



# A battery powered ferry as a successful example for an Interreg funded project



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An older picture of the team

## Schiffstechnik Buchloh

- Founded in 1994
- Employees/ Qualifications:
  - 4 Naval Architects
  - 1 Technician
  - 2 Draftsmen
  - 1 Assistent

## *Our knowledge for your vessel*

- 11 full-electric powered vessels (10 battery, 1 fuel cell + battery)
- Ferries, Day tour vessels, work boats
- Pax: 20 -180
- Length: 10-40 m

# References E-mobility

BVG Fahren 1-4



Sunje



Solaris



Alsterwasser Hamburg



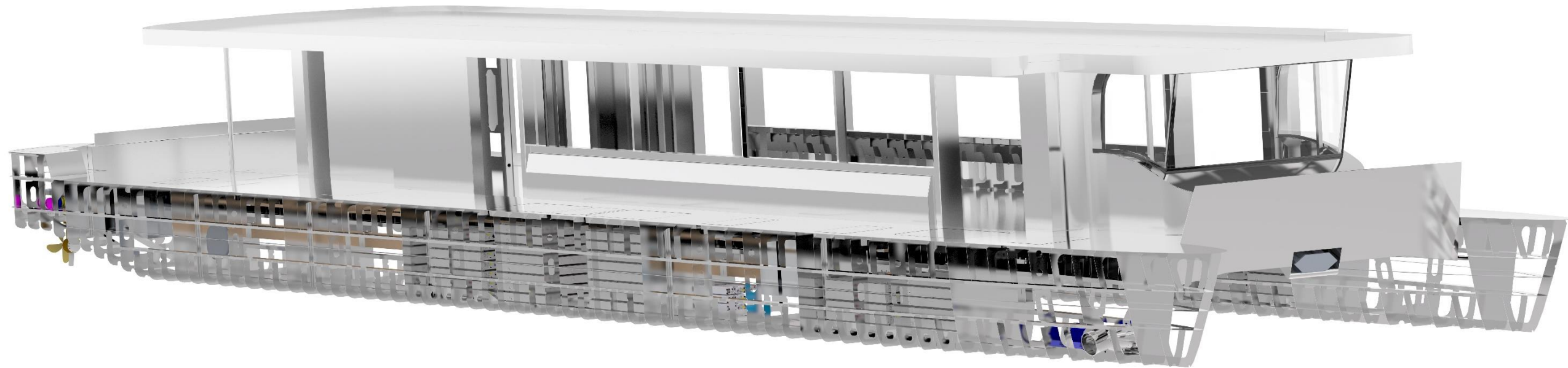
Dienstboot Rappbode



Autostadt Wolfsburg



## Current projects



# Sankta Maria II

## Sankta Maria Oberbillig - Wasserbillig



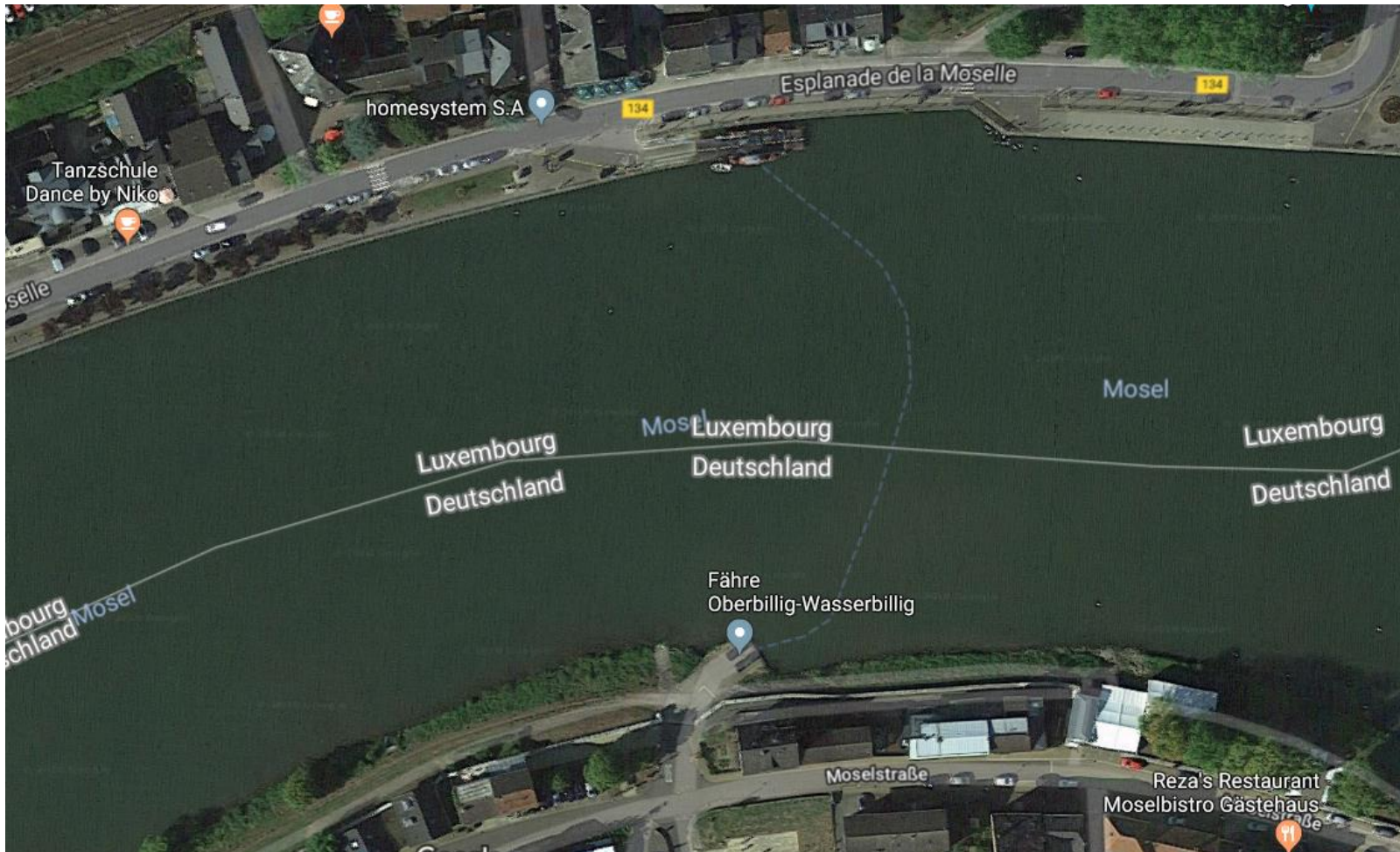
### Main dimensions:

Pax:	45
Cars:	6
Heaviest vehicle:	12t
Length over all:	28.00 m
Length in water line:	17.00 m
Beam over all:	8.90 m
Beam in the water line:	7.90 m
Depth	1.25 m / 1.40 m
Beam moulded:	5.10 m
Draught:	0.83 m
Payload:	25 t





# Environment and operational conditions



## General

- Short distance
- Few traffic
- Low current
- Short distance to grid connection

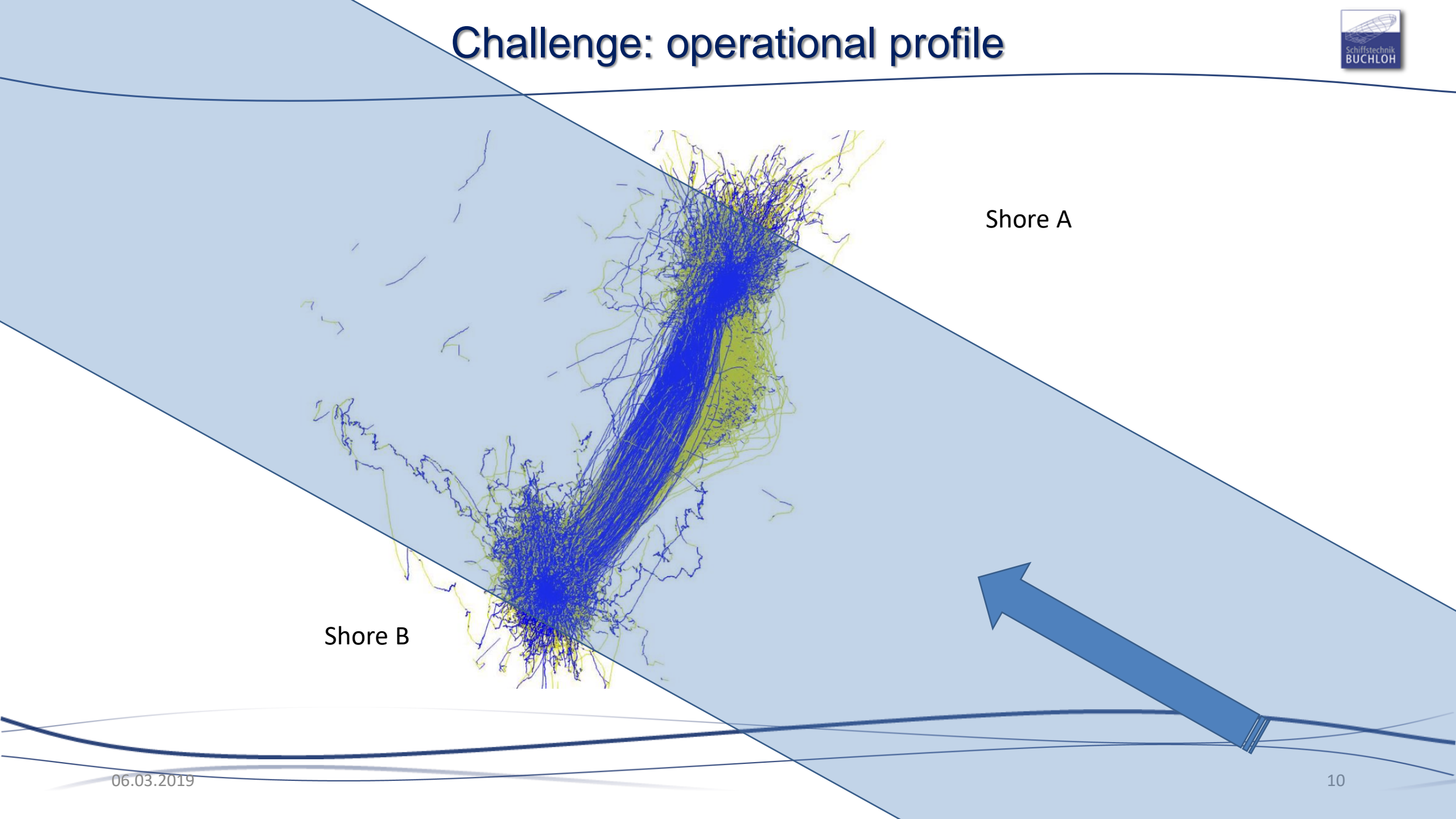
## Harbour Mertert:

- Short distance
- Protection from high waterlevels
- Electrical Infrastructure

## River dam Trier:

- Easy forecast for waterlevels
- Easy forecast for traffic
- Low current even at high waterlevels

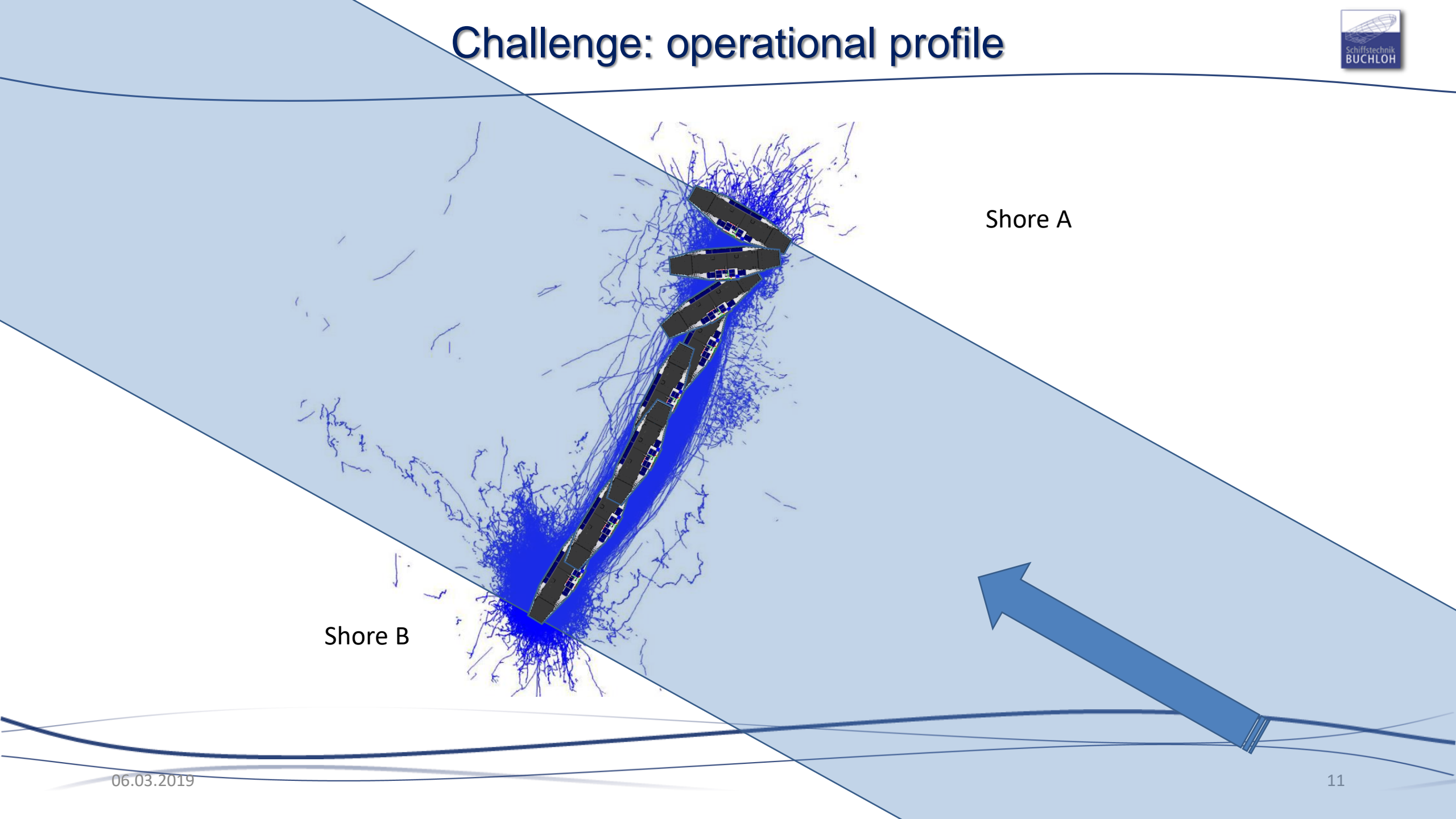
# Challenge: operational profile



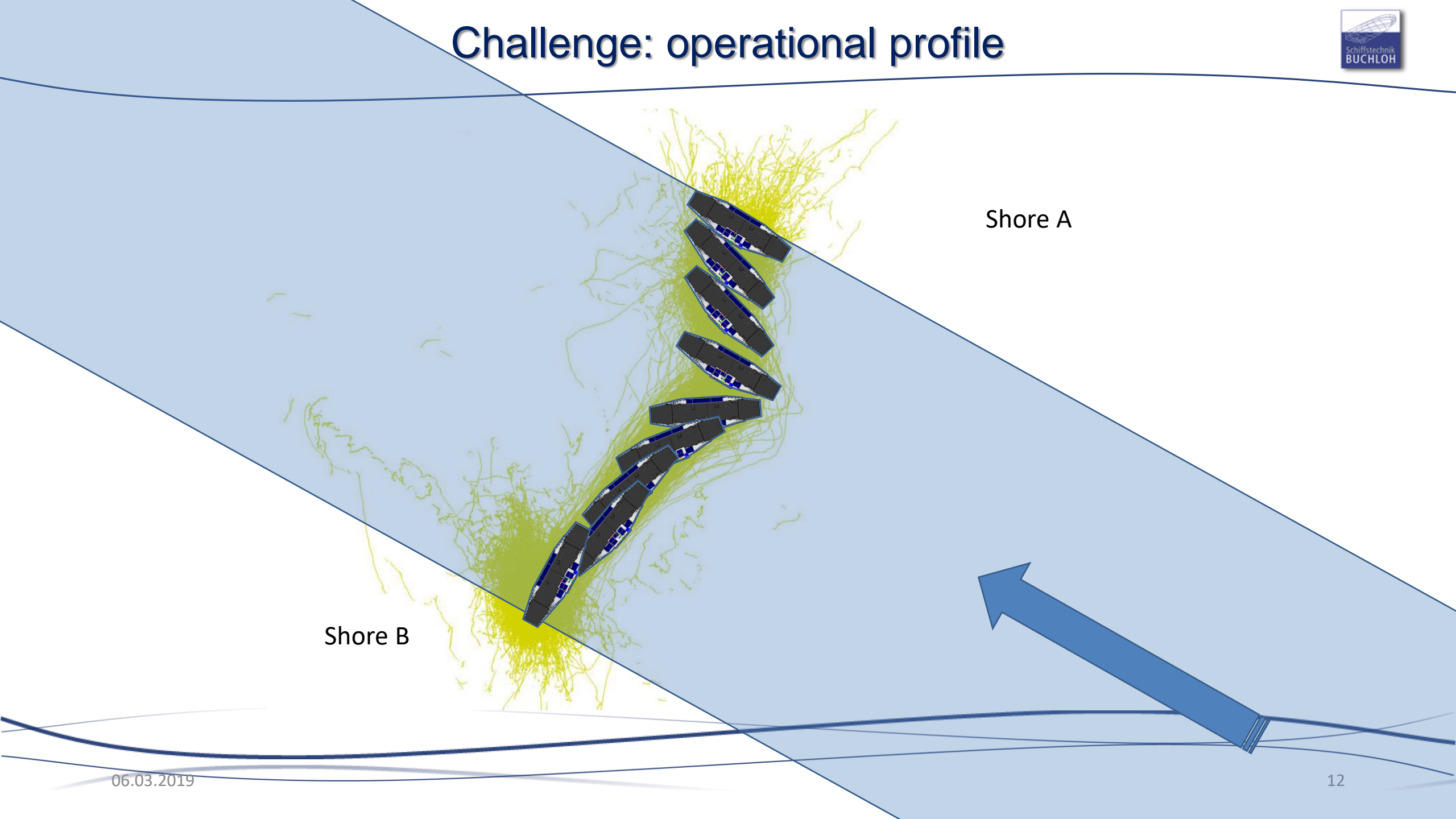
Shore A

Shore B

# Challenge: operational profile

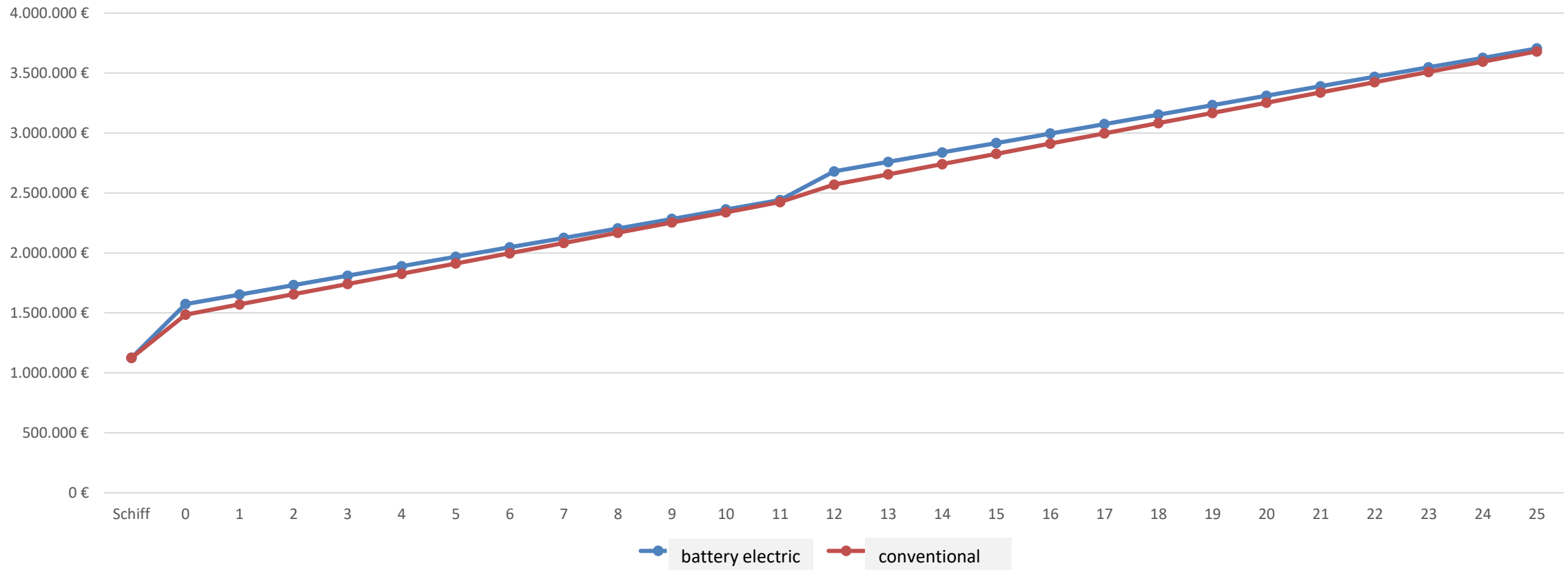


