

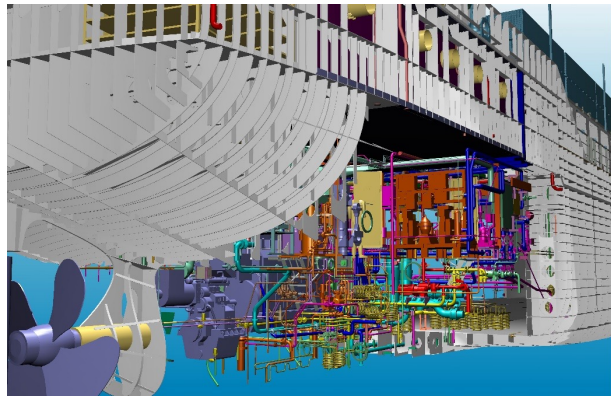
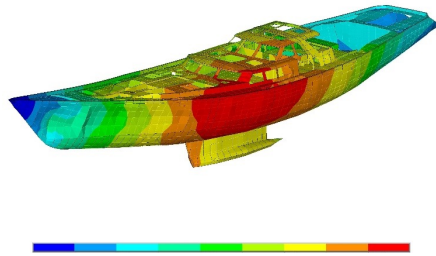
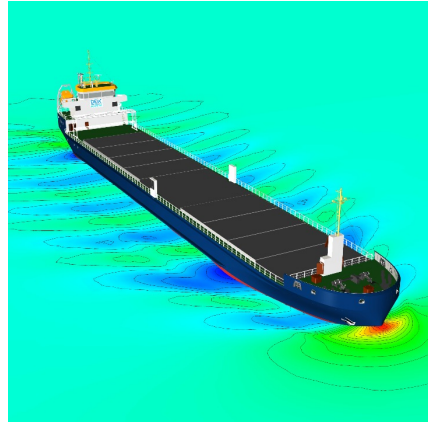


# Scheepsontwerp moet flexibel zijn voor de toekomst

Harry Linskens

2023-03-28

# Wie zijn wij?



**EMPLOYEES**

- STRUCTURAL DESIGNERS
- MECHANICAL ENGINEERS
- NAVAL ARCHITECTS
- STABILITY EXPERTS
- FEM EXPERTS
- CFD EXPERTS
- PROJECT MANAGERS
- DETAIL STRUCTURES AND OUTFITTING ENGINEERS

