

Kongsberg Maritime

We are a global technology partner, delivering integrated maritime solutions across the vessel lifecycle



Kongsberg Maritime



Patrick Banks

Vice President, Regional Sales, APAC
Kongsberg Maritime

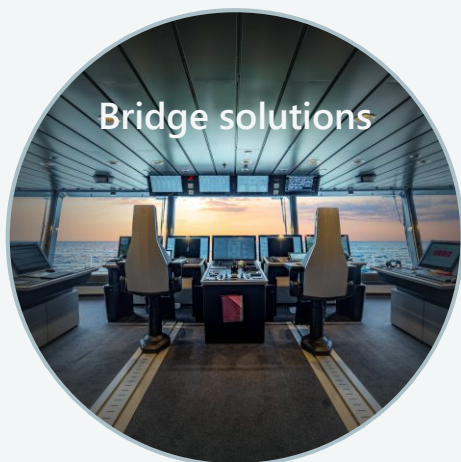
Integrated Energy Saving Technologies in Action

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Comprehensive portfolio for the maritime industry

From bridge to deck machinery and propulsors, and to the digital layer



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Energy Efficient Technology



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Propeller upgrades

Proven, quick ways to reduce fuel consumption



3-20%

Reblading

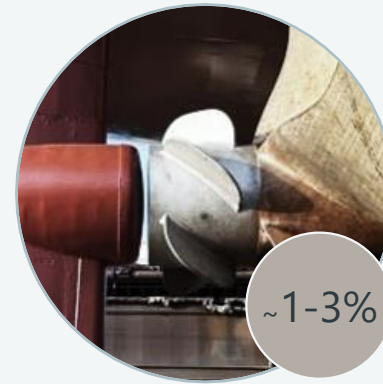
Optimising propeller blades or fixed pitch monoblocs to match actual ship operation



~5-25%

Promas Lite

Reblading and streamlining the propulsion and manoeuvring system for extra efficiency gains



~1-3%

Swirl Energy Regaining Cap

Propeller hub cap enabling incremental efficiency gains on FPPs – extended potential when combines with optimised blades



Development

~1,5%

Energy-saving hub cap for CPPs

Approx. 1,5% efficiency improvement as a standalone upgrade based on advanced hydrodynamic research

150+ projects delivered

Pilot Q2 2026

ROI typically within 2 years

Power limitation and engine load optimisation

Quick path to compliance



Engine Power Limitation (EPL)

Quick path to compliance with fuel emissions regulations



Shaft Power Limitation (ShaPoLi)

Quick path to compliance with fuel emissions regulations



Complementary measures: the holistic approach

Mitigating the effect of reducing design speed with re-optimisation measures, e.g. reblading

Power systems and electrification

Optimal energy production and utilisation throughout



Power systems

Complete, integrated power systems designed to work together for maximised synergies and efficiencies

Include switchboards, drives, and automation (PMS/EMS/IAS)



Shaft motors & generators

Propeller shaftline motors and generators

Thruster electrical motors

Own designs available

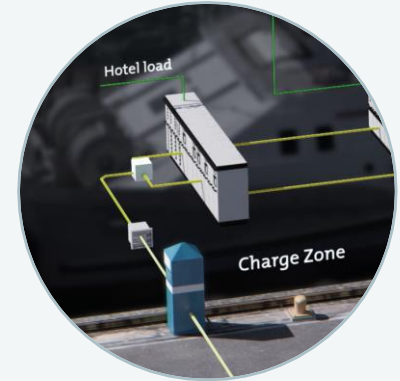
Integration of third-party products



Battery energy storage systems

Enabler for zero-emission in port and at sea, and for enhanced redundancy and operational flexibility

Free-standing units and containerised solutions available



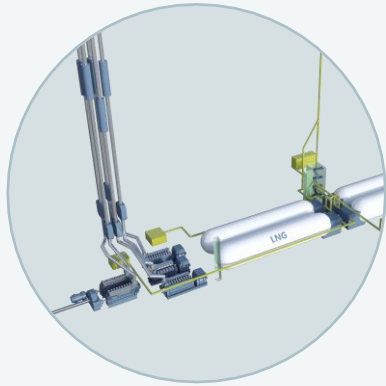
Shore connections

Integration of high- and low-voltage shore connections for zero-emission stays in harbour and battery charging

Includes control and PMS interface

New fuel and auxiliary power integration

Gearing up for low- to no-carbon operations



Fuel Gas Supply System (FGSS)

Making the best use of gas engines, safely and reliably
Fuel gas supply system and automation



Wind-Assisted Propulsion System (WAPS)

Advisory
Integration



Alternative fuels

Fuel conversion advisory
Integration of alternative fuels



Fuel cells

Advisory
Ongoing developments

CEMS – Continuous Emissions Monitoring System

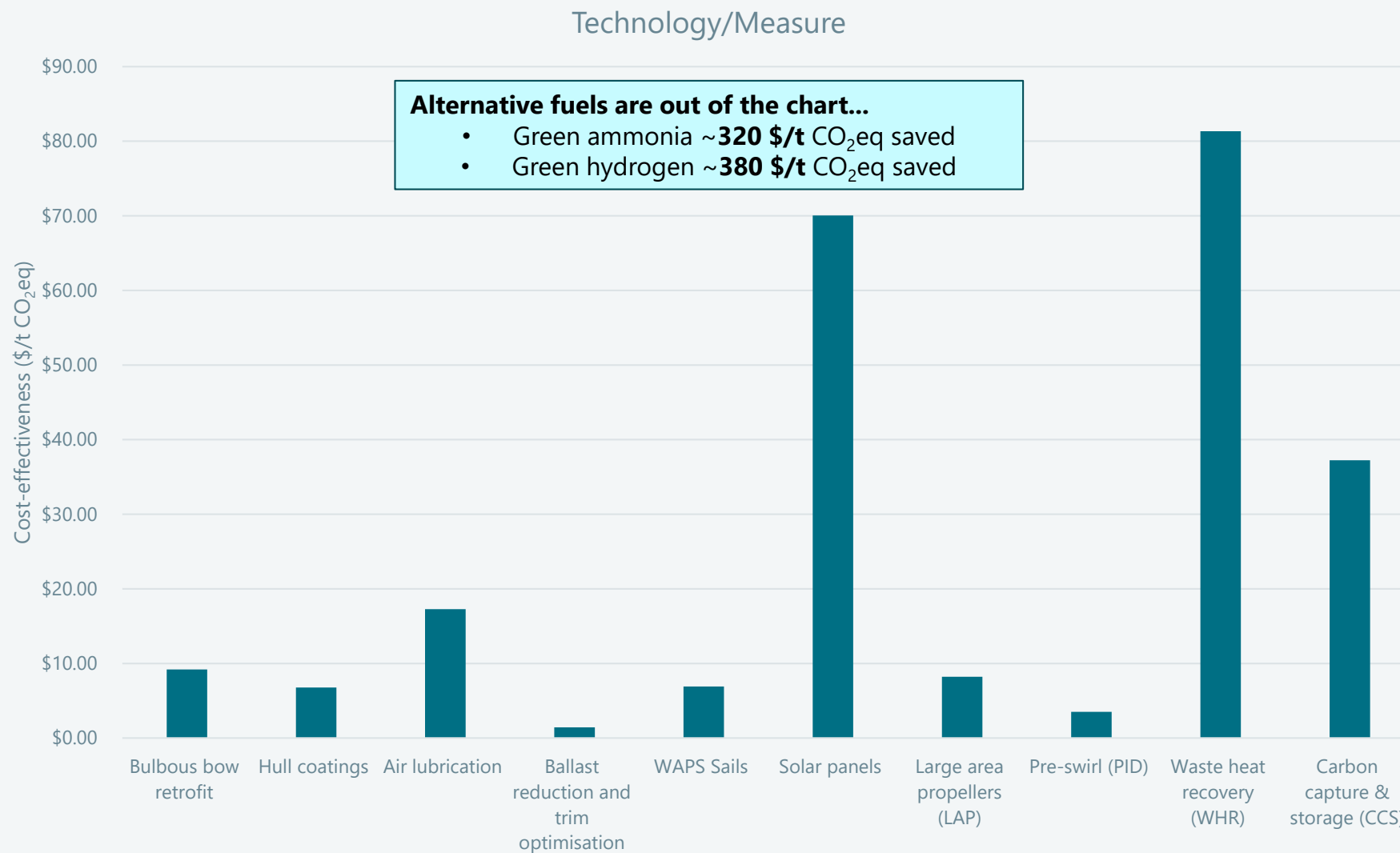
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K-Sail

