– Wind Propulsion –
Meeting the Decarbonisation Challenge

IWSA
International Windship Association

Ambitious Decarbonisation Targets

1.5°C

"All ships built today must operate in a net zero emissions world at the end of their service life."

"Carbon budget expended by 2030 if we continue 'Business-as-Usual' approach."

IWSA
International Windship Association

What Wind Power Delivers…

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?**

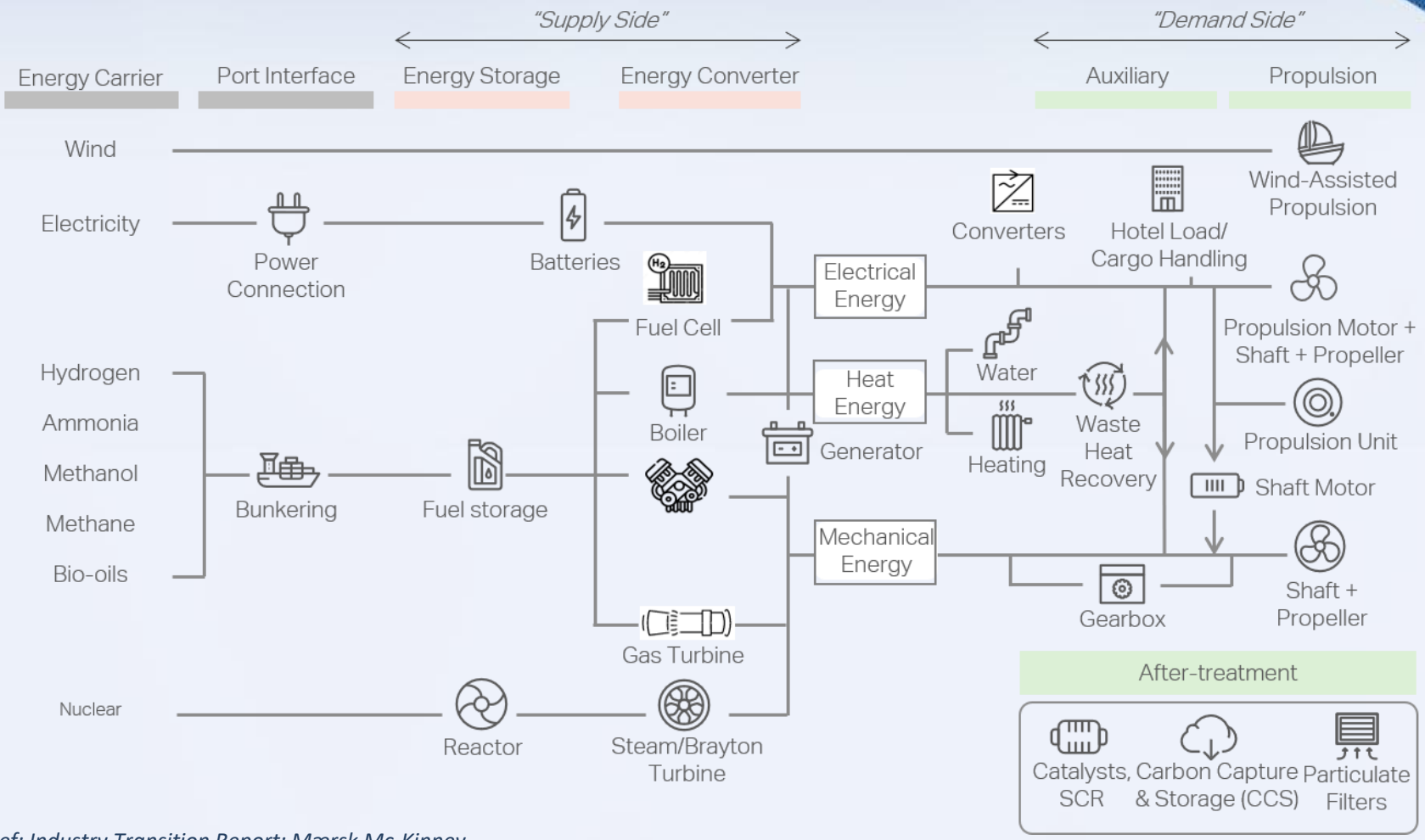
RETROFIT
5-20% propulsive energy
& optimised up to 30%

