



What shore power can do to reduce you port's CO2-footprint.

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/// Cruise Industry increasingly in the Focus of protestors

Anti-Cruise Protesters in City and harbour



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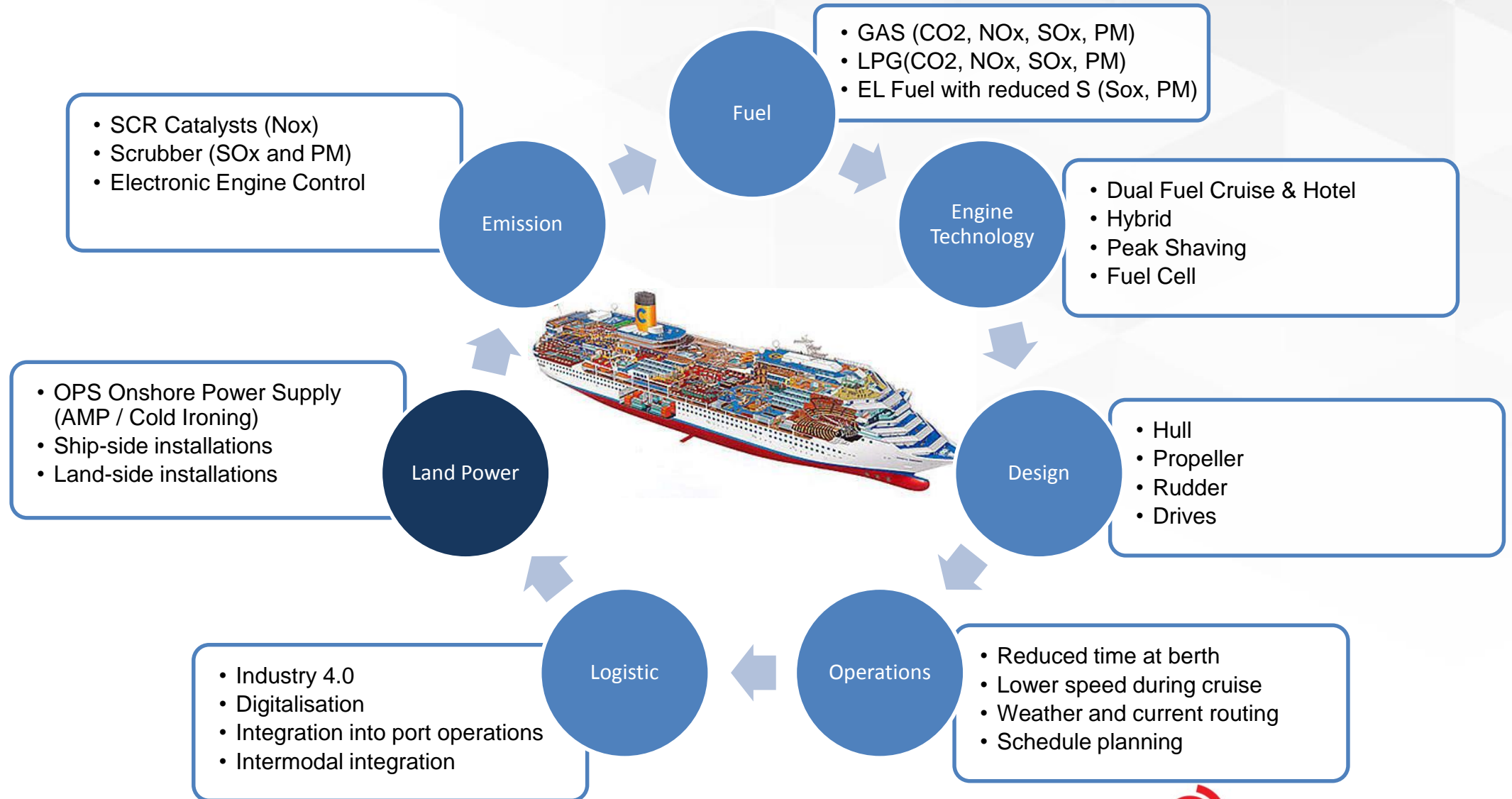
/// Cruise Industry increasingly in the Focus of protestors