Integrated wind assist technology

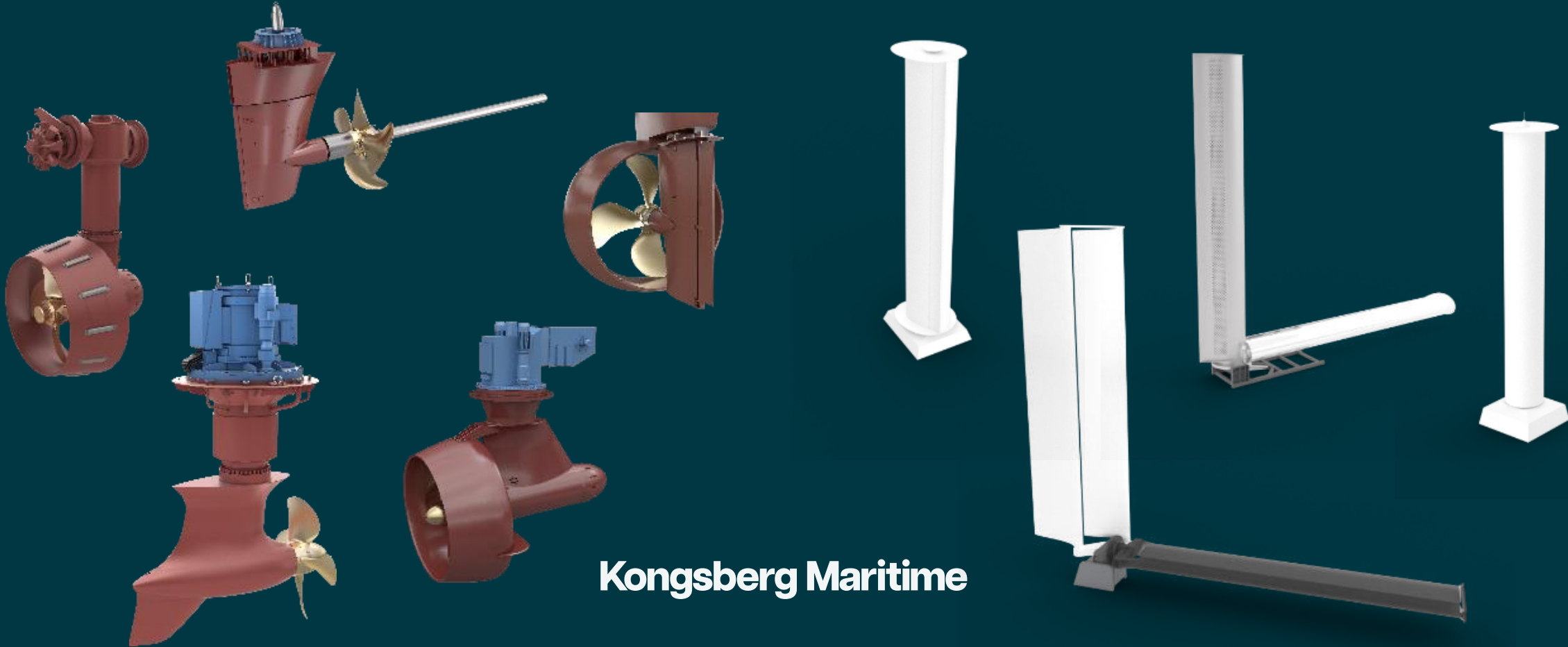
Why wind assist?



- Cost efficient
- Fuel-savings
- Installation
- Retrofit
- ROI

Propulsion devices needs careful consideration

...same goes for wind assist devices



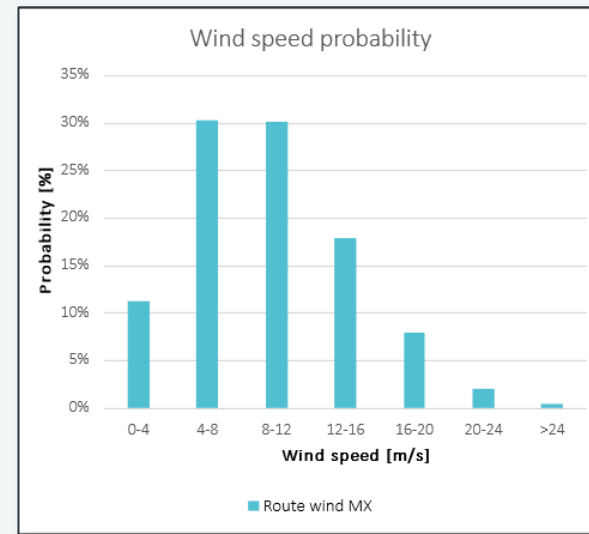
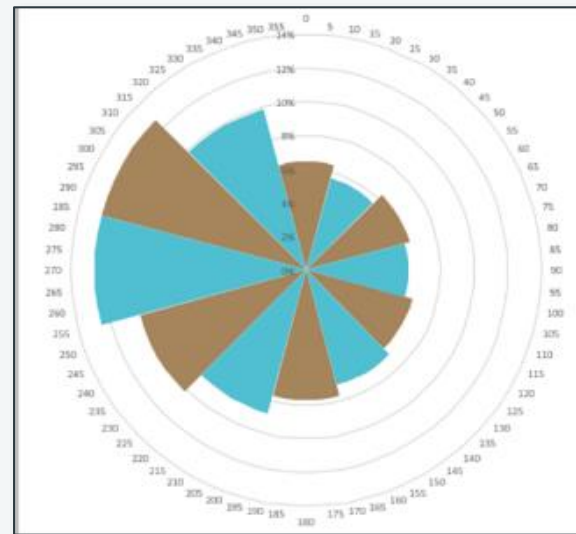
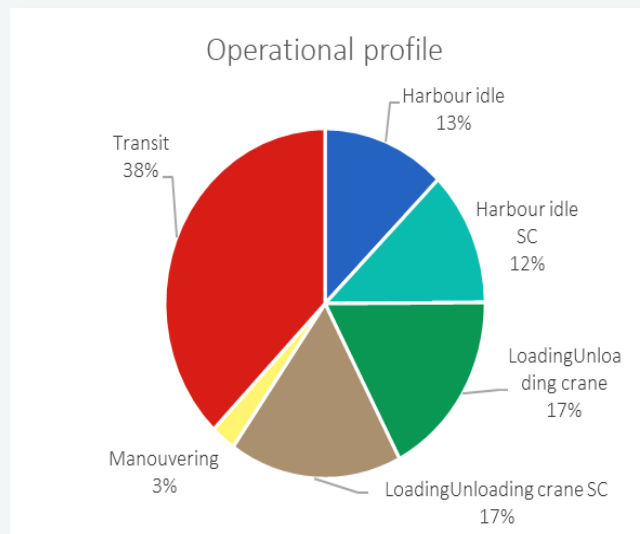
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Case Study