# Challenge: operational profile

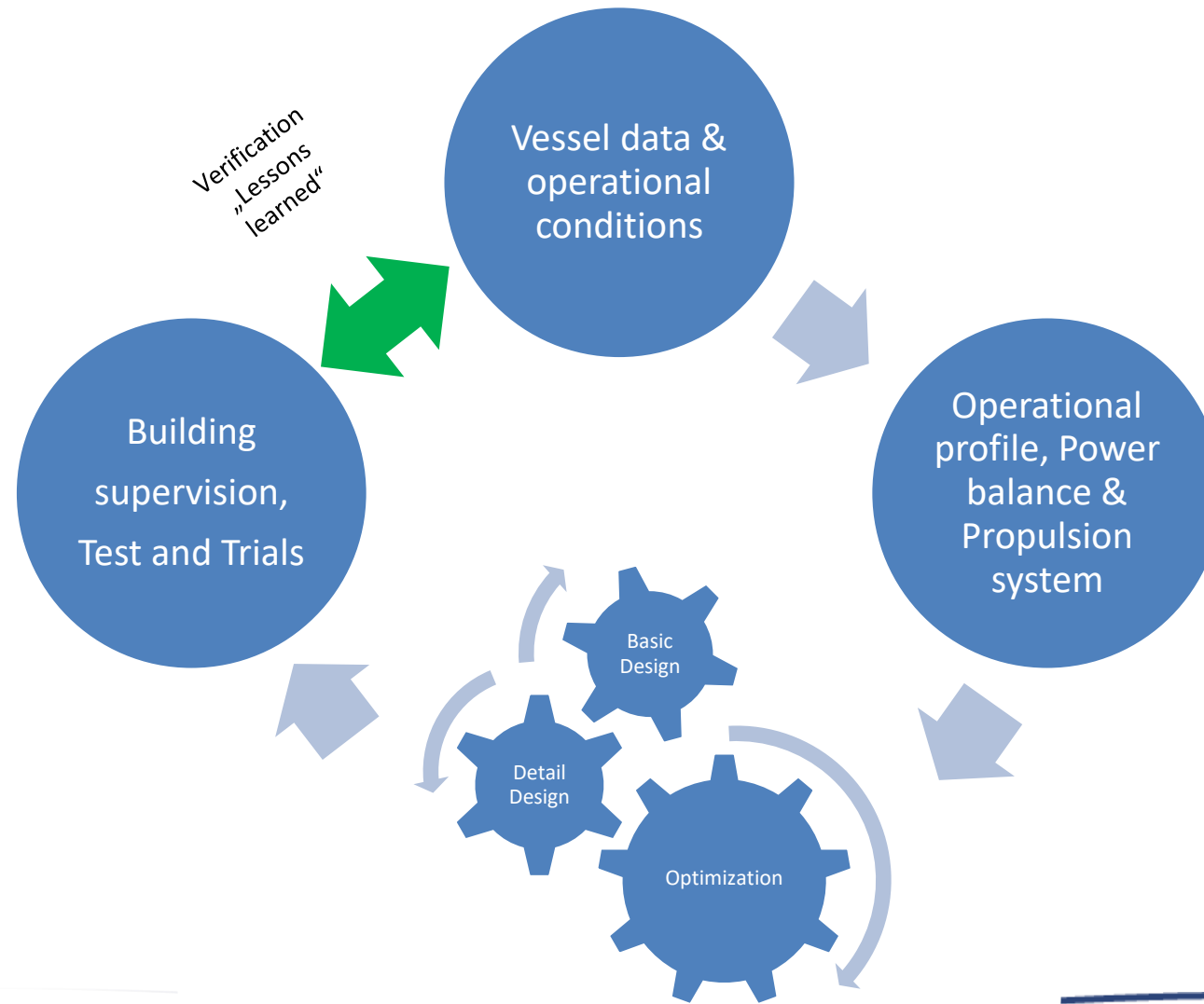


# Profitability analysis

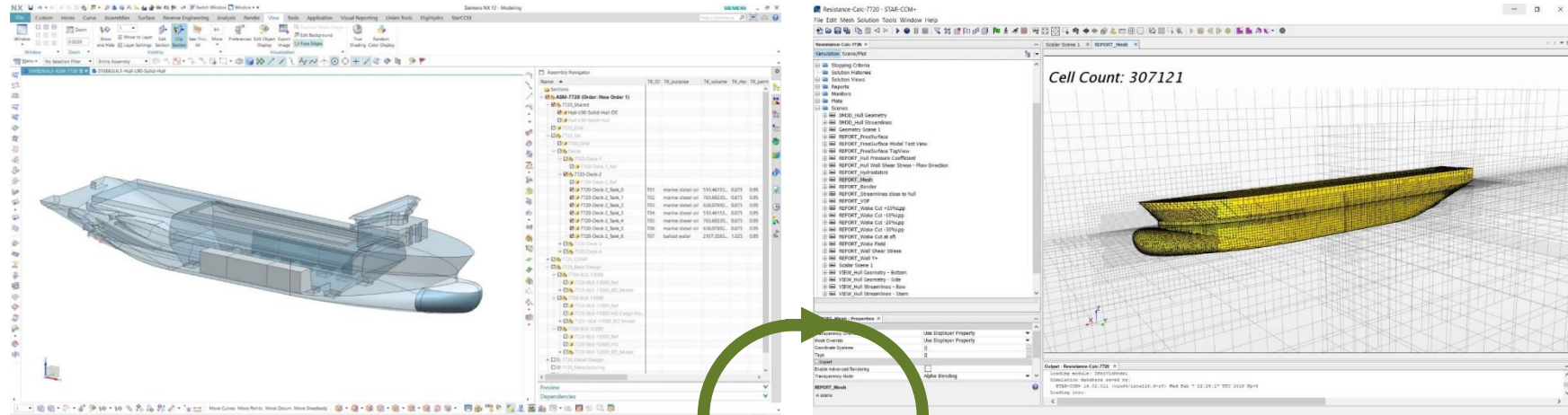
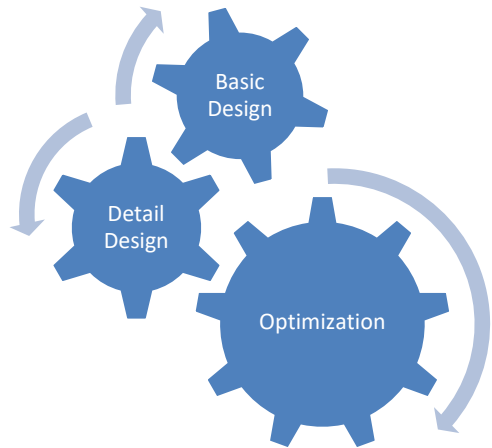
Accumulated cost



