Wind Assisted Ship Propulision "WASP"

WASP is co-funded by the North Sea Region Programme 2014-2020
Total budget € 5.393.222 - ERDF contribution 2.613.458 €
Priority 2: Eco-innovation: Stimulating the green economy

https://northsearegion.eu/wasp

Partners


Interreg
North Sea Region
WASP
European Regional Development Fund
EUROPEAN UNION
wasp
Wind Assisted Ship Propulsion


GREEN TRANSITION
DENMARK


NETHERLANDS
MARITIME
TECHNOLOGY


KLU
KÜHNE LOGISTICS UNIVERSITY


BOOMSMA


SSPA
Your Maritime
Solution Partner


NORD
University


IWSA
International Windship Association


Scandlines


CHALMERS
UNIVERSITY OF TECHNOLOGY

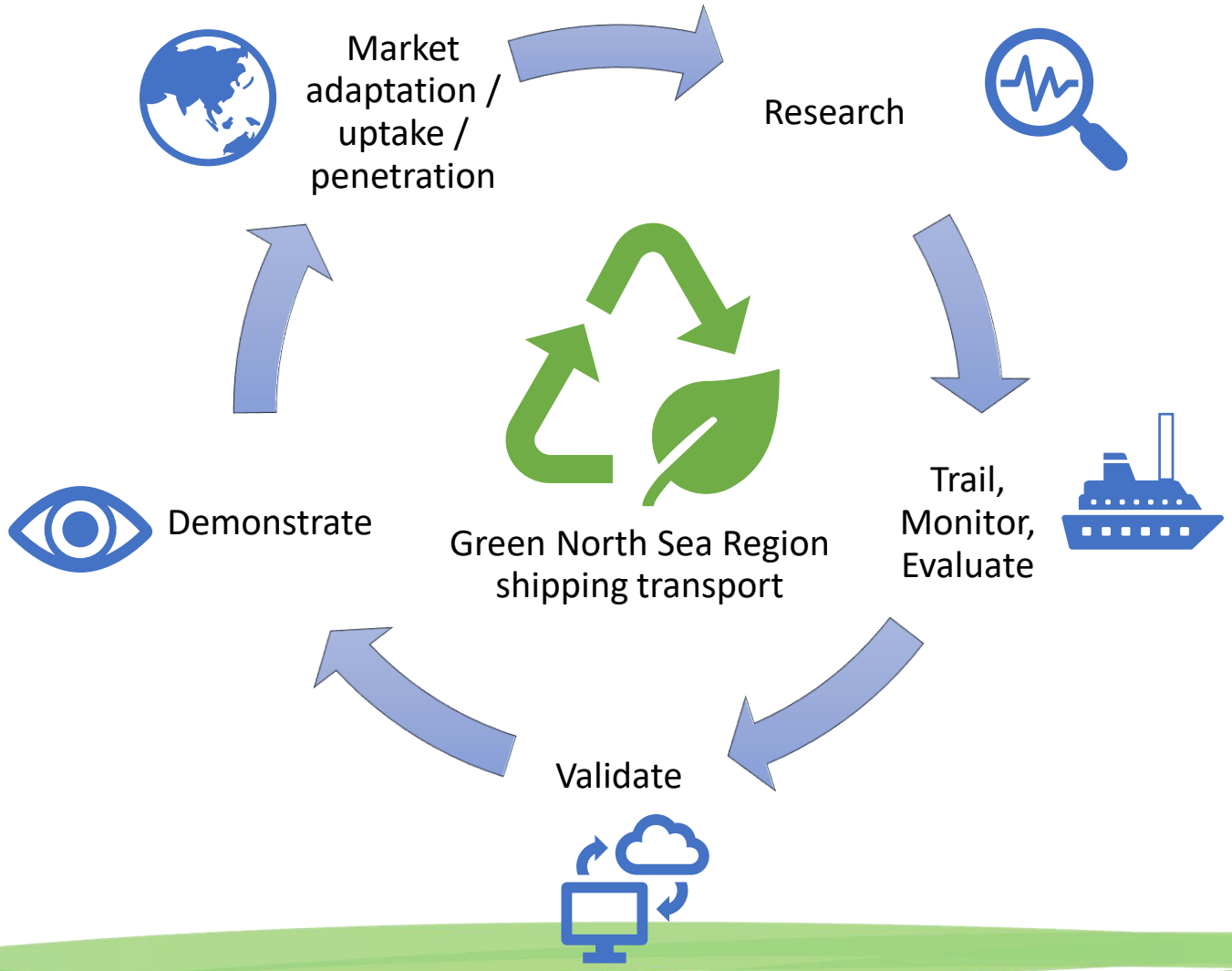

Scheepvaartbedrijf van Dam


KU LEUVEN


B


HHX
.blue

Project cycle



Interreg North Sea Region WASP
European Regional Development Fund
EUROPEAN UNION
wasp Wind Assisted Ship Propulsion

