Next generation of ferry – We do not only build a ship
We build the future - Together

EnergyWeek 2019 MARCH 18 - 21 VAASA, FINLAND

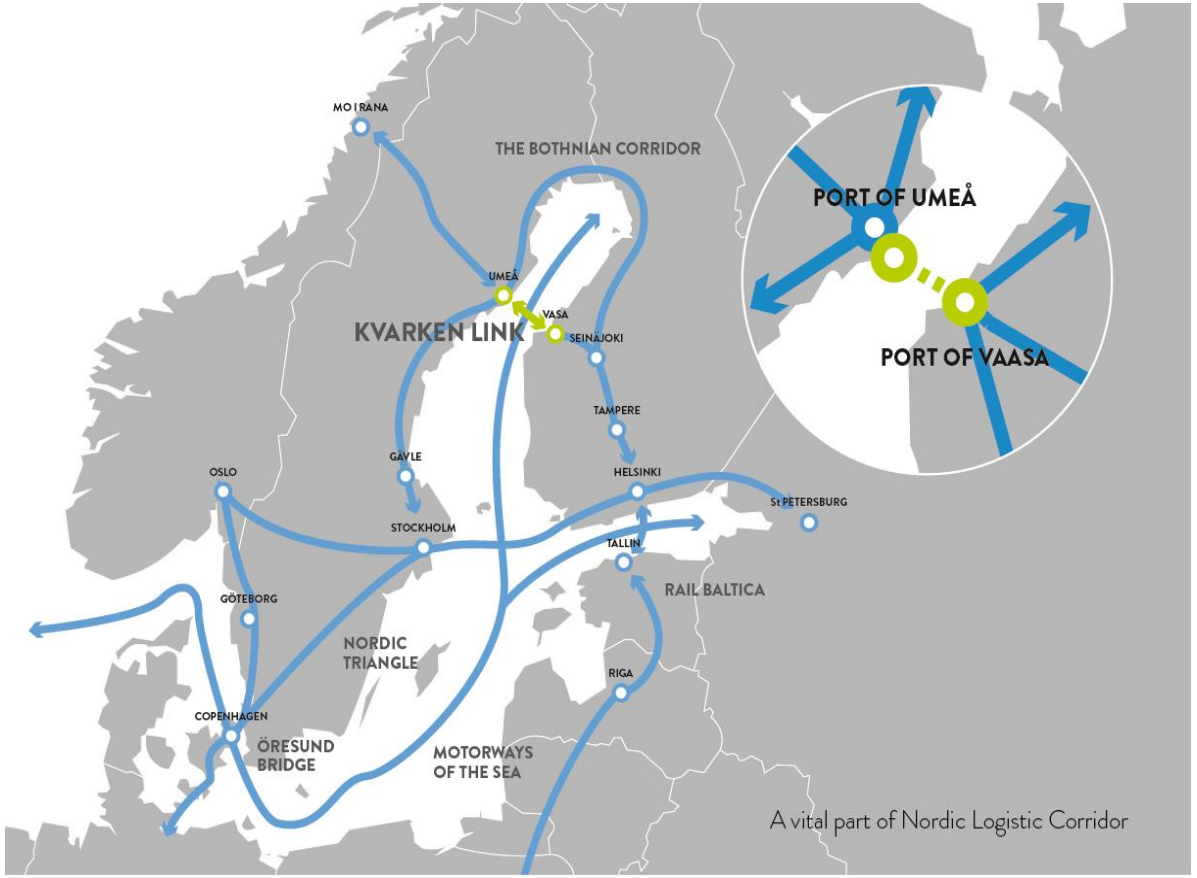
Managing Director NLC Ferry/Wasaline Peter Ståhlberg

4 jan 2013 NLC Ferry/Wasaline started the traffic between Vasa and Umeå with m/s Wasa Express.

1 jan 2015 Kvarken Ports a joint Port company commenced the operation in January 2015

Kvarken Link Ab founded 2015 and Kvarken Link Oy founded 2019

All companies are owned by City of Vasa and Municipality of Umeå, 50-50



Project objectives

- Establish a long-term sustainable transport solution between Finland and Sweden, to the alternative of 800 km road-transport with a 80 km sea transport route.
- Build the most environmental friendly passenger ferry on earth that is reliable and fit for purpose, minimum 50 % reduction of CO^2
- Use predictable maintenance with a long term operational agreement to reduce and increase predictability of OPEX and reduce risks for unexpected surprises and increase operational reliability
- Future ready to allow for upgrades and sustainability improvements

Guidelines for design - Focus on innovation, technology demonstrators and fast intro of new products/solutions/services – The design to support flexibility to keep the innovate grade high during the whole life span, not only when built.

