



# A realistic approach to decarbonization in times of uncertainty

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Energy Saving Technologies



# IMO ISWG-GHG 20

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From saving the oceans. To safeguarding the planet.

## Right now

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- Trajectory to reduce emissions remains
- EU ETS
- Fuel EU
- CII, EEXI
- Fuel prices still high

# “Strategy” Employed by most companies

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- Reduce Energy Requirements
  - Conventional ESDs (around Propeller)
  - Reduce Friction
- Improve Operation
- Electrification
- Fuels
- Air Lubrication
- Wind
- Carbon Capture

# The ERMA TECH GROUP Ecosystem

## Energy Efficiency

**FLEXSERIES**  
Energy Saving Devices for Hull and Propeller



**CARBON FIT**  
Carbon Capture & Storage



**ARMADA**  
Passive Air Lubrication System  
\*Strategic Partnership



**NaviPULSE**  
Variable Frequency Drives



**AMIO**  
Coriolis Flow Meters



**METIS**  
Intelligent Analytics



**BLUE CONNECT**  
Alternative Maritime Power



**DBPI®**  
Ultrasonic Antifouling



**POLCOR**  
Cathodic Protection



**HAZDASH**  
IHM Platform



**ERMA FIRST FIT BWTS**  
BWTS Full Flow EC



**ERMA FIRST FLOW**  
BWTS Filterless Side Stream EC



**EcoOne**  
BWTS Chemical Injection



**oneTANK**  
BWTS Intank



**ALIOS**  
Fresh Water Treatment



**Cleansewage-BIO**  
MBBR STP



**Cleansewage-MBR**  
Advanced Membrane STP



**POSEIDON FIT**  
Bilge Water Separator



**OWS-COM**  
Bilge Water Separator



**TRITON EC & FIT**  
Electrochemical & Physicochemical STPs

## Water and Wastewater

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GROUP

# ERMA FIRST FLEX SERIES

Energy Saving Devices for Hull and Propeller

DECARBONISATION



Total savings ~7-8%

With low friction Paint >12%

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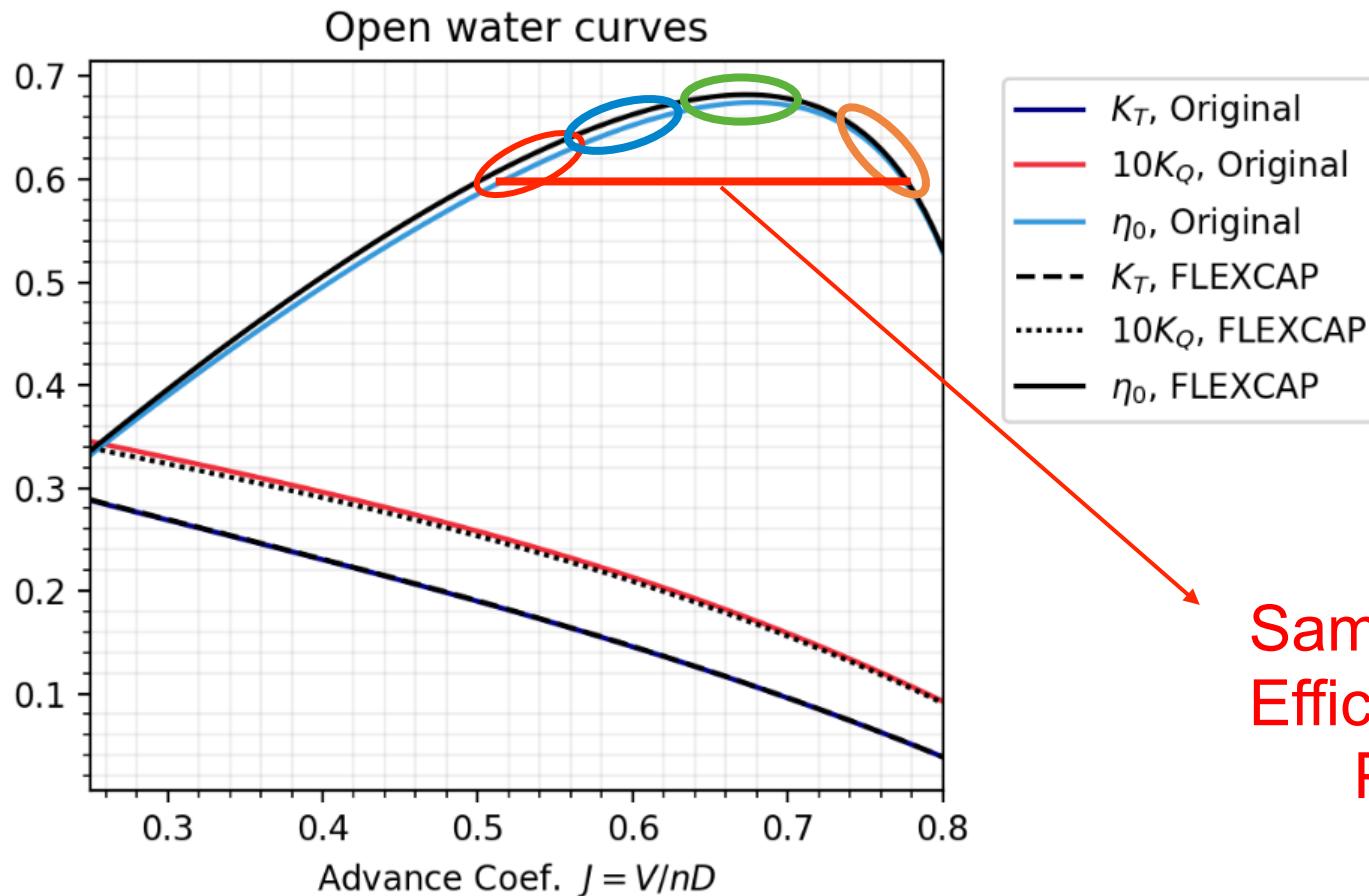


# The End



## But wait...

- The phenomena are “highly non linear” (a.k.a. not that simple...)