Anti-Cruise Protesters in City and harbour



/// Technological Factors for sustainable emission reduction

Various approaches and technologies in different maturity stages

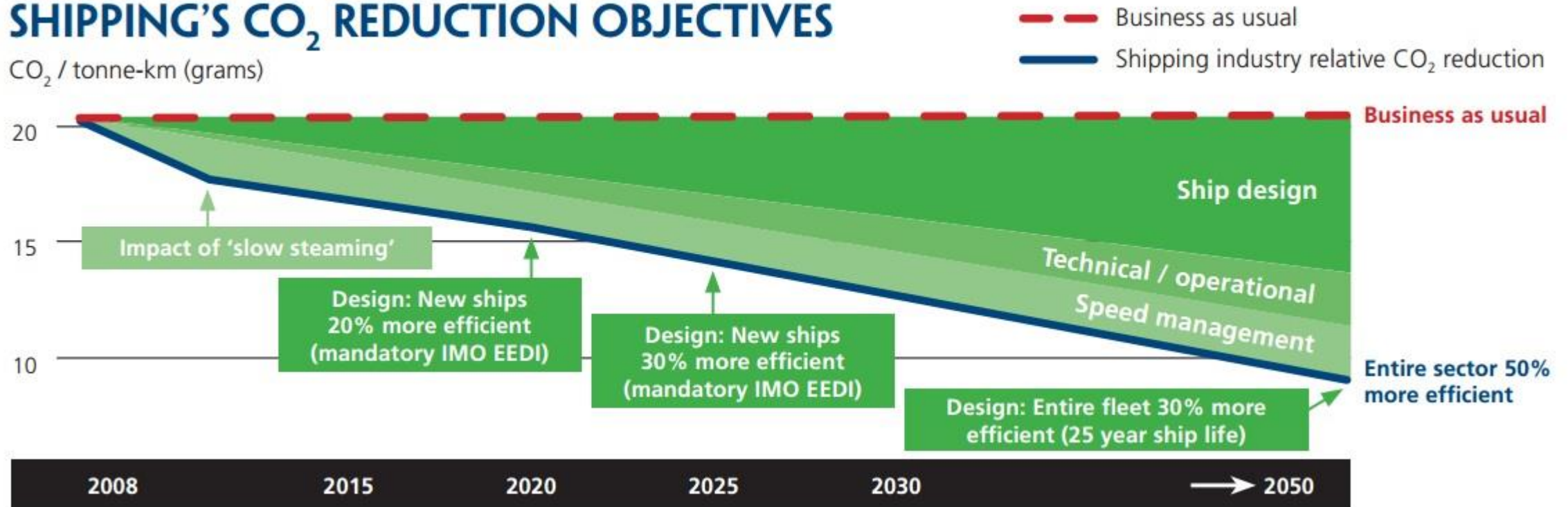


/// Technological Factors for sustainable emission reduction

Various approaches and technologies in different maturity stages

SHIPPING'S CO₂ REDUCTION OBJECTIVES

CO₂ / tonne-km (grams)

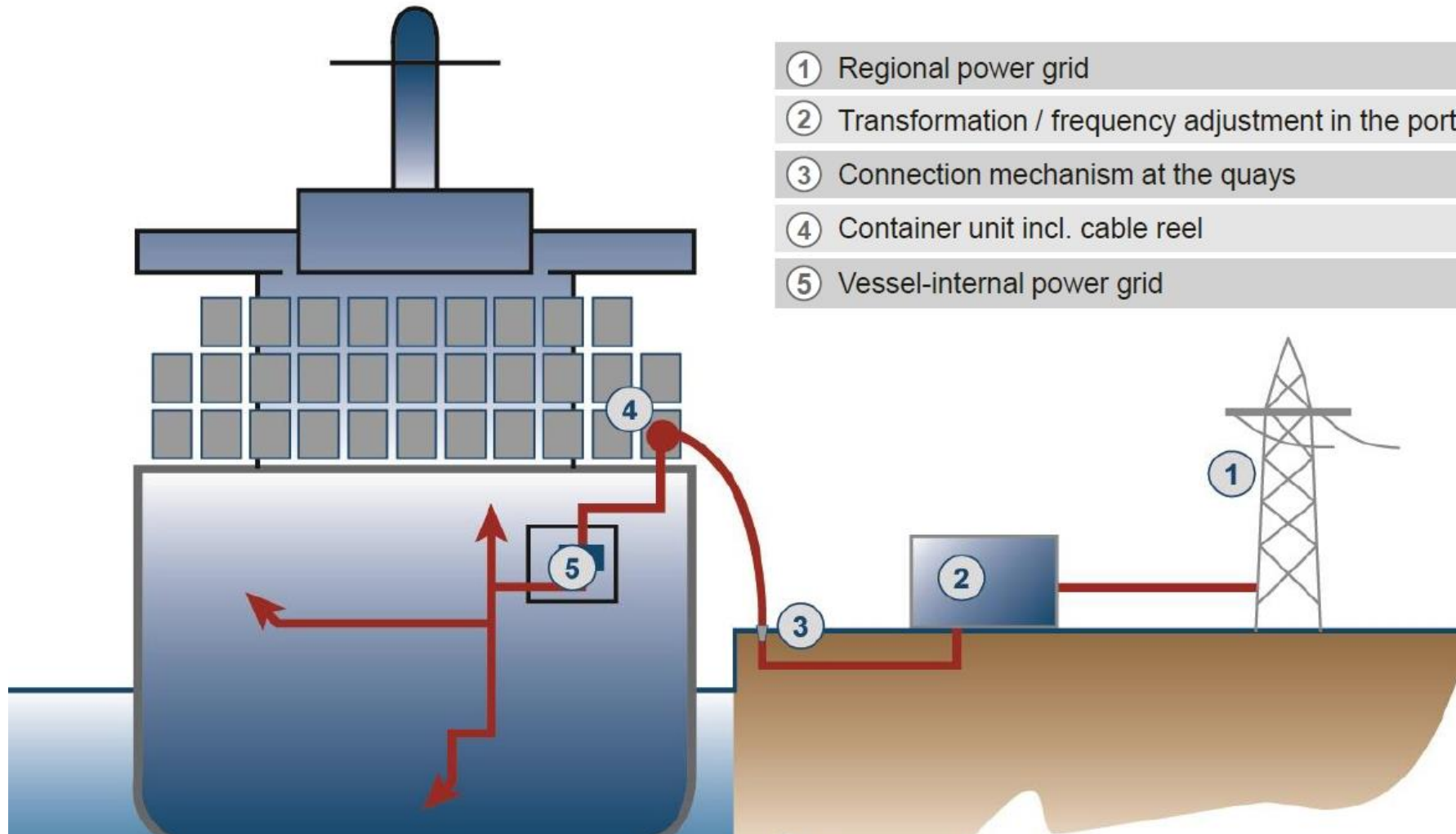


IMO 2050 goal:

- To reduce CO₂ emissions per tonne of cargo transported one kilometre, by at **least 50% by 2050**, compared to 2008
- Shore Power is an operational contributor