# Naval Architecture for electric vessels



# Integrated basic design

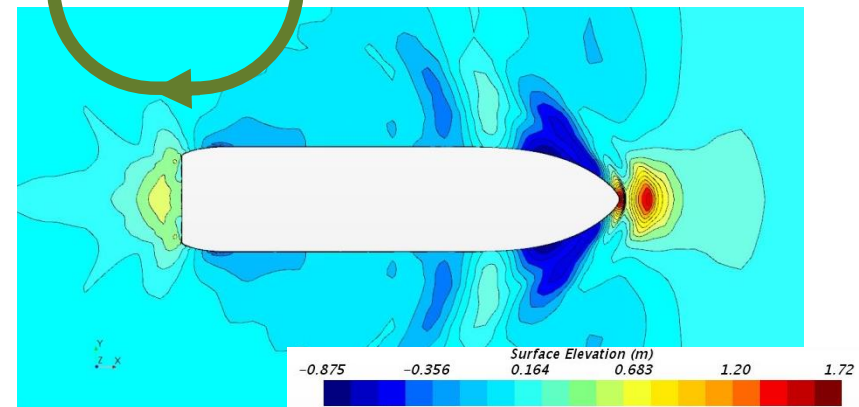


Hull design and room definition

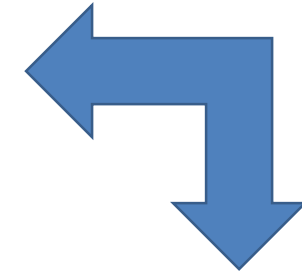
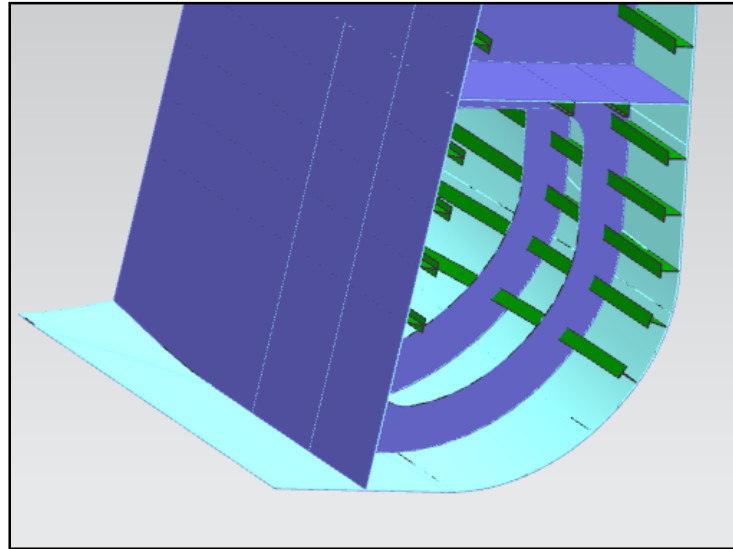
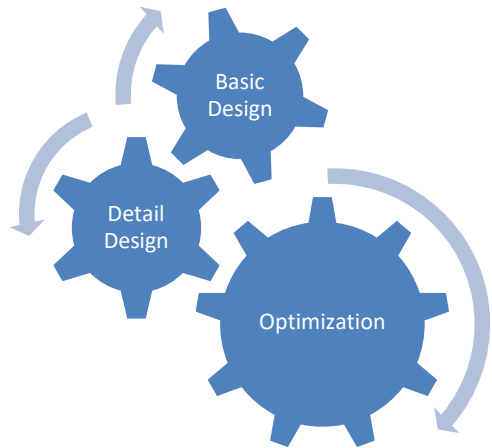
Hydrostatics

