

Presentation to:



## Solar ships & Ferries „Made in Germany“

Stralsund, Germany, 27 March 2019  
Ingo Schillinger

  
**Made in Germany!**



# Solar ships „Made in Germany“



emission-free



noiseless



economical



# Ampereship a company of the Central Industry Group



CIG is an innovation-driven, technologically advanced industrial conglomerate engaged in:

- shipbuilding
- constructional and industrial engineering
- production of complex architectural projects
- the renewable energy industry

The CIG companies complement each other seamlessly. The passion for efficiency and a customer-focused approach can be found in all of our subsidiaries.



approx. 600 employees  
approx. € 180M turnover/ year

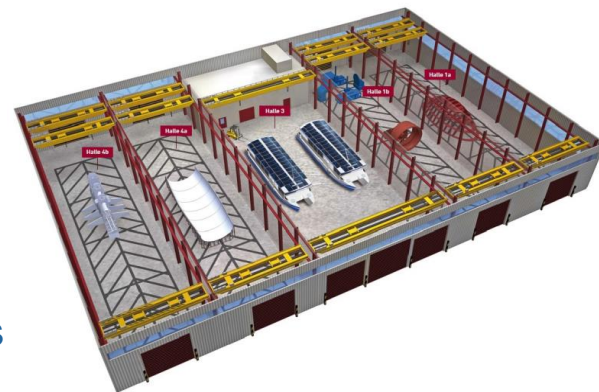


# Ampereship

A dedicated company working with the latest technologies



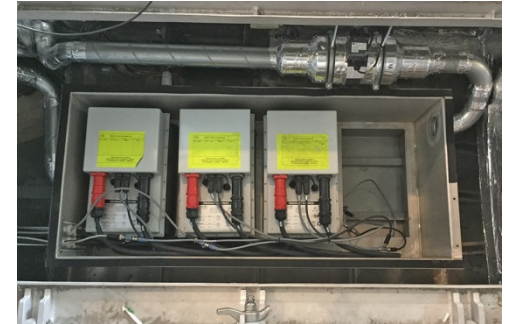
- Strong, experienced and motivated team
- Solid, experienced cooperation partners (engines, solar- & battery technology, controls, electronics etc.)
- Sophisticated system design
- Lightweight ship construction to ensure optimal floating and water resistance/drag profiles
- Compliance with all relevant safety regulations fire protection, heat and sound insulation, etc.
- Commercial use = cost effective and robust, resulting in optimized Total Cost Of Ownership/Life Cycle costs



# Overall integrated and optimized energy system "basis" of our electric solar ships



- Charge by solar cells: Achieving optimal efficiency
- Storage in batteries: Ensures the capacity required for the planned operation (always + 20% reserve)
- Minimum mass, maximum service life (use of high-quality battery technologies)
- Control electronics: ensuring high efficiency, absolute reliability
- Propeller: Optimal arrangement on the ship, maximum efficiency



# Environmental protection

## Tuned to the highest existing (and future) requirements



- Complete operation by solar energy possible
- Absolutely emission-free:
  - No soot particles
  - No CO<sub>2</sub> emissions
  - No NO<sub>x</sub> emissions
  - No SO<sub>x</sub> emissions
  - No noises, quiet operation by electric motors





# Safety is the utmost important item to Ampereship

- Highest possible redundancy due to complete double existing drive system
- Use of high-quality, proven technology
- No corrosion problems due to aluminum construction
- Excellent manoeuverability due to two swivelling drives (rudder propellers 360° rotatable)
- Proven energy balance and reliability





# Safety is the utmost important item to Ampereship

- Latest development in battery technics
- Li-polymer -> Cell protection: A short circuit remains restricted in 1 cell
- No interference with pacemakers or other healthy devices
- No interference with operational/control instruments



# References:

## 10 Electro-Solar Passenger ships and ferries



- 2013 Overschmidt 1 x 60 PAX Passenger ship, Solaaris Aasee
- 2014 Weiße Flotte HST 4 x 60 PAX Ferries, Berlin BVG (Fährbär 1 – 4)
- 2015 Weiße Flotte HST 1 x 60 PAX Passenger ship, Wolfsburg (Sünje)
- 2016 Talsperrenbetrieb 1 x Service- and Inspection boat (Rappbode)
- 2016 Weiße Flotte HST 1 x 60 PAX Passenger ship, Wolfsburg (Aluna)
- 2017 Eisenhardt  
Broke) 1 x 200 PAX Seminar ship, Berlin (Orca ten
- 2017 Gemeinde Oberbillig 1 x Car-Ferry, Deutschland-Luxemburg

## References:

### 1 x 60 PAX Passenger ship, Aasee – Münster (Ger)



- Catamaran aluminium hull
- Length 15.64 m / Width 4.60 m / Height 3.00 m
- Draught ca. 0.50 m
- 2 x Electric Engines with each 15 kW
- Battery capacity 114 kWh
- 28 Solar modules with each 185 W and a total Power of ca. 5.2 kWp
- Service speed ca. 9 km/h
- Max. Speed ca. 14 km/h
- Seating capacity inside max. 56 seats, outside max. 12 seats