Scheepvaartbedrijf van Dam
2 Ventifoils (Econowind)

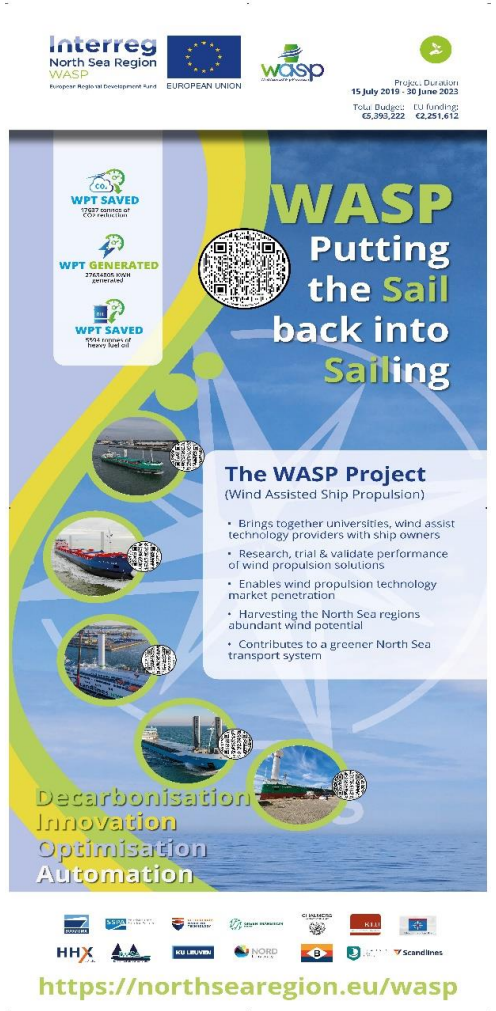
BOOMSMA
2 Flatrack Ventifoils (Econowind)

Scandlines
Flettner rotor (Norsepower)

Flettner (Eco flettner)

Twin wing (Econowind)

Project key objectives

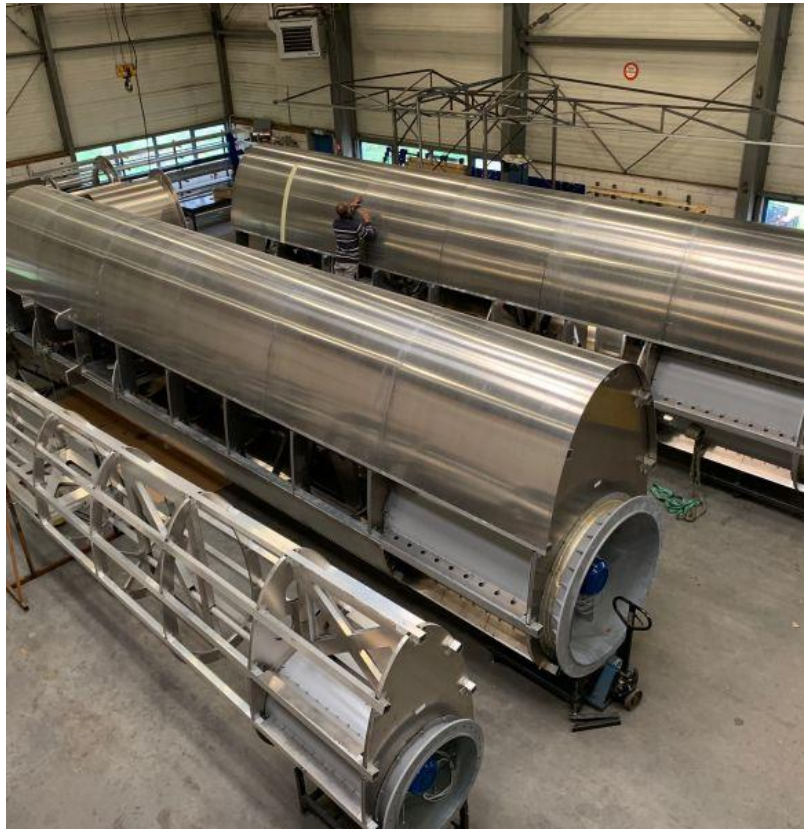


- **Primary objective**: Research, Trial and Validate the operational performance of a selection of wind propulsion solutions on five vessels operating in the North Sea region.
- **Installations**: Five systems successfully installed and in operation. Engineering, installation procedures, port operations, maintenance and training aspects are all being carefully assessed.
- **Monitoring & Evaluation**: All of the systems are being monitored by an expert evaluation team. Sea trials are being conducted and a digital twin is under development.
- **Performance:** Verification of the average annual savings on fuel are underway, but these are expected to be up to 10%, without adjusting the motor vessel operational profile.
- **Business Case Evaluation:** A broad evaluation of the current state of the industry has been completed. Comprehensive model on wind propulsion innovation uptake & and more detailed analysis of each business case is now underway.

