RoRoSeca

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DEN DANSKE MARITIME FOND

DTU

Brief project description

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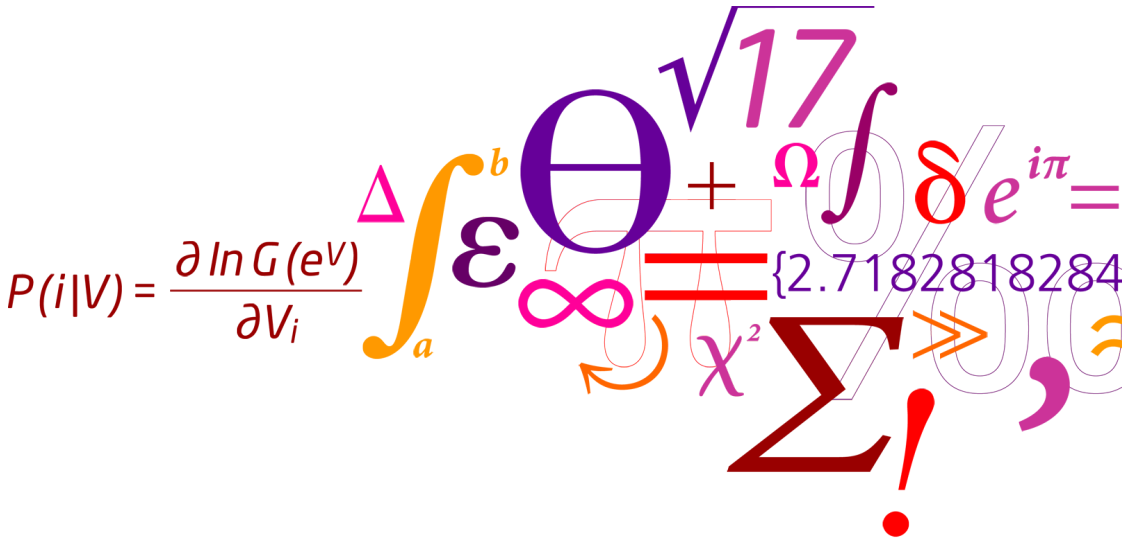

Title of project:

- **Mitigating and reversing the side-effects of environmental legislation on Ro-Ro shipping in Northern Europe**

- Main objective: identify and assess possible technical, operational, regulatory and financial measures for the mitigation and reversal of the negative repercussions of environmental legislation to the market shares of Ro-Ro shipping in Northern Europe.

- Sponsor: Danish Maritime Fund

- Duration: 2 years (15/6/2015-14/6/2017)

Background on impact: prior studies/papers

- Kalli et al (2009)
- Ljungström et al (2009)
- Stavrakakis et al (2009)
- Hader at al (2010)
- ECSA: Notteboom et al (2010)
- EC: Bosch et al (2009), Kehoe et al (2010), Delhaye et al (2010)
- ECSA & ICS: Grebot et al (2010)
- EMSA (2010)
- etc

- Special issue of Tr. Res. Part D on ECAs (2014)

Special issue

Transportation Research Part D xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

Transportation Research Part D

journal homepage: www.elsevier.com/locate/trd

Editorial

Emission control areas and their impact on maritime transport

Kevin Cullinane [a,*], Rickard Bergqvist [b,1]

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Transportation Research Part D 28 (2014) 74–90

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The possible designation of the Mediterranean Sea as a SECA: A case study

George P. Panagakos [a,1], Eirini V. Stamatopoulou [a,2], Harilaos N. Psaraftis [b,*]

[a] Laboratory for Maritime Transport, National Technical University of Athens, 9, Iroon Politechniou Str., Zografos, Greece
[b] Department of Transport, Technical University of Denmark, Bygningstorvet 1, 2800 Kgs Lyngby, Denmark

Results

- Shift to road >5%
- Less SOx
- Less CO_2 !