45



# De toekomst?

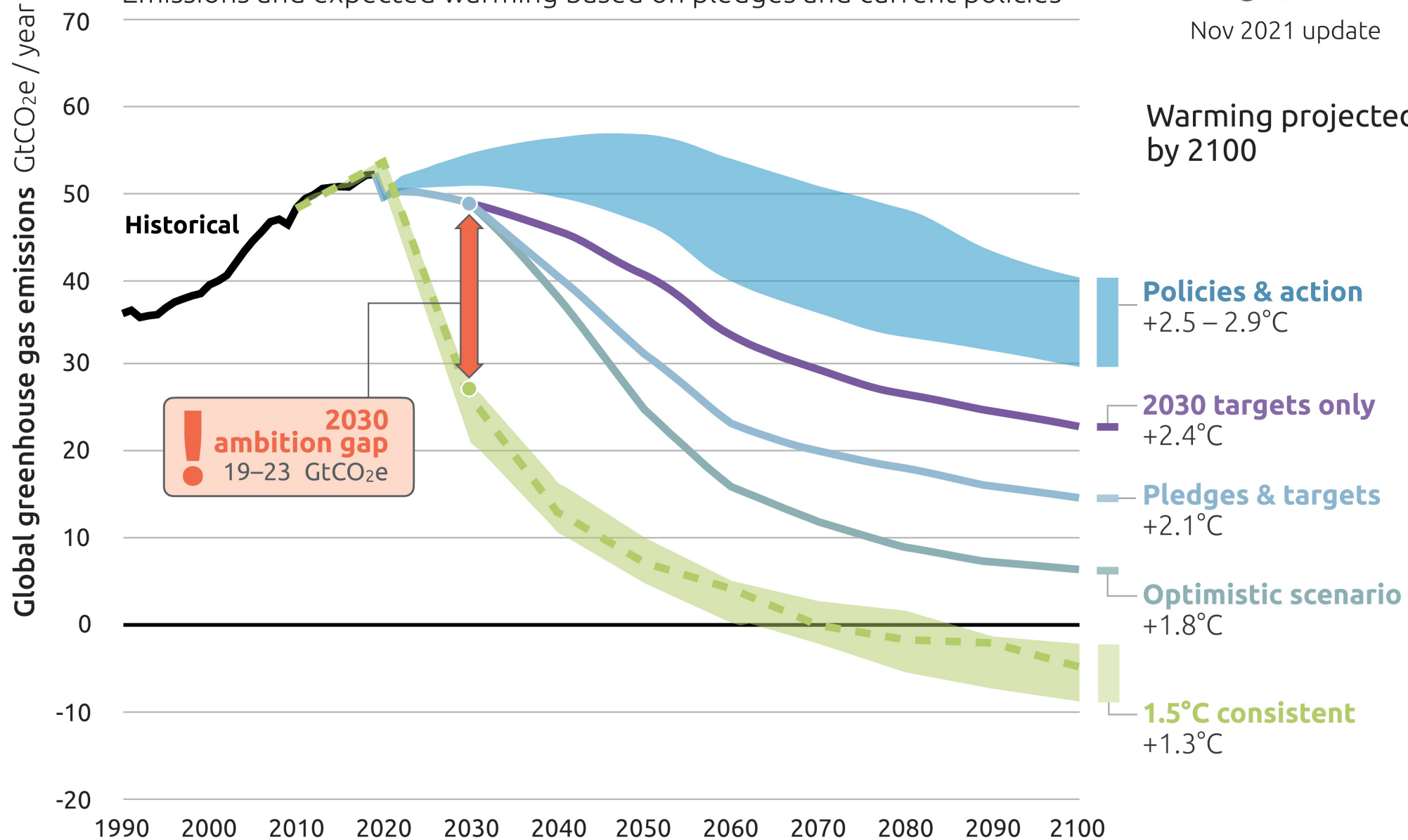
# 2100 WARMING PROJECTIONS

Emissions and expected warming based on pledges and current policies

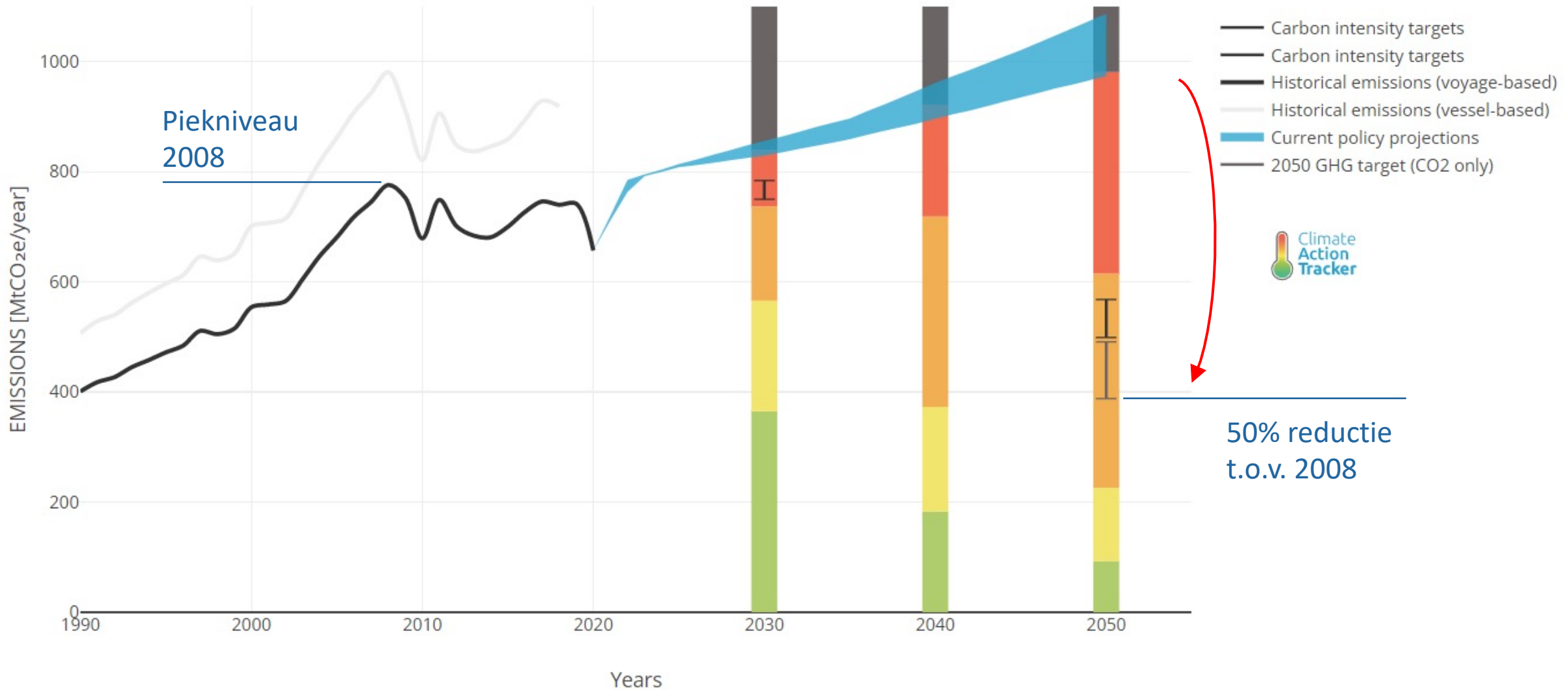


Nov 2021 update

Warming projected by 2100



# Internationale scheepvaart



Emissions?

Fuel type?

Fuel availability?

Regulations?

Conflict?

Climate change?

???

New technologies?

Fuel prices?

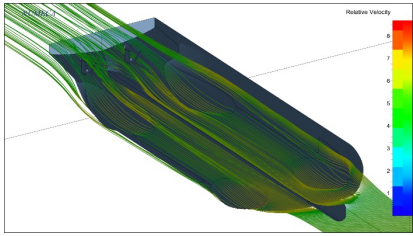
Ecological impact?

Old technologies?

World trade?

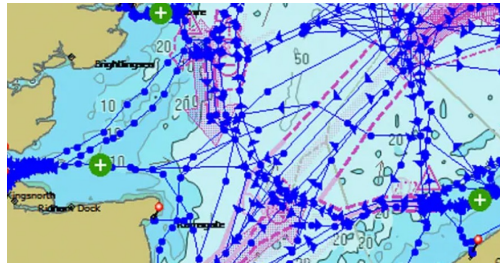
Wind power?

# DEKC DESIGN PHILOSOPHY TOWARDS ZERO EMISSION SHIPPING



## USE LESS ENERGY

- Hydro and Aerodynamically Optimized hull shape (parametric optimization)
- Thorough evaluation of the operating profile
- Route planning and operational performance optimization
- Low resistance hull coating
- Reduce energy consuming systems on board



## USE CLEAN ENERGY (WHEN AVAILABLE AND VIABLE)

- Bio or synthetic Fuels
- Renewable fuels
- Wind energy
- Shore connection

## ADOPT AVAILABLE TECHNIQUES TO DECREASE EMISSIONS

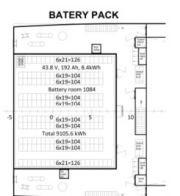
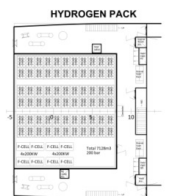
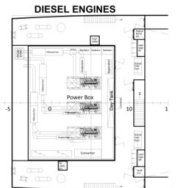
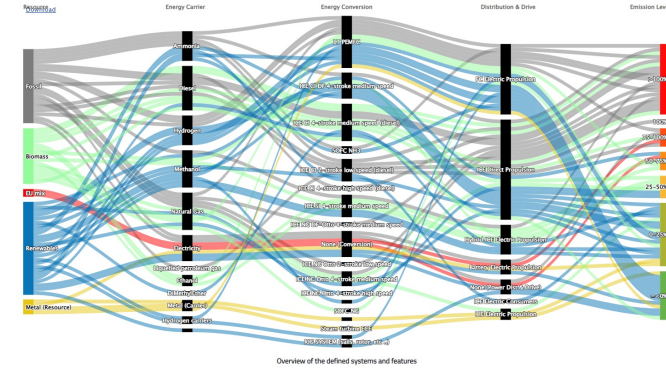
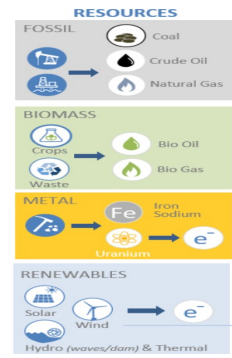
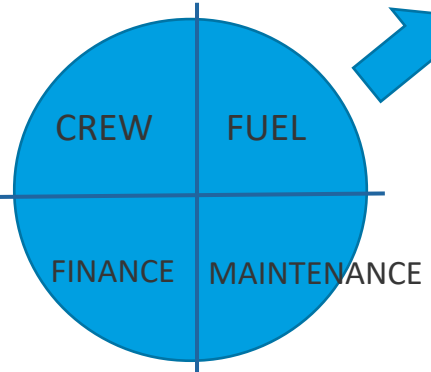
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- Heat recovery
- Led light / attention to low consuming electrical installations

## BE FLEXIBLE TO INCORPORATE FUTURE VIABLE SOLUTIONS

- Reserve space for future installations
- Tank space for future fuels
- Easy Engine Renewal
- Modular ship/system design

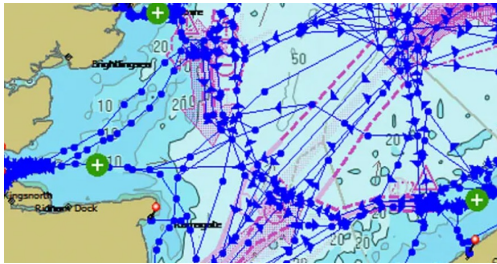
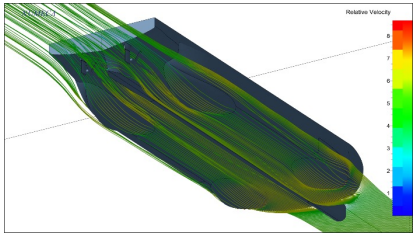
## RUNNING COST

+CO2 €€€ ?