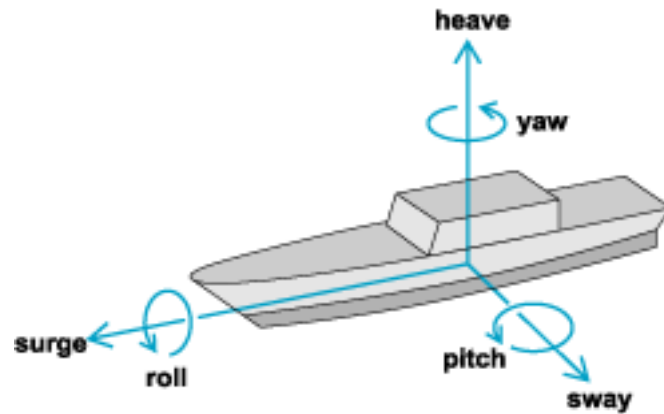
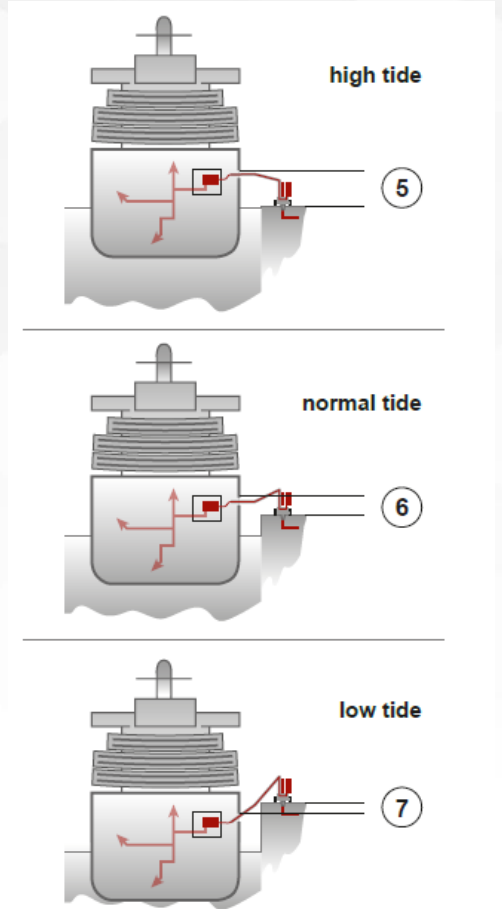
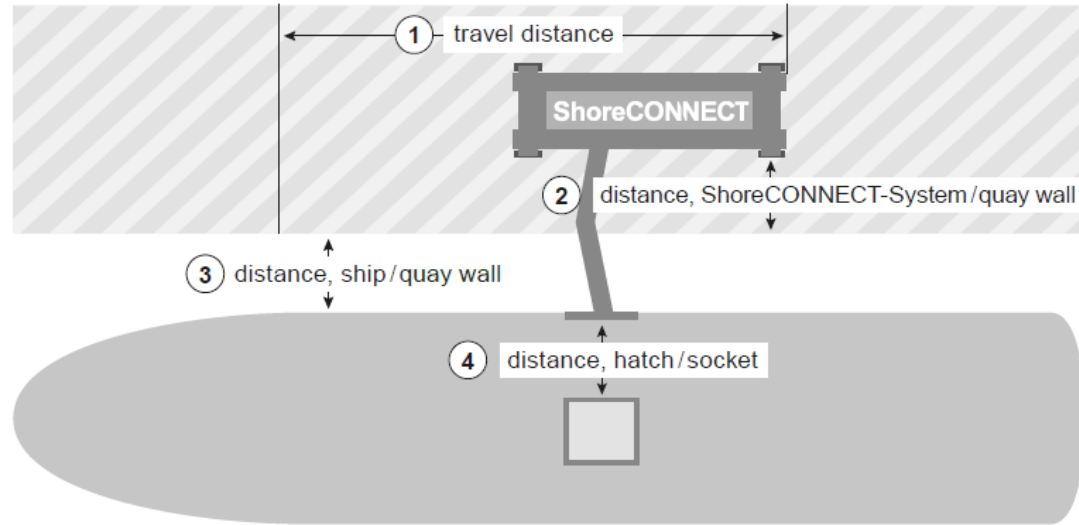
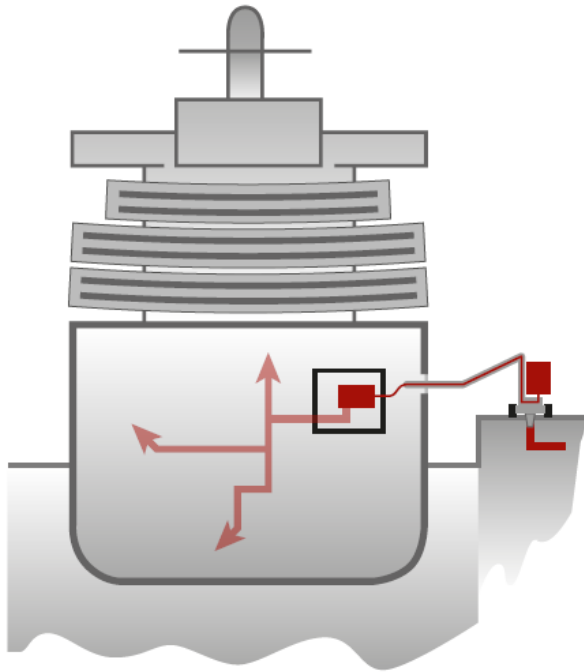
/// Land Power