#1 Smart ships & Remote operation

Test & Demonstation of a platform that enables

- *Remotely operated engine rooms & data management*
- *Intelligent ship operation*
- *Services based on digital technology*
- *Total CBM solution for the whole ship*

#2 Floating validation & service optimization

Reduce time-to-market for new innovations through

- *Proof of concept process stretching over the whole chain VEBIC –University - Industry Labs - RoPax/terminal*

#3 LNG & low emission solutions

Focus on innovative projects

- *Near-zero methane slip*
- *Emission control systems*
- *Cost efficient LNG/LBG solutions*

#4 Storage & hybrid solutions

Investigate New short shipping concepts based on batteries

- *Harbor-based support system technology for hybrid & fully electrified vessel types*
- *Storage in energy solutions applications*

Performance in Ice & research for Ice impact

Iceclass 1 A Super

- *Supports the research for Ice laboratory*
- *Living lab concept*

GUIDELINES FOR DESIGN

Environmental footprint

Bio/LNG Gas solutions - fuel gas handling, gas tanks land and sea and bunkering
Catalyst for max reduction of Nox (exceeding IMO Tier III requirement)
Waste heat and cool recovery to maximise energy use

Navigation

Smart bridge enabling autonomous shipping and remote navigation + connection to Wärtsilä Hub Universities

Passenger flow and experience

Flexible use of passenger areas with intelligent ventilation and lightning
Auto-trim connected to Automatic cargo handling with led traffic lights
Autoregistering of cars
Smart cabins

Automation

Integrated Automation System with Smart Power Management System of engines, batteries, etc.
Connection to Wasaline HQ and Wärtsilä hub & Universities

Power generation

2-stage turbocharged multi-fuel engines (BioGas)
Power Conversion/ Drives with high redundancy
Hybrid solution with Batteries and inductive charging
Built in Flexibilty to swap or add power sources

Optimized operations & performance

Condition Based & Predictive Maintenance
Remote operation & services + Lab and University connection
Guarantees on emissions,fuel, availability & costs
Automooring

MAXIMUM FUEL SAVING, MINIMUM EMISSIONS

Dual fuel gasoil / LNG Machinery LBG ready.
- Low CO2
- No SOx
- Low NOx

Low sulphur distillate diesel fuel

Waste heat utilization LT water, HT water and exhaust gas

Waste heat utilization on LT Water

Electric propulsion "future ready" for further energy efficiency

Optimized mechanical propulsion

Podded propulsion with fuel saving. Improved maneuvering and ice navigation

Shafted propulsion with CP propeller

Power plant partly replaced by battery energy storage. Improved specific fuel consumption.

Diesel load highly variable.

High capacity shore connection. Energy storage charging at quayside.

Energy produced with diesels.

BASE LINE TECHNOLOGY
WASA EXPRESS

Nb 6002 – “KVARKEN FERRY” delivery April 2021

TECHNOLOGY

- Dual Fuel with LNG as primary energy source
  - Possibility to use LBG
- Electric Propulsion Drive with Azimuth Thruster Units
- Battery Power for Port entry/departure, Peak Shaving, Hotel Load and Boost Power
- Energy recovery and Environmental footprint in focus
- Ice Class 1A Super
- Passenger and Crew Comfort