“Typical” operation points

WED Installation

Low Friction

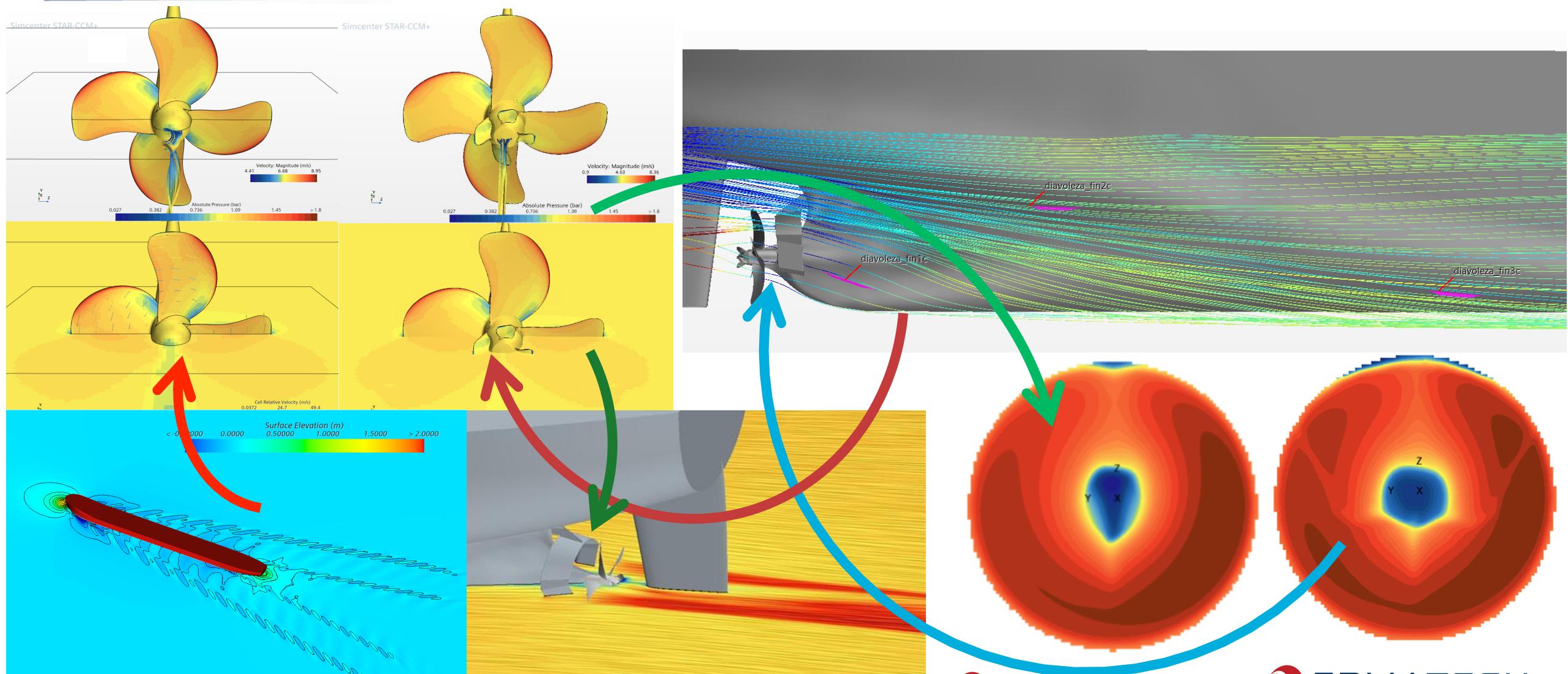
Wind

Same  
Efficiency

Preswirl will reduce Power Margin

# ERMA FIRST FLEX SERIES