OPTIMISED NEWBUILD
50-80%+ possible with
operational changes

Win-Win-Wind Situation

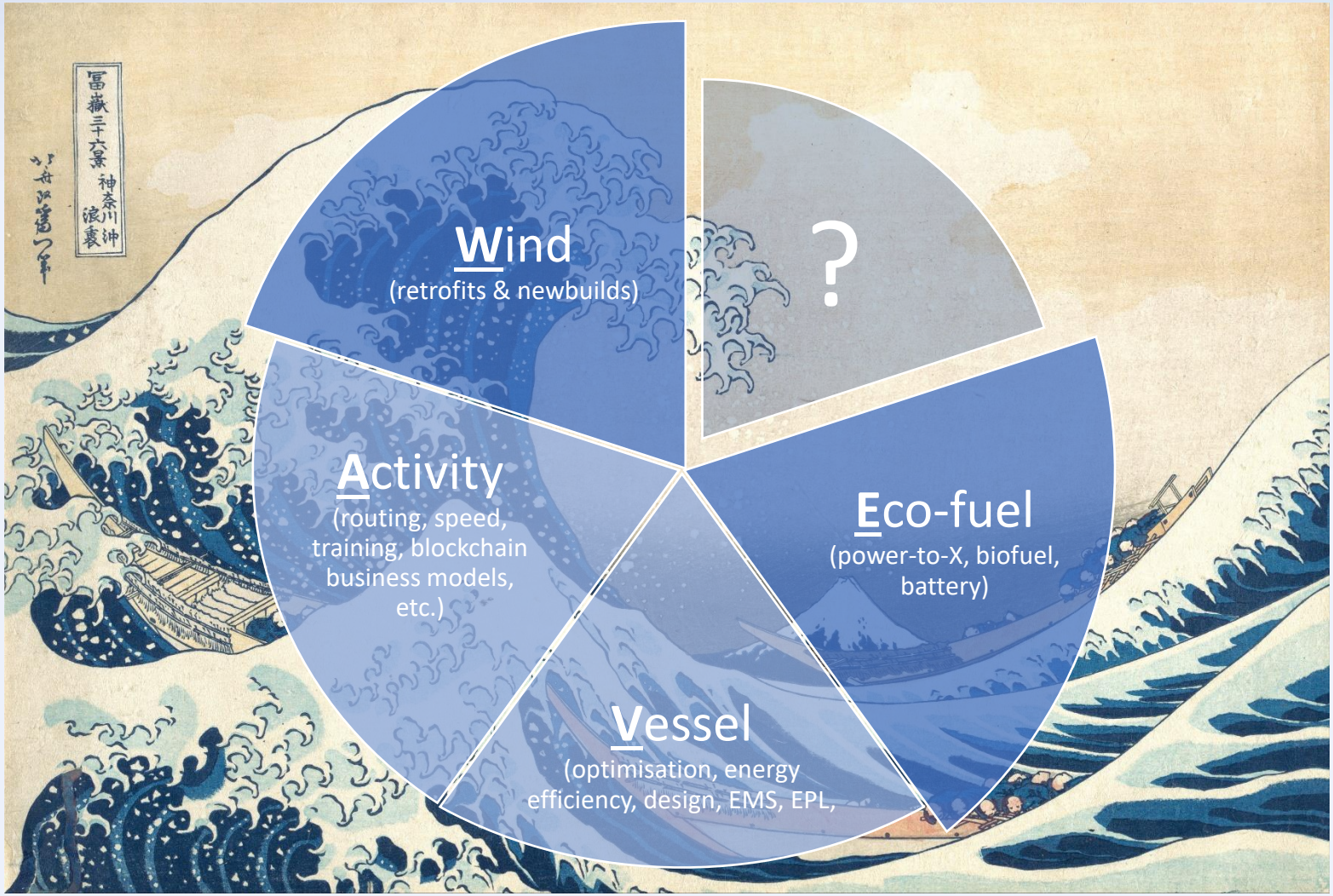
IWSA International Windship Association

Wind as a Primary Energy Propulsion Provider



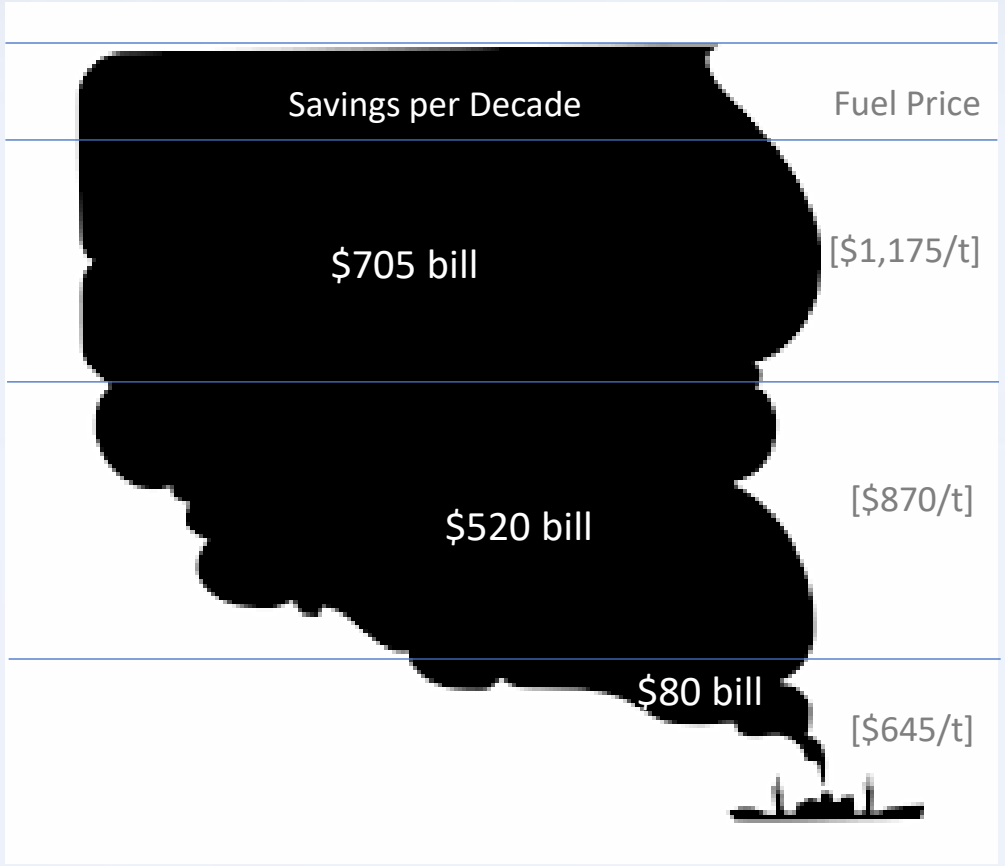
Ref: Industry Transition Report: Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping (2021)

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,

The Shipping Decarbonisation Challenge….

Could Wind Propulsion Fund the Decarbonisation Transition of the Fleet?



UMAS/ETC Report

IMO2050 (50%) = $1-1.4 trill

100% Decarbonisation = $1.4-$1.9 trill

[$1.4 trill = $20+mill per ship]

Ref: UMAS/ETC Report (2020)

Full Wind Propulsion Roll Out in 2020s.

Installation costs = $200-300 bill

+ Reduce total cost by 10-20%

[$200-300 bill = <$5 mill per ship]

- *Static fleet size*: 60,000
- *Fuel:* $300 mill t/yr / *CO2*: 1bill t/yr
- *Price*: $645/t (VLSFO Global Av./02 May'23)
- *Increase*: 35%/decade from 2030s
- *Wind*: 20% power delivery (inc. some operational changes)

NOTE: No IRR/Currency rates etc included

$1.3 trillion+ savings by 2050 (+ lowers total cost to $1.1-1.7 trill)

IWSA International Windship Association

Large Vessel Installations Today…

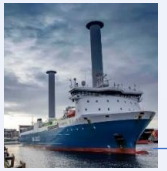
24 Ocean Going Vessels with Wind-Assist Systems installed by May 2022