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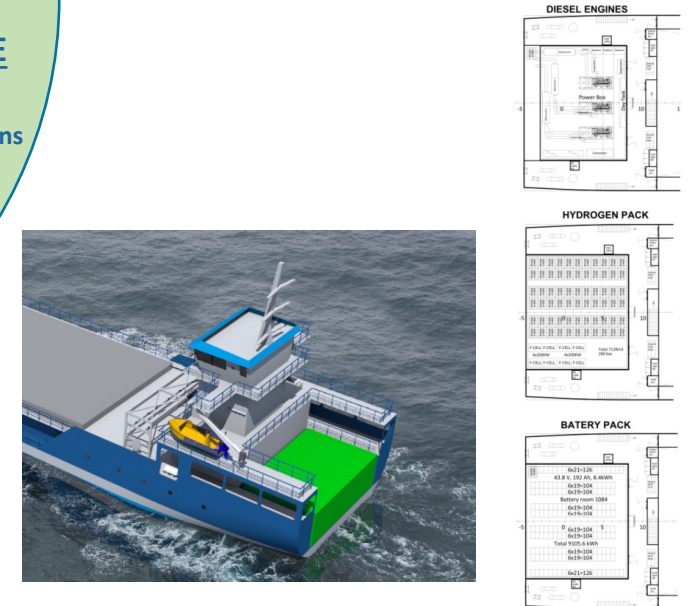
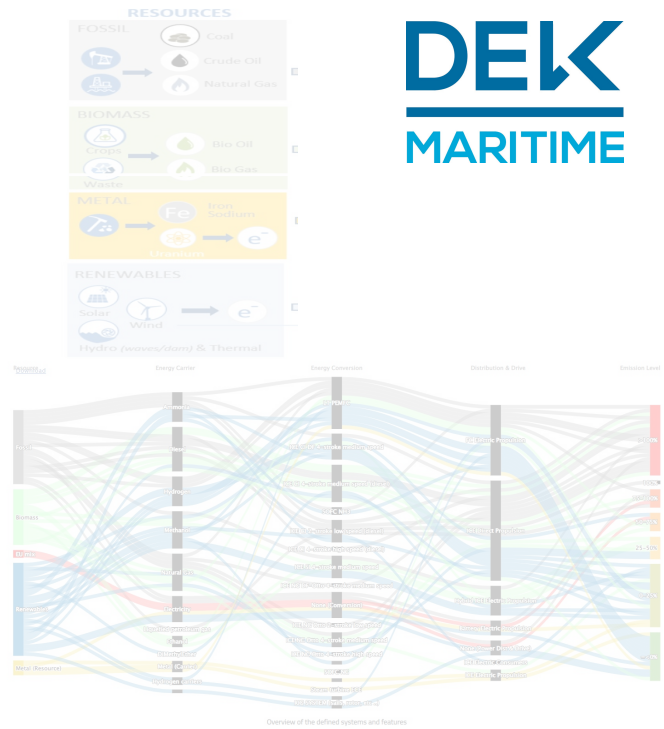
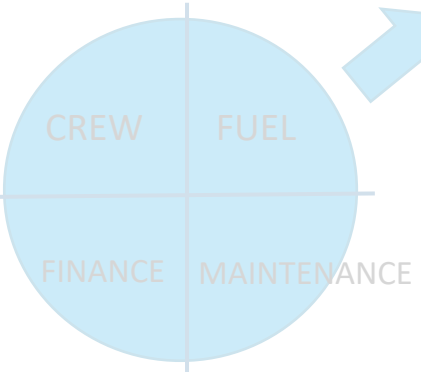
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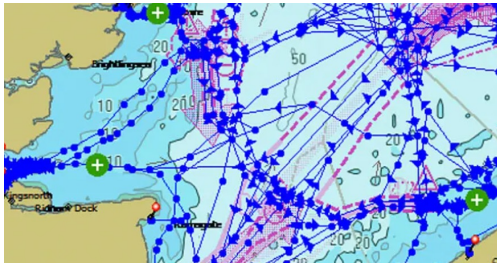
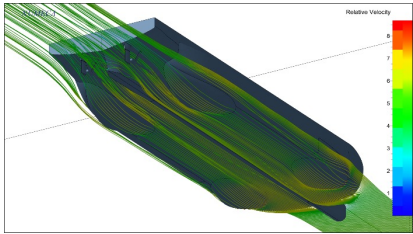
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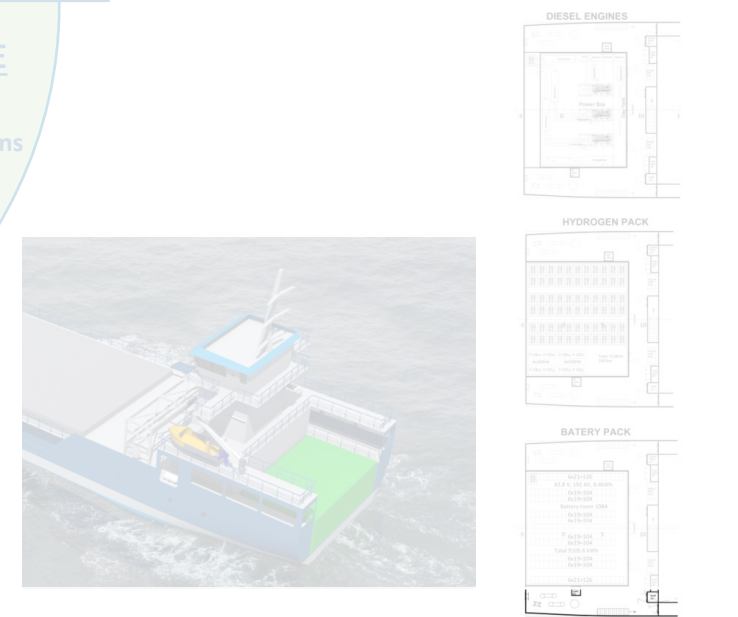
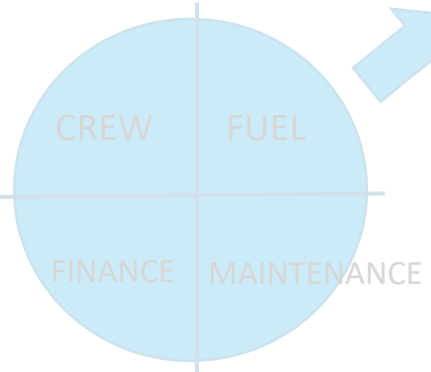
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RUNNING COST