Optimization Using State of the Art simulation

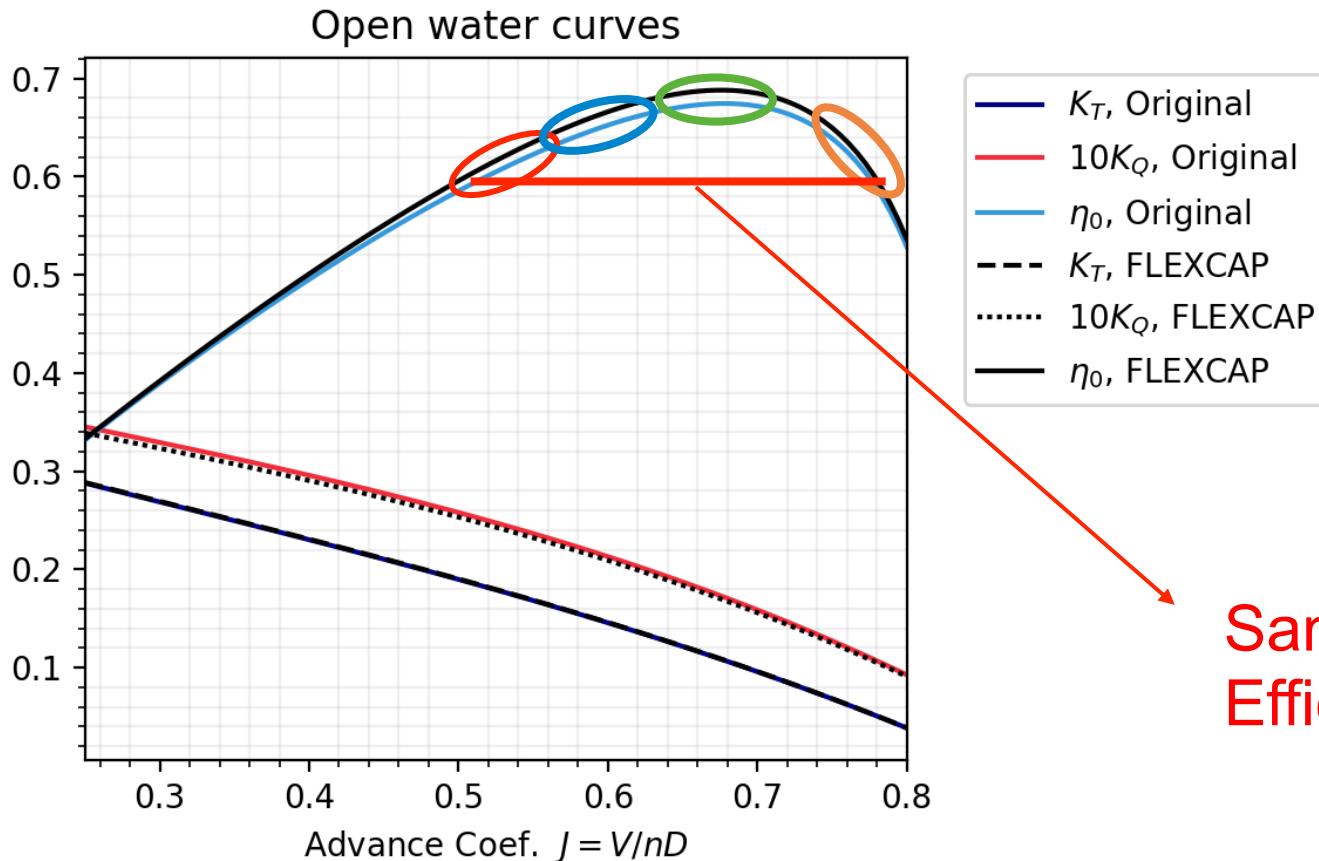


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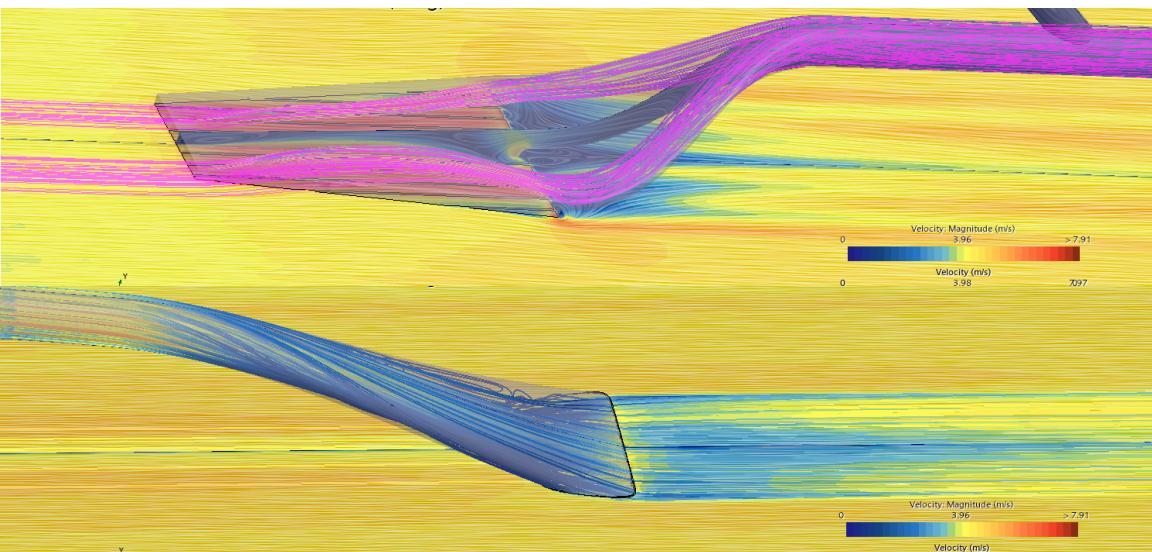
Low Friction