& 9 x Wind-ready + more than 20 small sail cargo, fisheries & cruise vessels in operation















Ship Types
Tankers x 3 (+6) (5 x order) 2 x VLCC, 1 x LR2 Tanker (+ 6 wind ready)
Bulkers x 4 (+2) (5 x pending + 7 order) 1 x VLOC, 1 x Capesize, 1 x Ultramax, 1 x Kamsarmax (+2 wind ready)
RoRo x 6 (+1) (2 x pending + 1 order) (+ 1 wind ready)
Ferry/Cruise x 3
General Cargo x 7 (4 x pending + 3 order) 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)*









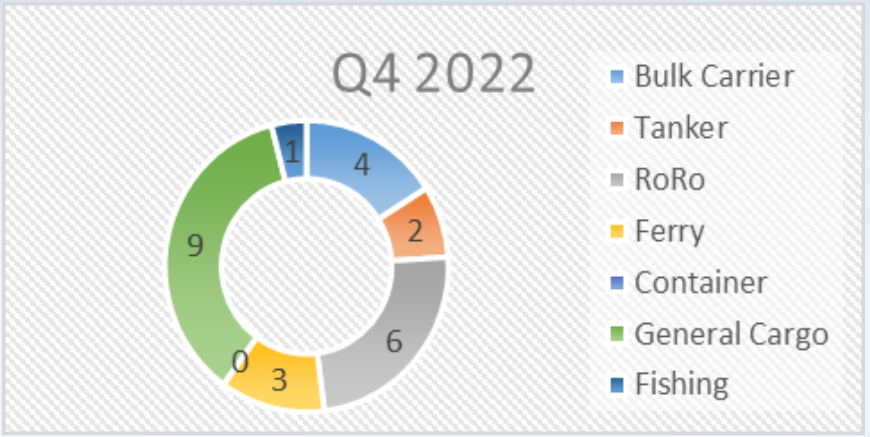