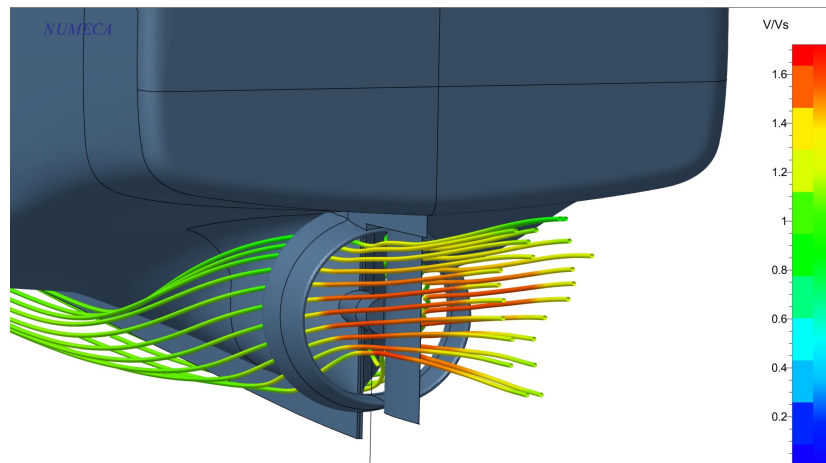
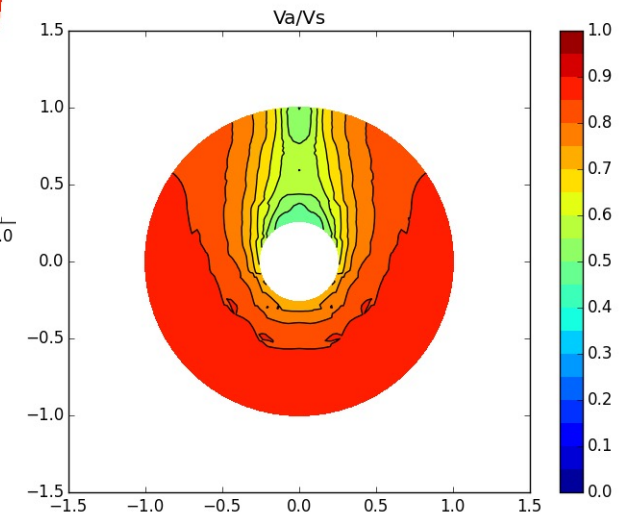
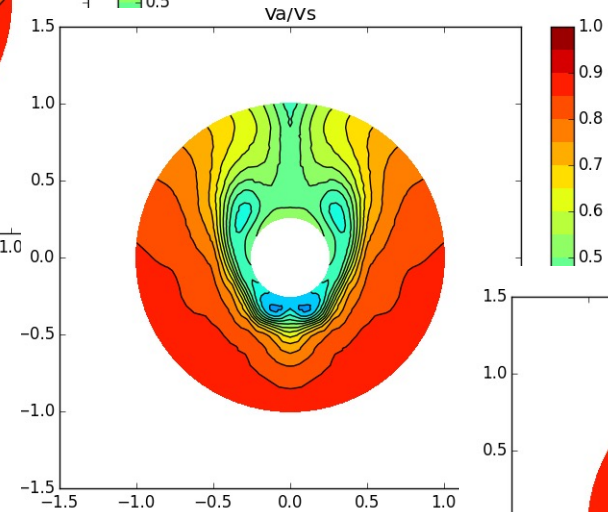
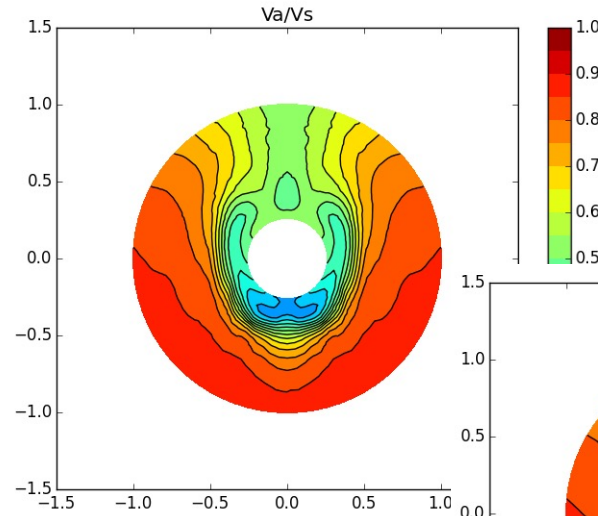
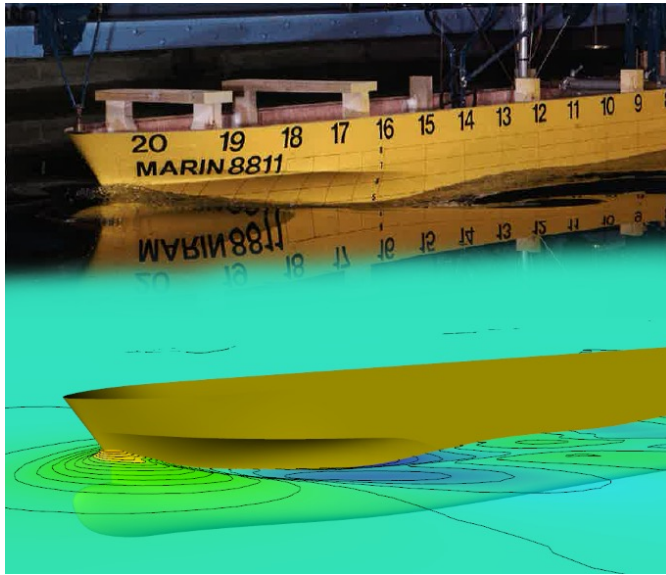
+CO2 €€€ ?



