



**VTT**

# Means for Decarbonizing Shipping

30/05/2022 VTT – beyond the obvious

# The most energy efficient mode of transportation



~11gC02  
/ tonmile  
(4<sup>th</sup> IMO GHG  
study)

11% of all  
transport  
emissions  
(IEA, ICCT)



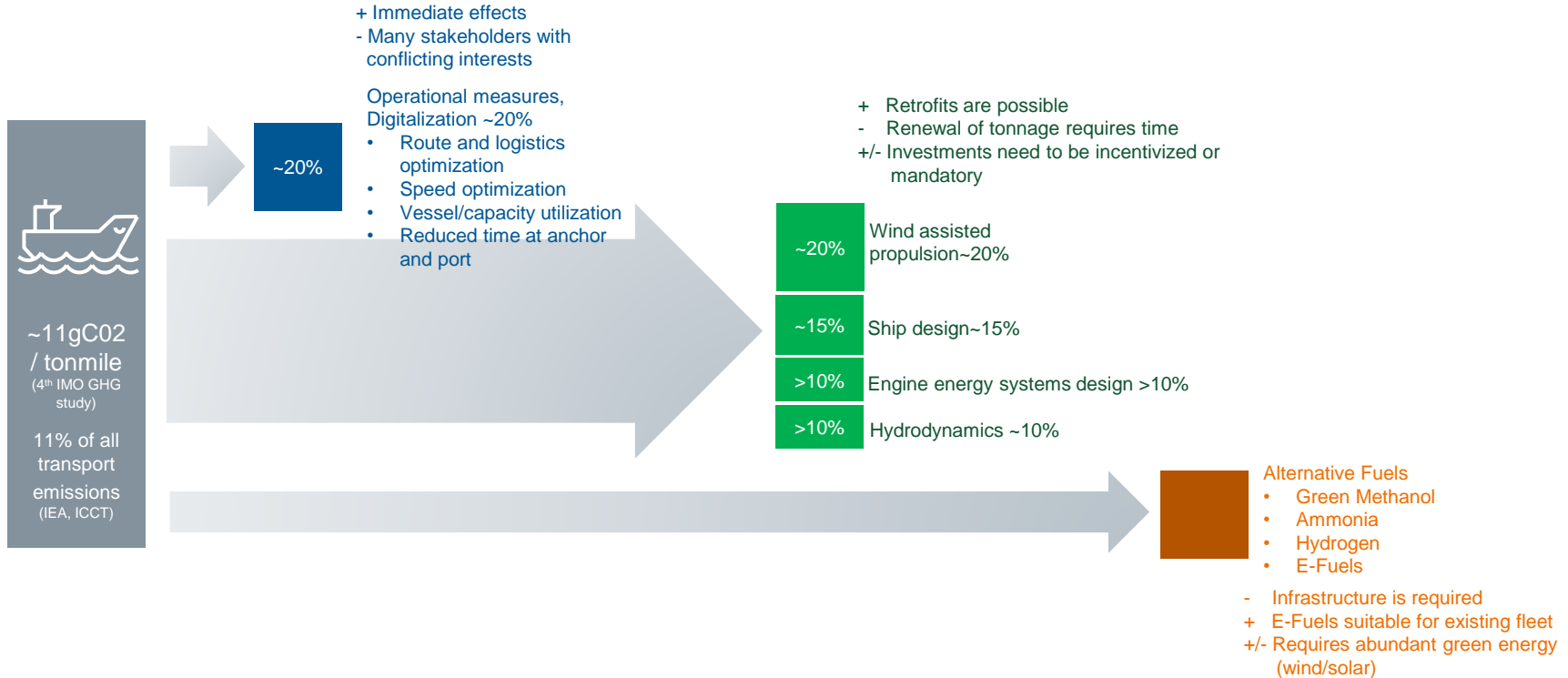
~ 110g C02 / tonmile (ACEA C02 emissions from HDVs)