...for inland and seagoing vessels



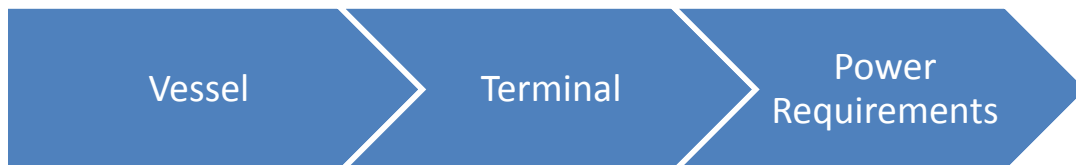
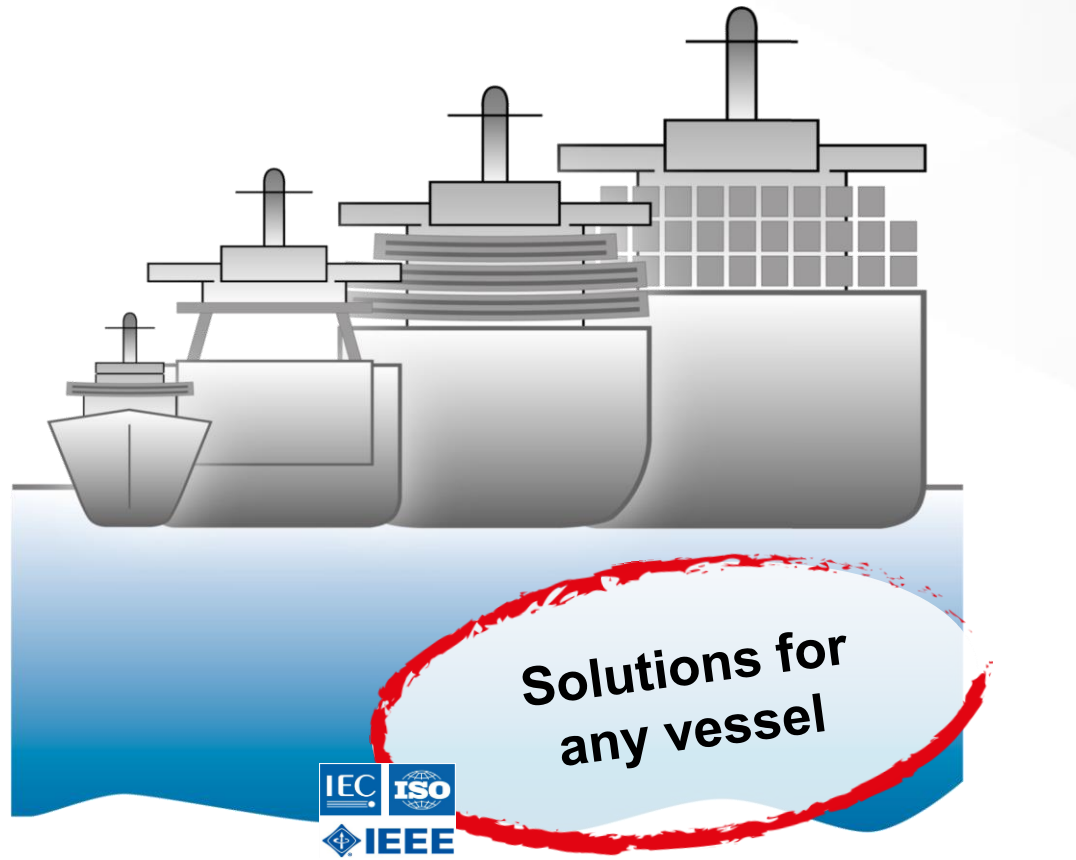
/// ShoreCONNECT – Systems Individualism is standard

Multiply factors allow no standard solutions, just standardized modules



/// Shore Power Supply solutions available

...for various vessels types, LVSC/HVSC, according to IEC Standard



Cruise Ship	up to 20 MW
Reefer	up to 8 MW
RoPax	up to 8 kW
Container Ship	up to 7 MW
Tanker	up to 6 MW
Bulk general cargo ship	up to 4 MW

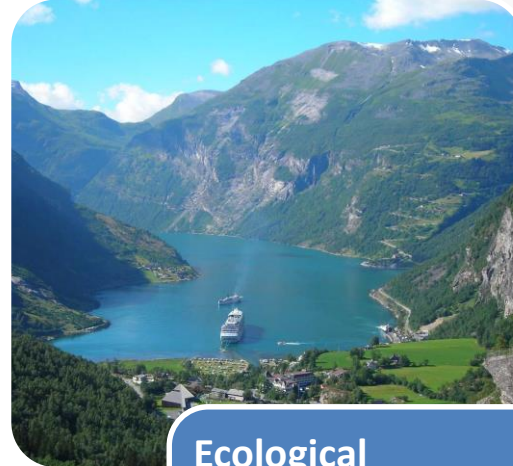
/// Drivers for improving the Status Quo on Emissions

PEST-Factors give reasons to act now



Political

- PPMC, laws and regulations
- Professional Associations
- International Standards
- Classification Societies



Ecological

- Global Warming
- Climate Change
- Extremer local wether
- Rising sea levels



Social

- Health-related (cancer, Asthma, life expectancy)
- Noise Reduction
- Immense Growth Cruise to 25 Mio PAX/a in 2020