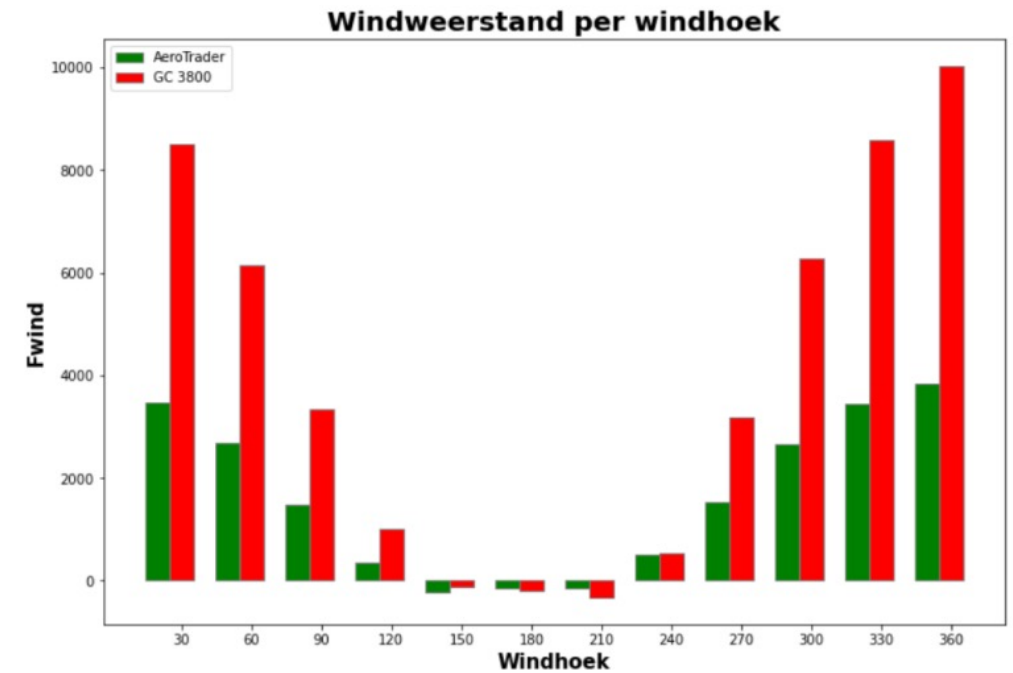
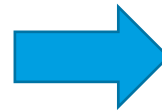
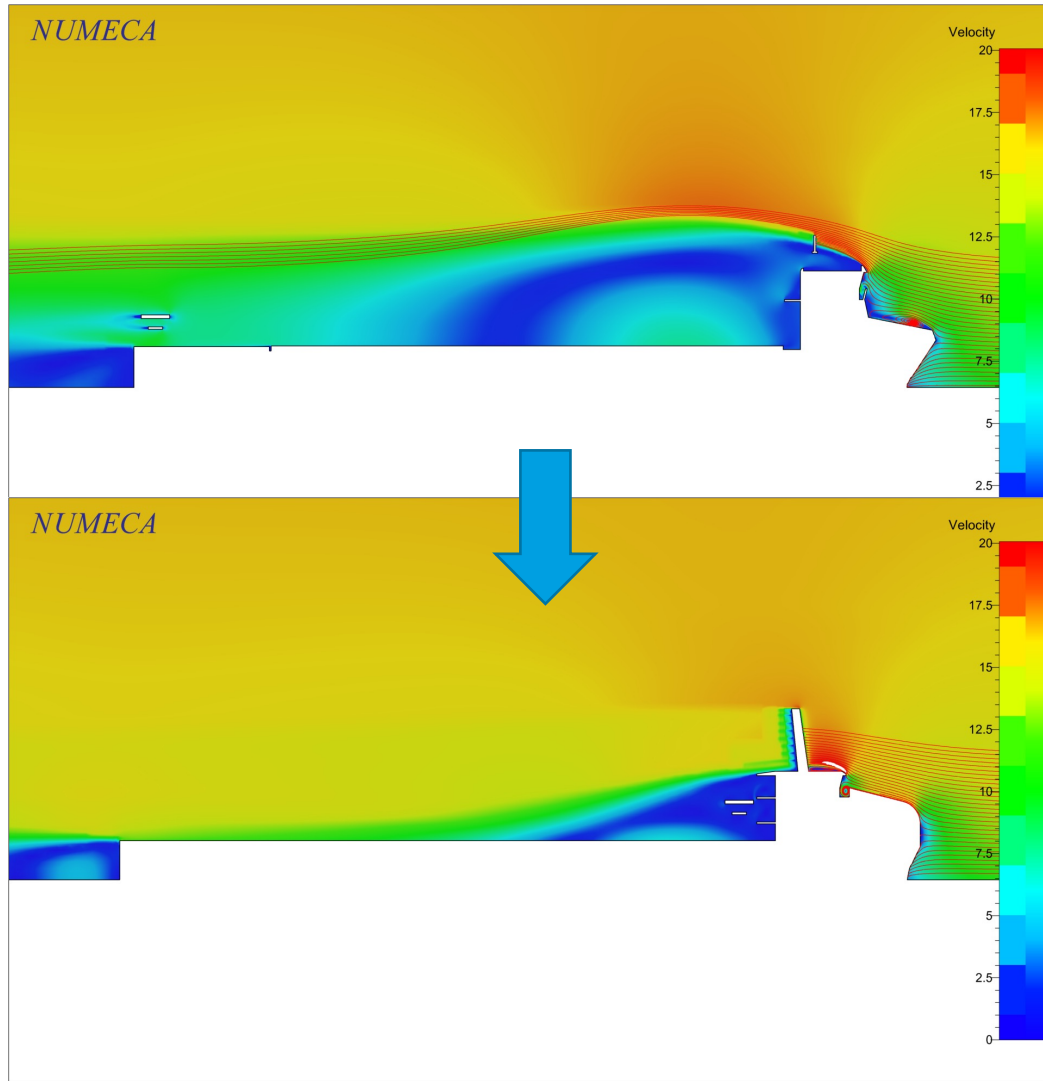
# Use Less Energy

