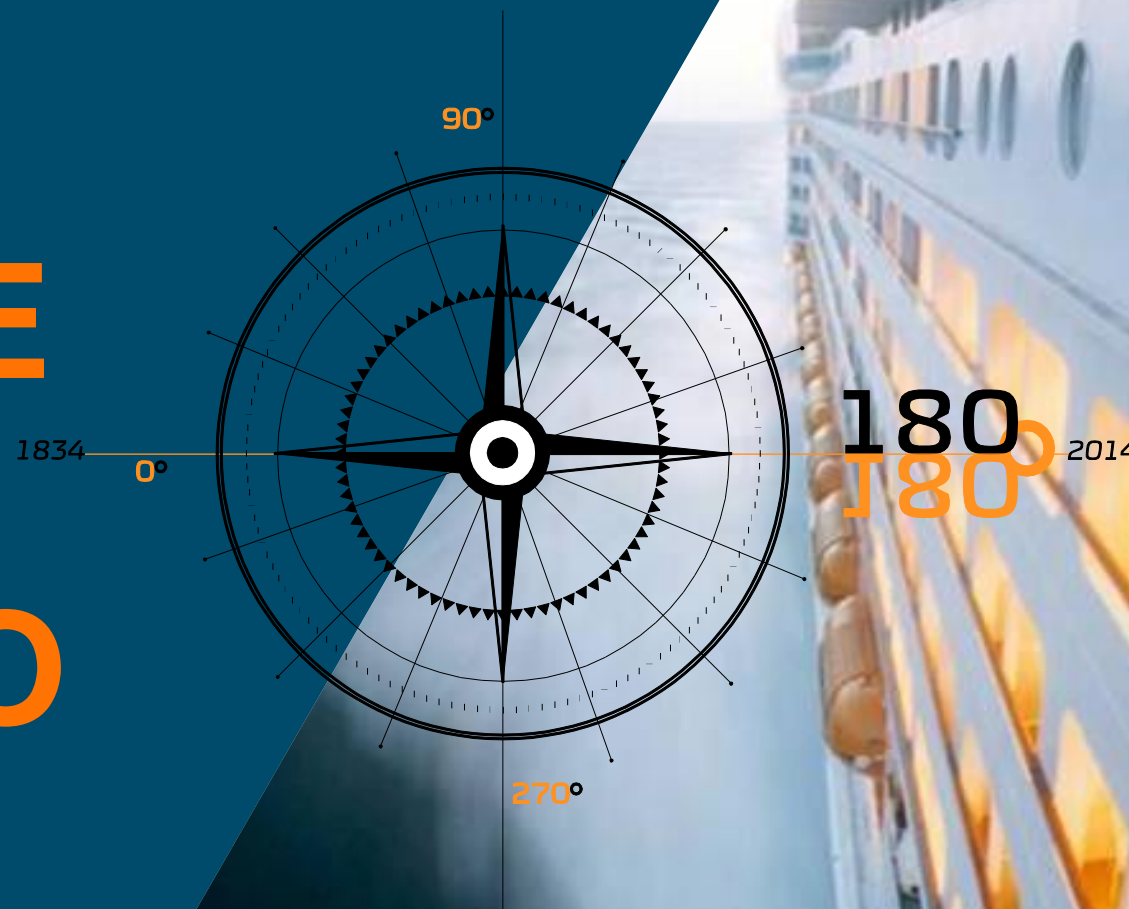


NAVIGARE VERSO IL FUTURO

Guido Barbazza

Port&ShippingTech

Genova, 29 Giugno 2017



- Digitalization and new technologies create **new business opportunities**
- Customers operating high performance equipments gets a **competitive edge** on the market
- **Complexity** of engines, propulsion, auxiliary and automation systems is **continuously increasing**
- Crews are reducing in number and is **difficult** to **find professional skills** to be utilized for maintenance and troubleshooting
- Needs to meet upcoming **emissions regulations**

Market and operating scenarios are quickly changing





WARTSILA 50 DF ENGINES



M/V VIKING GRACE



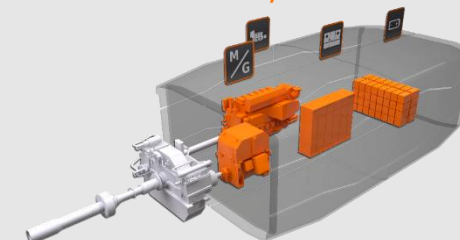


Wärtsilä HY

Wärtsilä HY combines engines, energy storage systems and power electronics. This solution provides **lower fuel consumption**, **reduced maintenance costs** and, in all operation modes and load points, the operation is **smokeless**

