

# Scandlines

## A vision of green shipping

Puttgarden/Rødby,  
04.06.2013

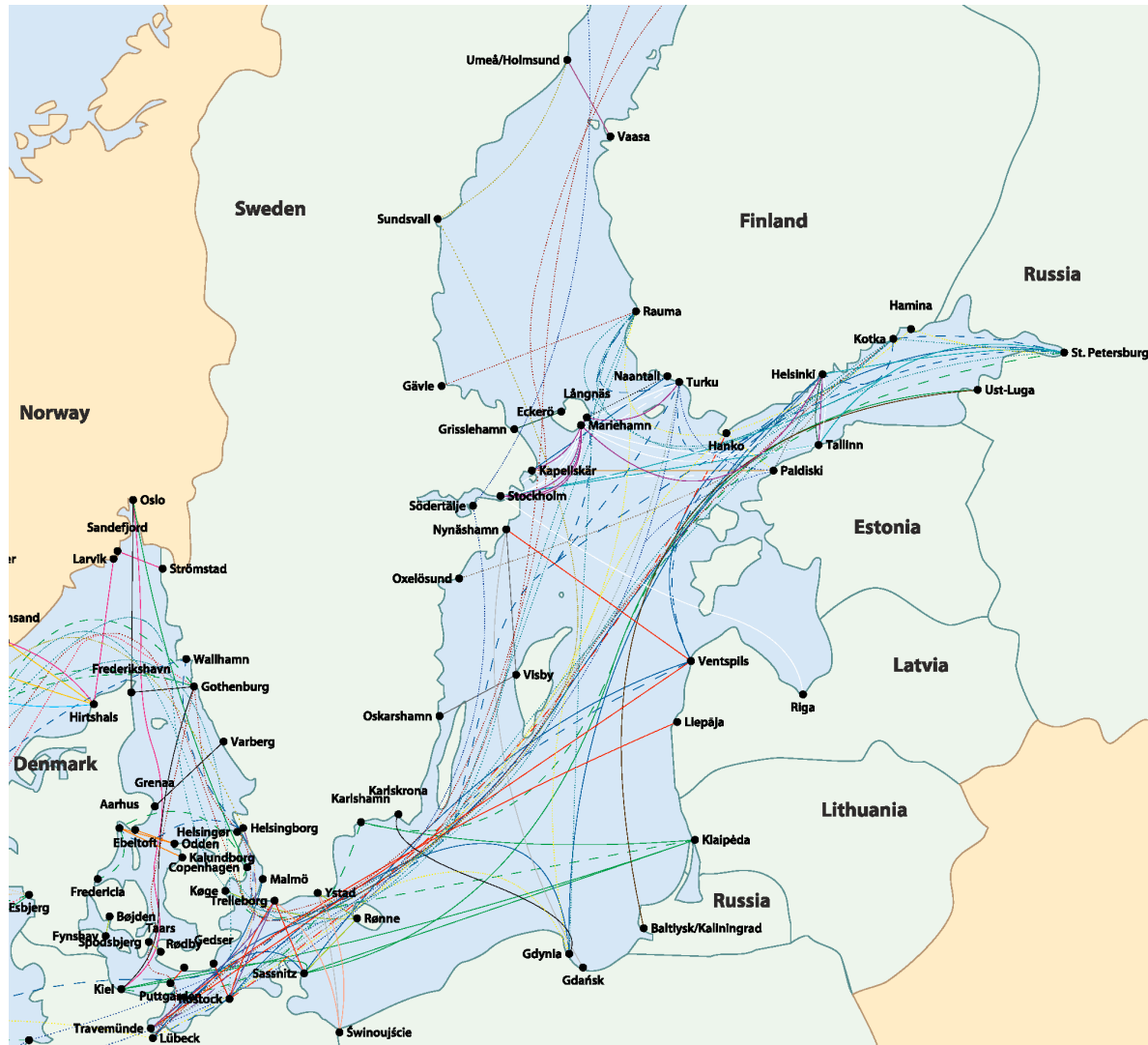
**THERE IS SOMETHING ABOUT SAILING**



# 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\*:

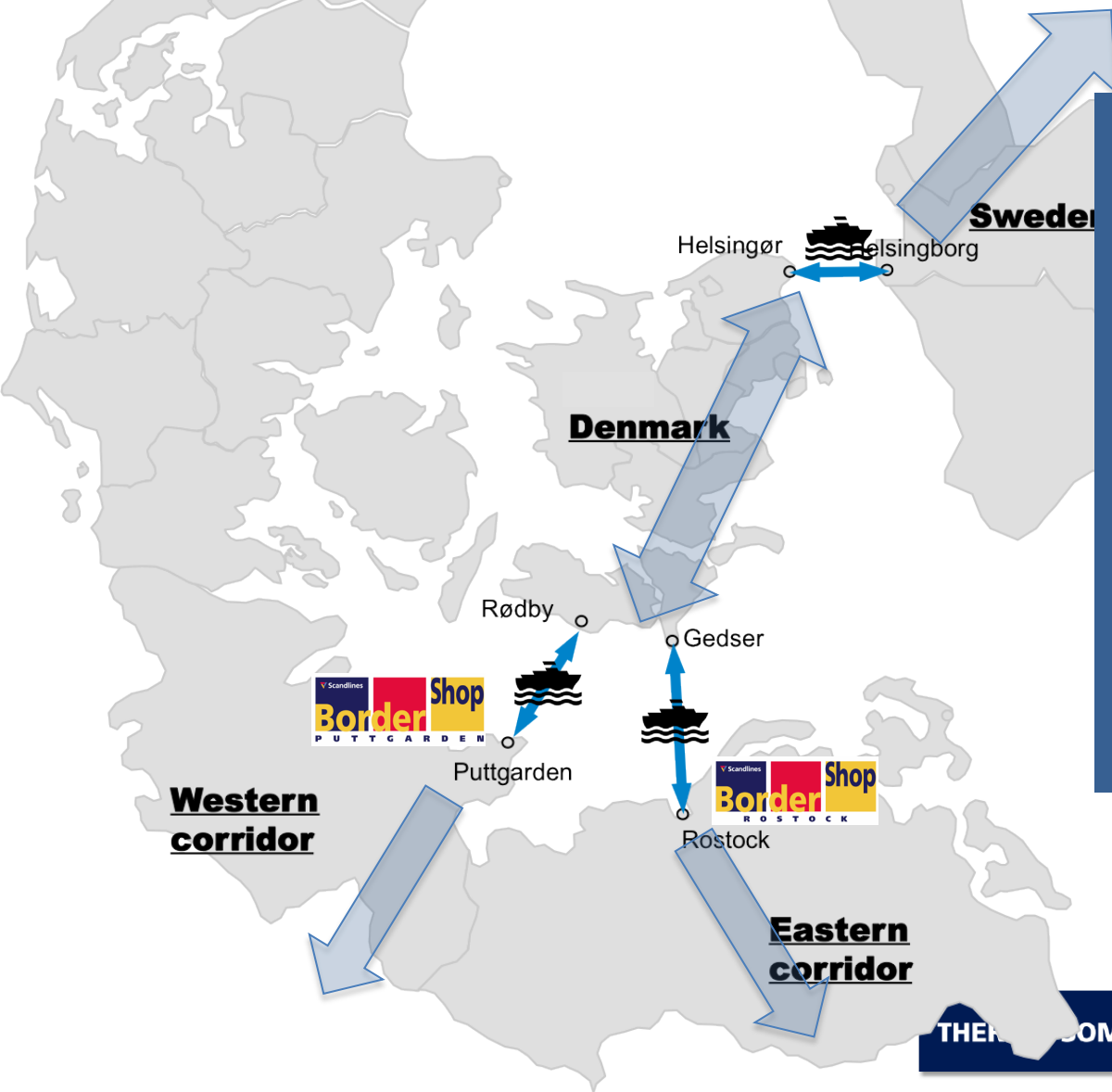
Pax: 233 mill.

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

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



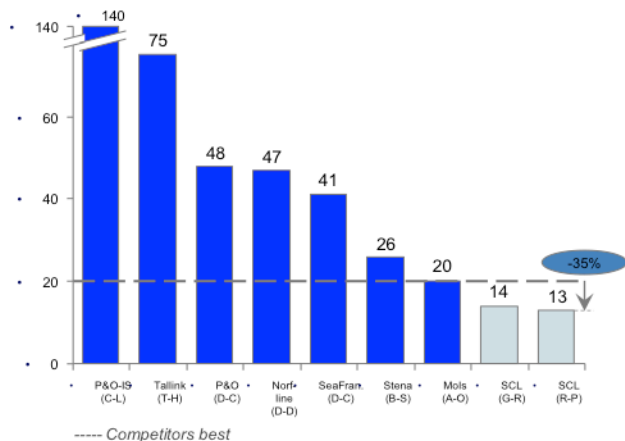
Loading and unloading in less than 15 minutes

