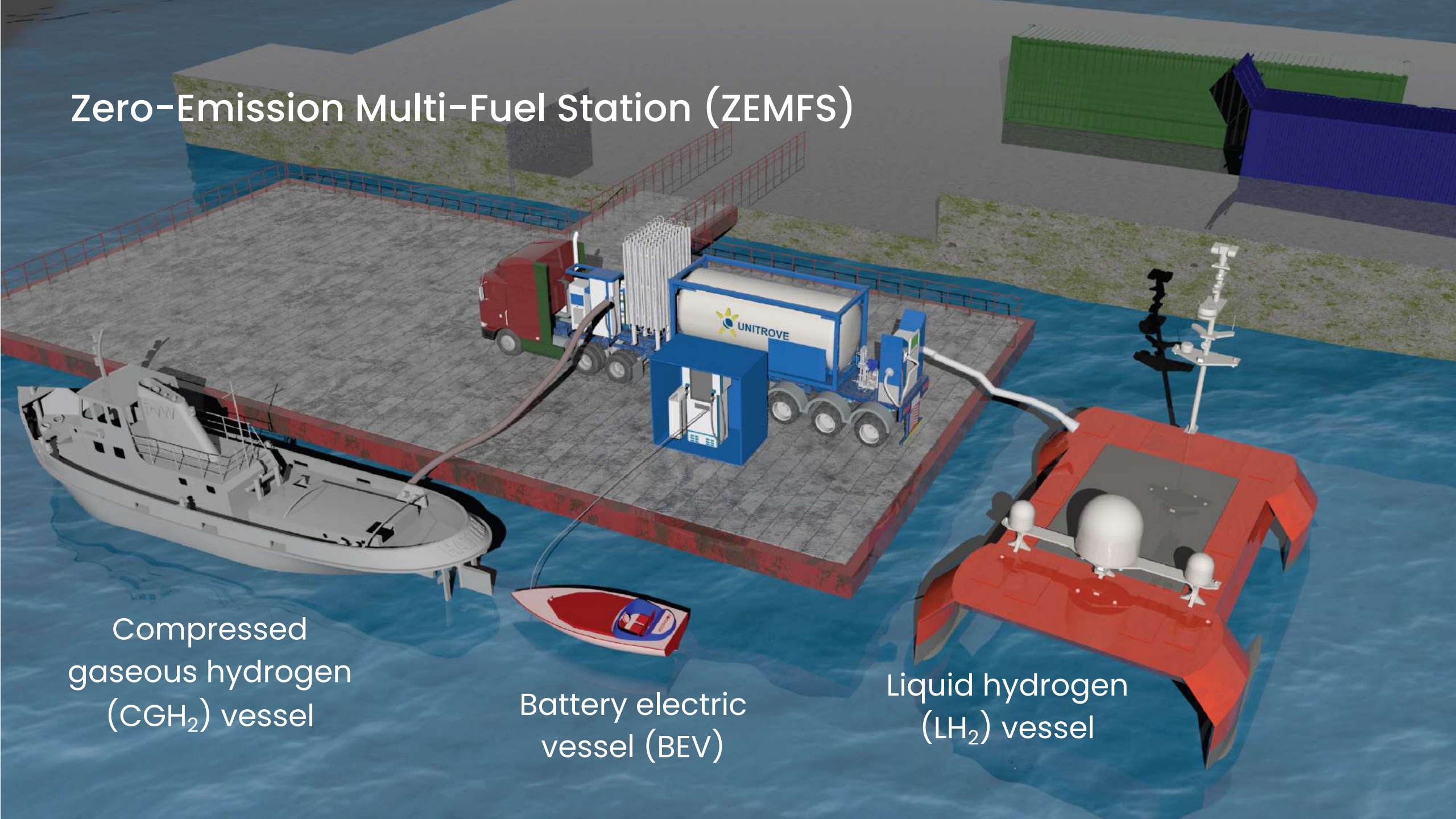
ACUA OCEAN · UNITROVE · PORT OF ABERDEEN EST.1136 · TRIDENT MARINE ELECTRICAL · NASH MARITIME · Established 1979 · University of Southampton · Z-M Tech Zero Emission Maritime Technology

UNITROVE

Introducing:
Zero-Emission Multi-Fuel Station (ZEMFS)

03

Zero-Emission Multi-Fuel Station (ZEMFS)