Ships and installations

Ship owner	**Van Dam Shipping**	**Boomsma Shipping**	**Scandlines Gedser-Rostock**	**Shipping company Rörd Braren**	**Tharsis Sea-River Shipping**
Country	The Netherlands	The Netherlands	Denmark	Germany	The Netherlands
Vessel	Ankie	Frisian Sea	Copenhagen	Annika Braren	Tharsis
Ship type	General cargo DWT 3638 t	General cargo DWT 6446 t	RoPax DWT 5000 t	Minibulker DWT 5035 t	General cargo DWT 2300 t
Wind Propulsion Technology (WPT)	2 retrofit front-placed suction wing of 16 meter.	2 Flatrack suction wings of 11m	Flettner rotor	Flettner rotor	2 flexible wings
WPT Provider	Econowind	Econowind	Norsepower	ECO Flettner	Econowind
WPT installation	March 2020	November 2020	September 2020	October 2020	Q1 2021
Trials planned	Q1 2021	Q1 2021	Q4 2020	2021	2021

MV Ankie

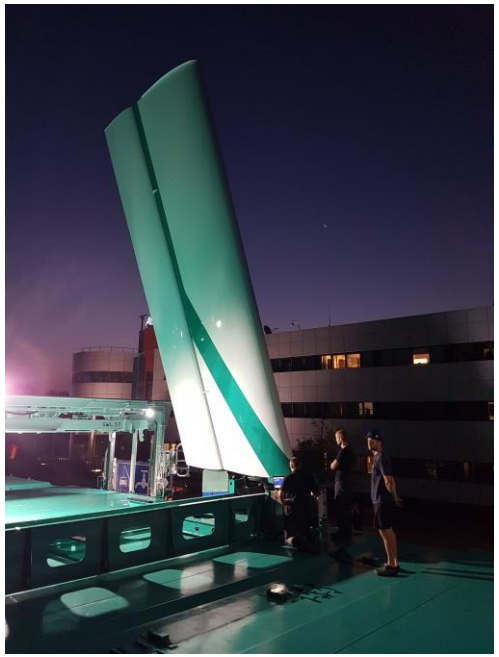


MV Copenhagen

MV Annika Braren

MV Frisian Sea

MV Tharsis



Sea Trial Procedures & Preliminary Results

Type A
Short trial with the device on and off

Type B
Random periods of device on or off during normal operation

Type C
Comparing longer periods before and after installation

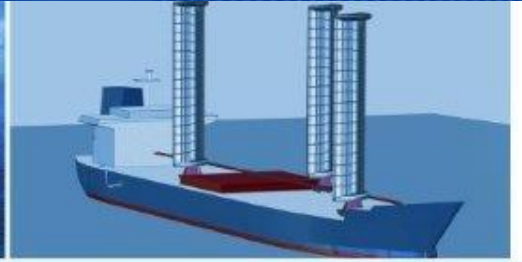
Type D
Sister ship comparison

- Sea Trials: Completed for Four Vessels – MV Tharsis partially completed Q1 2022 *(Covid delay)*
- Preliminary Results: Aligning with expectations – in fuel savings = up to 10% – procedure & route dependent results (thrust generation analysis, normalisation/comparative studies underway)

Thank you for your attention!