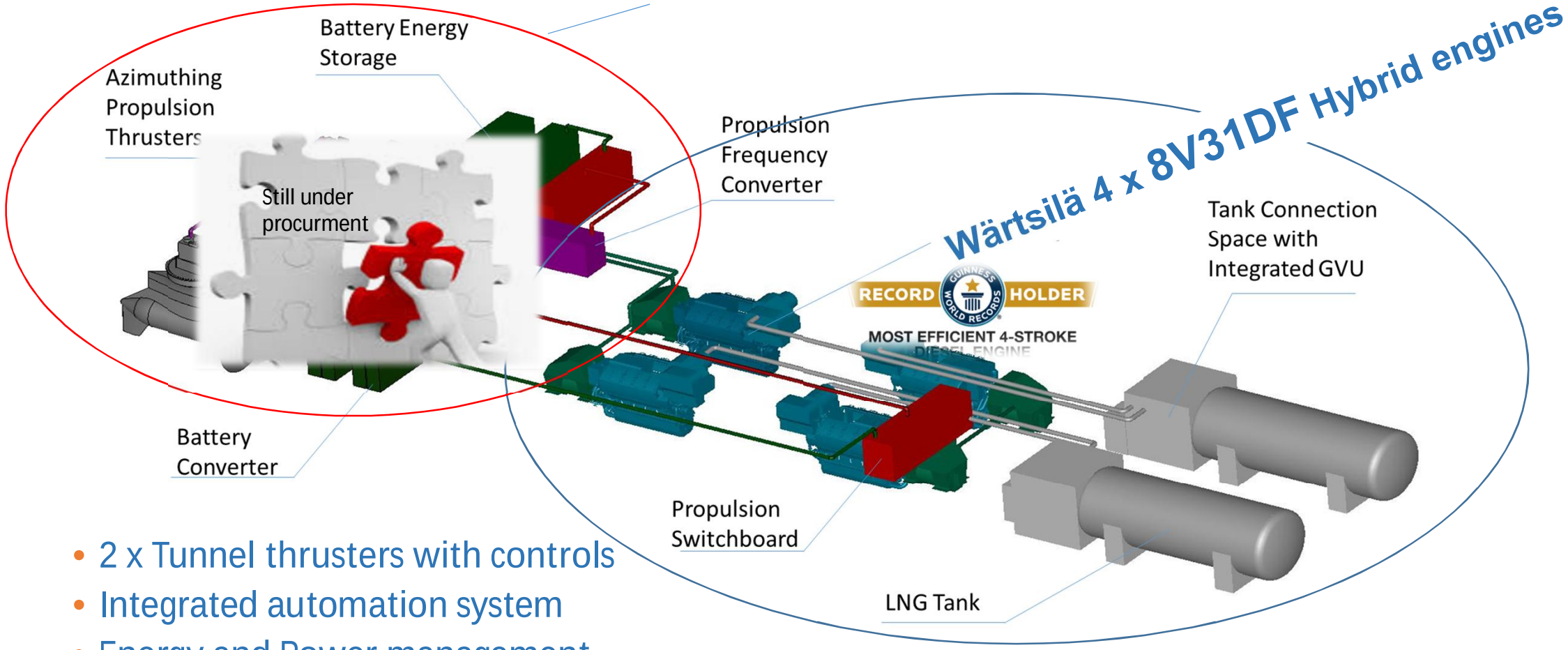
MAIN DIMENSIONS

Loa	150.0	m
Lwl	137.8	m
Beam mld.	26.0	m
Draught, Design	6.10	m
Gross Tonnage, about	24 300	
Deadweight, Design abt.	3 500	t
Max. persons onboard (LSA)	1 000	

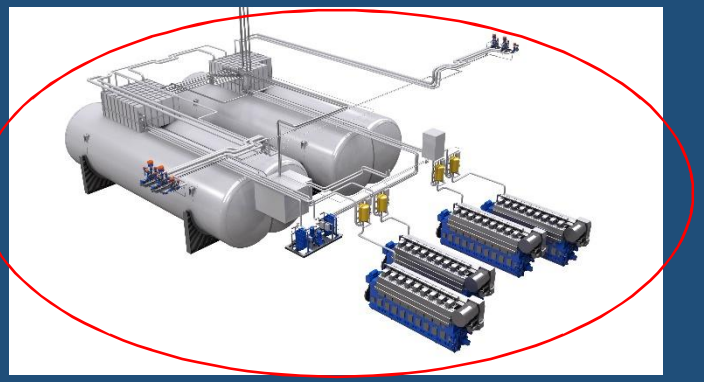
CAPACITIES

Passengers	800
Lane metres	1500
Cabins	68
Speed	20 kn
Public Decks	2

Newbuilding 6002 – Energy Solution and Power Transmision



- 2 x Tunnel thrusters with controls
- Integrated automation system
- Energy and Power management
- NOR Catalysators