General Cargo, 12500 DWT



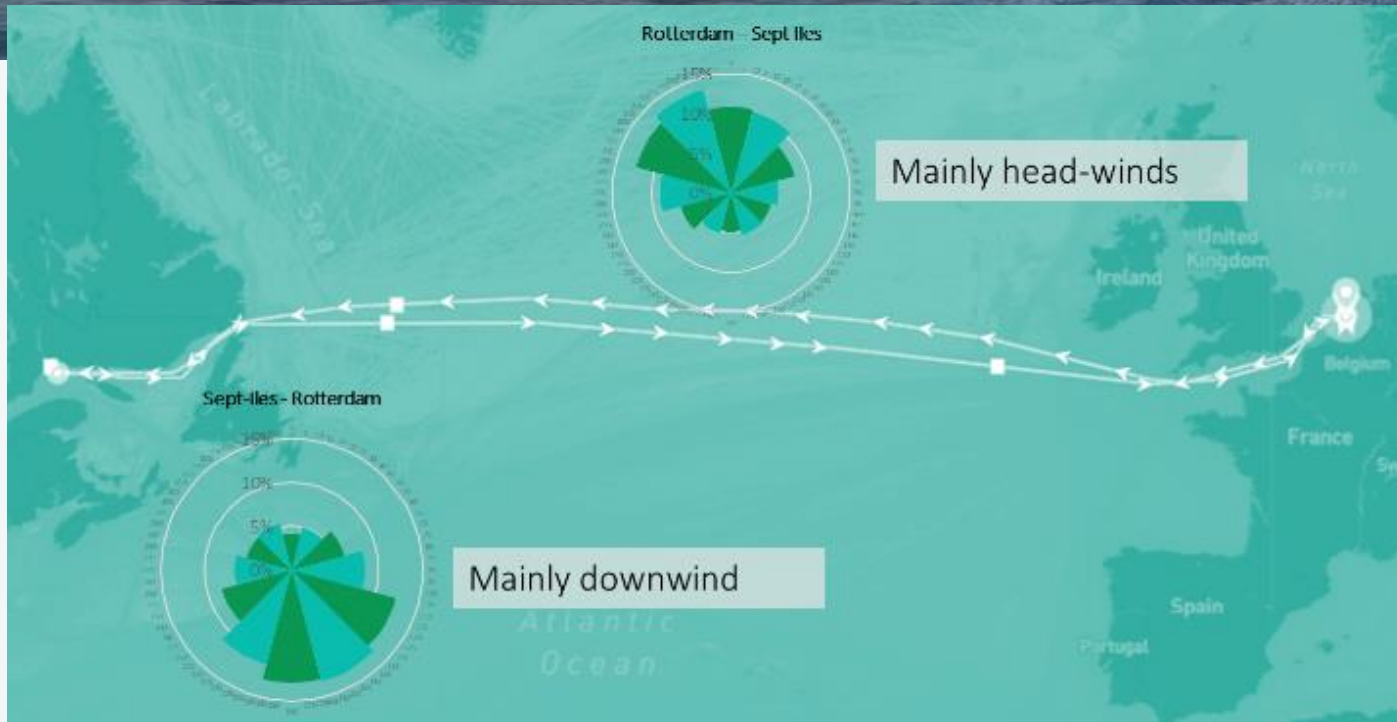
Rotor-sail to enhance side and downwind performance