Wind

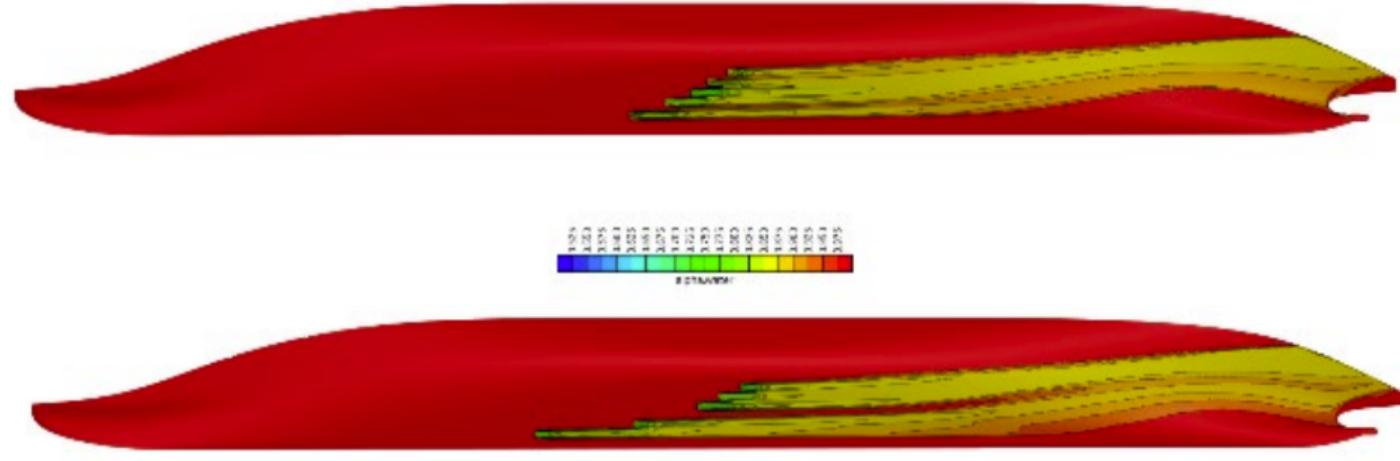
# Air Lubrication System

**Armada Technologies' Passive Air Lubrication System (PALS)** uses the forward motion of the ship to draw air from the deck and to create an air-water mixture for lubrication.

