

Scandlines

A vision of green shipping

Puttgarden/Rødby,
04.06.2013

THERE IS SOMETHING ABOUT SAILING

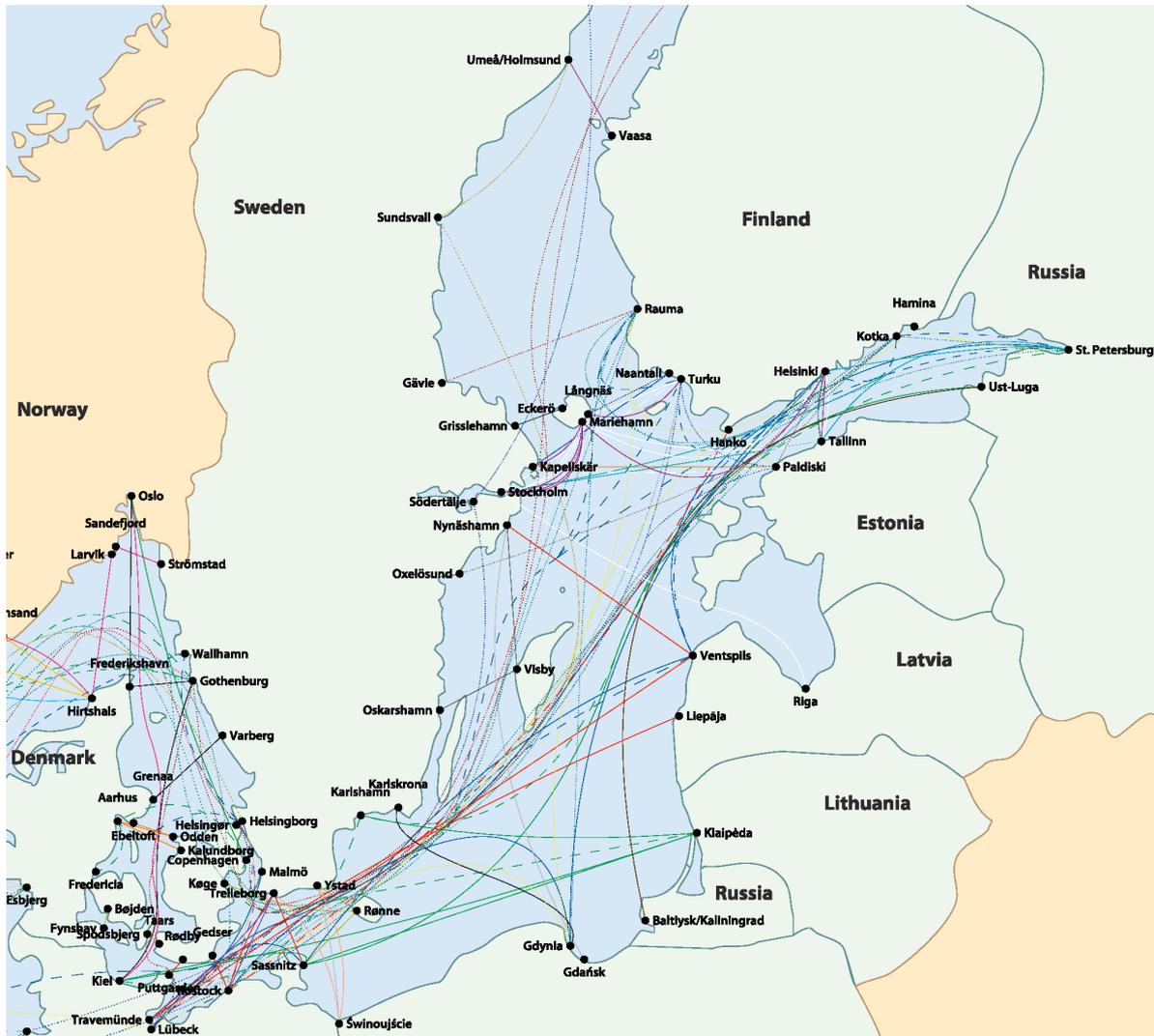
 **Scandlines**

Marko Möller, Scandlines Deutschland GmbH, marko.moeller@scandlines.com

Agenda

- Baltic ferry shipping
- Scandlines in a nutshell
- Scandlines' Traffic Machines as a worldwide benchmark
- Environmental Challenges ahead: Hybrid propulsion for greener shipping:
- A green Vision for the Fehmarnbelt: Zero Emission Ferries
- Fixed Fehmarnbelt Link vs. Zero Emission Ferries

Baltic Ferry and Ro-Ro network



* Source: Baltic Transport Journal

✓ Baltic ferry shipping is world market leader in terms of transported units and trips performed

✓ Baltic ferry traffic volumes 2011*:

Pax: 233 mill.