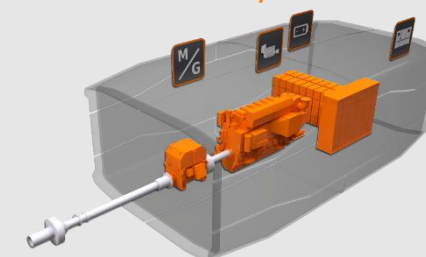
MECHANICAL-HYBRID

PTO/PTI

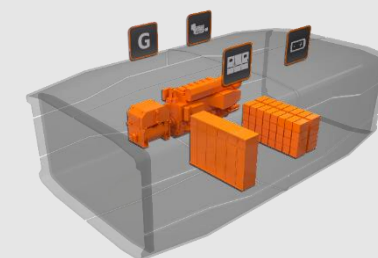


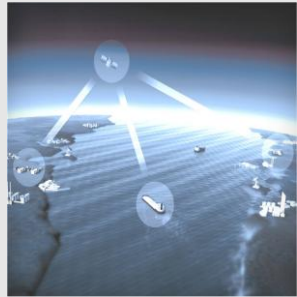
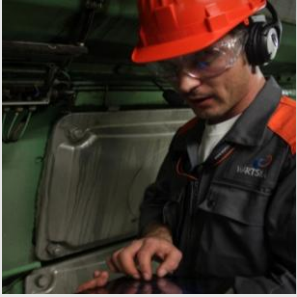
MECHANICAL-HYBRID

SHAFT M/G



ELECTRICAL-HYBRID





WIRELESS ENGINE ROOM CONNECTIVITY



AUGMENTED REALITY GOOGLES



SATELLITE CONNECTION

- Mobility package for FS engineers: **connectivity** with knowledge and information **on line, 24/7**
- **Remote virtual engineer**: remote advise in real time for complex troubleshooting and repair

WÄRTSILÄ GENIUS SERVICES

ENIRAM SOLUTION/PLATFORM



ENIRAM SKYLIGHT 1.0



OPTIMISE

PREDICT

SOLVE

VSE

Genius Platform
Guaranteed
Performance
Services
Eniram
Integration
Remote Services
Smart Operations

Engine CBM
Rotation
Equipment CBM
Powerplant level
CBM
Ship level CBM

Powerplant
efficiency
Ship efficiency
Environmental
Services
Fleet Management
Cargo Operations
Grid Operations



Rough Seas

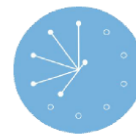
WATER CARRIER

Water is valuable
→ water is transported



Rough Seas

- Scarcity of resources is predominant
- Climate change adds further stress
- Cartels and bilateral agreements have overtaken free markets
- Wealth is divided unequally among nations, resulting in tension



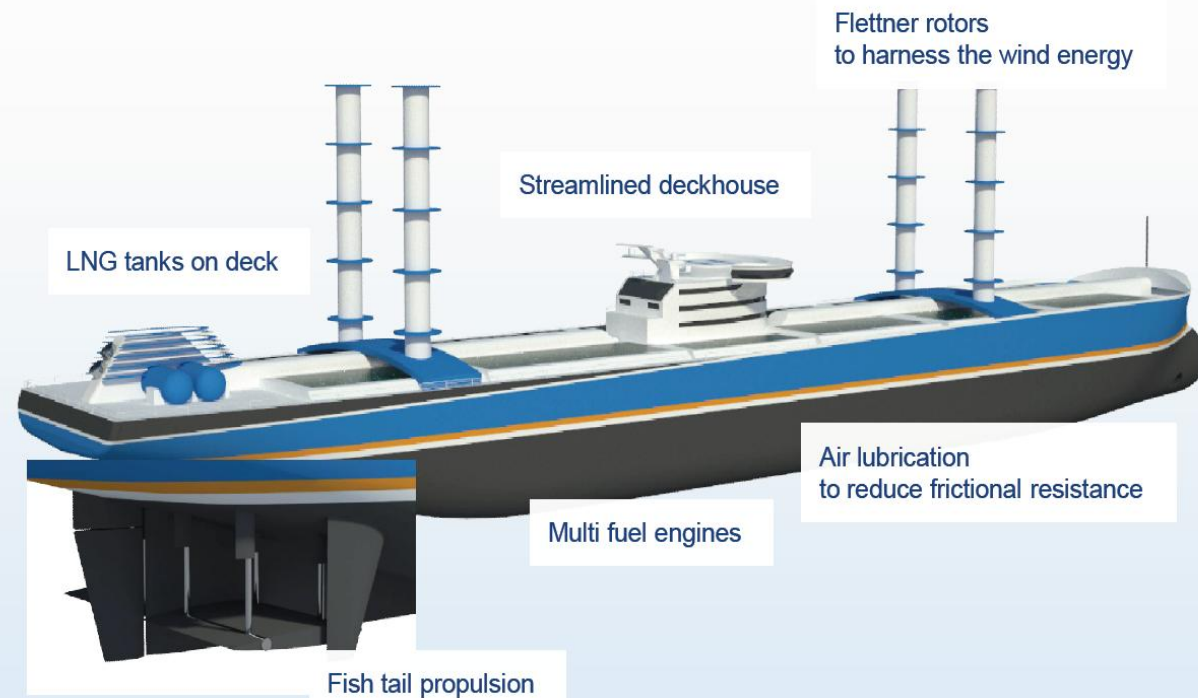
Water is valuable and is in short supply → water is transported