# References:

## 4 x 60 PAX Ferries Berliner VG, Berlin (Ger)



- Catamaran aluminum hull
  - Handicapped accessible (incl. toilet)
  - Length 18.50 m / Width 5.20 m
  - Height 3.25 m / Draught ca. 0.60 m
  - 2 x Electric Engines with each 10 kW
  - Battery capacity 70 kWh
  - 52 Solar modules with each 205 W and a total Power of ca. 10.7 kWp
  - Service speed ca. 8 km/h
  - Max. Speed ca. 14 km/h
- Seating capacity inside max. 31 / 35 seats, authorized for 49 persons



# References:

## 2 x 60 PAX Passenger ships Autostadt, Wolfsburg (Ger)



- Catamaran aluminium hull
- Handicapped accessible (incl. toilet)
- Length 18.50 m / Width 5.40 m
- Height 3.25 m / Draught ca. 0.63 m
- 2 x Electric Engines with each 15 kW
- Battery capacity 70 kWh
- 52 Solar modules with each 205 W and a total Power of ca. 10.7 kWp
- Service speed ca. 8 km/h
- Max. Speed ca. 15 km/h
- Seating capacity inside max. 60 seats
- Little pantry installed



# References:

## 1 x Service & Inspection boat, Rappbode (Ger)



- Catamaran aluminium hull
- Length 10.50 m / Width 5.10 m / Height 3.25 m
- Draught ca. 0.60 m
- 2 x Electric Engines with each 6 kW
- Battery capacity 40 kWh
- 18 Solar modules with each 205 W and a total Power of ca. 3.7 kWp
- Service speed ca. 7 km/h
- Max. Speed ca. 10 km/h
- Seat capacity inside max. 20 seats / outside 6 seats
- Toilet / Pantry





# References:

## 1 x 200 PAX Seminarship, Berlin (Ger)



- 1 x Electric Engine with 110 kW
- 1 x Bow thruster 70 kW
- Battery capacity: 200 kWh
- 95 Solar modules with each 327 W and a total power of ca. 32 kWp
- Length 35.00 m / Width 8.00 m
- Draught ca. 1.00 m



# References:

## 1 x 200 PAX Seminarship, Berlin (Ger)



- Service speed ca. 6 - 10 km/h
- Max. Speed ca. 14km/h
- Toilet (handicapped accessible)
- Pantry
- 2 x Anchor piles



# References:

## 1 x Electric solar Car Ferry, Oberbillig (Ger)



- First full electric inland waters car-ferry in the world
- 4 x Electric engines with each 20 kW
- 2x Lithium-Polymer-Batteries with Battery Management System
- Total capacity:  $24 \times 10.5 \text{ kWh} = 252 \text{ kWh}$
- 15 Solar modules with each 345 W and a total Power of ca. 5.2 kWp



# References:

## 1 x Electric solar Car Ferry, Oberbillig (Ger)



- Length 28.00 m / Width 9.00 m
- Draught ca. 0.80 m
- Service speed ca. 6 km/h
- Max. Speed ca. 13 km/h
- 6 Cars / 45 Passengers (25 t)
- Pantry

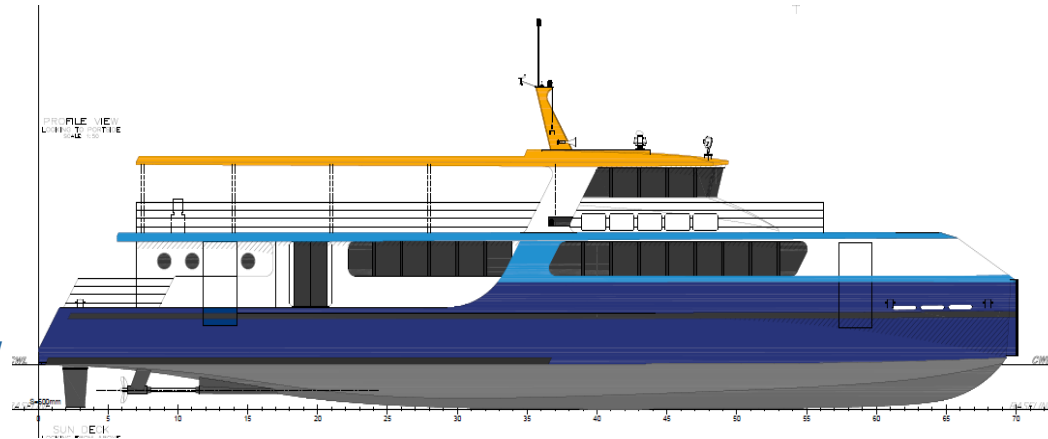


# Ongoing Project:

## 1 x 150 PAX Passenger ship, Flensburg (Ger)



- Catamaran aluminum hull
- Handicapped accessible (incl. toilet)
- Length 32.00 m / Width 8.00 m
- Draught ca. 1.20 m
- 2 x Electric Engines with each 80 kW
- Battery capacity 300 kWh
- 75 Solar modules with each 327 W and a total power of ca. 22.5 kWp
- Service speed ca. 14 km/h
- Max. Speed ca. 18 km/h
- Area of application Baltic Sea