Technological

- High exit barriers
- New solutions
- Technologies at various maturing levels

Vessel

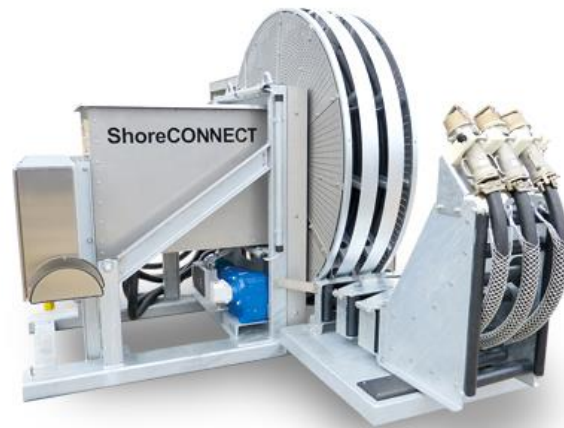
Terminal

Power Requirements

Stakeholder Requirements

/// Industry Products – Shore Power Solutions – ShoreCONNECT

Multiple factors allow no standard solutions, just standardized modules



Vessel

Terminal

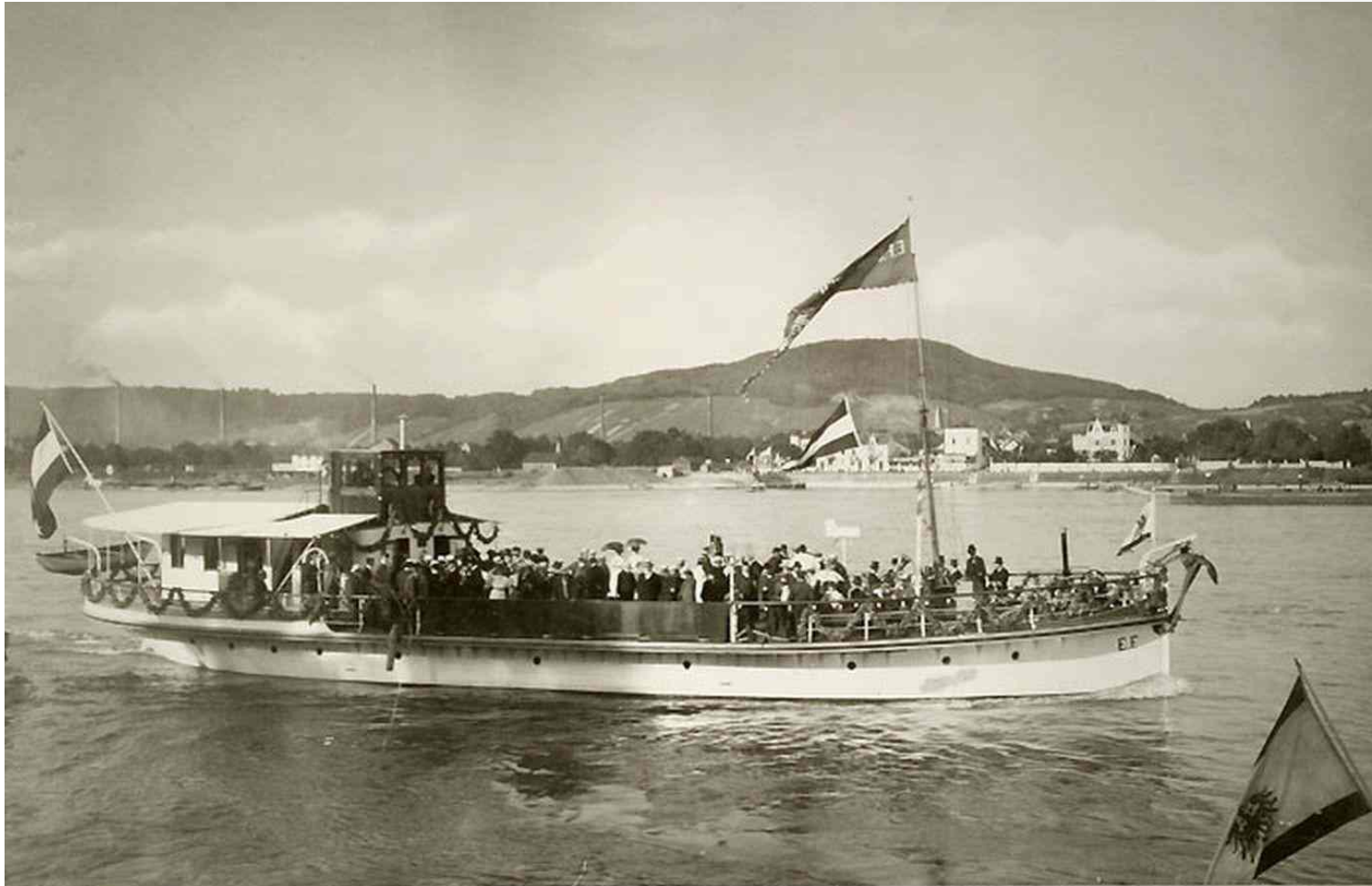
Power
Requirements

Stakeholder
Requirements

Modes of
Operation

Usage of
MODULES

/// Electric Ferry – not new, just a renaissance



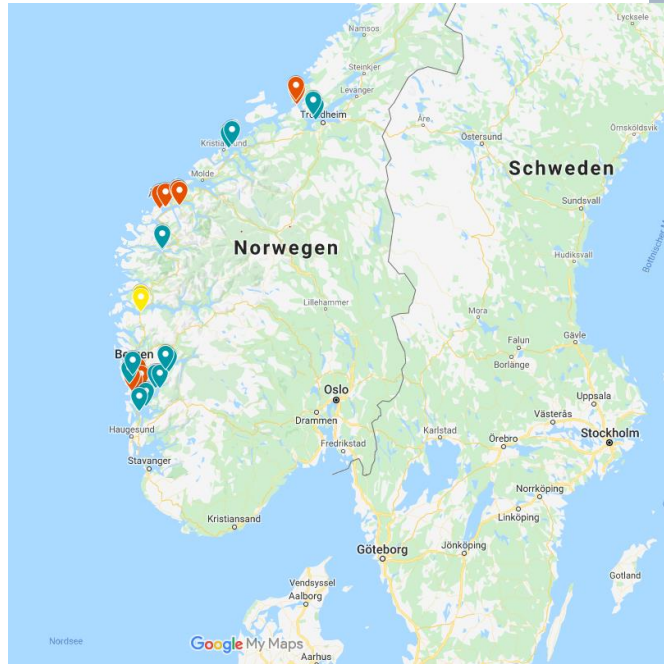
Electrical, catenary-powered Ferry on Straussee near Berlin, Germany in 1915