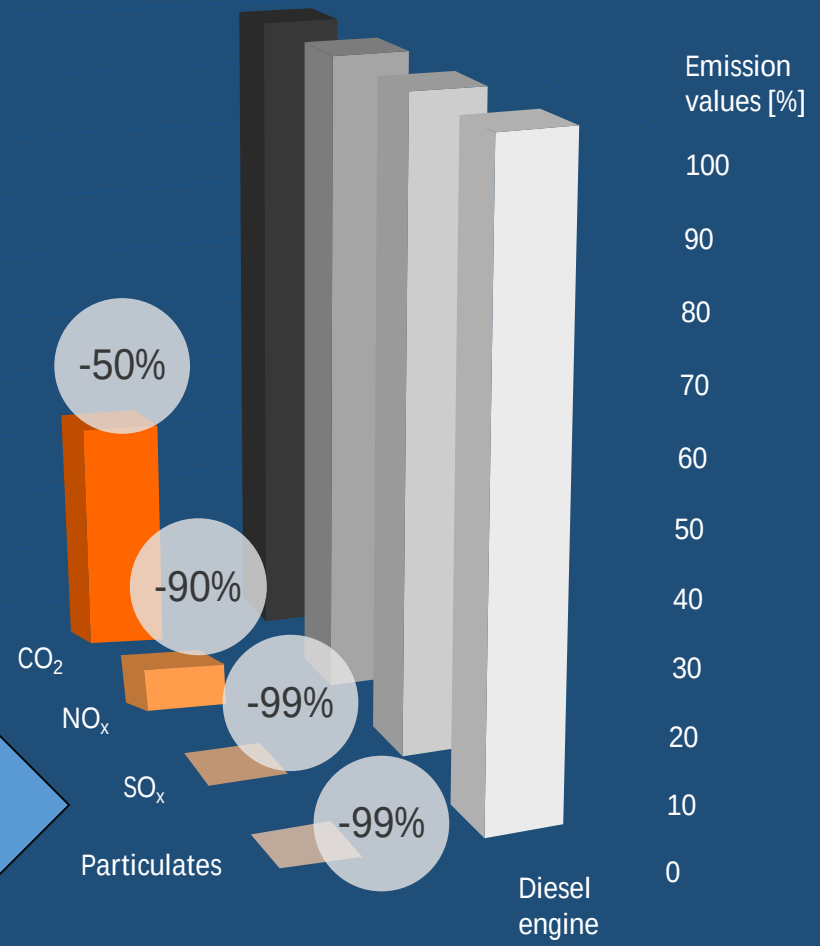
IMO Tier III compliant

IMO 2030 compliant

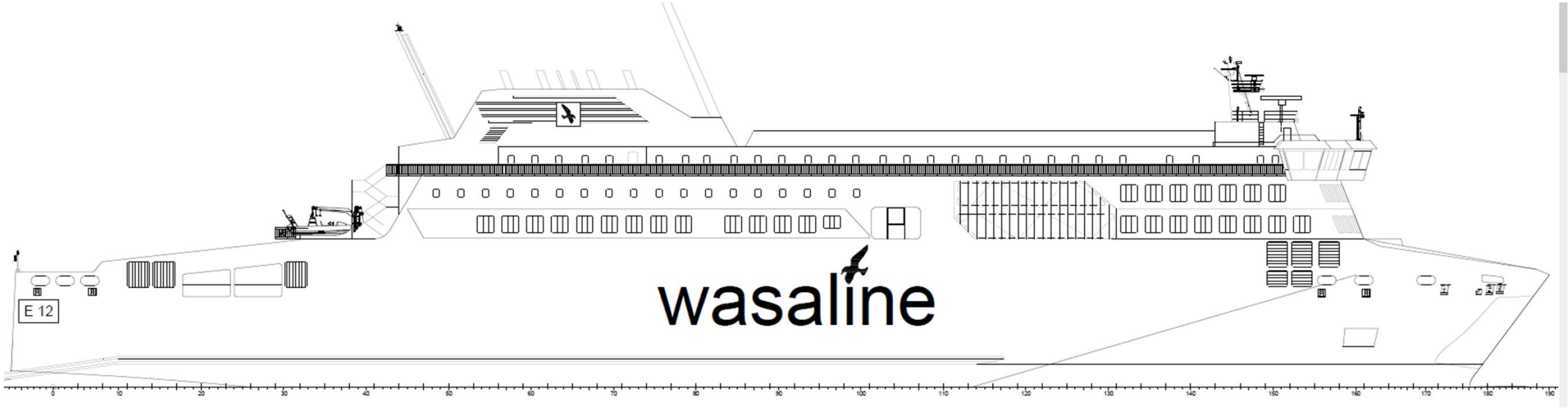
SOx compliant

LNG

Emission reduction new vs old vessel



INNOVATING THE FUTURE TOGETHER!



more information kvarkenlink.com (April 2019)

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