# Ongoing Project:

## 1 x 300 PAX Passenger ship, Kiel (Ger)



- Catamaran steel/aluminum hull
- Handicapped accessible (incl. toilet)
- Length 33.00 m / Width 9.00 m
- 2 x Electric Engines with each 280 kW
- 68 Solar modules with each 327 W and a total power of ca. 20.4 kWp
- Draught ca. 1.45 m
- Service speed ca. 16 km/h
- Max. Speed ca. 22 km/h

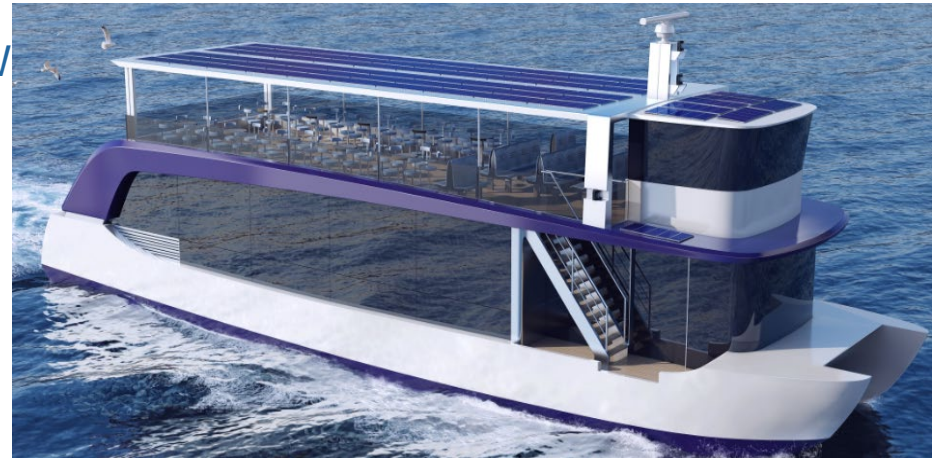


# Ongoing Project:

## 1 x 120 PAX Passenger ship, Wismar (Ger)



- Catamaran aluminum hull
- Accessible for handicapped (incl. toilet)
- Length 26.00 m / Width 6.50 m
- 2 x Electric Engines with each 45 kW
- 66 Solar modules with each 345 W and a total power of ca. 22.7 kWp
- Draught ca. 1.00 m
- Service speed ca. 10 km/h
- Max. Speed ca. 15 km/h



# Ongoing Project: 1 x 80 PAX Passenger ship, Hamburg (Ger)



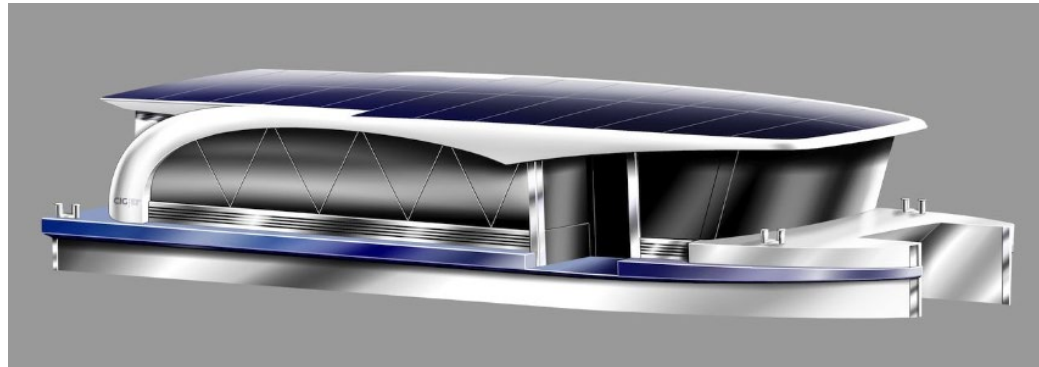
- Catamaran aluminum hull
- Handicapped accessible (incl. toilet)
- Length 24.90 m / Width 5.80 m
- 2 x Electric Engines with each 15 kW
- 36 Solar modules with each 345 W and a total power of ca. 12.4 kWp
- Draught ca. 0.70 m
- Service speed ca. 8 km/h
- Max. Speed ca. 14 km/h



# Ongoing Project: 1 x 60 PAX Passenger ship, Konstanz (Ger)



- Catamaran aluminum hull
- Handicapped accessible (incl. toilet)
- Length 18.50 m / Width 5.40 m
- 2 x Electric Engines with each 15 kW
- 52 Solar modules with each 300 W and a total power of ca. 15.6 kWp
- Draught ca. 0.70 m
- Service speed ca. 8 km/h
- Max. Speed ca. 15 km/h
- Area of application: Baltic Sea





## Advantages working with Ampereship

- Safety is the utmost important item
- Own unique management system regarding on-board current systems
- Years of experience in electric sailing under different circumstances
- After sales and technical department will provide full service
- Just 1 supplier to contact: Ampereship
- Building certificates in all kind of waters





**Experience without any obligation electric sailing on one of our boats..**



## Contact details

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