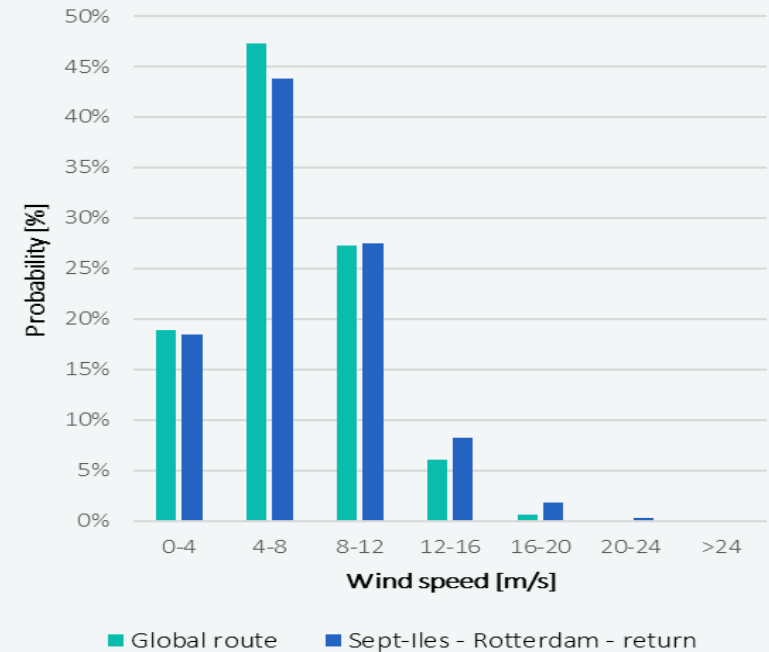
Case Study

Dry Bulk Carrier, 82000 DWT

Suction wings to enhance upwind performance

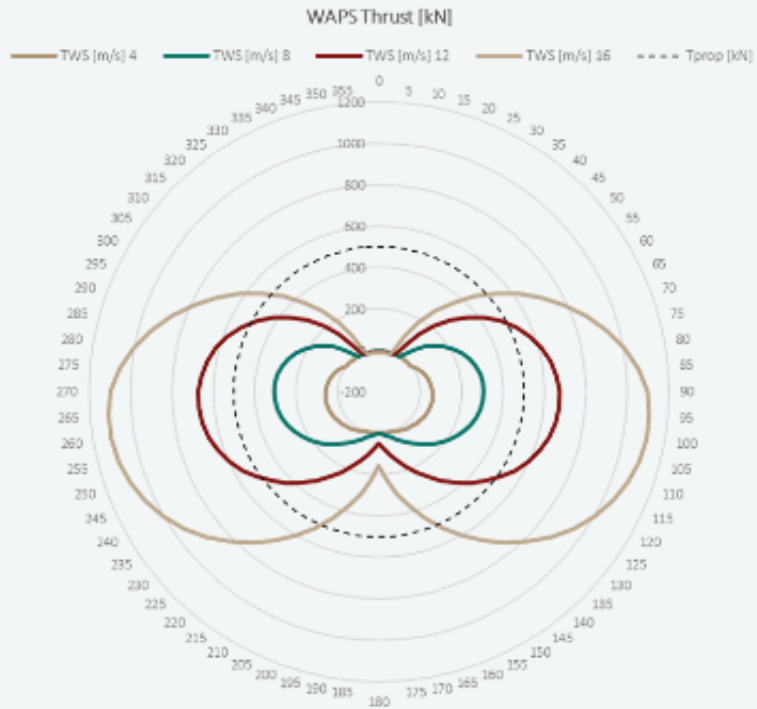


Wind speed probability

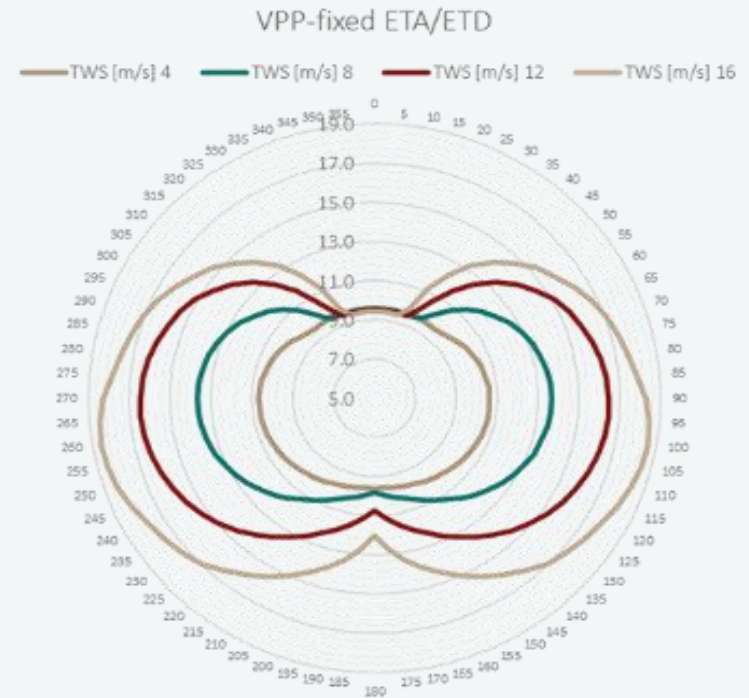


Case Study

Dry Bulk Carrier, 82000 DWT



WIND ASSIST SAVINGS: 20-36%



K-SAIL NET SAVINGS: 25-48%

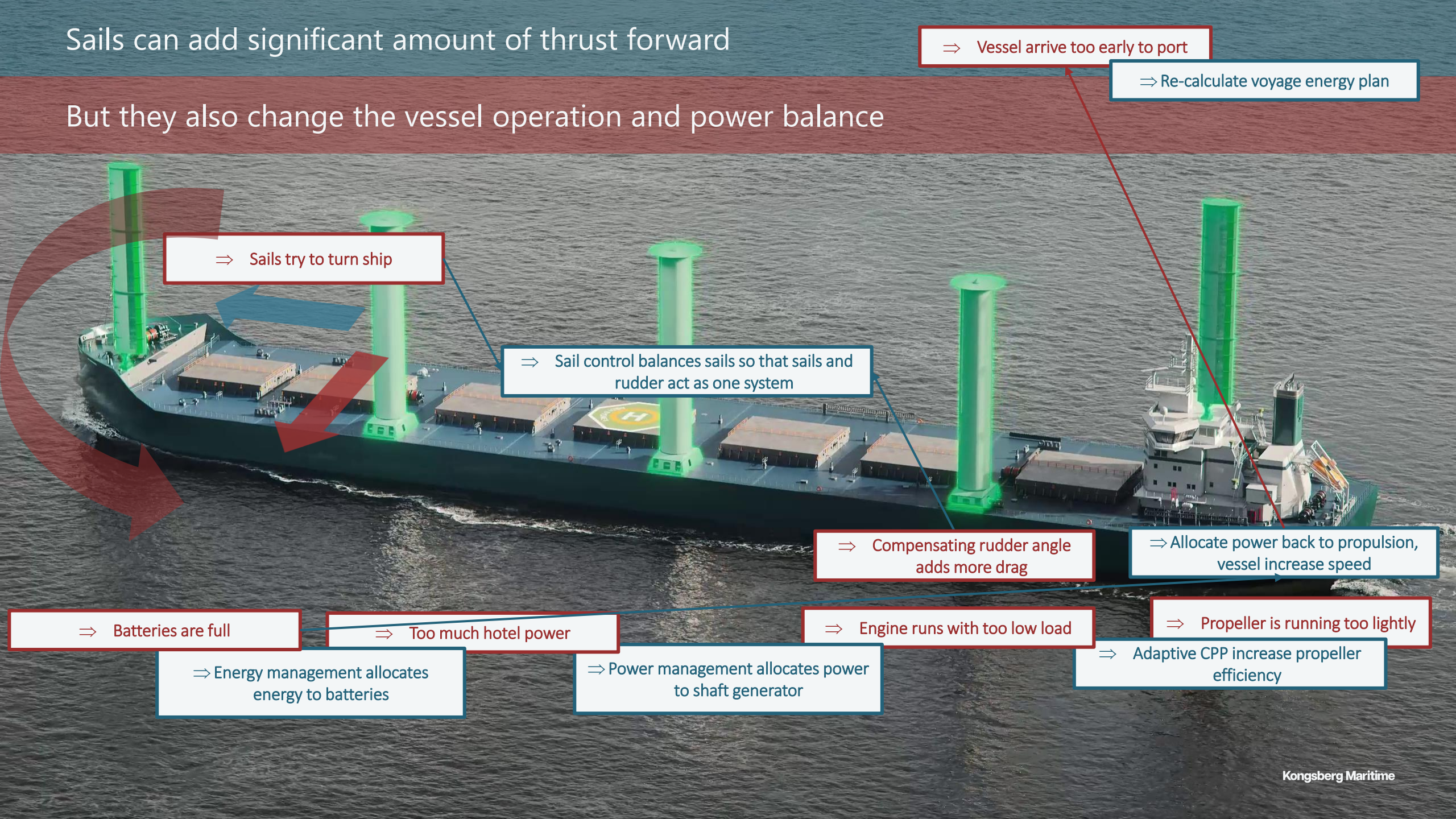
Speed varies from 9,2kn to 19kn, AVG speed 12kn

