Decade of Wind Propulsion
2021-2030
Delivery | Optimisation | Facilitation

www.decadeofwindpropulsion.org

International Windship Association
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“All ships designed and built today must operate in a net zero emissions world at the end of their service life”

Source: International Council on Clean Transport (ICCT), Oct 2020
Direct Application of Wind Power

- Pure Zero-Emissions Energy Source
- Abundant & Available Worldwide Today
- Free & Delivered to the Point of Use
- No New Infrastructure or Onboard Storage
- Harvesting Technology Available Now
- Compatible with All Fuels
- Facilitates Secondary Renewable Fuels
- Uniquely Available to Shipping
- Shift from CAPEX to OPEX possible

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

OPTIMISED NEWBUILD
50-80%+ possible with operational changes

Wind Propulsion, Key Driver for Shipping Decarbonisation
Decarbonise Shipping by 2050 - 06 Jul 2021
## Hybrid W.A.V.E.

<table>
<thead>
<tr>
<th><strong>WIND</strong></th>
<th>+</th>
<th><strong>ACTIVITY</strong></th>
<th>+</th>
<th><strong>VESSEL</strong></th>
<th>+</th>
<th><strong>ECO-FUELS</strong></th>
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<tbody>
<tr>
<td>Wind – assist or Primary wind power (Primary Renewable)</td>
<td></td>
<td>Operational optimisation</td>
<td></td>
<td>Vessel optimisation</td>
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<td>Renewable energy or waste-derived fuels (Secondary Renewables)</td>
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<tr>
<td>-retrofit wind-assist (5-20% savings – possible up to 30%)</td>
<td></td>
<td>-voyage &amp; fleet management</td>
<td>-design</td>
<td></td>
<td>-2nd gen biofuels</td>
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<tr>
<td>-newbuild primary wind 50%++</td>
<td></td>
<td>-weather routing</td>
<td>-size &amp; capacity</td>
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<td>-batteries</td>
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<td>-today’s tech + optimise &amp; cheaper</td>
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<td>-speed reduction</td>
<td>-energy management system</td>
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<td>-synthetic fuels + CCS</td>
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<td>-lease/OPEX approach</td>
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<td>-virtual arrival</td>
<td>-energy efficiency measures</td>
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<td>-bio-gas/liquids</td>
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<td></td>
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<td>-crew training</td>
<td>-air lubrication</td>
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<td>-H2 &amp; H2 carriers</td>
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<td>-data/ blockchain</td>
<td>-reduced engine power etc.</td>
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<td>*Electric propulsion systems enables modular approach</td>
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<td>-new business models etc.</td>
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<td>20-30%</td>
<td>+</td>
<td>20%</td>
<td>+</td>
<td>20-30%</td>
<td>+</td>
<td>20-40%</td>
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*Note: All figures are estimates. Any one measure in each category could provide a significant % of the proposed total.*
Could Wind Propulsion Fund the Decarbonisation Transition of the Fleet?

- **Static fleet size:** 60,000
- **Fuel:** 300 mill tn/yr
- **CO2:** 1 bill 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 = $300bil
+ Reduce total cost by 10-20%

$300 bil invested (2020s+) = $1trillion+ savings by 2050 + lowers total cost to $1.1-1.7 trillion
Large Vessel Installations

2021: 20 Ocean Going Vessels with Wind Propulsion Technology (WPT) installed & 1 Wind-ready + more than 20 small sail cargo, fisheries & cruise vessels in operation

2022/3: 40-50 Ocean Going Vessels with WPT installed + Robust R&D pipeline

2030: Up to 10,700 WPT installations (10-15% of global fleet) EU commissioned report 2016/17

2050: 37,000 – 40,000 vessels with WPT (40-45% of global fleet) UK Clean Maritime Plan Research 2019

Current Installations

- **Tankers x 2**
  (1 x pending new build)
  1 x VLCC, 1 x LR2 Tanker

- **Bulkers x 2 (+1)**
  (2 x pending)
  1 x VLOC, 1 x Ultramax
  1 x Kamsarmax (wind ready)

- **RoRo x 2**
  (1 x pending new build)

- **Ferry/Cruise x 3**

- **General Cargo x 5**
  (2 x pending)
  Various sizes: 2–12,000dwt

- **Fishing Vessels x 1**

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

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