Electrical, battery-powered Ferry on River Rhein near Cologne, Germany in 1908

— *Eröffnungsfahrt* —
— *der ersten Elektrischen Fähre des Rheinstroms - Godesberg - Niederdollendorf* —

/// FerryCHARGING – Fully Automated Pantograph System

32 fully automated charging stations 2...8 MW



/// FerryCHARGING – Fully Automated Connector System

Crossing Anda-Lote, Norway, MF Gloppefjord & MF Eidsfjord



/// FerryCHARGING (bow-Type)

Crossing MTO, Kingston-Wolfe Island and Milhaven-Amherst Island



/// ShoreCONNECT Variants

for various vessels types including connection box land side and/or onboard unit



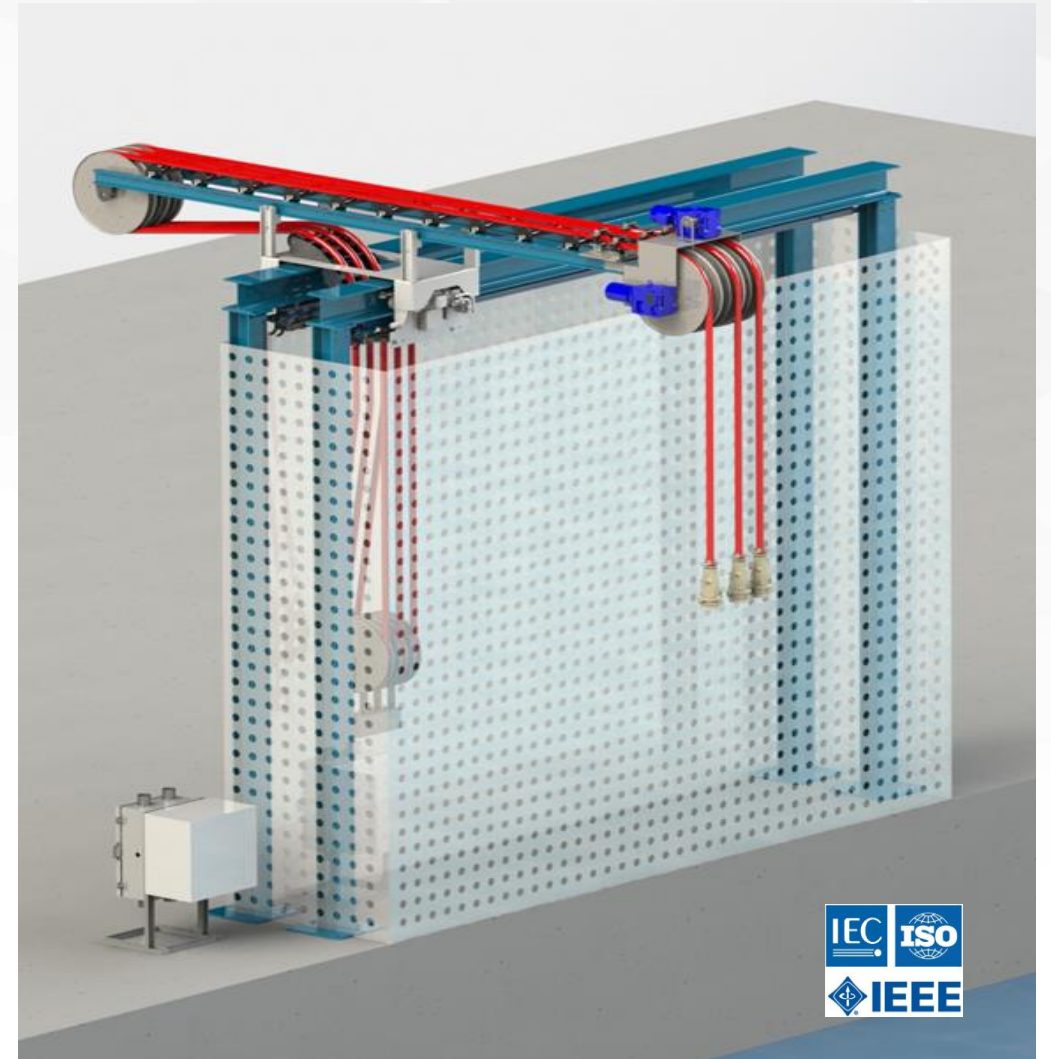
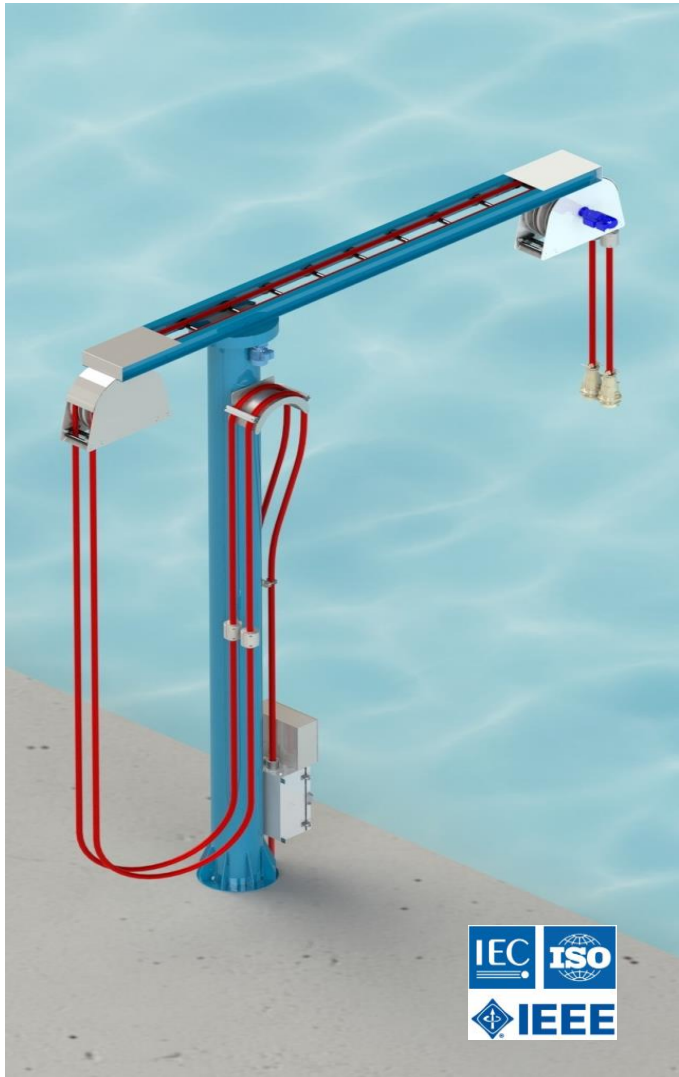
/// Cable Reel Container Systems