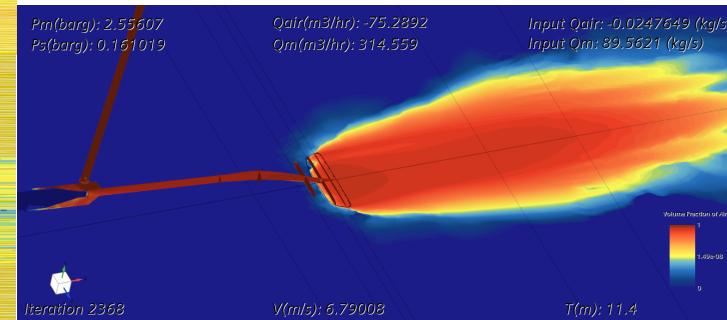
- No compressors
- less power



Inlet/outlet Optimization

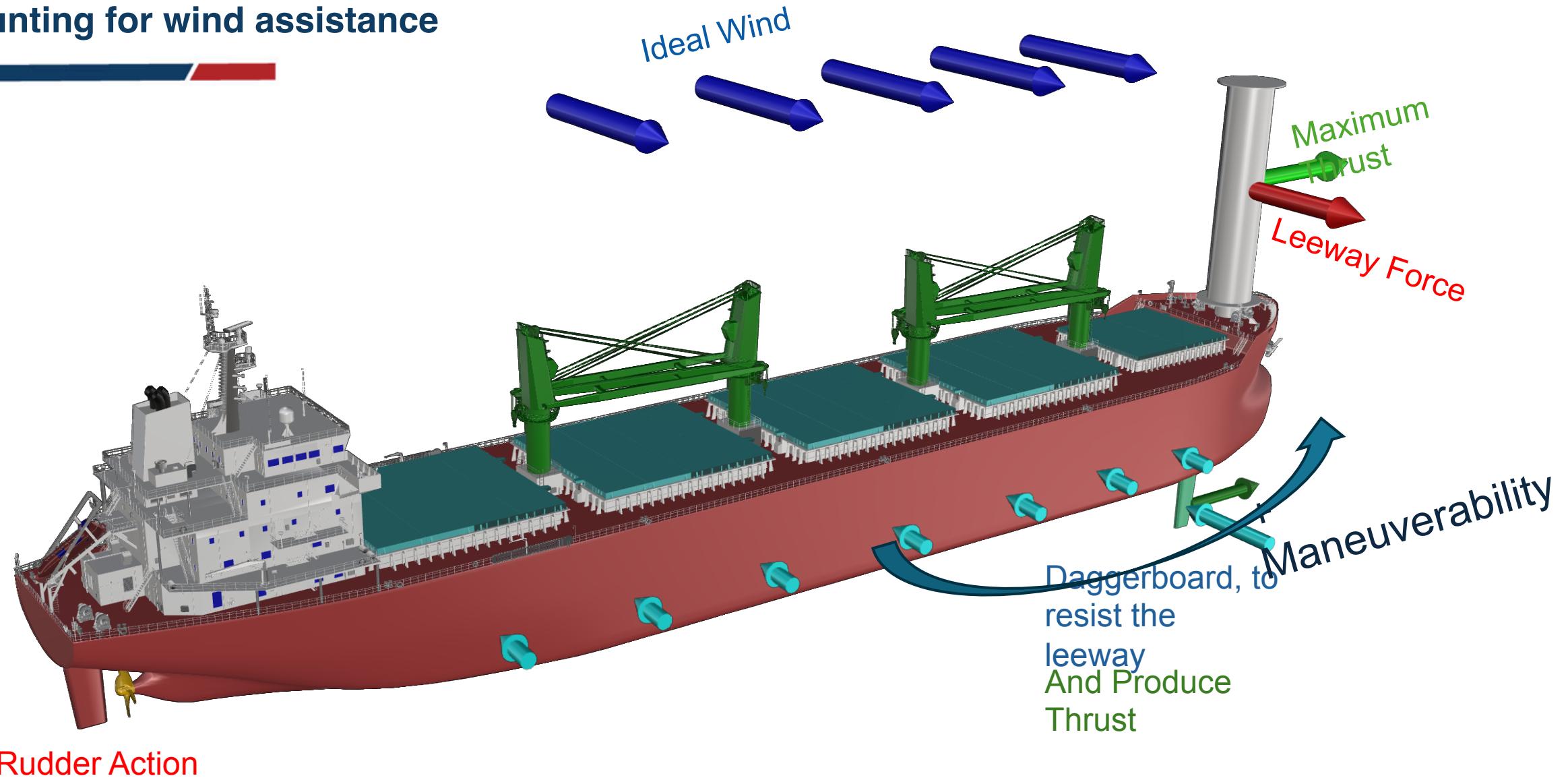


Ensure Air does not reach Propeller



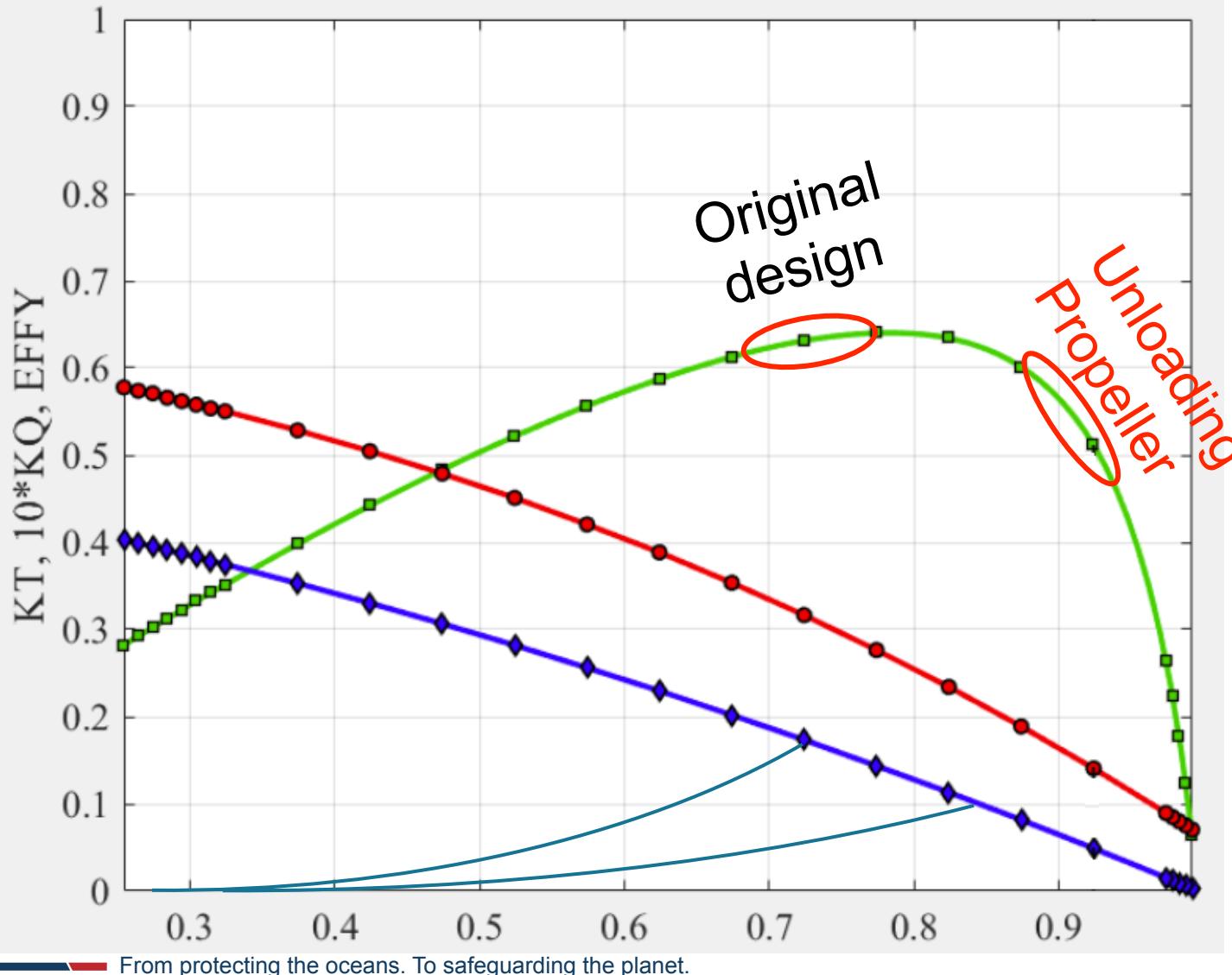
*Strategic partnership:*

## Accounting for wind assistance



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# Issues with assistance