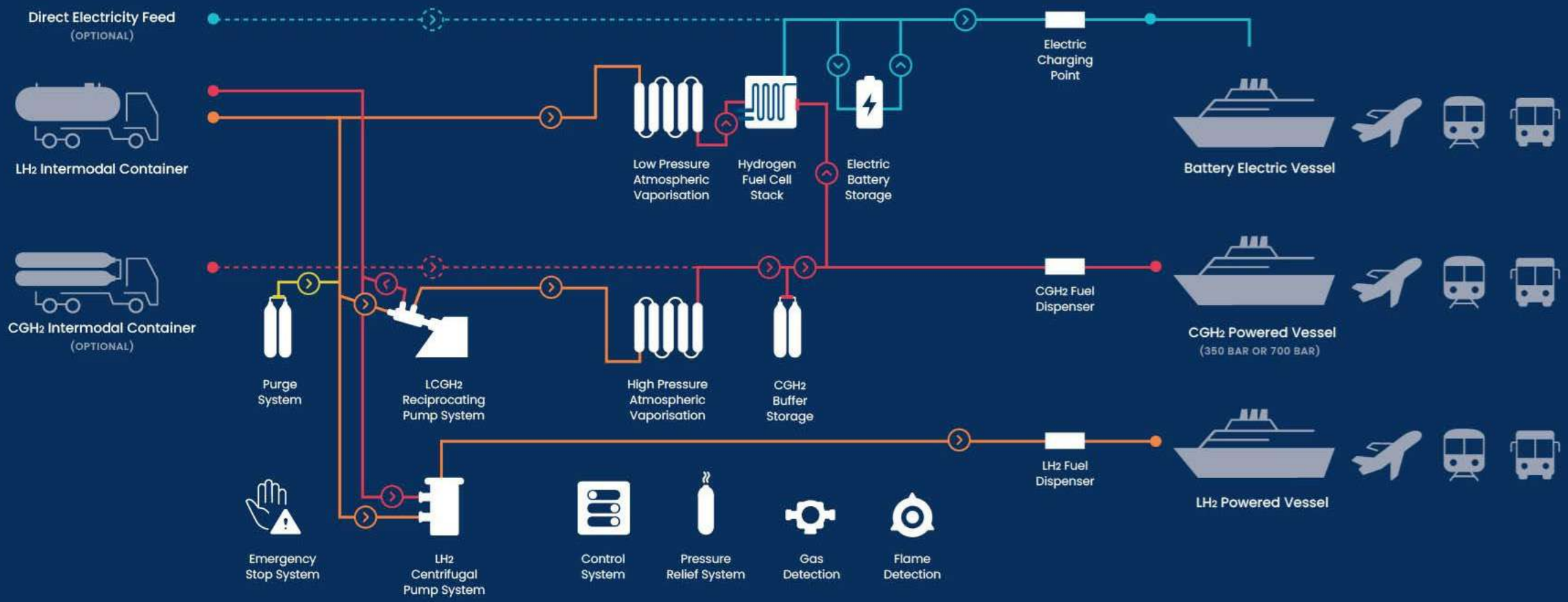
Compressed gaseous hydrogen (CGH_2) vessel

Battery electric vessel (BEV)

Liquid hydrogen (LH_2) vessel

Zero-Emission Multi-Fuel Station (ZEMFS)