...for container vessels



/// ShoreCONNECT Variants

...for various vessels types

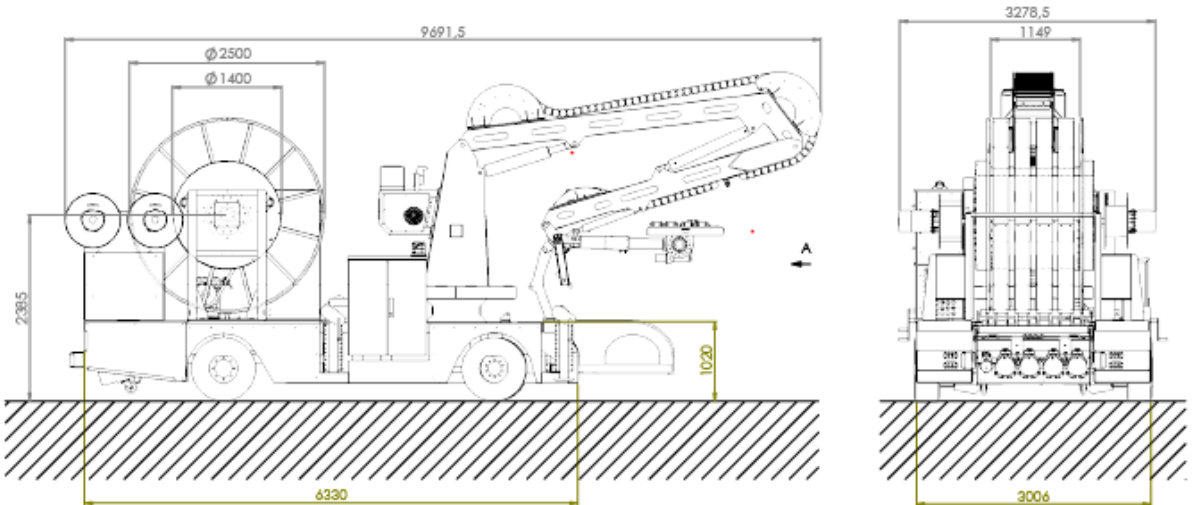
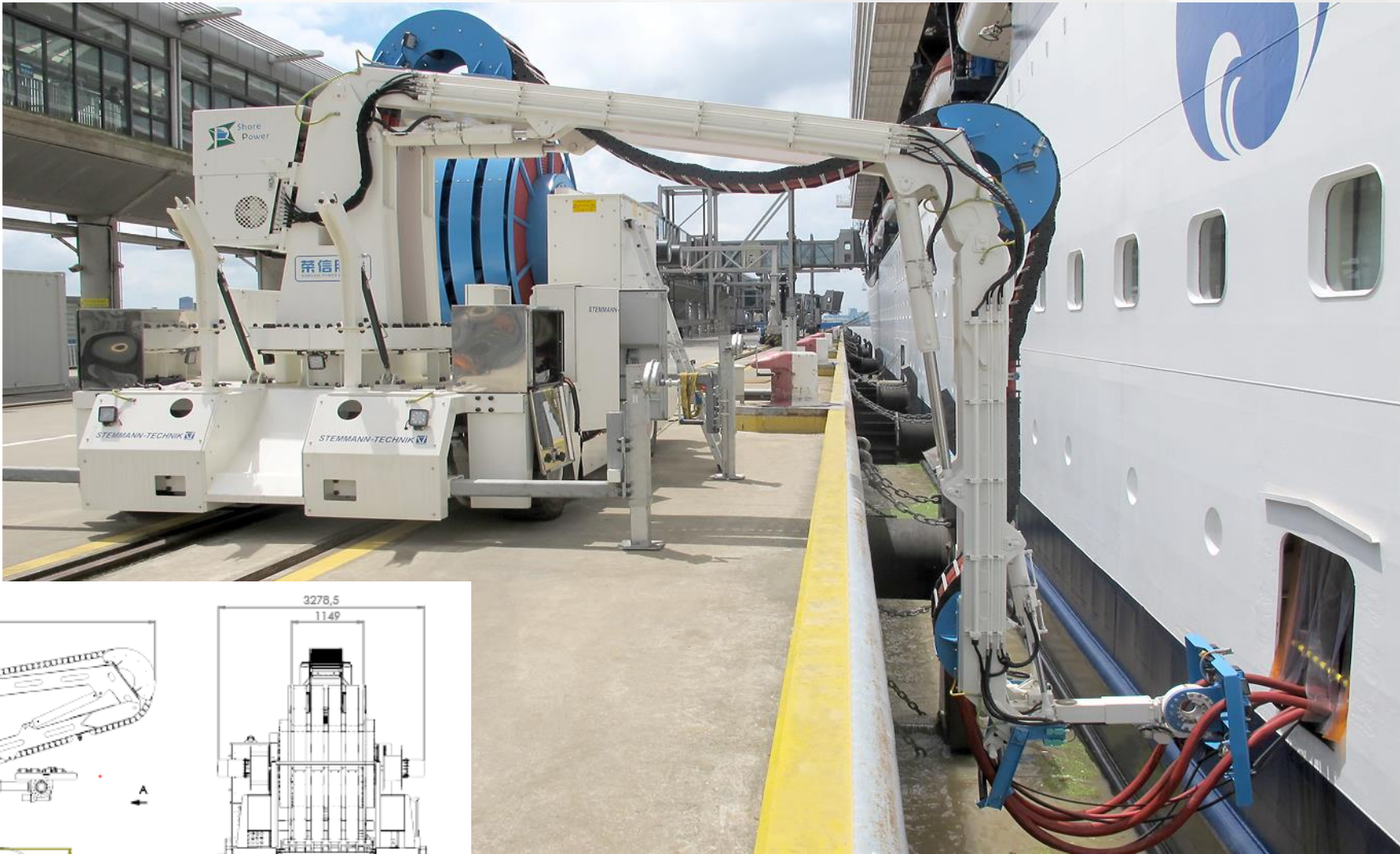