## 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...

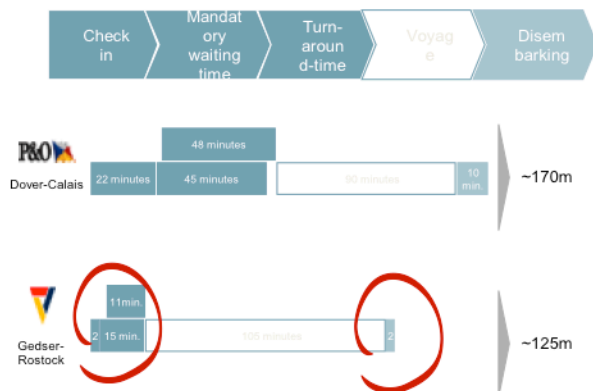
• Average total turn-around-time in harbor (minutes)



## 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



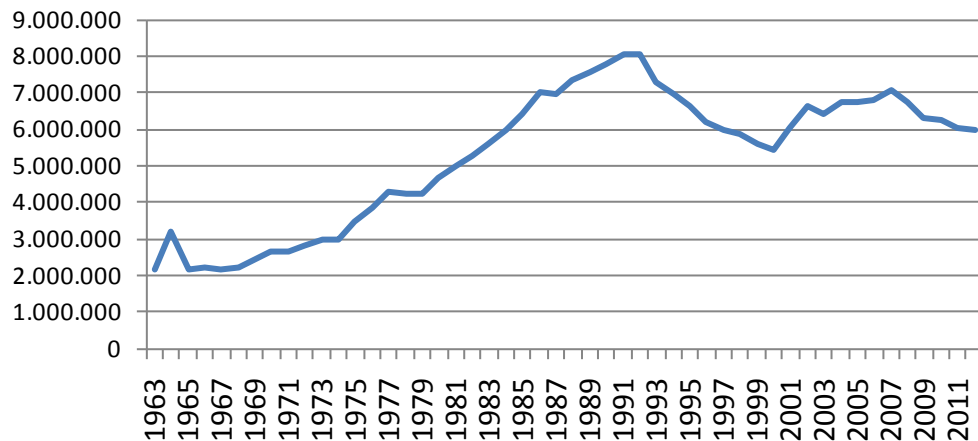
... operates 24/7, 365 days a year, departure every 30 minutes

Source: Study BCG



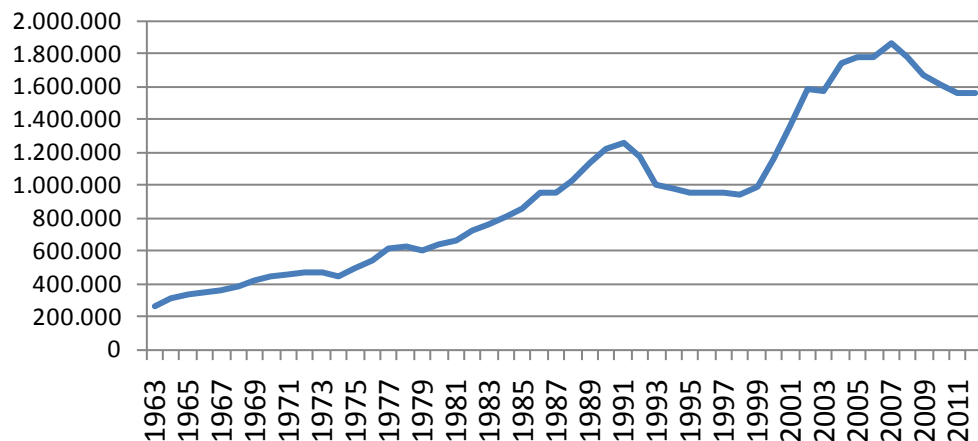
# 50 years Vogelfluglinie Rødby-Puttgarden