Kongsberg SAIL – K-Sail™ Fully Integrated Wind Assist



Sails can add significant amount of thrust forward

But they also change the vessel operation and power balance



⇒ Vessel arrive too early to port

⇒ Re-calculate voyage energy plan

⇒ Sails try to turn ship

⇒ Sail control balances sails so that sails and rudder act as one system

⇒ Compensating rudder angle adds more drag

⇒ Allocate power back to propulsion, vessel increase speed

⇒ Batteries are full

⇒ Too much hotel power

⇒ Engine runs with too low load

⇒ Propeller is running too lightly

⇒ Energy management allocates energy to batteries

⇒ Power management allocates power to shaft generator

⇒ Adaptive CPP increase propeller efficiency

⇒ Re-calculate voyage energy plan

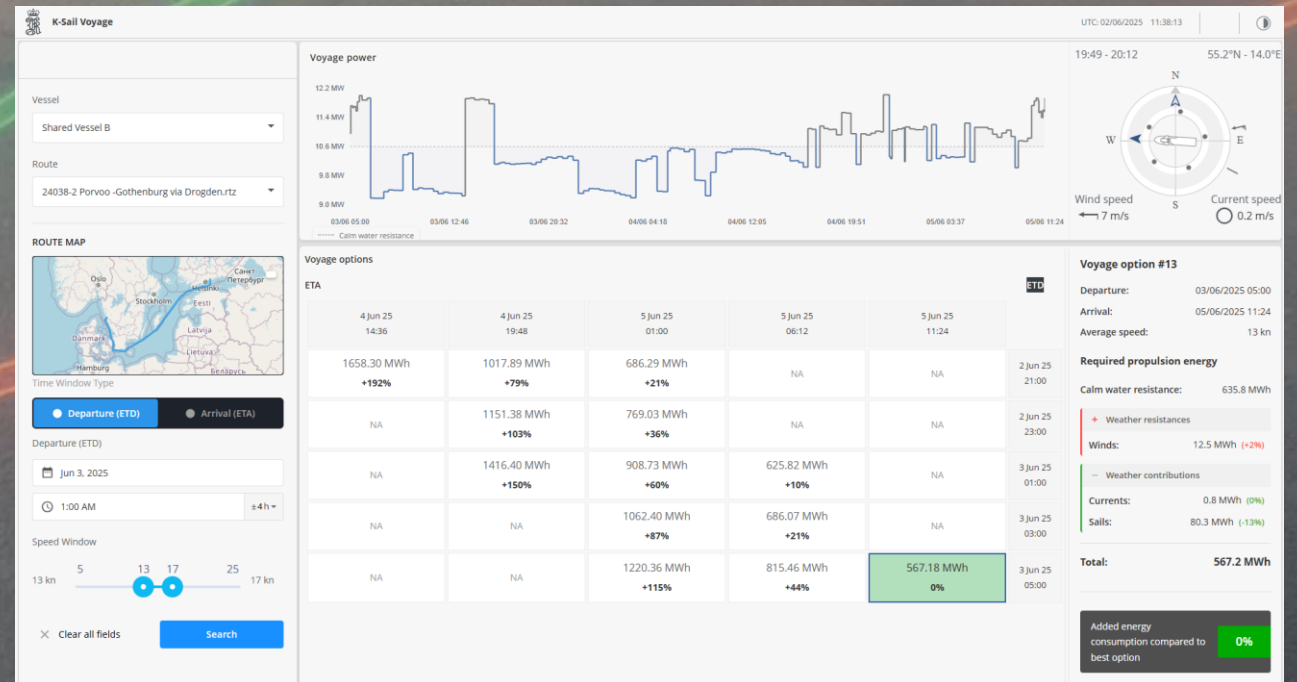
ETA

Variable speed and power over route

⇒ Plan according to forecasts of wind, currents and waves

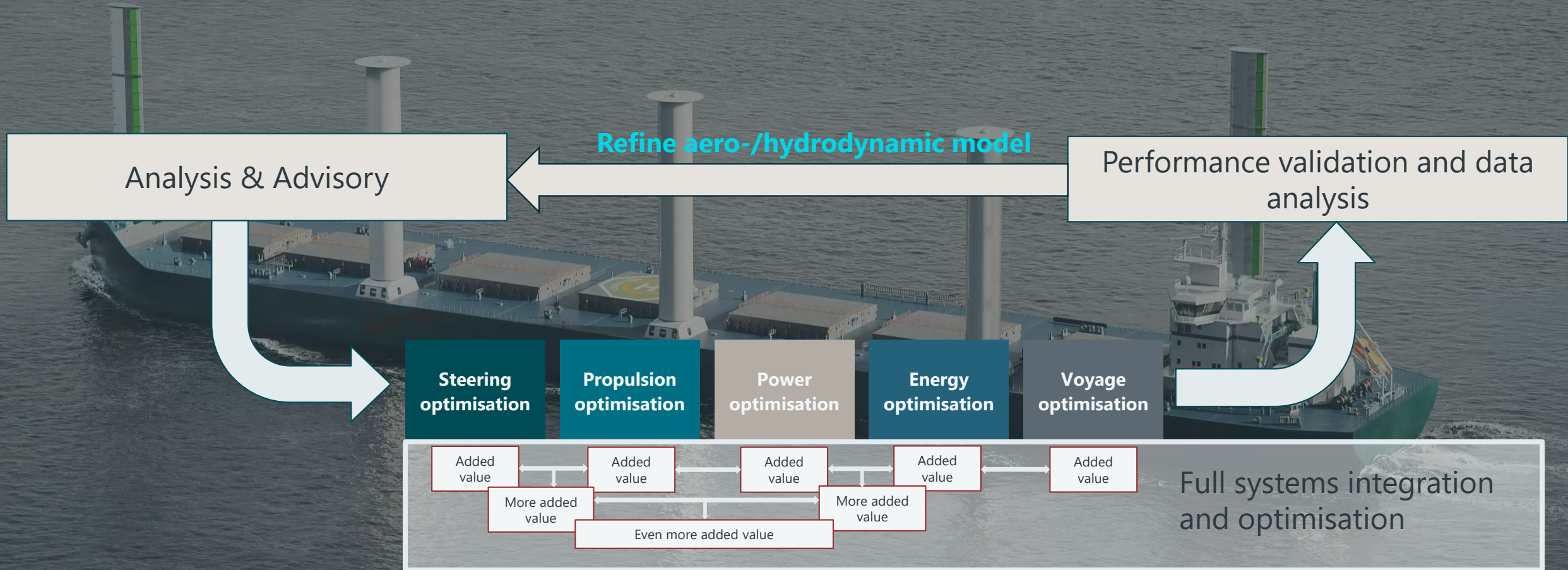
With wind assist, the energy plan over a route need to consider variation in speed and power over the whole route with regards of environmental variables

ETD



Balancing power, speed and emissions

K-Sail™ – Value through integration, advisory and life-cycle support





General Cargo – 12500 DWT
Mediterranean / Europe, west coast

WAPS: 1x 28m Rotor sail + 1x 36m Suction wing

Wind assist savings: 4-29% @ 13kn



Savings with **K-Sail**: **5-38%** @ avg 13 kn



Picture courtesy: Terntank

Chemical tanker – 15000 DWT
Baltic Sea / North Europe

WAPS: 4x 16m Suction wing

Wind assist savings: ~9% @ 12,5kn



Savings with **K-Sail**: **~15%** @ avg 12,5kn



Dry bulk carrier – 82500 DWT
North Atlantic

WAPS: 3x 35m Rotor sail + 2x 36m Suction wing

Wind assist savings: 20-36% @ 12kn



Savings with **K-Sail**: **25-48%** @ avg 12kn

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Complete Solution

Superefficient Kamsarmax Bulker
Case Study 82 000 dwt

Comply with CII throughout ship lifetime without need to adapt low carbon fuels



Reduce Power Demand – Improve Energy Efficiency

SuperEfficient bulker

Wind propulsion

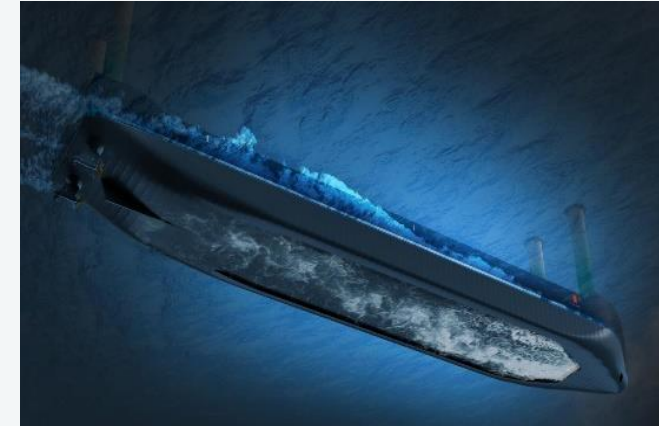


Rotor sails and suction wings to harness the power of the wind.