Energy scarcity

- Consumption of natural resources should be minimized
- Ships will contain technology to reduce energy consumption

Dwt	150 000 dwt
Length	285 m
Breadth	46 m
Draft	16 m





Yellow River

MEGABOX CARRIER

Transport of consumer
goods from Africa to
China

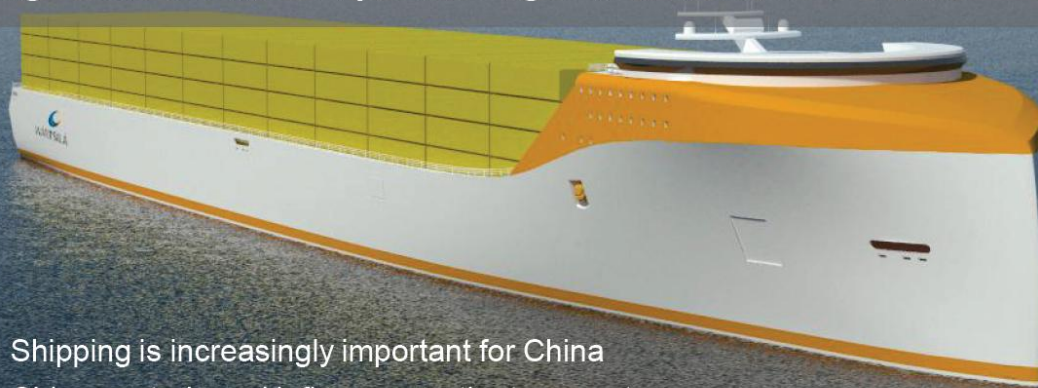


Yellow River

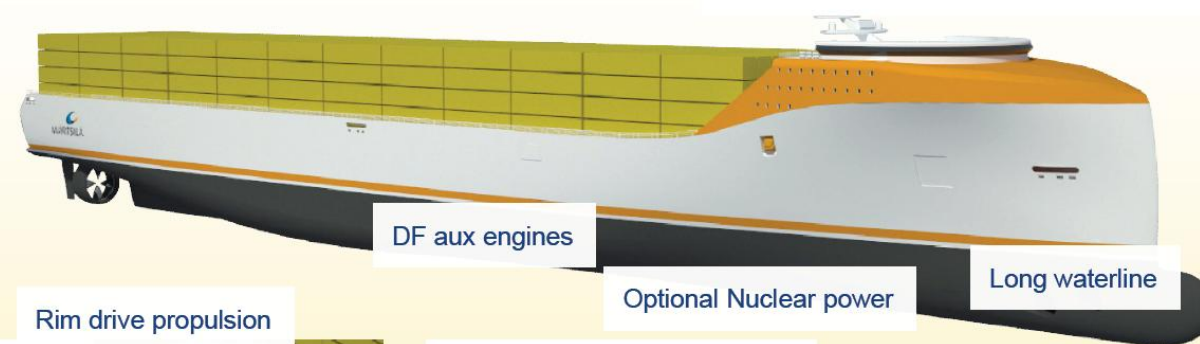
- China dominates the global arena
- Resource-intensive manufacturing has moved to Africa and other Asian countries
- Economic growth is significantly slower in the West
- Climate change is tackled only on a regional level – no global agreements exist



Large trade volumes of produced goods from Africa to China



- Shipping is increasingly important for China
- China controls and influences entire transport



Rim drive propulsion



Cargo ramp
Cargo hold can be loaded
simultaneously with the cargo
deck. Flexibility and speed.