## Passengers

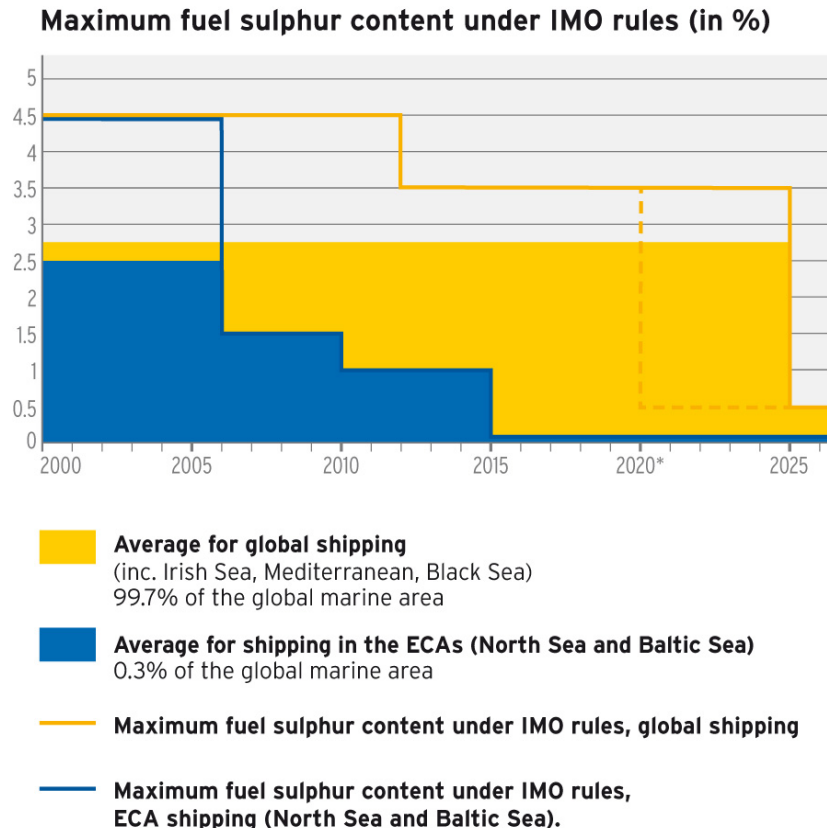


- ✓ Opened 14 May 1963
- ✓ 50 Mill. Passengers until 1977
- ✓ 100 Million passengers until 1988
- ✓ Today, 50 years after the opening, more than 260 Mill. passengers were transported on the link

## 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](http://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 CO<sub>2</sub> reduction

### Liquefied natural gas (LNG)

No SO<sub>x</sub>, CO<sub>2</sub> ↓ 20%, NO<sub>x</sub> ↓ 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<sub>x</sub> ↓ up to 98%

#### **But:**

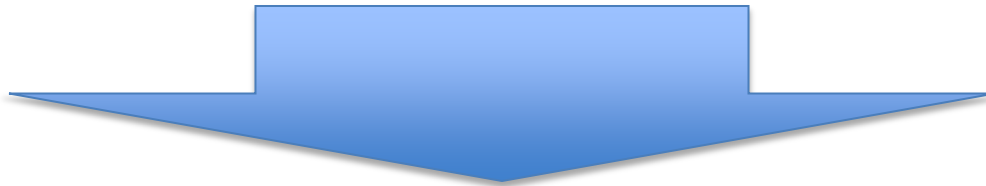
- proven technology for onshore operation only
- prototype status of marine applications (no prototypes for complex multiengine RoPax vessels at all)
- capacity ,stability and weight issues hamper retrofitting
- high investment costs due to pilot character of installations
- No contribution to CO<sub>2</sub> reduction



# Scandlines' innovative two-stage approach

- (1) Hybrid propulsion to reduce fuel consumption and CO<sub>2</sub> 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/CO<sub>2</sub> emissions ↓ 20%
- **Installation of Scrubbers**
  - SO<sub>x</sub> ↓ 99%, PM ↓ 88%, (CO<sub>2</sub> ↑)