Integrated system incl. CPP, route optimisation and intelligent EMS

Air lubrication

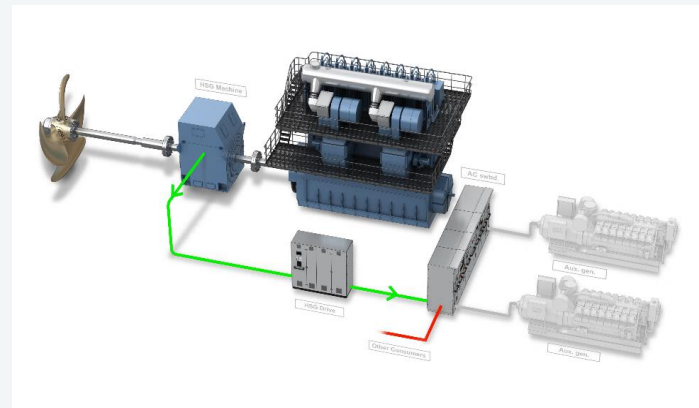
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Novel air lubrication concept to reduce frictional resistance.

Optimized hull form to maximize benefit of air lubrication.

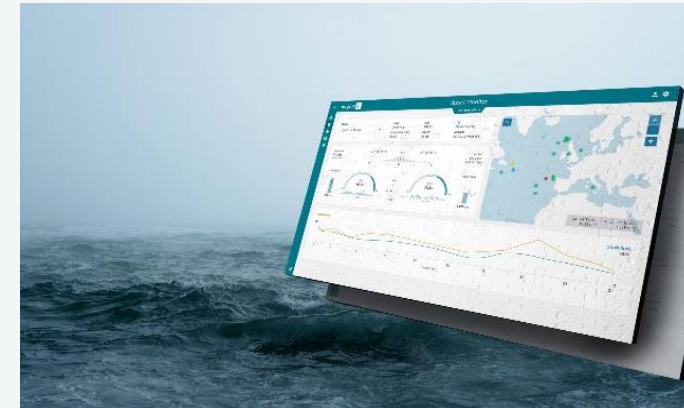
Large PTO



Large PTO with frequency drive for improved efficiency.

PROMAS CP propeller for better performance with wind and to enable large PTO

iEMS



Intelligent energy management system (EMS) in combination with energy and route optimization to get best efficiency from wind and propulsion

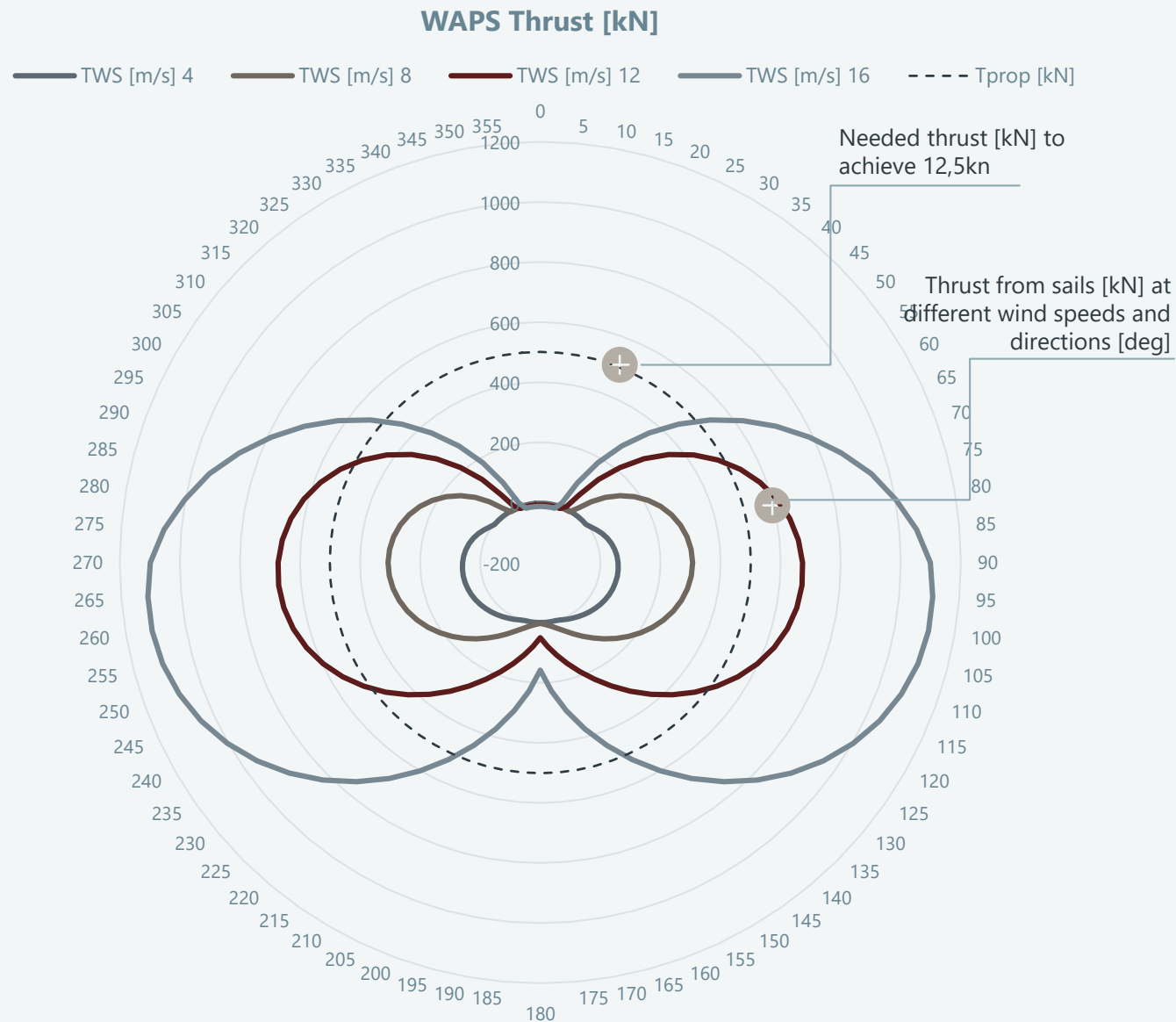
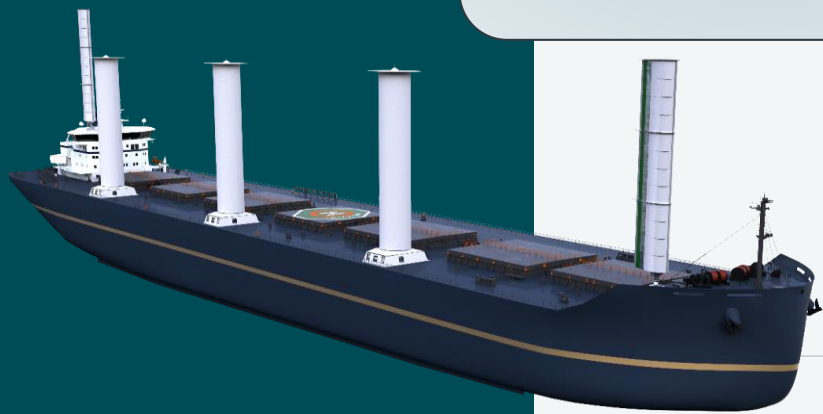
Wind Assisted Propulsion System (WAPS)