## Solutions:

- Keep assistance low
- Controllable Pitch Propeller
- Blades changing geometry

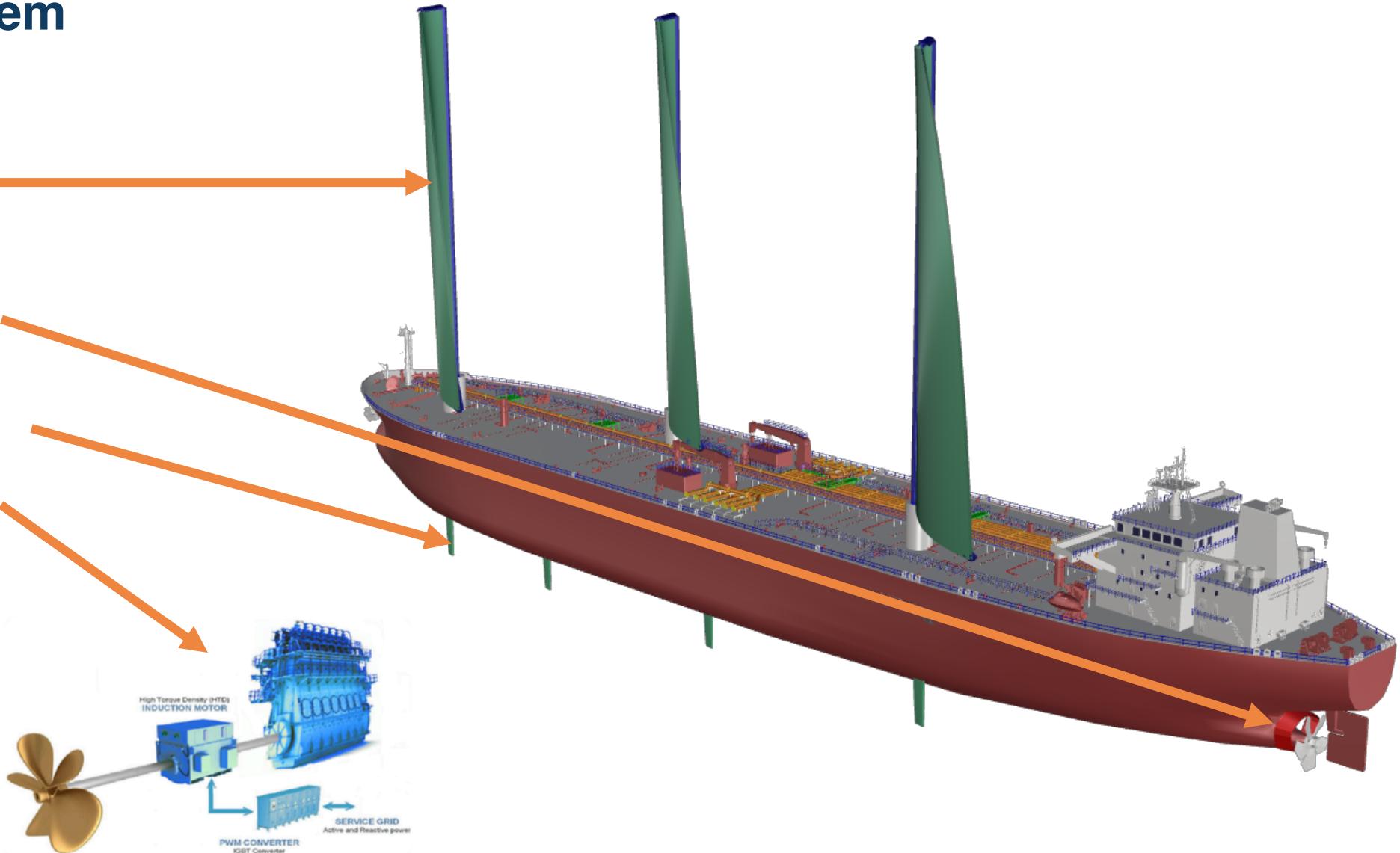
## Takeaways

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- Future Unknown, but Energy Reduction remains a Must
- Solutions for Energy Improvement Already in Place
- Cumulative Savings CAN reach or exceed 10%
- ONLY if systems are Designed together
- Wind Assistance and Air Lubrication are promising, but not there yet

# Extended Ecosystem

- FLEXWIND
- FLEXRING V2
- FLEXCAP V2
- Daggerboards
- Power Take Off
- CPP
- Routing



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THINK DECARBONISATION ...

THINK ENVIRONMENTAL PROTECTION ...

THINK ERMA TECH GROUP!



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