- Hydro and Aerodynamically Optimized hull shape

# Weerstand en voortstuwing optimaliseren in CFD



# Windweerstand optimaliseren in CFD



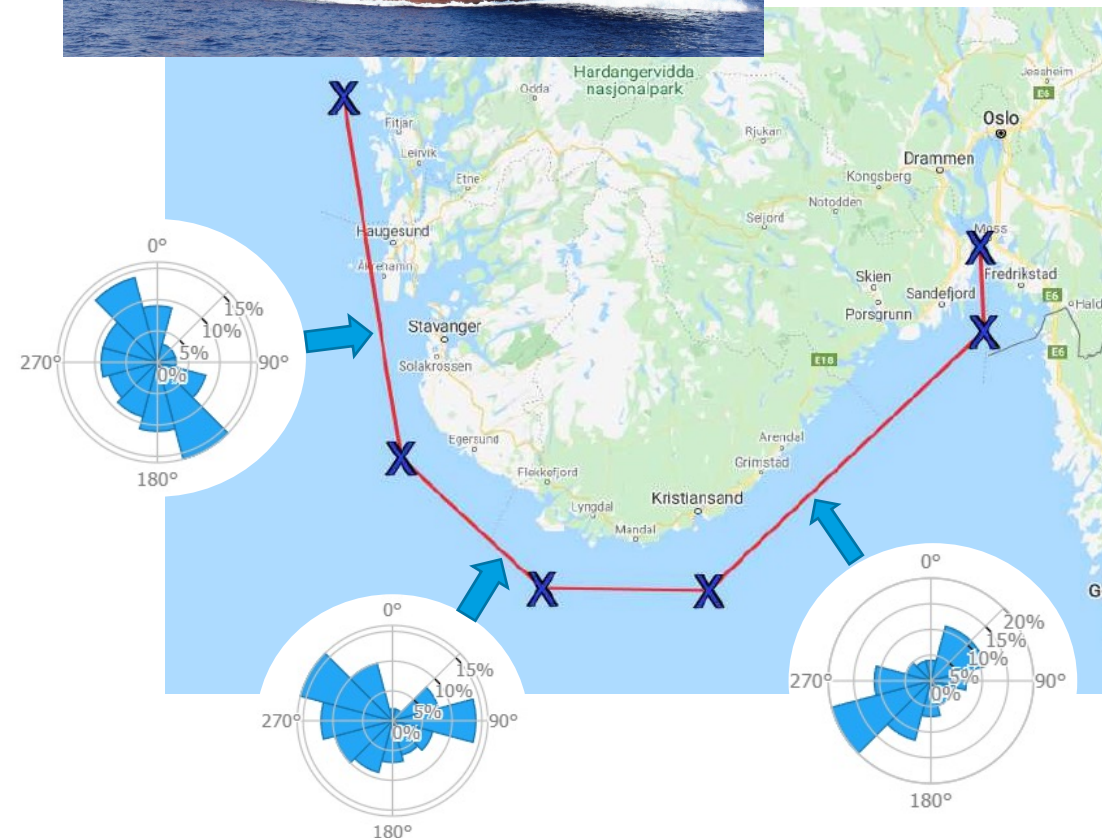
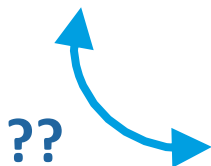
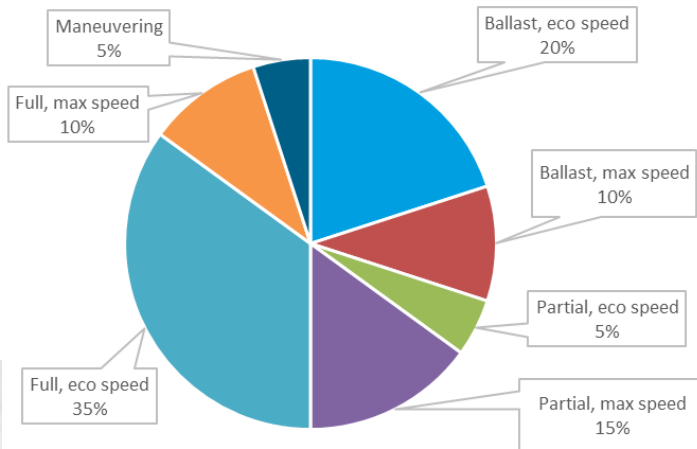
Figuur 5.2 windweerstand per windhoek

# Use Less Energy

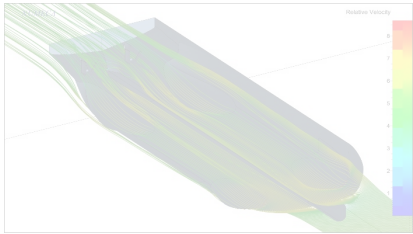
- Hydro and Aerodynamically Optimized hull shape
- Thorough evaluation of the operating profile
- Route planning and operational performance optimization

# Waar ontwerp je een schip voor?

Operational profile



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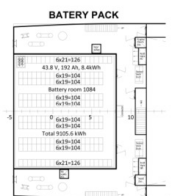
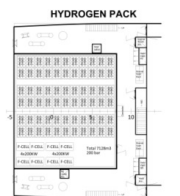
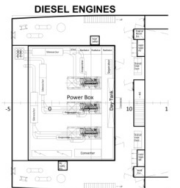
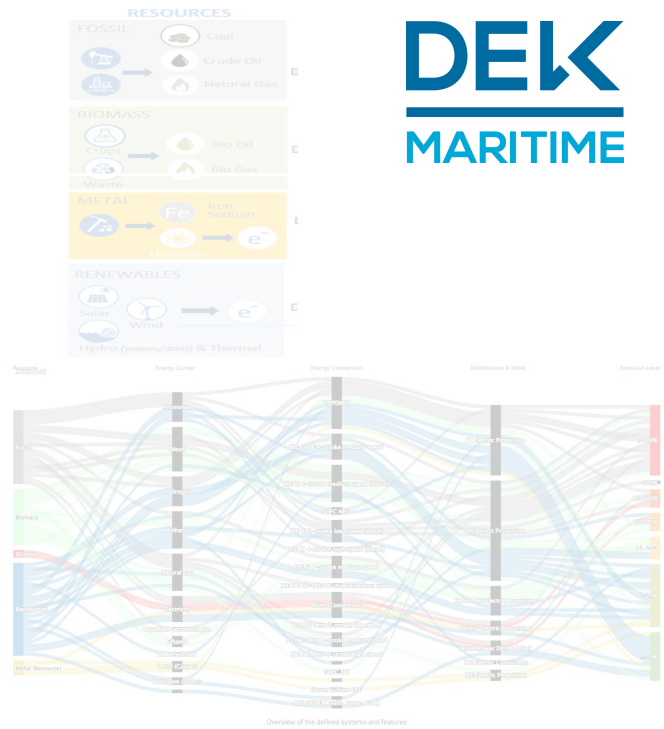
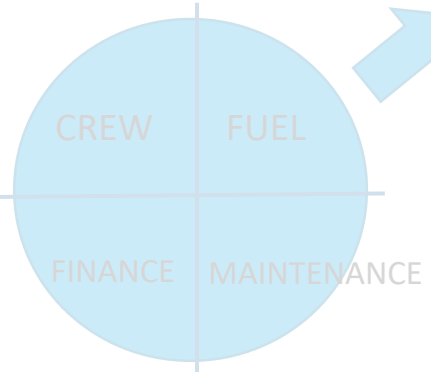
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RUNNING COST

+CO2 €€€ ?