Cars: 91 mill.

Trucks: 11 mill.

* Source: ShipPax Halmstad

Scandlines is a vital part of the transport infrastructure connecting Scandinavia and the Continent

Scandlines facts

- ✓ Danish-German company
- ✓ Employees: 1.800
- ✓ Turnover: 608m €.
- ✓ 3 "Traffic Machines" offering high frequency and large capacity with crossing times less than 2 hours
- ✓ Traffic Machines 2012 in figures:
 - ✓ Passengers: 15 mill.
 - ✓ Cars: 3,3 mill
 - ✓ Trucks: 814.000
- ✓ 2 border shops in Rostock and Puttgarden

**Western
corridor**

**Eastern
corridor**

THE SOMETHING ABOUT SAILING

 Scandlines

Scandlines' Vogelfluglinie: worldwide benchmark for highly-efficient short sea shipping systems



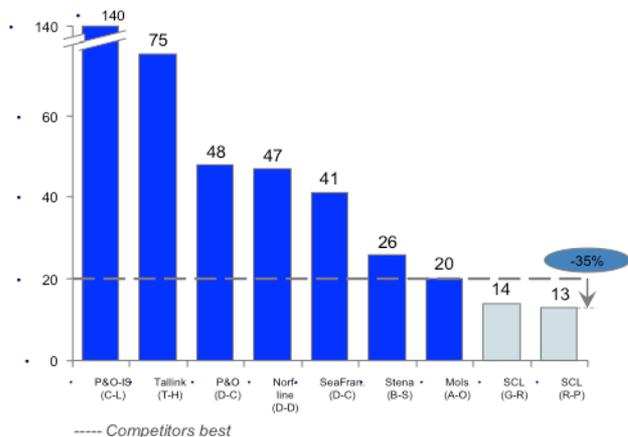
← Loading and unloading in less than 15 minutes →

Port infrastructure

- Clear signposted access
- Automatic Check-In
- Railway track, ramps, exits optimized for fast turnover

Scandlines drastically faster to turn around their vessels in harbor...

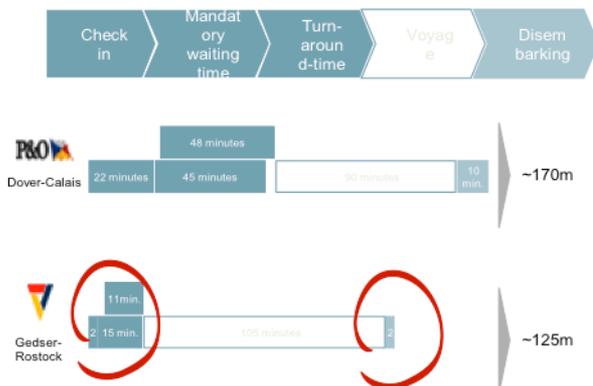
Average total turn-around-time in harbor (minutes)



Service on board

- Restaurants and Cafes
- Rest zones, children's corner
- Perfume- and Travel-Shops