Liquid Hydrogen (LH_2) | Compressed Gaseous Hydrogen (CGH_2) | Electricity



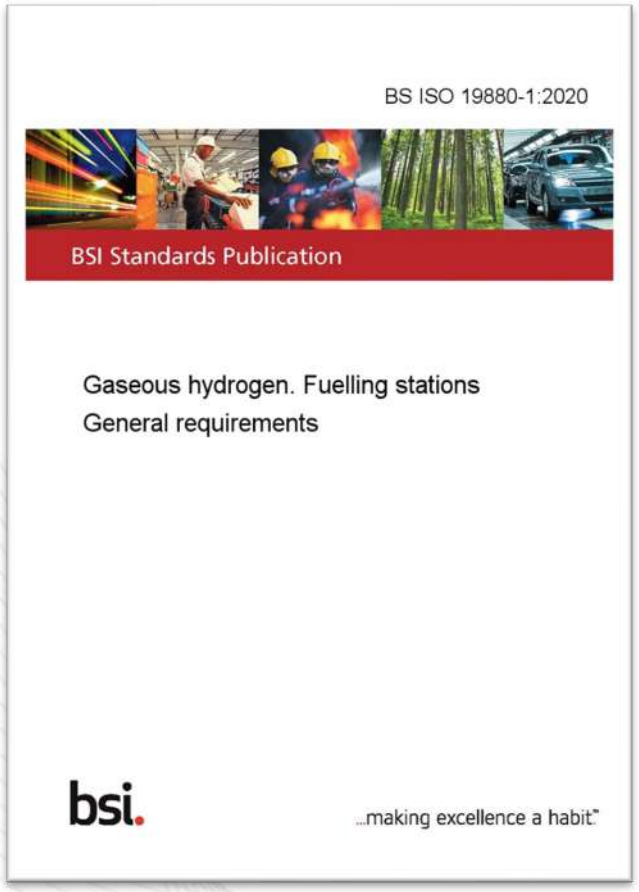
PORT OF TYNE

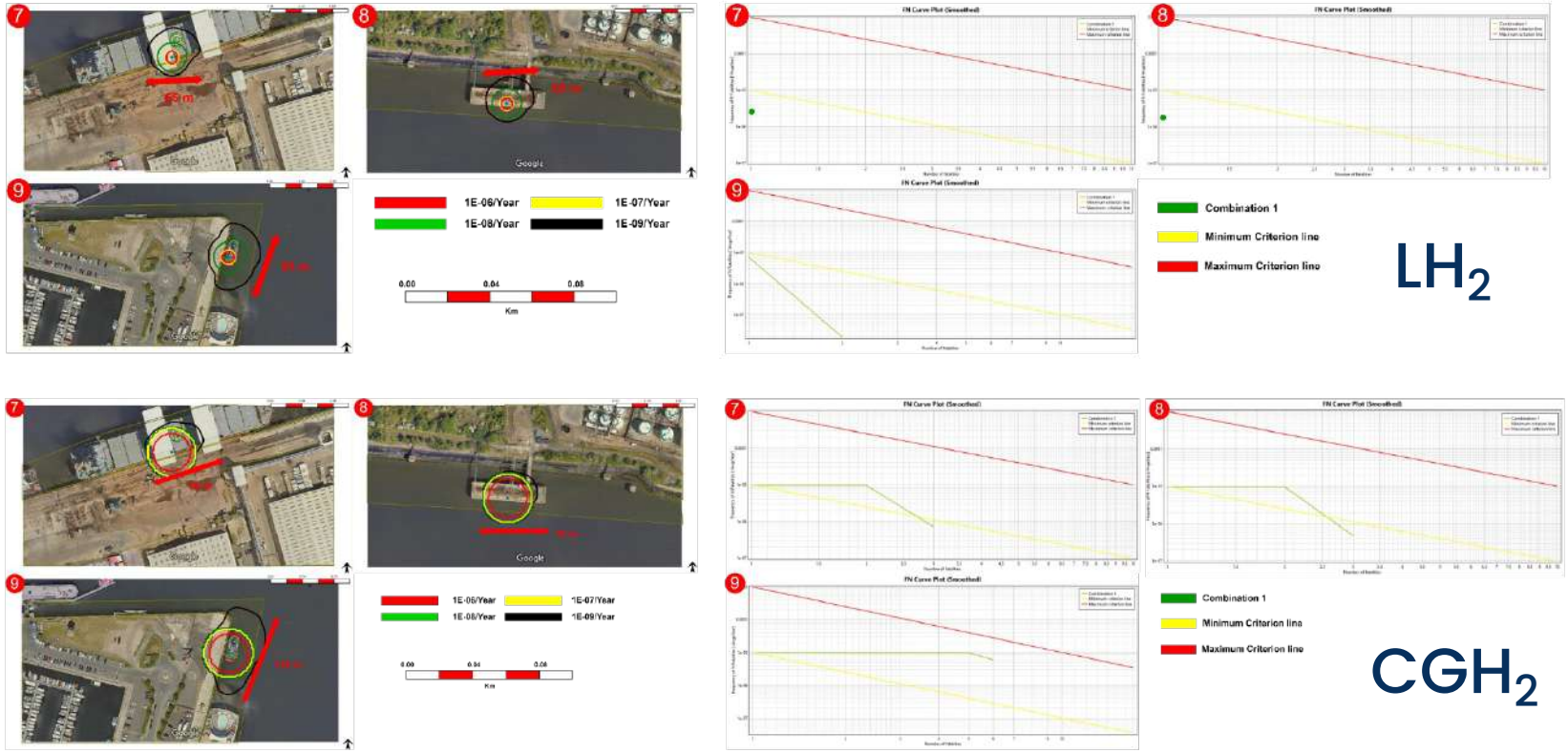
2025

World's First Zero-Emission Multi-Fuel Station (ZEMFS)

Clean Maritime Demonstration Competition: Round 4 - Proposal

Safety and Regulations





Training and Visualisation

Virtual reality (VR)
Augmented reality (AR)
Mixed reality (MR)