Wind Propulsion: Meeting the Decarbonisation Challenge

SeaFuture | 07 June 2023

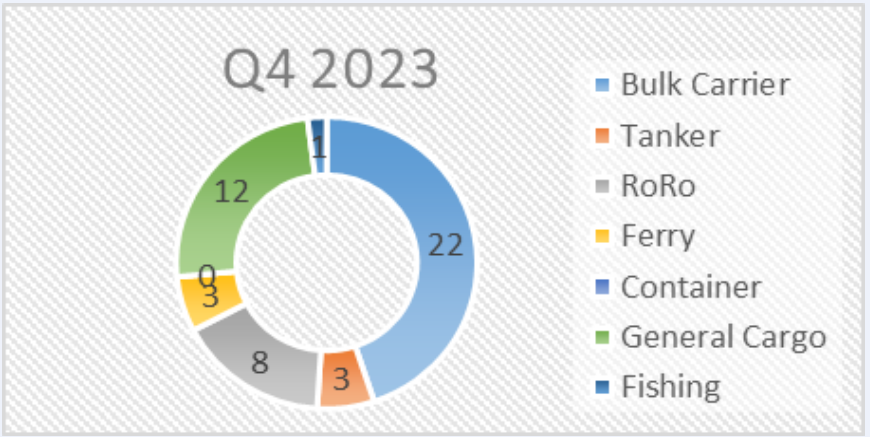
IWSA International Windship Association

Market Development – 400GT+



24 vessels installed
+ 3 wind-ready

1.5 million dwt



49 vessels installed
+ 7 wind-ready

3.3 million dwt

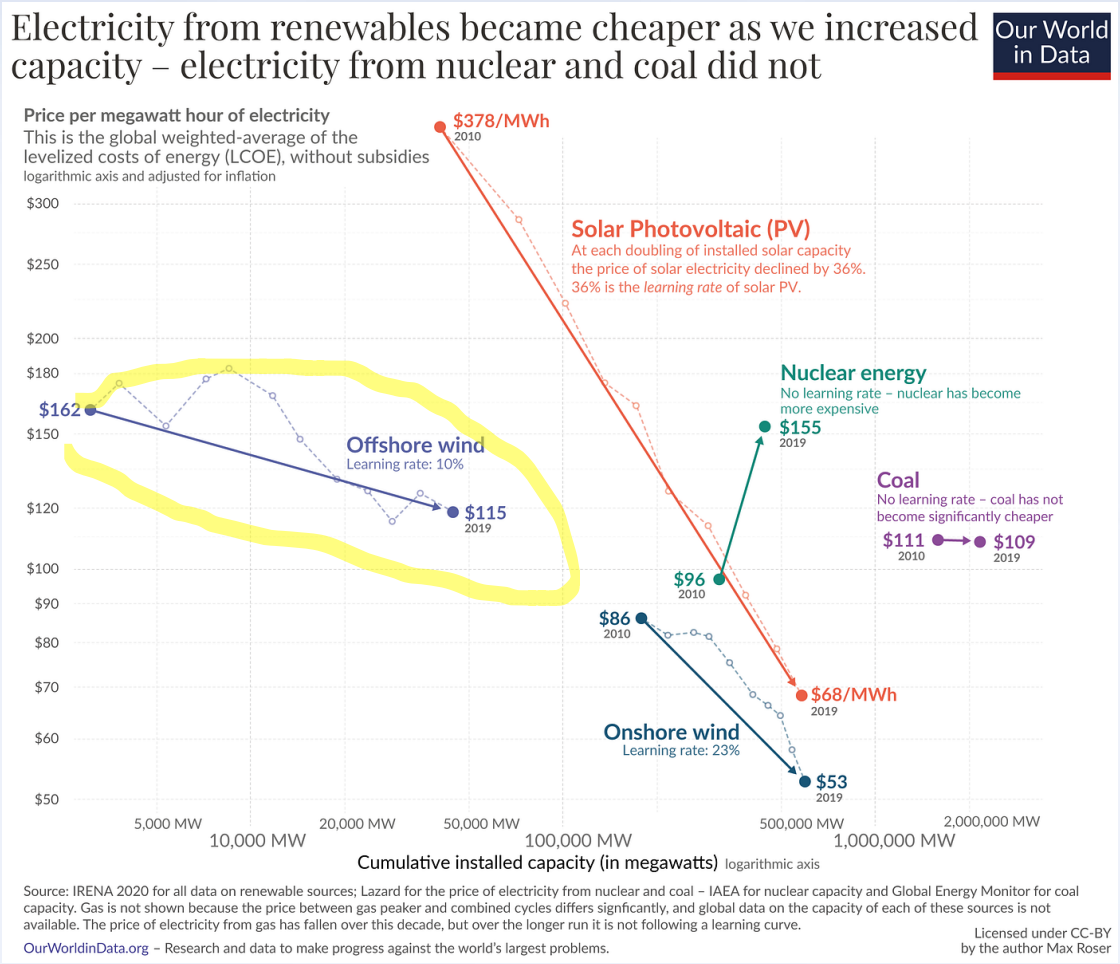
Large WPT installations by Fleet Category 2022-23

[additional 20+ traditionally rigged cruise and small cargo vessels & sizeable number of small indigenous sailing vessels worldwide.]