https://northsearegion.eu/wasp





IWSA
International Windship Association

Decade of Wind Propulsion 2021-2030



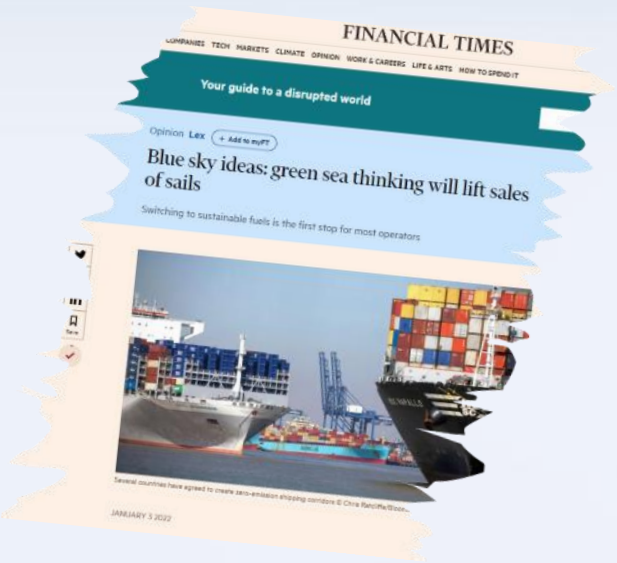

Delivery | Optimisation | Facilitation

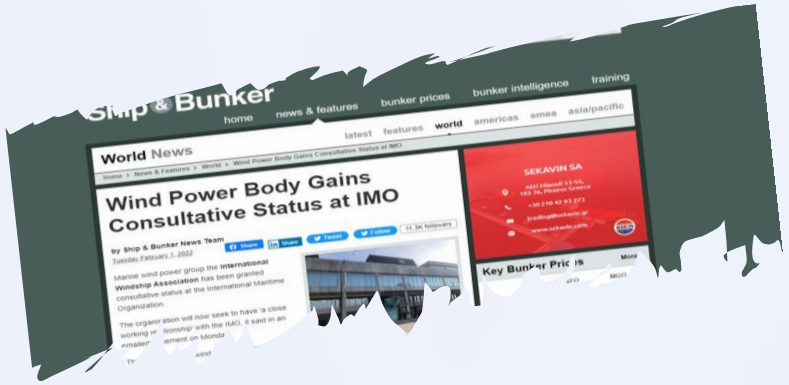
www.decadeofwindpropulsion.org





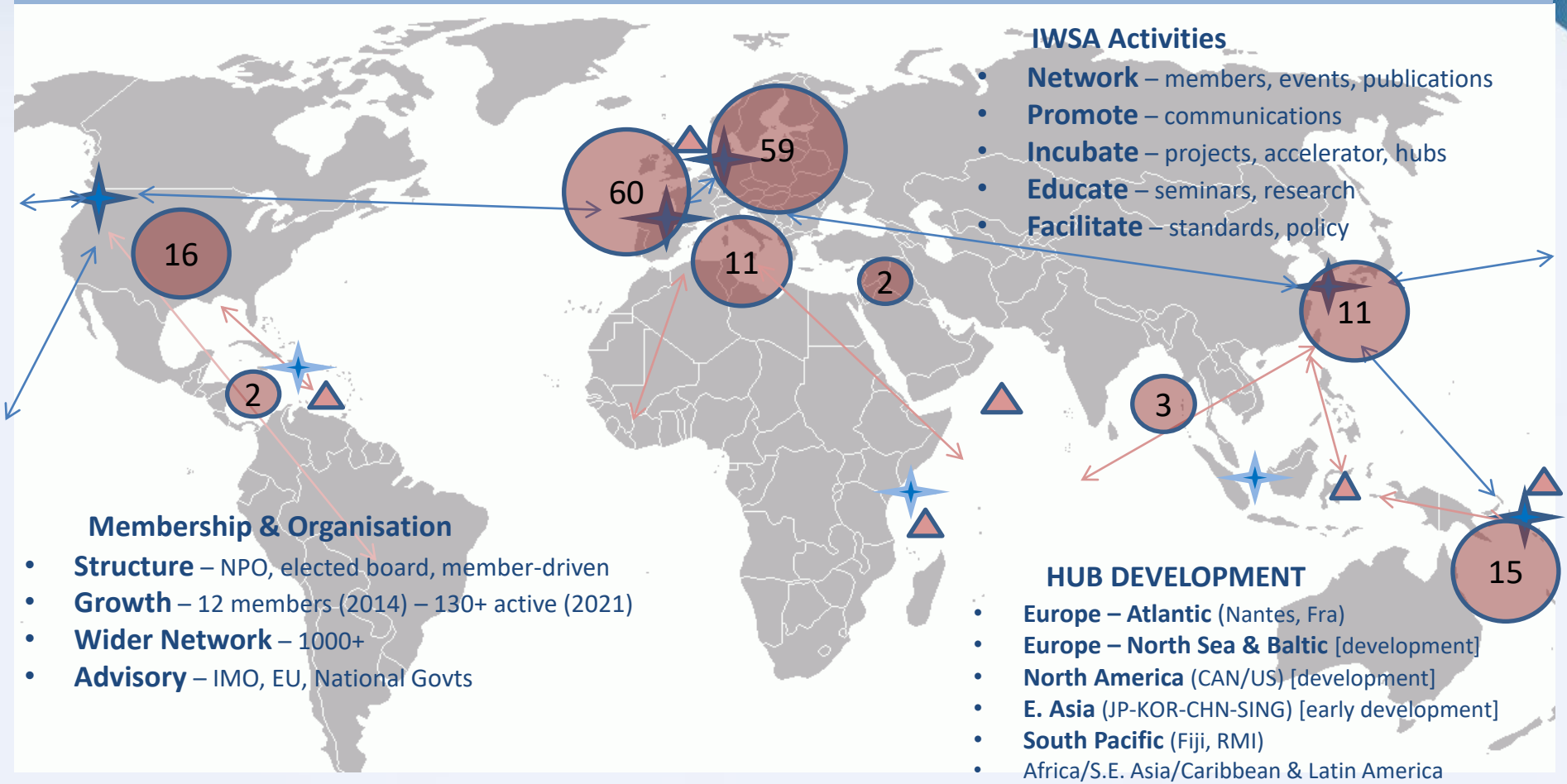
Wind Propulsion Momentum…





International Windship Association Network

A unique, fast growing tech segment: significant decarbonisation & operational cost reduction potential