SuperEfficient bulker

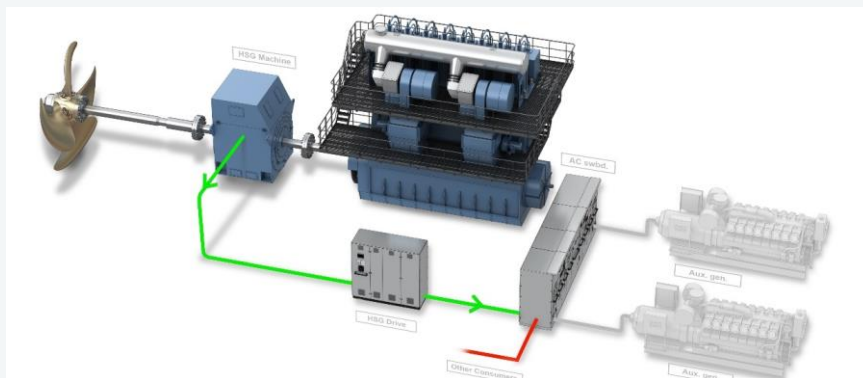
WAPS Installation – combine technologies:

2 x Bound-4-Blue eSails (suction wing) 36m – fixed to enhance upwind performance

3 x Norsepower rotor sails 35m – tiltable to enhance max sailing thrust

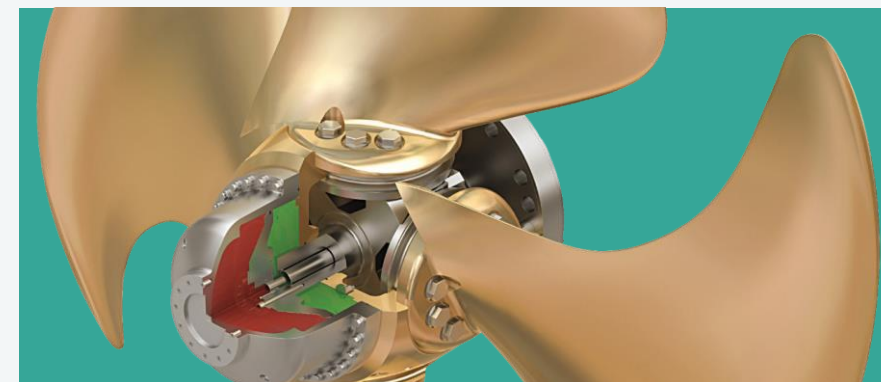


Hybrid shaft generator (PTO + frequency converter)



- PTO is ideal for a ship with wind propulsion and air lubrication
- Higher hotel load from air compressors and electric motors for rotor sails and suction wings
- Increased electric load concurs with lower propulsion power demand – available power on main engine

Controllable Pitch Propeller (CPP)



- CPP will give better efficiency compared to FPP in vessels with wind propulsion
- Variable thrust conditions
- Retain steering performance in good wind conditions without too high rpm on propeller
- Ideal for large PTO installations
- Option to consider: Full feathering for sailing

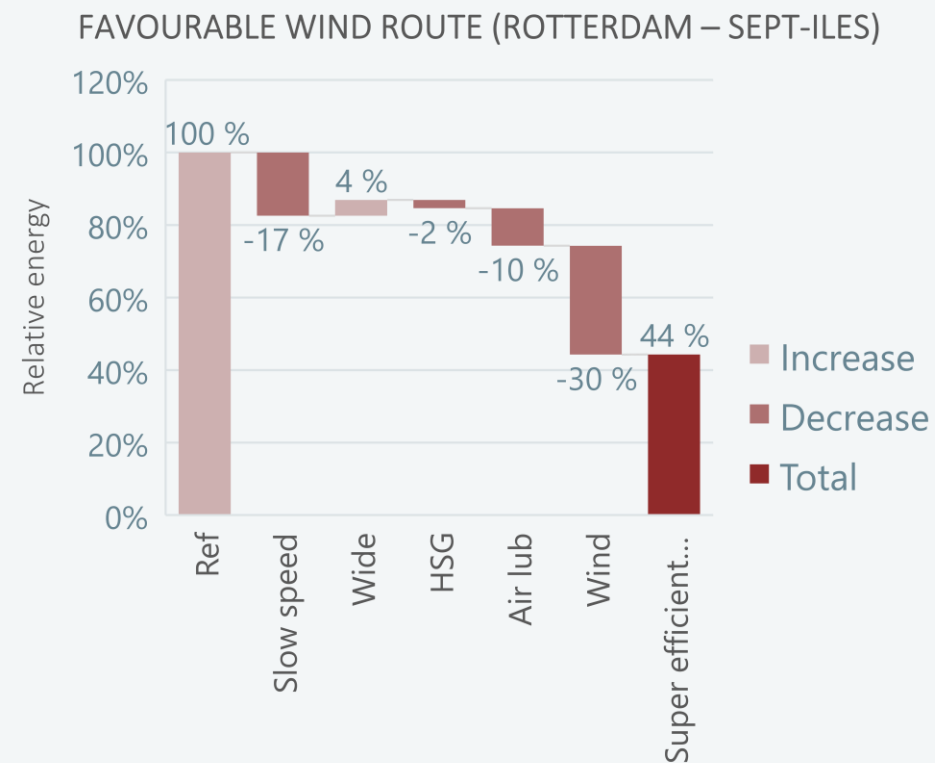
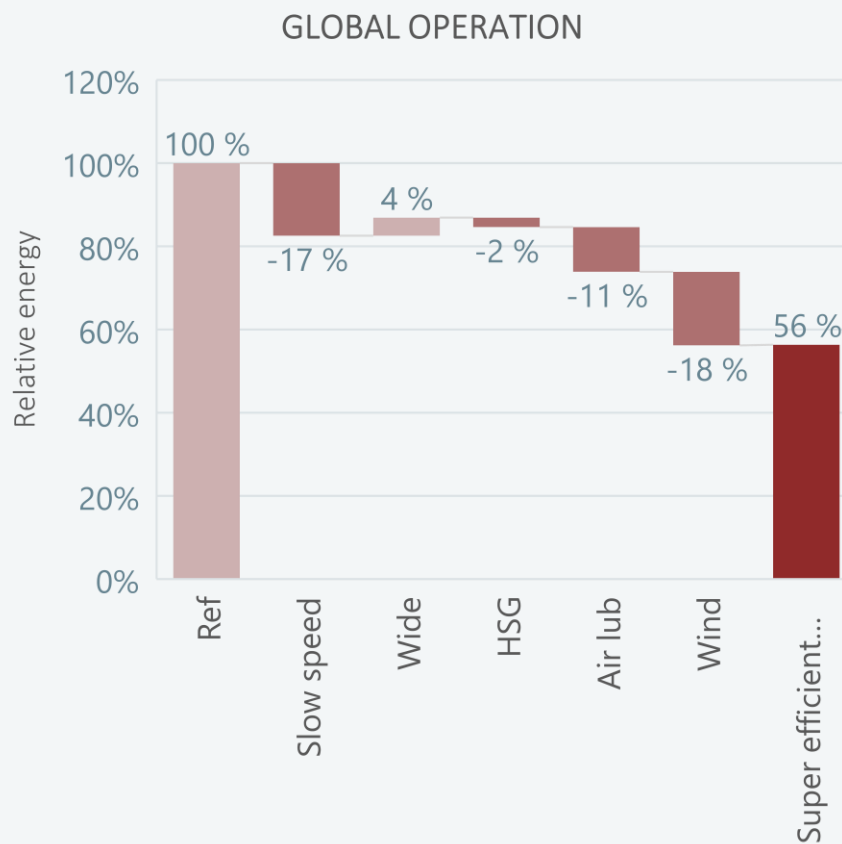
PTO + CPP