Ref: MEPC79/INF.21

IWSA International Windship Association

Wind Propulsion: Learning Curve

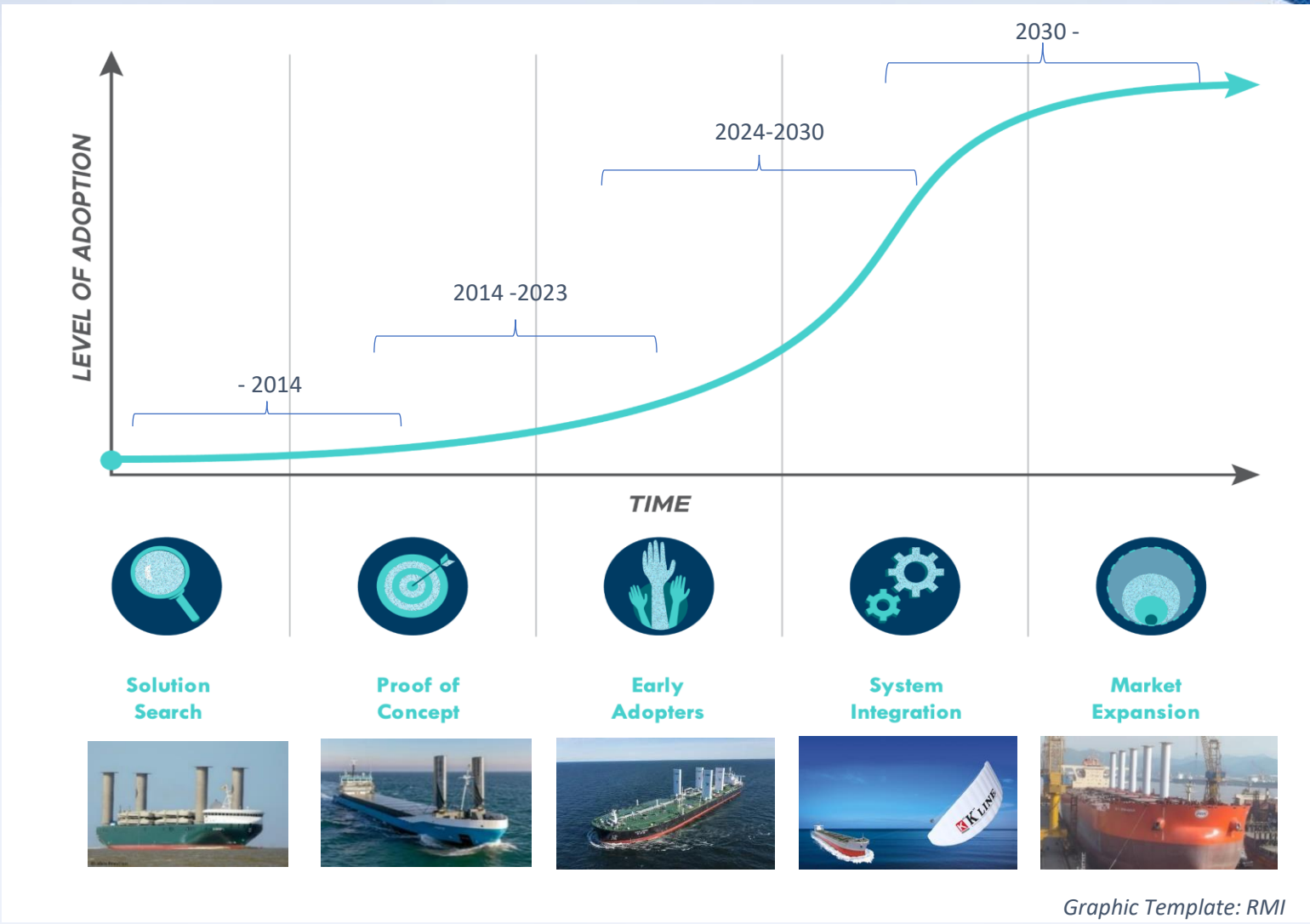


- Est. 10% reduction in cost each time installations double.
  (Ref: CEDelft report 2016)

✓ Economies of scale
✓ System optimisation/integration
✓ Improved materials
✓ Installation techniques
✓ Relocate production etc.

- Similar trajectory to Offshore Wind – largest savings in early deployment phases ('S-Curve').