IWSA Activities

- **Network** – members, events, publications
- **Promote** – communications
- **Incubate** – projects, accelerator, hubs
- **Educate** – seminars, research
- **Facilitate** – standards, policy

Membership & Organisation

- **Structure** – NPO, elected board, member-driven
- **Growth** – 12 members (2014) – 130+ active (2021)
- **Wider Network** – 1000+
- **Advisory** – IMO, EU, National Govts

HUB DEVELOPMENT

- **Europe – Atlantic** (Nantes, Fra)
- **Europe – North Sea & Baltic** [development]
- **North America** (CAN/US) [development]
- **E. Asia** (JP-KOR-CHN-SING) [early development]
- **South Pacific** (Fiji, RMI)
- Africa/S.E. Asia/Caribbean & Latin America

Wind Propulsion Hubs
Additional WP Hubs (proposed)
2 IWSA Members
Traditional Sail Cargo Networks

IWSA International Windship Association

Direct Application of Wind Power

Wind Energy

Zero - **Emissions**
Zero - **Cost**
Zero - **Volatility**
Zero - **Infrastructure**
Zero - **Storage**

Wind Propulsion Technology

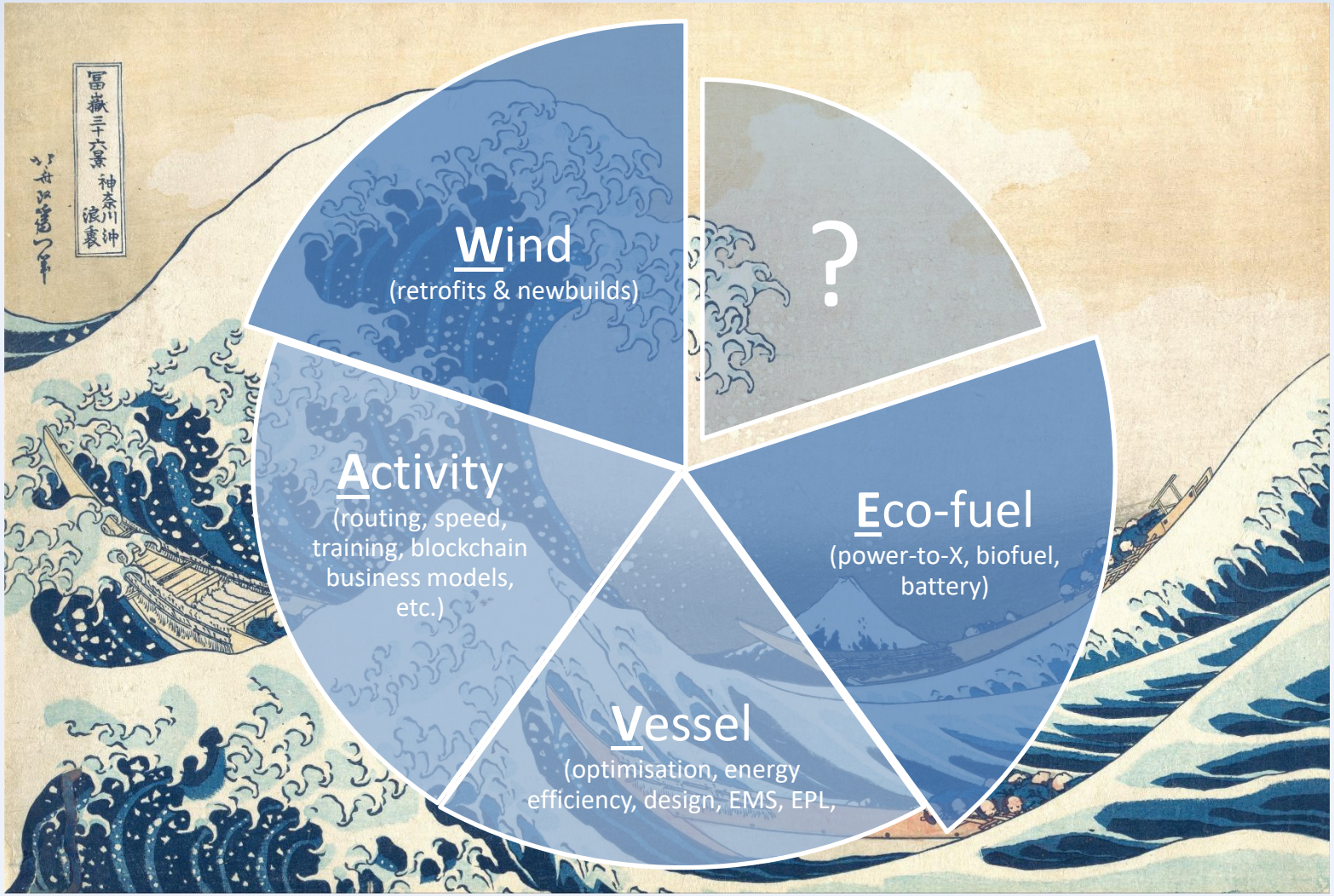
Zero - **Development Time**
Zero - **Compatibility Issues**
Zero - **Additional Crew**
Zero - **CAPEX?**