SuperEfficient bulker

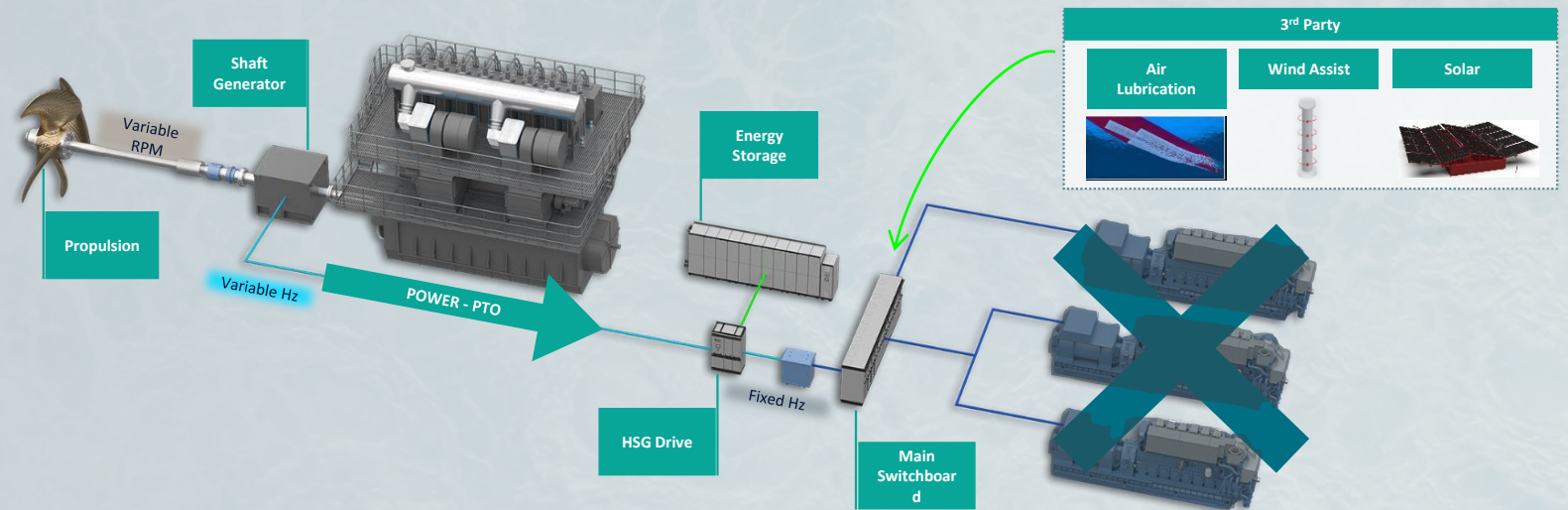
Annual Fuel Saving

SuperEfficient bulker

- Assumptions:
- MGO price 800 \$/ton
 - CO2 tax: 0 \$/ton
 - Shore power (in ports) 0,15 \$/kWh



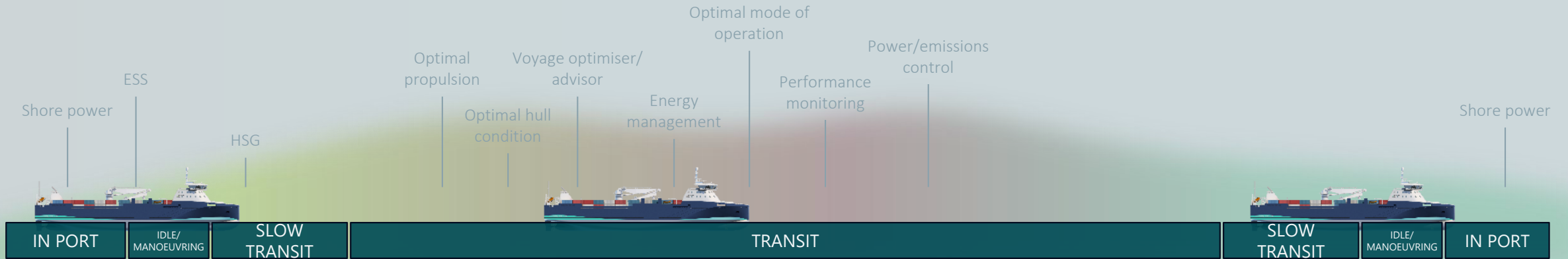
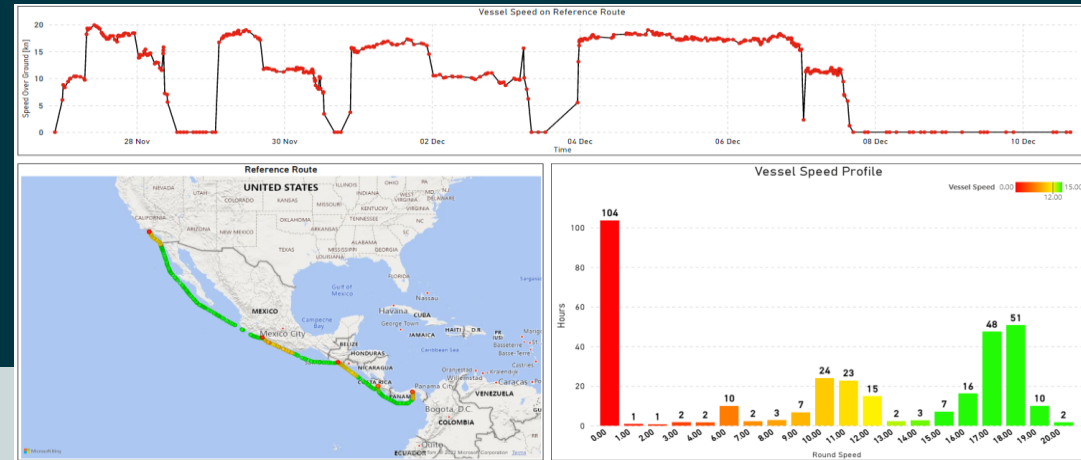
Complete Solution



Kongsberg Maritime

Understanding your needs

We leverage the power of integrated solutions and advanced tools for modelling, simulation and design to determine the ideal efficiency improvement package for your vessel and operations for maximised, durable benefits.



Fleet Strategies for Improving CII Ratings



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Protecting
people
and planet



Let's Connect

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