- RoPax going 23 knots
- Low load factor

Transportation Research Part C 52 (2015) 57–73

Contents lists available at ScienceDirect

Transportation Research Part C

journal homepage: www.elsevier.com/locate/trc

Maritime routing and speed optimization with emission control areas

Kjetil Fagerholt [a,*], Nora T. Gausel [a], Jørgen G. Rakke [b], Harilaos N. Psaraftis [c]

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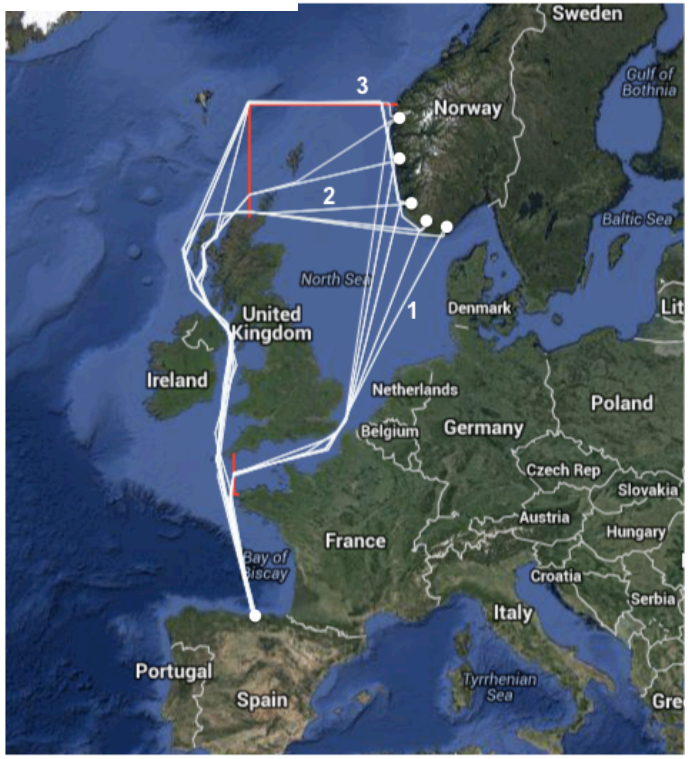
- Speed optimization, ship routing and ECAs



Transportation Research Part D 39 (2015) 56–64

Contents lists available at ScienceDirect

Transportation Research Part D

journal homepage: www.elsevier.com/locate/trd

On two speed optimization problems for ships that sail in and out of emission control areas

Kjetil Fagerholt [a,b], Harilaos N. Psaraftis [c,*]

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[b] Norwegian Marine Technology Research Institute (MARINTEK), Trondheim, Norway
[c] Department of Transport, Technical University of Denmark, Lyngby, Denmark

- Where to cross the ECA and what the speeds should be outside and inside the ECA

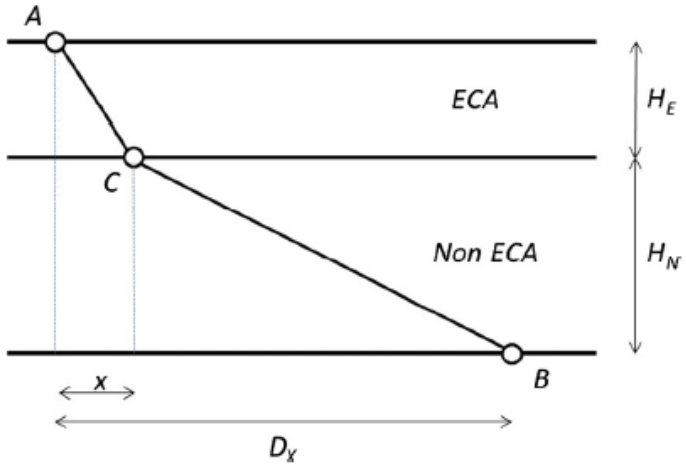


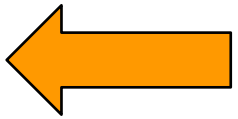
Fig. 5. Illustration of the ECA refraction problem.