RETROFIT
5-20% propulsive energy
& optimised up to 30%

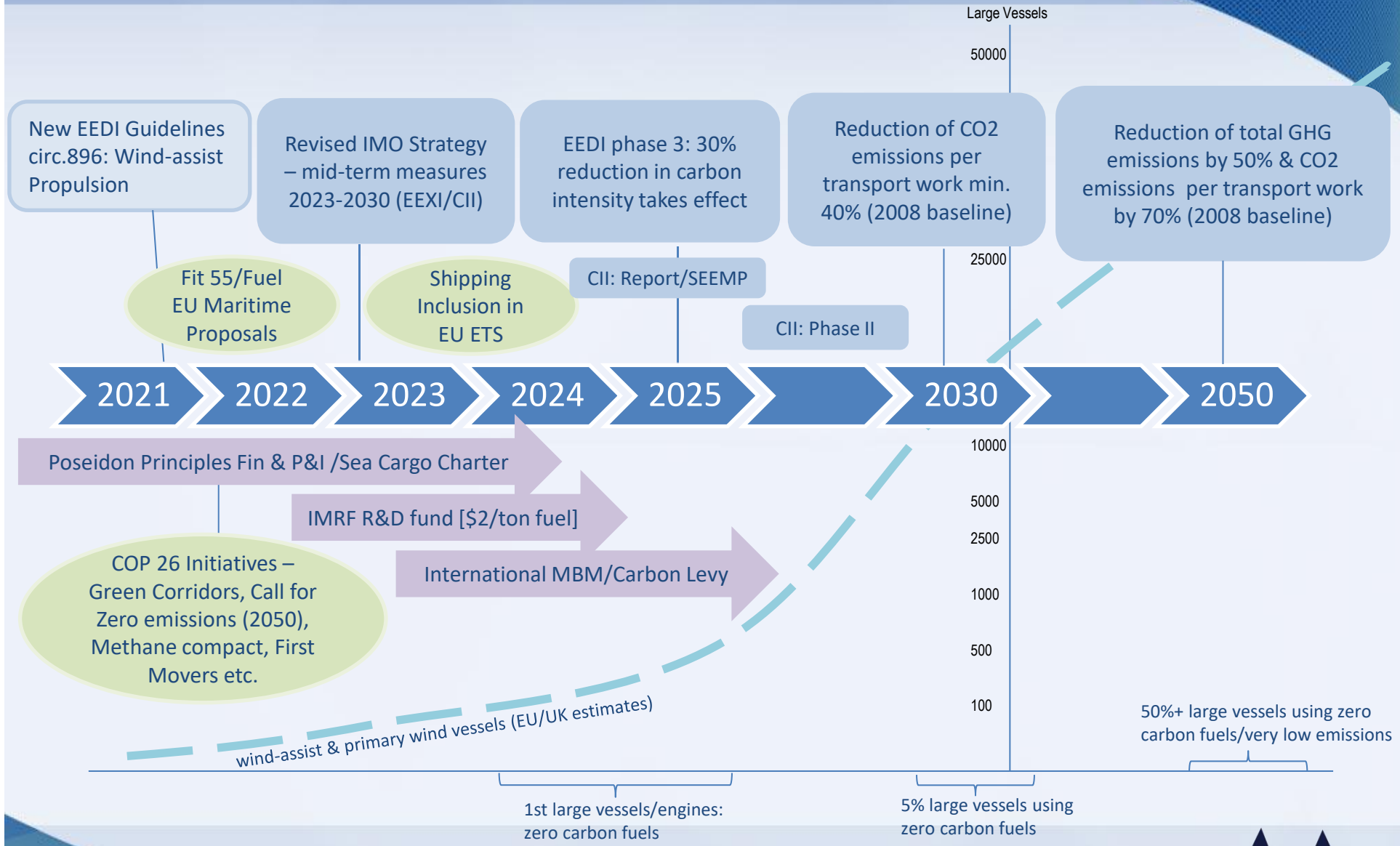
OPTIMISED NEWBUILD
50-80%+ possible with
operational changes

Win-Win-Wind Situation

Hybrid W.A.V.E.