Open Oceans

ALGAE HARVESTING VESSEL

Algae is used to produce bio fuels
→ new ships are needed

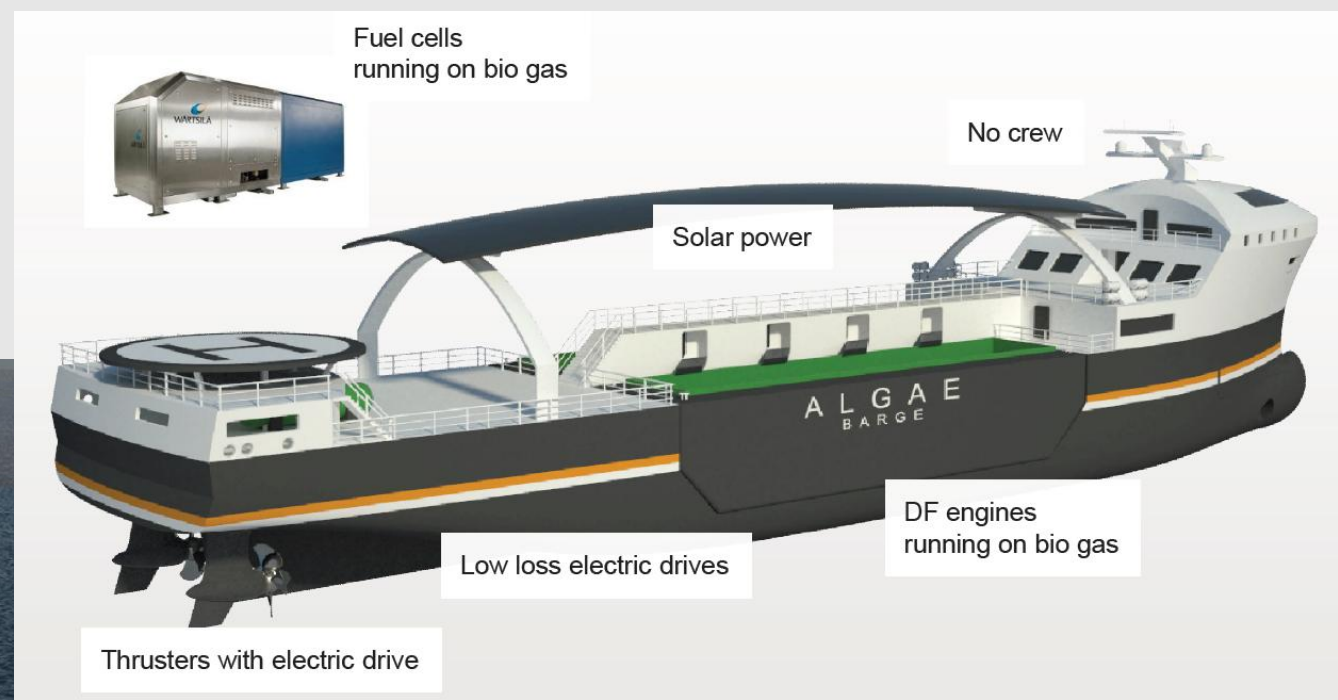


Open Oceans

- Global mega-corporations and megacities have gained power over the nation states
- Governments cooperate on the governance of climate issues and free trade protocols
- Climate change is perceived as an opportunity and innovating green solutions is a lifestyle



Climate change is perceived as an opportunity and innovating green solutions is a lifestyle → new green technology is introduced





USS ZUMWALTH

1.0 STEAM

End of the 18th century: in England a Steam Engine powers a loom for the first time – the dawn of mechanical production.

2.0 ELECTRIFICATION

End of 19th century: Electrification enables mass production to be broken down into specialized activities on the production line – in America abattoirs to begin with, and later in the auto industry. Quality improves, prices declines.

3.0 AUTOMATION

50 years ago: Aided by microelectronics and IT, and in particular by programmable logic controllers, the Automation of production gains ground. Machines take ever more complex tasks out of human hands and raise productivity.

4.0 DIGITALIZATION

Today: Cyber-physical system (CPS) are central to the digitalization of production. Workpieces, tools, production, plant and logistics components with embedded software are all talking to each other. Smart products know how they are made and what they will be usedd for.



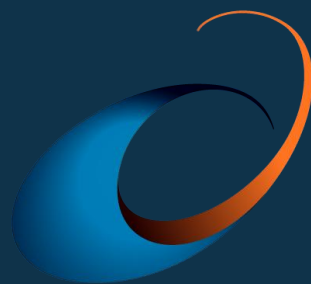
3D PRINTED DIESEL ENGINE PART



METAL 3D PRINTING MACHINE







WÄRTSILÄ

Thank you!