Structure of the project

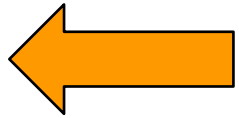
- 4 Work Packages

- WP1 Project management

- WP2 Enhanced modal split and emissions models (Year 1)
  - Task 2.1 Scenario definition and data collection
  - Task 2.2 Modal split model development and calibration
  - Task 2.3 Emissions and external cost calculator



- WP3 Measures to mitigate or reverse modal shifts (Year 2)
  - Task 3.1 Measures from the Ro-Ro operator
  - Task 3.2 Measures from policy makers



- WP4 Dissemination

Case studies based on

Industry endorsements

- DFDS
- Interferry
- European Community Shipowners Associations (ECSA)

Current DFDS network

- 18 Routes (22 links)
- 38 vessels
- Up to 535 departures/week, 13 countries, 30 ports
- 4 main areas
  - North Sea (9 Routes, 20 vessels)
  - Baltic Sea (5 Routes, 7 vessels)
  - Cross-Channel (3 Routes, 6-7 vessels)
  - Mediterranean (1 Route, 1-2 vessels)

Task 2.1: select routes for analysis

Route selection criteria

- Geographical balance → Proportion by Region
- Chain configuration → By Sailing Distance & Frequency
- Volume → By Vessel and Route Capacity
- Commodity mixture → Cargo type and value
- Vessel types → Ro-Ro, Ro-Pax, Cruise, abatement
- Data availability

Active routes to study (7)

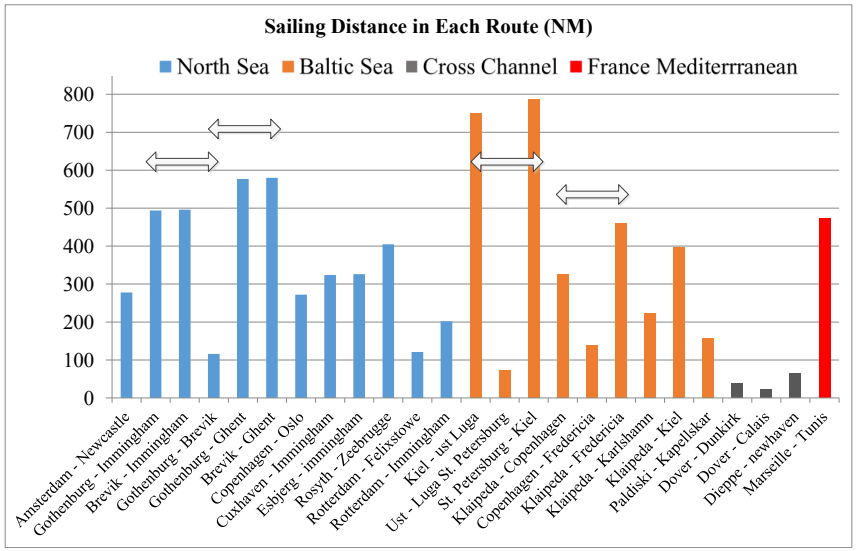
Route	Vessel		Vessel Capacity	
	Type	Tech	Lane meters	Passengers
NORTH SEA				
Gothenburg – Ghent – Brevik	RoRo	Scrubber	3831	12
	RoRo	Scrubber	3831	12
	RoRo	Scrubber	3831	12
Copenhagen – Oslo	Cruise	Scrubber	(450 cars)	1790
	Cruise	MGO	(320 cars)	1989
Esbjerg – Immingham	RoRo	Scrubber	3000	12
	RoRo	MGO	3000	12
Rotterdam – Felixstowe	RoRo	Scrubber	2772	12
	RoRo	Scrubber	2772	12
	RoRo	MGO	1680	12
BALTIC SEA				
Klaipeda – Kiel	RoPax	Scrubber	2115	328
	RoPax	Scrubber	2240	328
Klaipeda – Karlshamn	RoPax	MGO	2490	600
	RoPax	MGO	2496	600
CROSS CHANNEL				
Dover – Calais	RoPax	MGO	1784	1100
	RoPax	MGO	1949	405