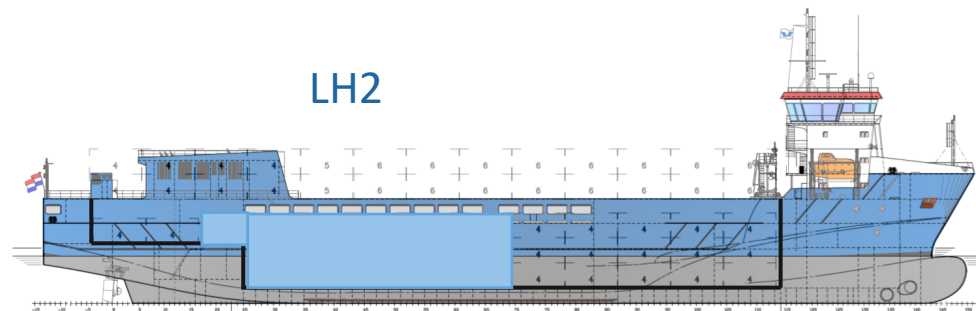
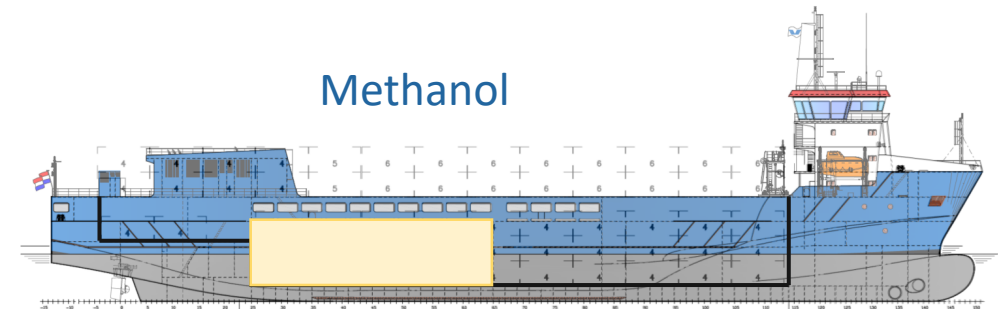
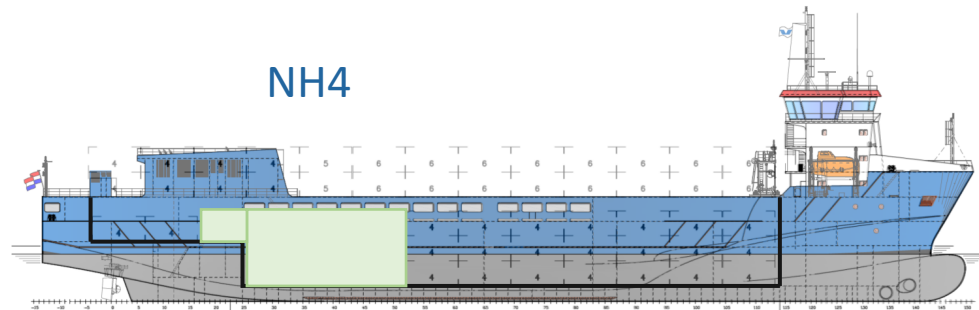
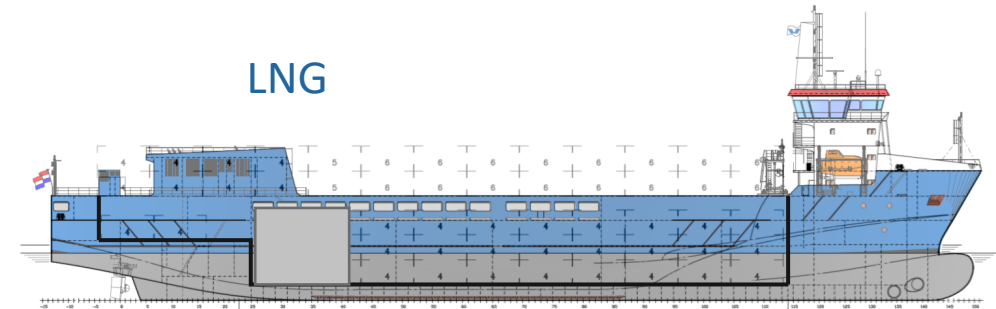
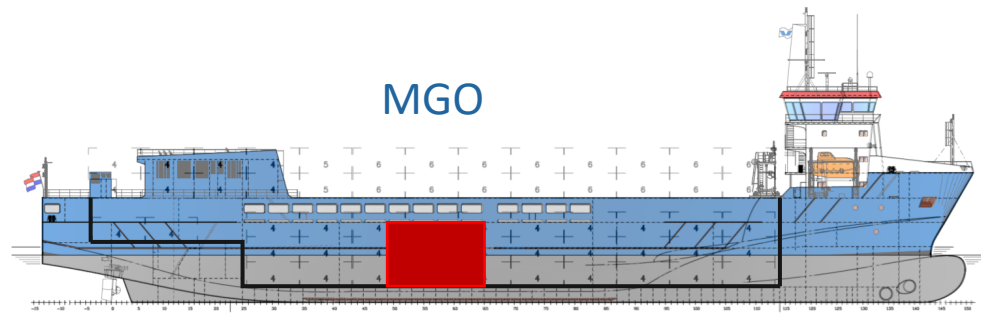




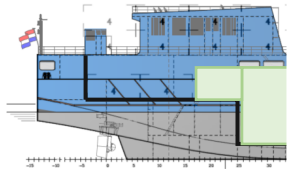
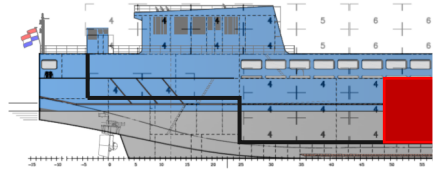
# Be flexible to incorporate future viable solutions

- Reserve space for future installations
- Tank space for future fuels

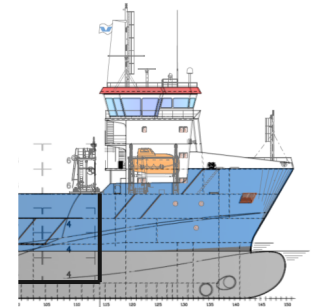
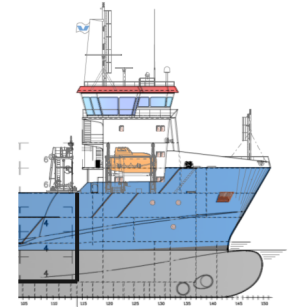
# Wat op te offeren?