... resulting in over 45 minutes saved against a leading Channel operator



Port service

- Bunker supply
- Storage
- Catering-supply

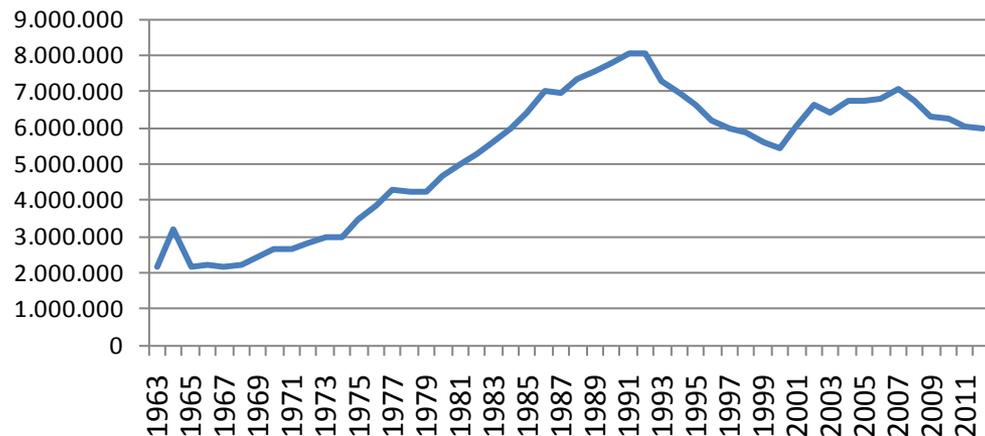


... operates 24/7, 365 days a year, departure every 30 minutes

Source: Study BCG

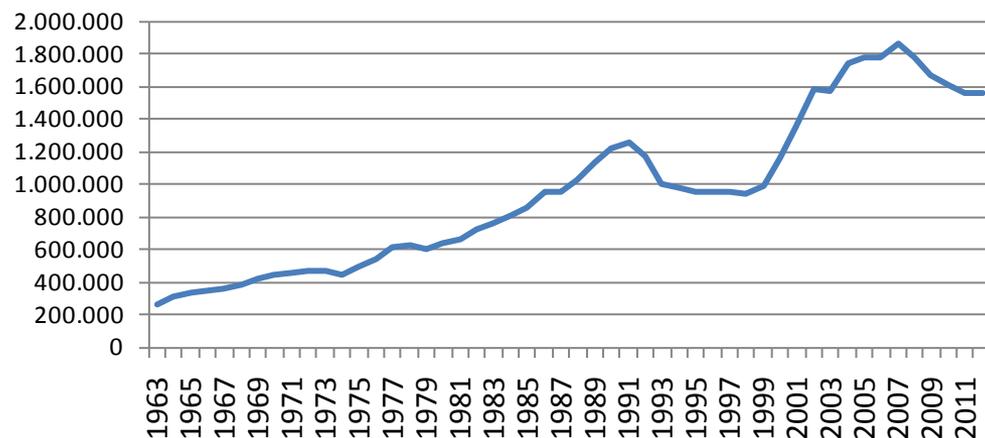
50 years Vogelfluglinie Rødby-Puttgarden

Passengers

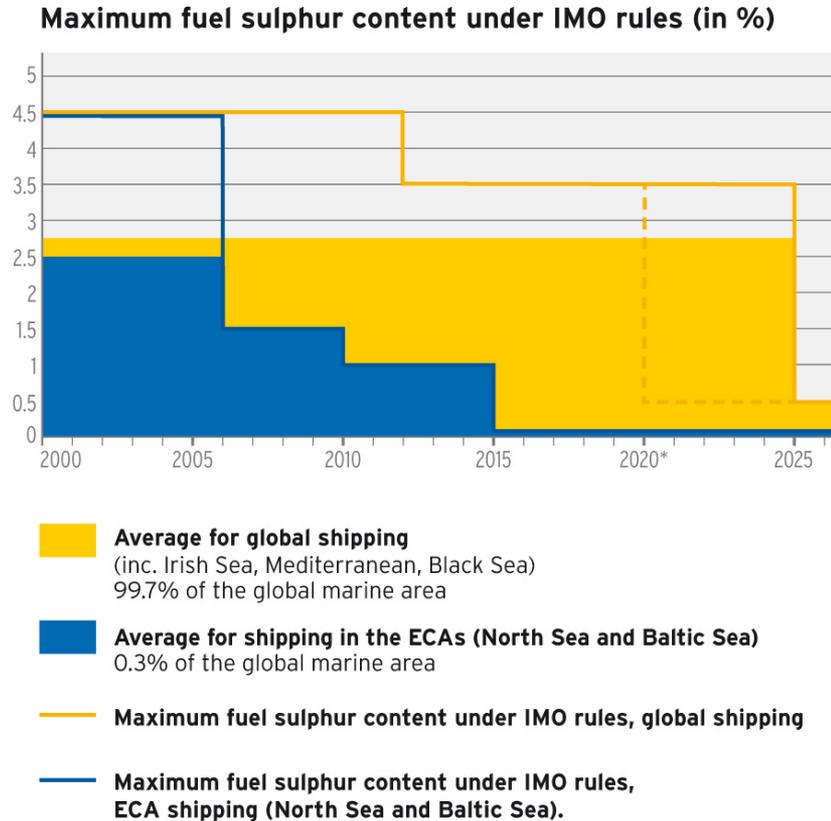


- ✓ Opened 14 May 1963
- ✓ 50 Mill. Passengers until 1977
- ✓ 100 Million passengers until 1988
- ✓ Today, 50 years after the opening, more than 260 Mill. passengers were transported on the link