Wind
(retrofits & newbuilds)
?
Activity
(routing, speed, training, blockchain business models, etc.)
Eco-fuel
(power-to-X, biofuel, battery)
Vessel
(optimisation, energy efficiency, design, EMS, EPL,

Policy Pipeline & Wind Propulsion



IWSA International Windship Association

Large Vessel Installations Today…

19 Ocean Going Vessels with Wind-Assist Systems installed by Q2 2022

& 1 Wind-ready + more than 20 small sail cargo, fisheries & cruise vessels in operation










Ship Types
Tankers x 2 (1 x pending newbuild + 2 order) 1 x VLCC, 1 x LR2 Tanker
Bulkers x 2 (+1) (8 x pending + 3 order) 1 x VLOC, 1 x Ultramax 1 x Kamsarmax (wind ready)
RoRo x 4 (2 x pending + 1 new build)
Ferry/Cruise x 3
General Cargo x 7 (3 x pending) Various sizes: 2–12,000dwt
Large Fishing Vessel x 1

NOTE: *More large WPT vessels in operation than all new alternative fuelled ships combined (excluding tankers & LNG/LPG)*





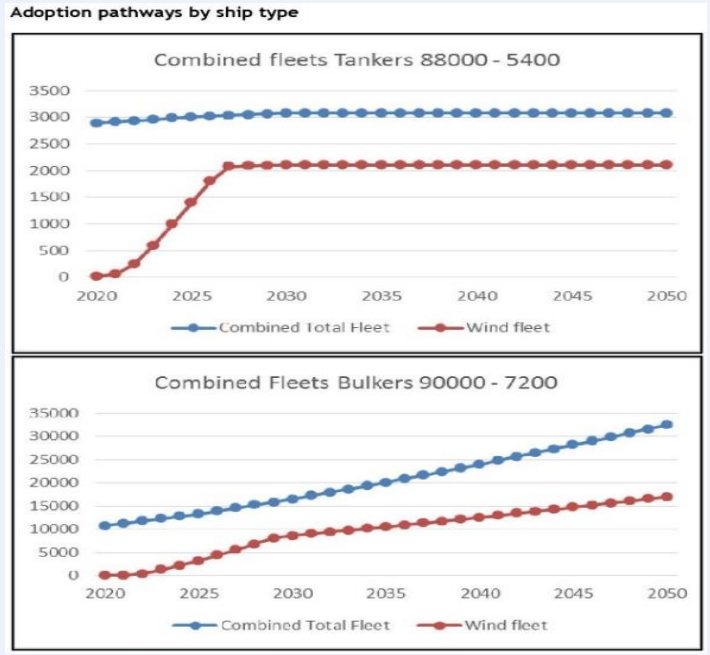





Market Forecasts & Pipeline Status

By 2023: **Existing Pipeline** – 40+ retrofit & newbuild vessels sea trialling & commercial operations
Robust R&D Pipeline: 30+ Additional technologies & projects under development worldwide

2030

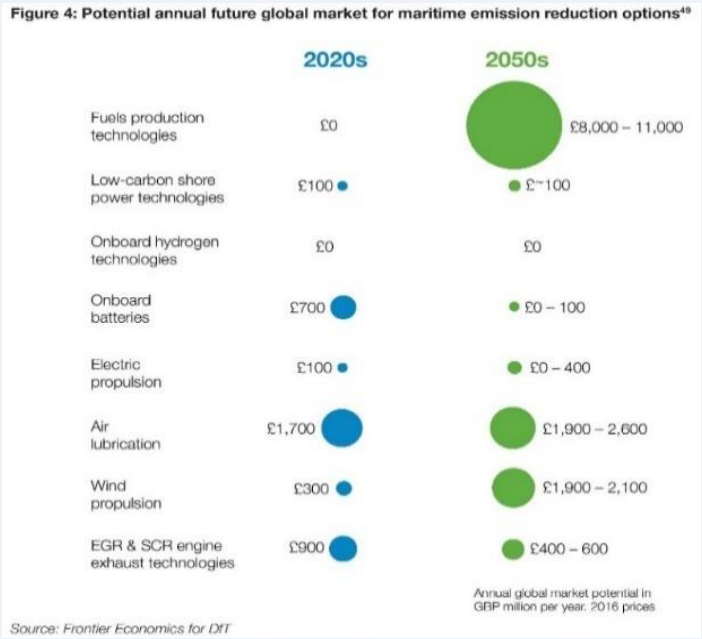


EU Report: Market potential for bulk carriers, tankers & container vessels = ***3,700-10,700 installed systems***

Current Combined Bulker Fleet: total c.12,300

2050s

UK Government: **37,000 – 40,000 vessels** with wind systems installed (**40-45% of the global fleet)**