Hydrodynamics

Global strength



# Parametric detail design

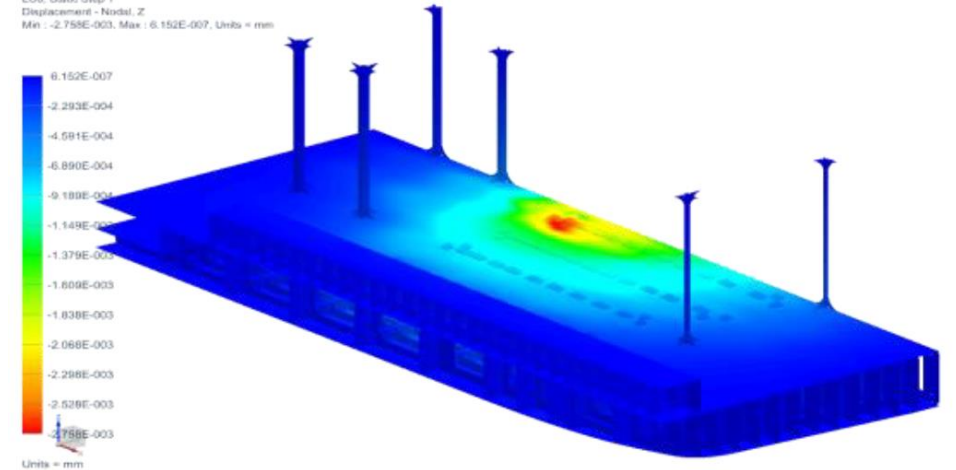


Structural optimization for actual loads

Detail design

Global and local strength analysis

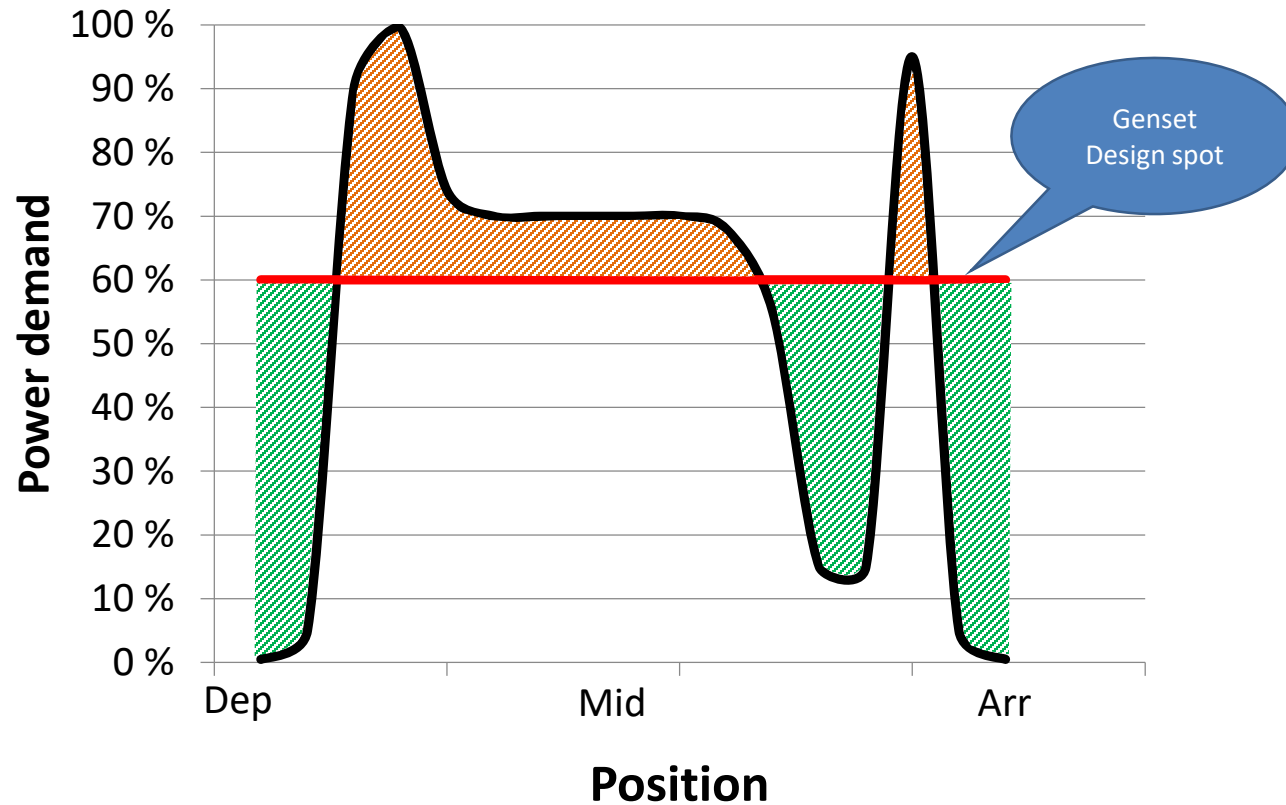
DOC7500-Engine girders stiffness\_sim1 : Engine girders stiffness Result  
 LCo: Stato Ship 1  
 Displacement - Nodal, Z  
 Min: -2.758E-003, Max: 6.152E-007, Units = mm





# Is the battery always a suitable solution ?

Hybrid power concept "Peak shaving"



- Diesel electric system
- Static load on Gen-Set
- Red = Battery is discharged
- Green = Battery is charged