Cars



Future challenges: Upcoming environmental regulations



Source: TT-Line

Development of technical solutions to comply with future regulations is still in pilot status



Simulation of LNG ro-ro ship
Source: Swedish Marine Technology Forum



Pilot scrubber installation on DFDS vessel
Source: www.greenship.org

Possible solutions to meet sulphur requirements

Shift to 0,1% S Gas Oil

Limited investment costs only

But:

- drastically higher bunker costs (up to 80%)
- possible shortages of gas oil could further lead to raising prices
- no contribution to CO₂ reduction

Liquefied natural gas (LNG)

No SO_x, CO₂ ↓ 20%, NO_x ↓ 80%

But:

- economically viable for newbuildings only
- Lack of present regulations to use as a fuel
- bunkering infrastructure will not be available on a large scale until 2015

Exhaust Gas Cleaning (Scrubber)

SO_x ↓ up to 98%

But:

- proven technology for onshore operation only
- prototype status of marine applications (no prototypes for complex multiengine RoPax vessels at all)
- capacity ,stability and weight issues hamper retrofitting
- high investment costs due to pilot character of installations
- No contribution to CO₂ reduction

Scandlines' innovative two-stage approach

- (1) Hybrid propulsion to reduce fuel consumption and CO₂ emissions up to 20%**
(dimension of scrubber depends on engines' energy output)



- (2) Installation of the smallest possible scrubber configuration**

Technology for greener shipping: Conversion of today's ferries on Vogelfluglinie (Pilot Project)

Retrofit of all 4 ferries:

- **Energy reduction measures**
 - Hybrid system and optimized propellers
 - Fuel consumption/CO₂ emissions ↓ 20%
- **Installation of Scrubbers**
 - SO_x ↓ 99%, PM ↓ 88%, (CO₂ ↑)



Technology for green shipping: Zero-Emission-Ferries

Energy source

Energy carrier

Energy converter

Wind

Hydrogen → H₂

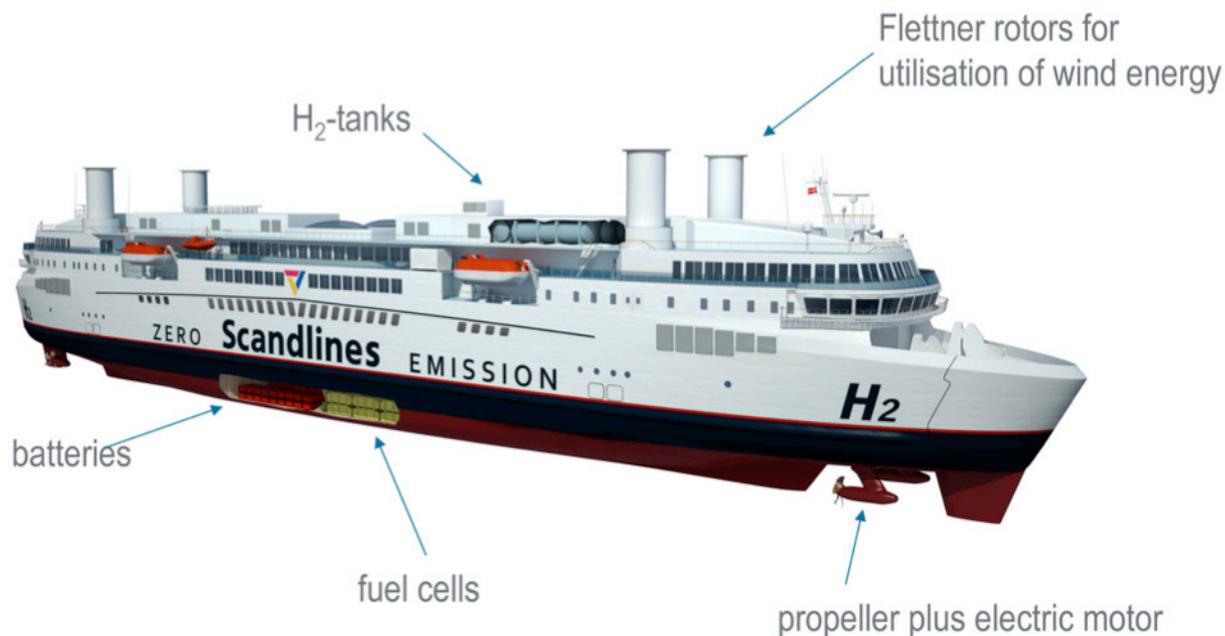
Fuel Cell, Battery

∅ Consumption and Emissions **Present** per trip:

- 0.95 t Heavy fuel oil
- 2.96 t CO₂
- 0.10 t SO_x
- 0.05 t NO_x

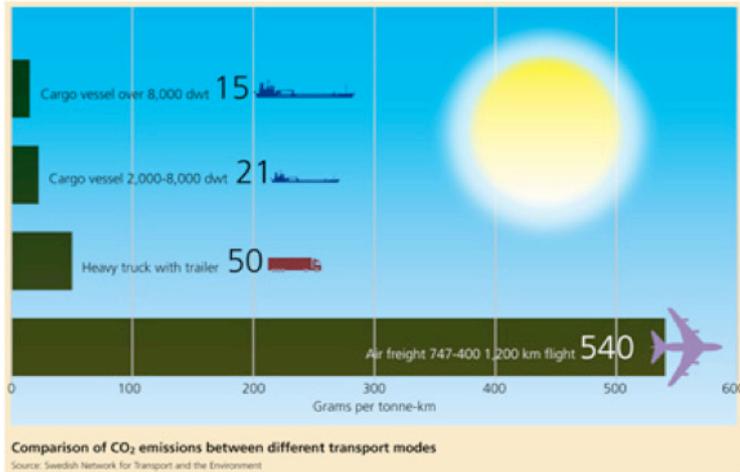
∅ Consumption and Emissions **Future** per trip:

- 0.00 t Heavy fuel oil
- 0.00 t CO₂
- 0.00 t SO_x
- 0.00 t NO_x



Source: FutureShip GmbH

Zero Emission Ferry – a greener solution



Source: NTM Sweden

- ✓ Shipping is the most efficient means of transport!
- ✓ By using green energy, Zero Emission Ferries further increase cost/benefit ratio of shipping
- ✓ Political consensus to shift more freight from road to sea!



Source: Femern A/S, Grontmij

How do fixed links fit to that?

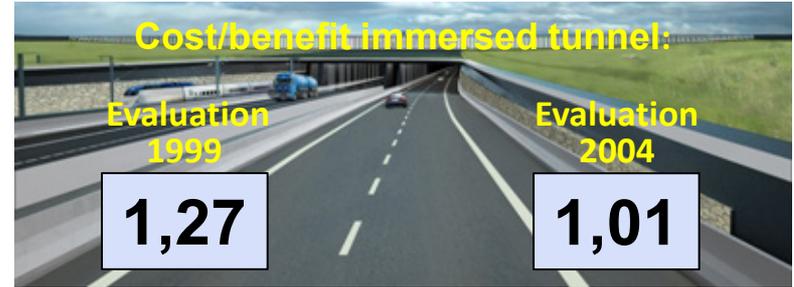
Fehmarn Belt fixed link:

- Environmental impact: 3-5m t CO₂ during building phase (Grontmij 2011)
- Significant CO₂ output by vehicles after opening

Ferry System vs. Fehmarn Belt Fixed Link



Source: PLANCO (2000): Economic Evaluation of an improved Ferry System, Final Report



Source: COWI/Planco (1999): Economic and Financial Evaluation of a Fixed Link across the Fehmarn-Belt, Final Report

Source: COWI (2004): Economic Assessment of a Fixed Link across the Fehmarn Belt, Summary Report



Fixed Link: Viable with state guarantees and EU funding only

Main benefits of Zero Emission Ferries:

- ✓ Technical quantum leap for EU's maritime economy, role model for competitors
- ✓ European yard sector gets boost
- ✓ Technological innovation secured
- ✓ Jobs in Germany and Denmark will be safeguarded
- ✓ Private investment of 500m €

Zero Emission Ferries would have a positive business case, if fixed link will be postponed until 2030!

Thank you for your attention!