~ 90% of all goods and commodities are transported by sea



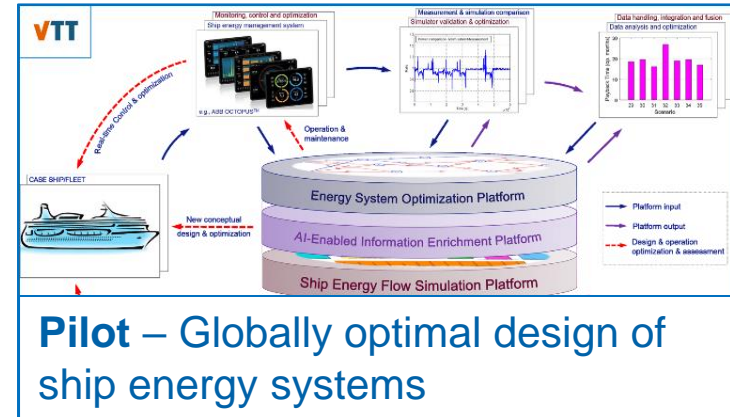
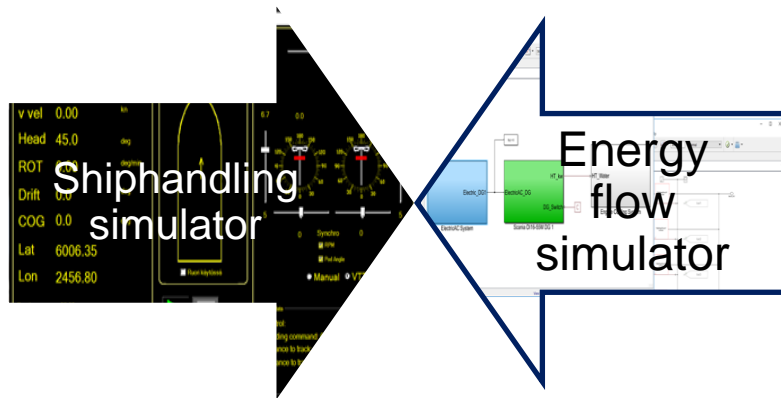
# Potential to cut shipping emissions



# Examples on topical research and technical solutions

- Digitalization
- Propulsion hydrodynamics
- E-fuels

# Enabling maritime digitalization by extreme-scale analytics, AI and digital twins



**Pilot** – Globally optimal design of ship energy systems

# Hydrodynamics and ship design

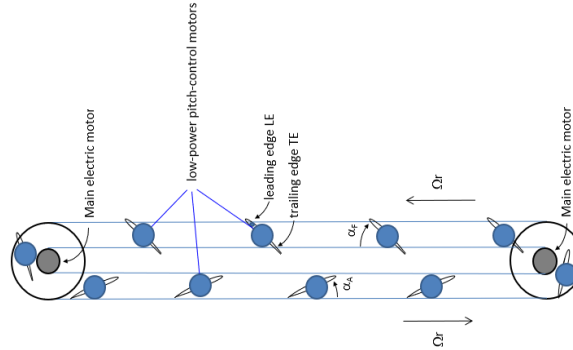
## Large area propulsion

A new propulsion concept for high propulsive hydrodynamic efficiency

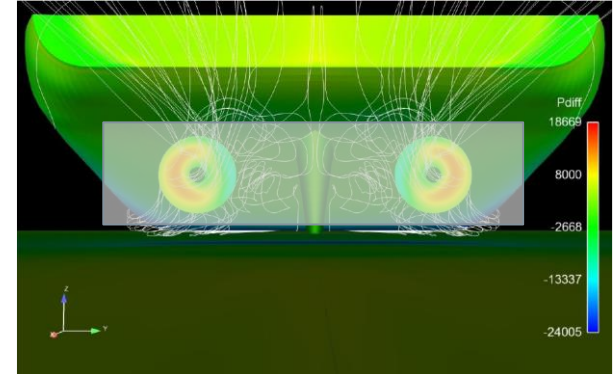
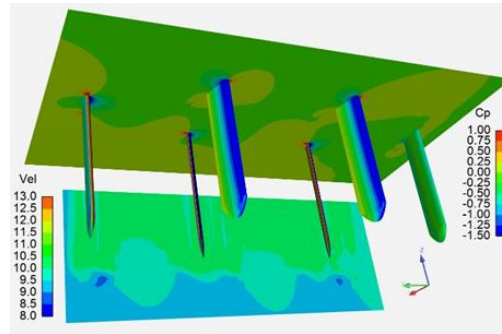
A. Sánchez-Caja<sup>a</sup>, J. Martio, V.M. Viitanen