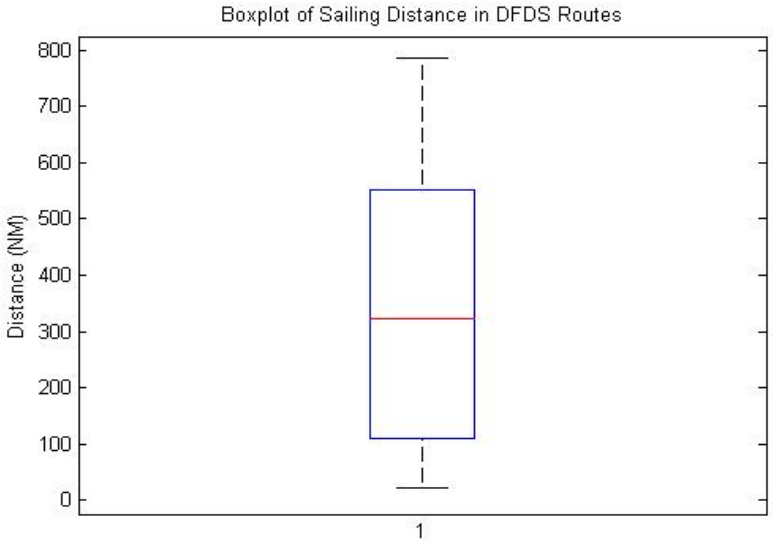
Plus!

- Esbjerg- Harwich (recently shut down)
- Marseille-Tunis (outside SECA)

Short vs long routes

- Distance





Distance of Proposed Routes
577*
326
272
121
397
223
22

Volume

- The selected routes account for approximately 43% of the total DFDS lane meters capacity

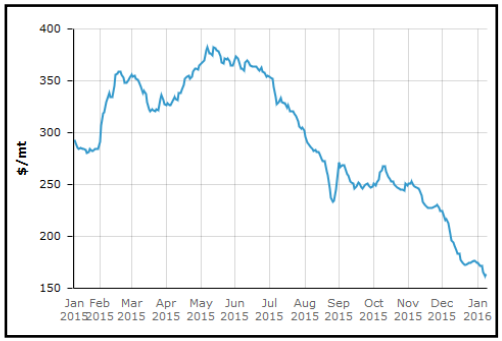
Vessel Type and Technology

- 2 Cruise Ships (1 MGO, 1 scrubbers)
- 12 Ro-Ro (3 MGO, 9 scrubbers)
- 8 Ro-Pax (5 MGO, 3 scrubbers)

Challenges

- **How to isolate effect of sulphur legislation from that of other developments that happened in parallel**

- Precipitous drop of fuel prices



- Russian economic crisis

- **Lower fuel prices may induce higher speeds and hence more CO_2!**

DTU project team presentations

- Thalis Zis: the enhanced modal split model (Task 2.2)
- Jacob Kronbak: modelling the transport cost (Task 2.2)
- Hans Otto Kristensen: the SHIP DESMO model (Task 2.3)

External speakers

- Chris Pålsson, Lloyds List Intelligence
- Mogens Bech, Danish Maritime Authority
- Maria Deligianni, ECSA
- Olaf Merk, OECD/ITF
- Poul Woodall, DFDS
- Per Wimby, Stena
- Anna Larsson, Trident Alliance

Panel:

- Katrine Bjerregaard, Green Ship of the Future
- Jesper Stubkjær, Danish Shipowners Association
- Johan Roos, Interferry
- Valdemar Ehlers, Danske Maritime

Thank you

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