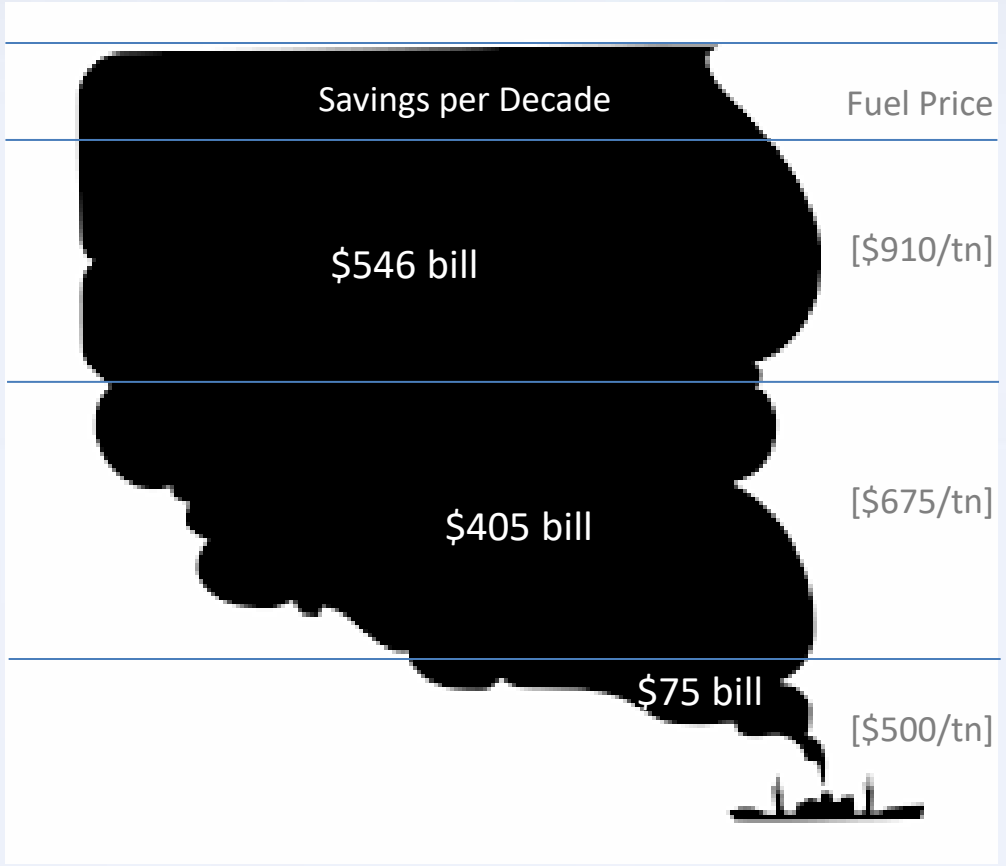


Drivers, Barriers & Solutions

	Drivers	Barriers	Solutions
Policy	IMO GHG strategy – EEDI/EEXI/CII Speed/Power restrictions Fit 55/National Maritime Pathways Paris + IPCC 1.5C report	Efficiency vs Resilience COLREGS, Charter terms Inclusion in Decarbonisation Reports, Silo'ed approach etc.	Market analysis & reports – WASP & IWSA WiSP – EEDI/EEXI circ .896, 3rd party IWSA – engagement
Price	Upward pressure - LNG Uncertainties – price/avail. Carbon Price increase/EU ETS High price/avail. - low carbon fuels	Split incentive Difficulty in adopting global CO2 pricing + LCA Commodity vs Saving	Ringfenced Carbon levy Lease/Rental/Module Pay-as-you-save models
Providers	Increasing number/Robust pipeline Toolbox – Horses4Courses Hybrid approach + Class	R&D finance Long lead times/compliance: SMEs Scaling & Scattershot Strategy	Demonstrators – WASP Wind Hubs/Clusters Accelerator program 3rd Party platforms & Class
People	New Boardroom Pressure = B2B + C2B Collaborative approach	Not uniform Risk management Lack of Edu/training resources	Multi-stakeholder projects Education program Access to experts/network
Perception	Clear Change Credible, Viable, Profitable Positive Environmental Statement	Old/Unreliable - persists Not-fuel based + visibility Report/Policy exclusion	Demonstrate tech widely Transparency – news, savings, reports etc.

The Shipping Decarbonisation Challenge….

Could Wind Propulsion Fund the Decarbonisation Transition of the Fleet?



- *Static fleet size*: 60,000
- *Fuel:* 300mill tn/yr
- *CO2*: 1bill tn/yr
- *Price*: $500/tn (VLSFO/04 May 21)
- *Increase*: 35%/decade from 2030s
- *Wind*: 20% (inc. operation change)

NOTE: No IRR/Currency rates etc included

UMAS/ETC Report
IMO2050 (50%) = $1trill
100% Decarbonisation = $1.4-$1.9 trill

[$1.4 trill = 23 mill per ship]

WPT cost = $5 mill/ship = **$300bill**
+ Reduce total cost by 10-20%

$300 bill invested (2020s+) = **$1trillion**+ savings by 2050 + lowers total cost to **$1.1-1.7 trillion**

Win-Win-Wind Propulsion….

www.wind-ship.org

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