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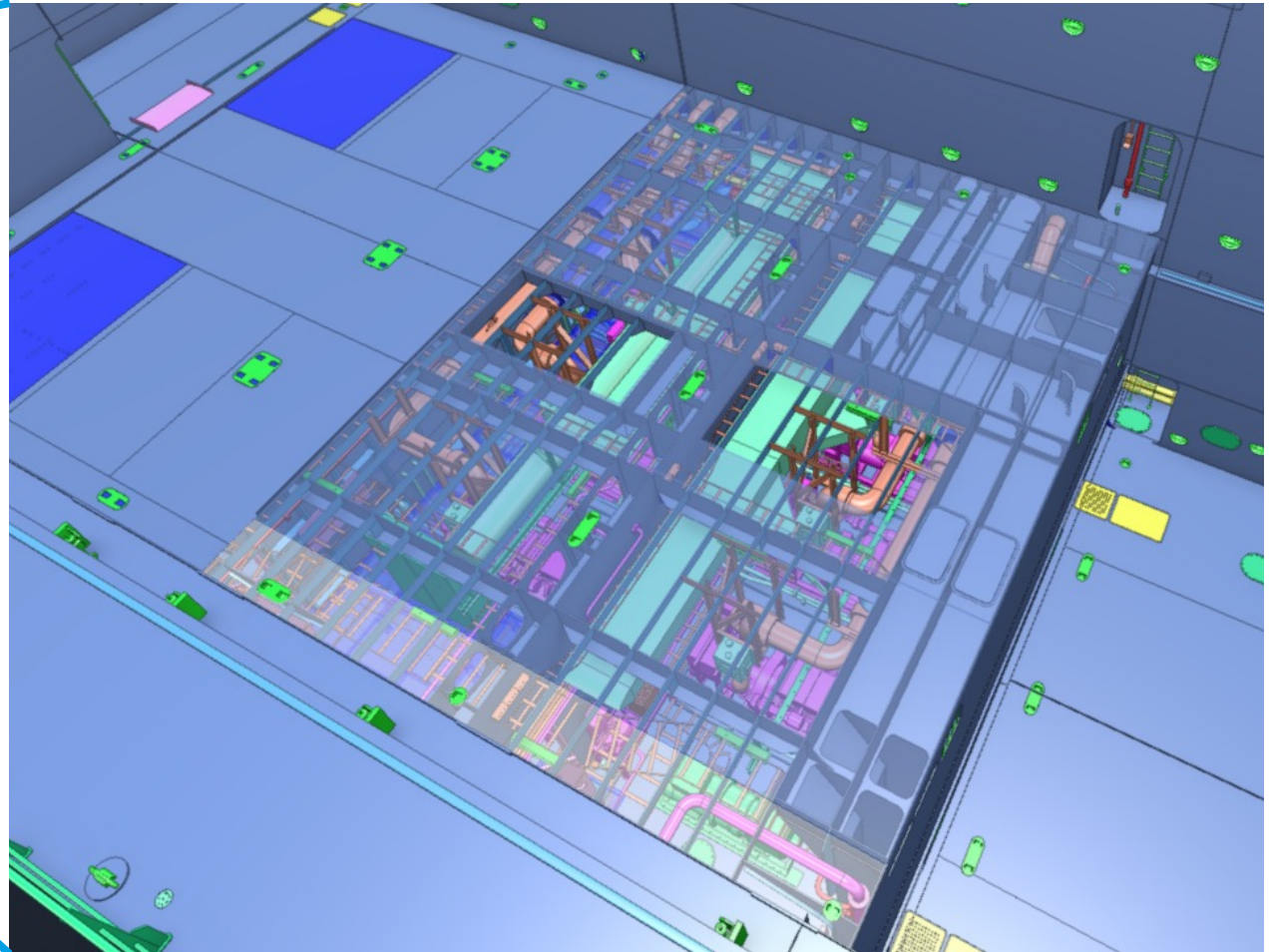
Batteries



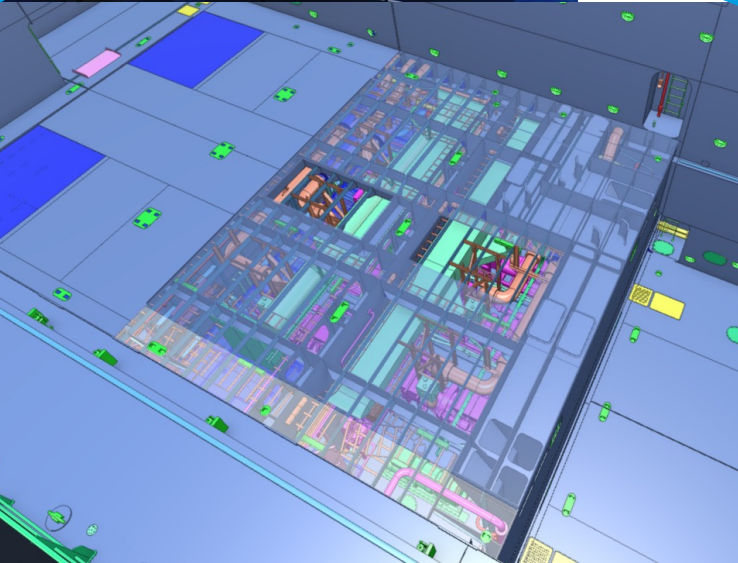
# Hoe is de voorstuwingsstrein te wisselen?



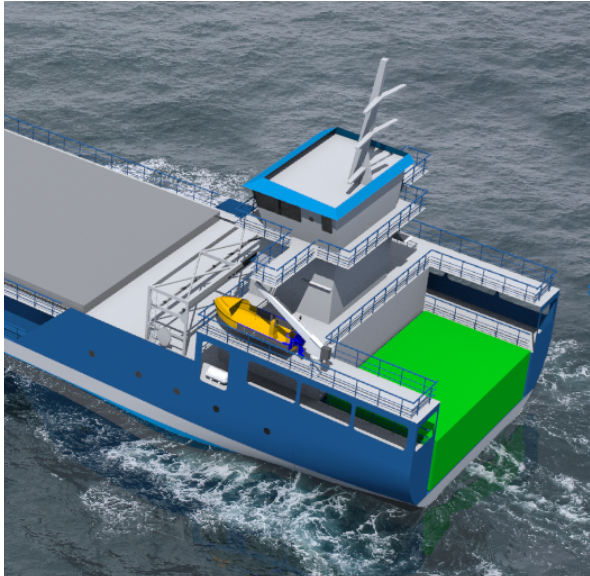
“Soft patch”?



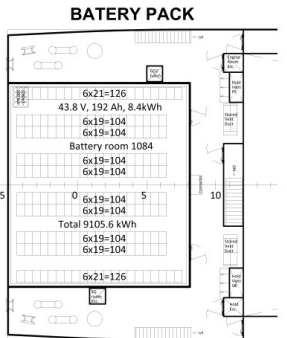
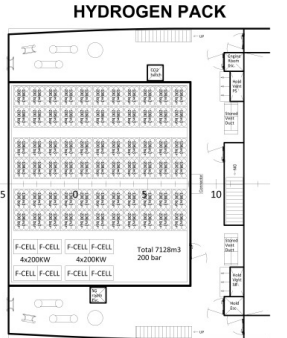
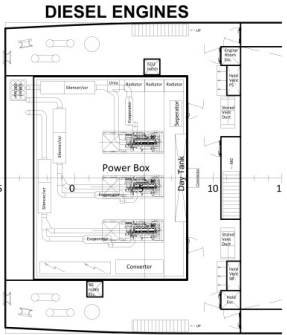
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“Soft patch”?



Modular power pack!



# Schip van de toekomst?