# Technology for green shipping: Zero-Emission-Ferries

Energy source

Wind

Energy carrier

Hydrogen → H<sub>2</sub>

Energy converter

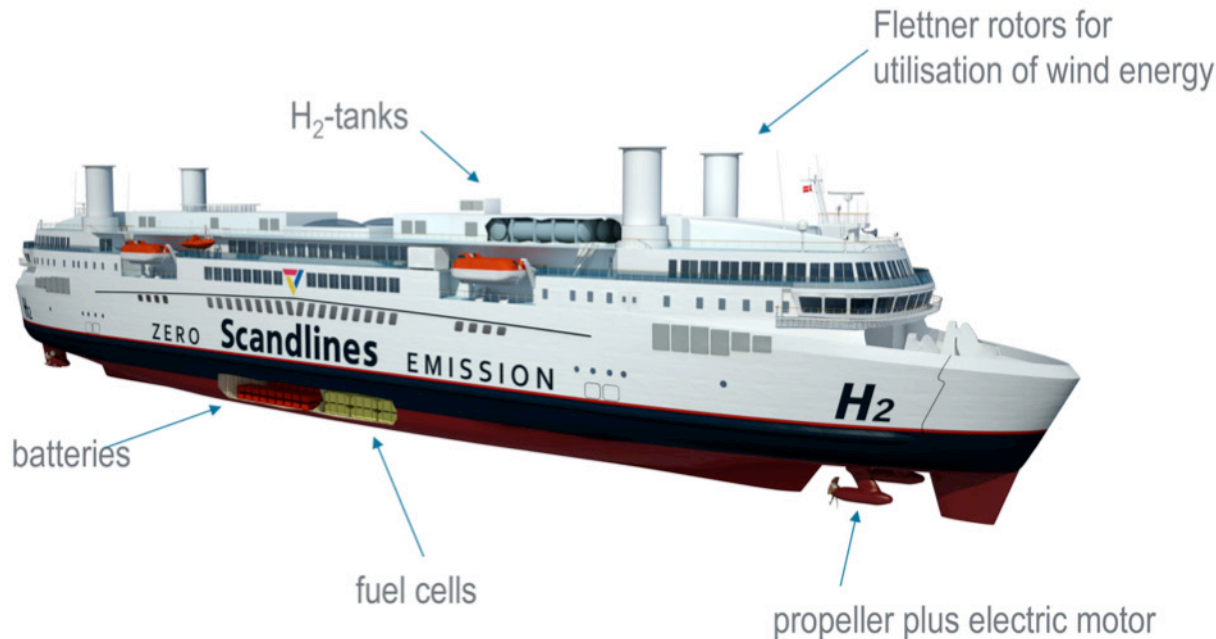
Fuel Cell, Battery

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

- 0.95 t Heavy fuel oil
- 2.96 t CO<sub>2</sub>
- 0.10 t SO<sub>x</sub>
- 0.05 t NO<sub>x</sub>

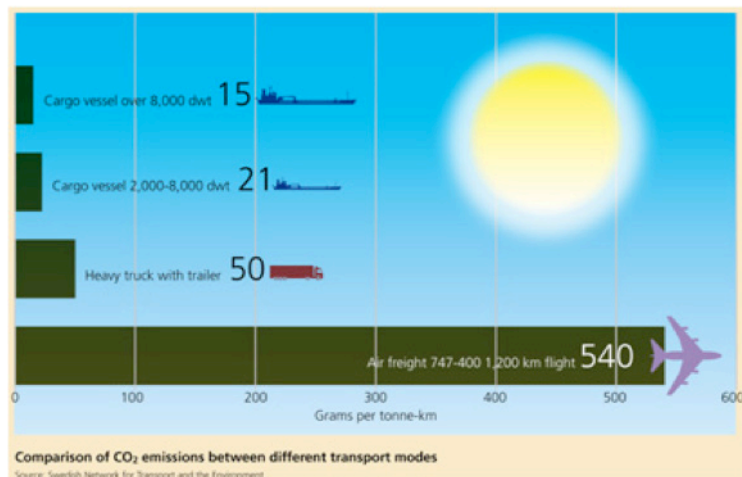
Ø Consumption and Emissions **Future**  
per trip:

- 0.00 t Heavy fuel oil
- 0.00 t CO<sub>2</sub>
- 0.00 t SO<sub>x</sub>
- 0.00 t NO<sub>x</sub>



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?

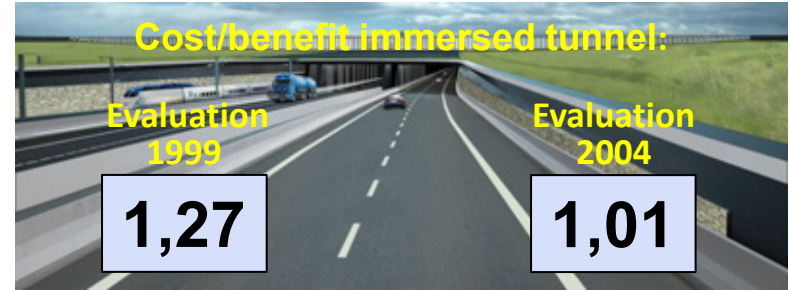
Fehmarn Belt fixed link:

- Environmental impact: 3-5m t CO<sub>2</sub> during building phase (Grontmij 2011)
- Significant CO<sub>2</sub> 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!