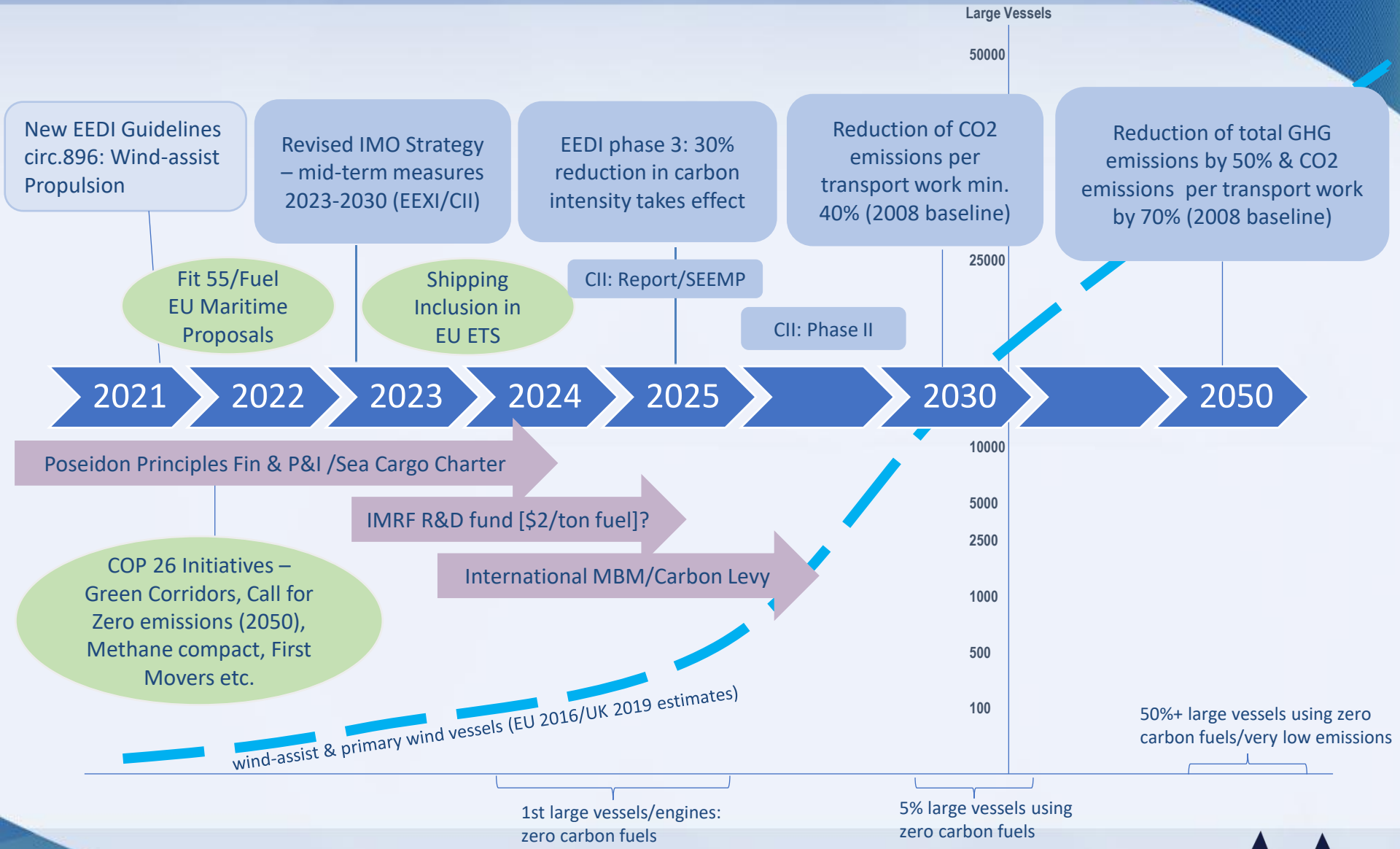
Wind Propulsion: Innovation Curve



Graphic Template: RMI

IWSA International Windship Association

Policy Pipeline & Wind Propulsion



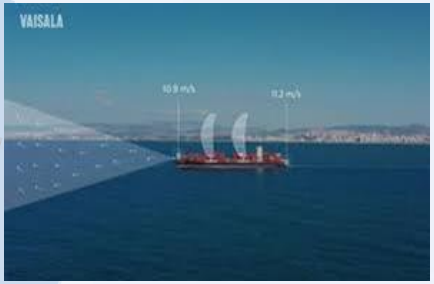
IWSA
International Windship Association

Wind Propulsion: Trends

Retractable/Mobile

Wind-Routing

Primary Wind



Optimisation

Energy Harvesting

Modular/Containerised

Wind-Ready

Scaling Production

IWSA
International Windship Association

Win-Win-Wind Propulsion….

www.wind-ship.org

Gavin Allwright
secretary@wind-ship.org

IWSA International Windship Association