/// Project Rotra Vente ShoreCONNECT Cuxhaven

...for various vessels types



/// Onshore Power Supply for Cruise Liners



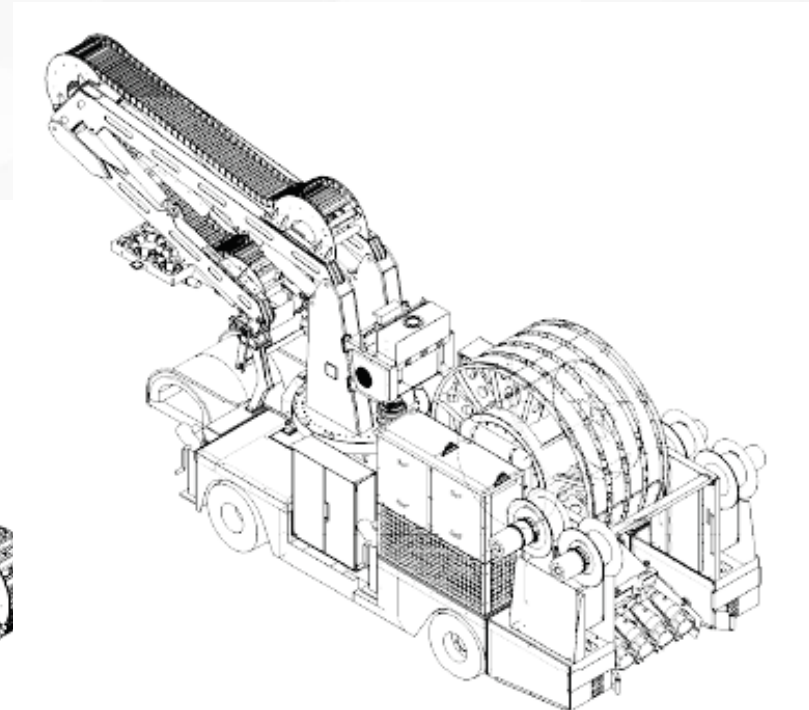
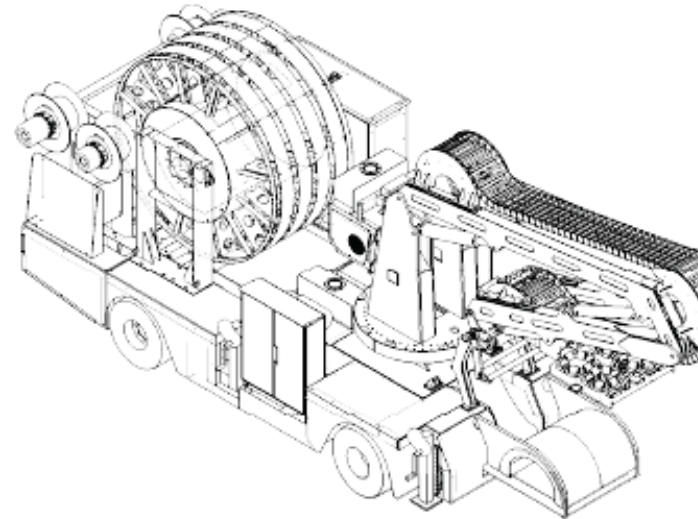
/// Onshore Power Supply for Cruise Liners

...fast and simple connection to the cruise ship (Hamburg-Altona)



/// Conclusions

- **World is facing the problems:**
not more than +1.5° celsius increase, so go down with CO₂ by zero asap
- **Port industry under attack:**
Immense contribution to emmissions of their clients pull ports in the spotlight of public criticism
- **Modular solutions are available**
Shore power reduces GHG-emission, noise, pollution
- **Solutions commercially interesting**
 - full cost analysis of Diesel-usage vs electrical power
 - Consideration of future CO₂-cost necessary





We are excited to help reducing port and vessel emissions.

We look forward to co-operate with you.

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