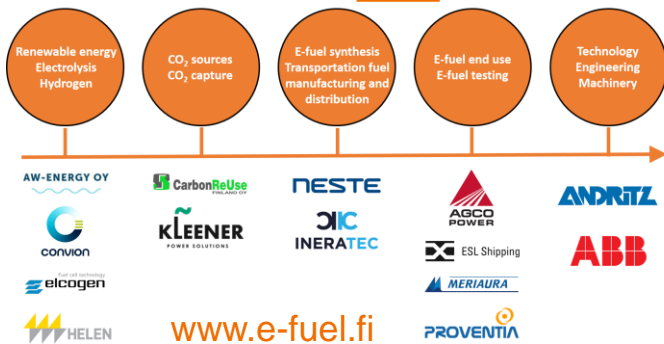
<sup>a</sup>VTT Technical Research Center of Finland, Finland

Application  
Container ship

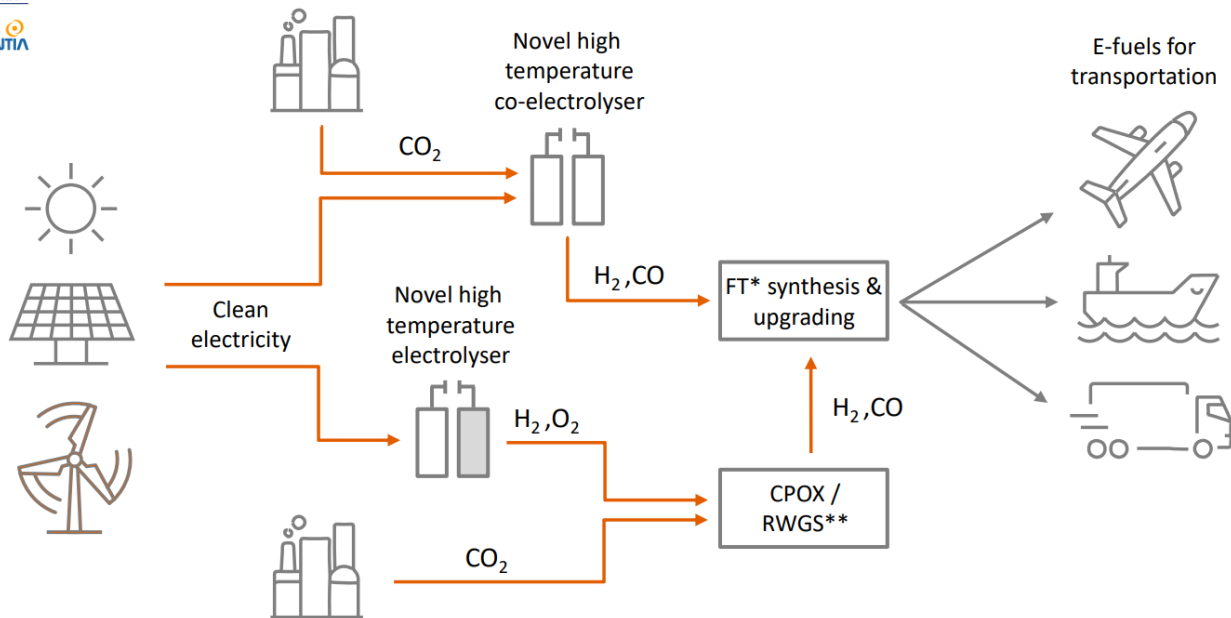


Up to 12% reduction  
in required power i.e  
emissions





## E-fuel concept



\* Fischer-Tropsch  
\*\*Catalytic partial oxidation / Reverse water-gas shift

- Shipping is the most energy efficient mode of transportation and the most important contributor for global wellbeing!
- Energy is required to move goods – yet reductions can be achieved by
  - Operational measures
  - Ship, machinery and energy system designs
- Green fuels – already viable options



# bey<sup>0</sup>nd

## the obvious

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