UNITROVE

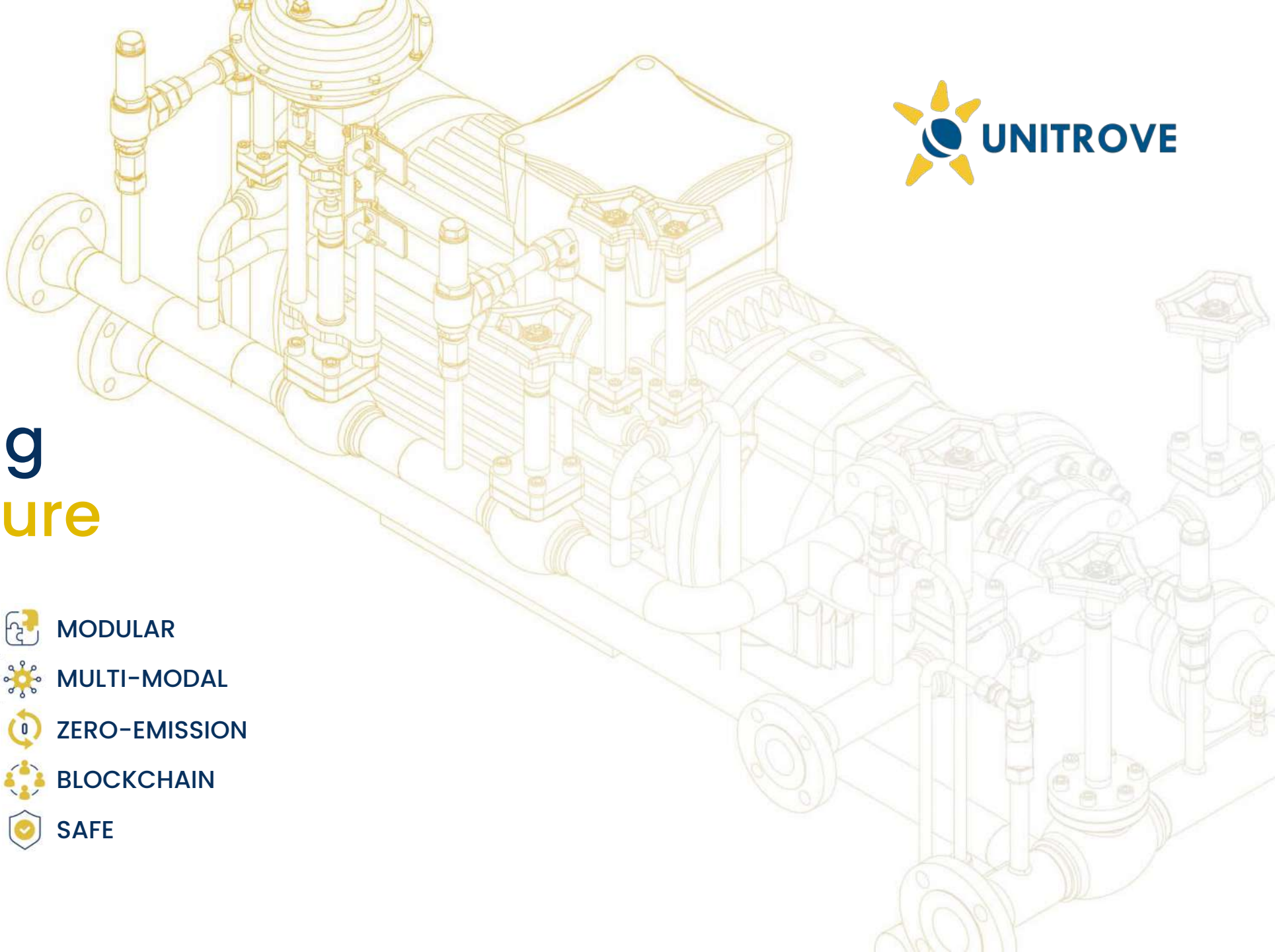
Kickstart solution to the Shipowners' Challenges

0

ZERO-EMISSION

Multi-Fuelling Infrastructure as-a-Service

UNITROVE



Reinventing Infrastructure

- PORTABLE
- TINY FOOTPRINT
- LOW POWER
- INTELLIGENT
- AUTONOMOUS
- MODULAR
- MULTI-MODAL
- ZERO-EMISSION
- BLOCKCHAIN
- SAFE

Holistic approach to sustainability is a must

By embracing the UN Sustainable Development Goals (SDGs) as a complete framework, this helps us to contribute towards all goals collectively without compromise.

UNITROVE

Thank You

Steven Lua, CEO

E steven.lua@unitrove.com
T +44 7792 989420