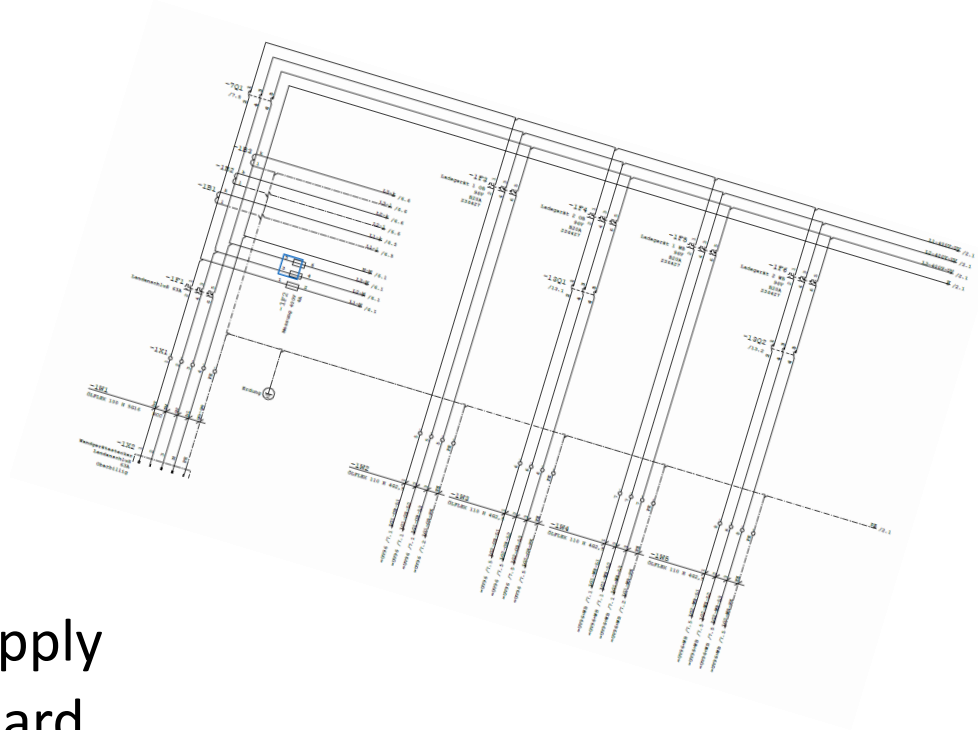
# Challenges in the design of electric or hybrid vessels

- Old or insufficient rules
- Minimization of power consumption
- Minimization of CAPEX
- Capture of a detailed operational profile
- Translation of a captured operational profile into new conditions (changes in capacity etc.)



## ○ Electrical engineering

- Current flow drawing
- Schemes drive train
- Schemes lighting
- Schemes on-board power supply
- Power balance for on board power supply
- Partlist for electrical consumers on board
- Specification of electrical components and integration into the 3D model





Thank you for your attention !