SKEMA

INTERACTIVE KNOWLEDGE PLATFORM
FOR MARITIME TRANSPORT AND LOGISTICS

Impact Study on Annex VI of the MARPOL Convention on Short Sea Shipping

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Nautical Enterprise

SEVENTH FRAMEWORK PROGRAMME
European Community

Directorate-General
for Energy
and Transport

Contents

Origination of Study

- DG-TREN FP7 Project: SKEMA (2008-2011)
- SKEMA will establish a Sustainable Knowledge Platform to be used by policy makers and stakeholder groups in the European maritime and logistics industry.
- As part of the SKEMA Project a number of studies will be carried out that will address specific areas of interest to DGTREN.

Objective of Study

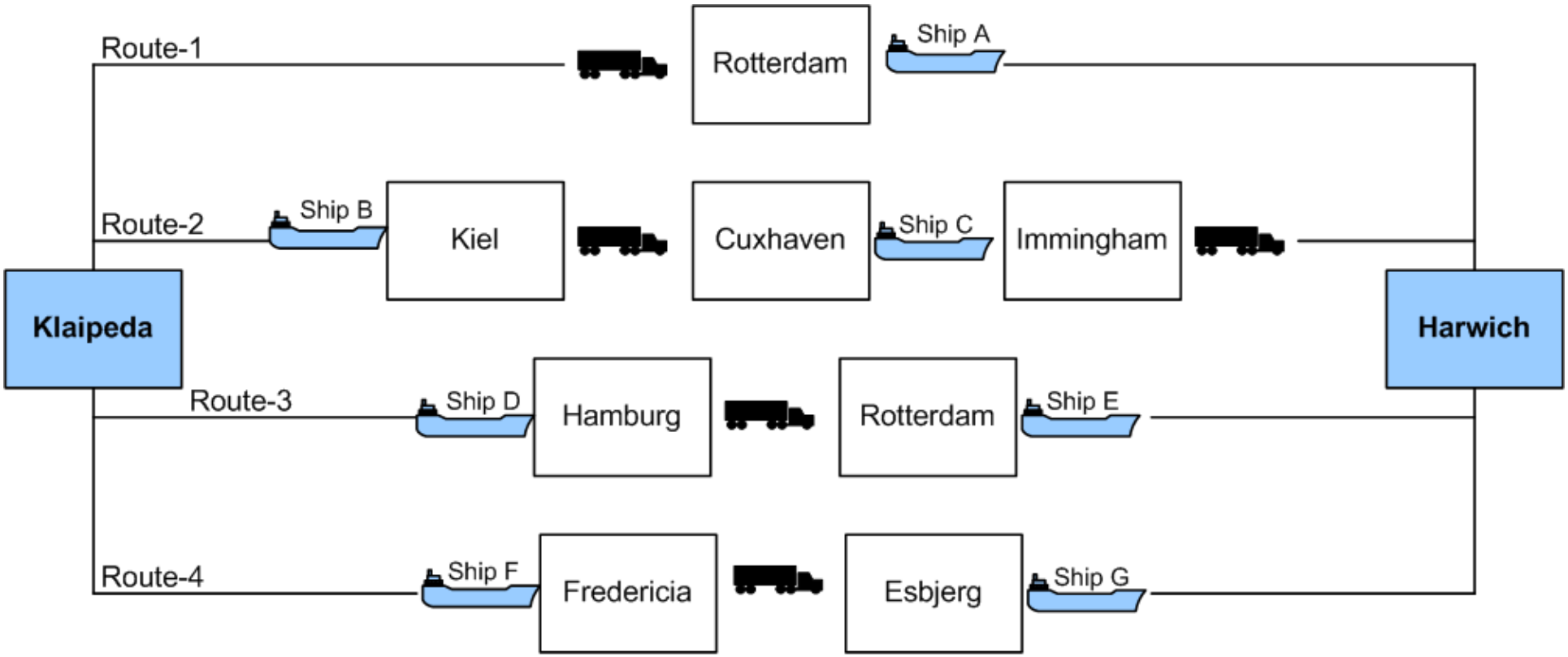
Overall Objective:

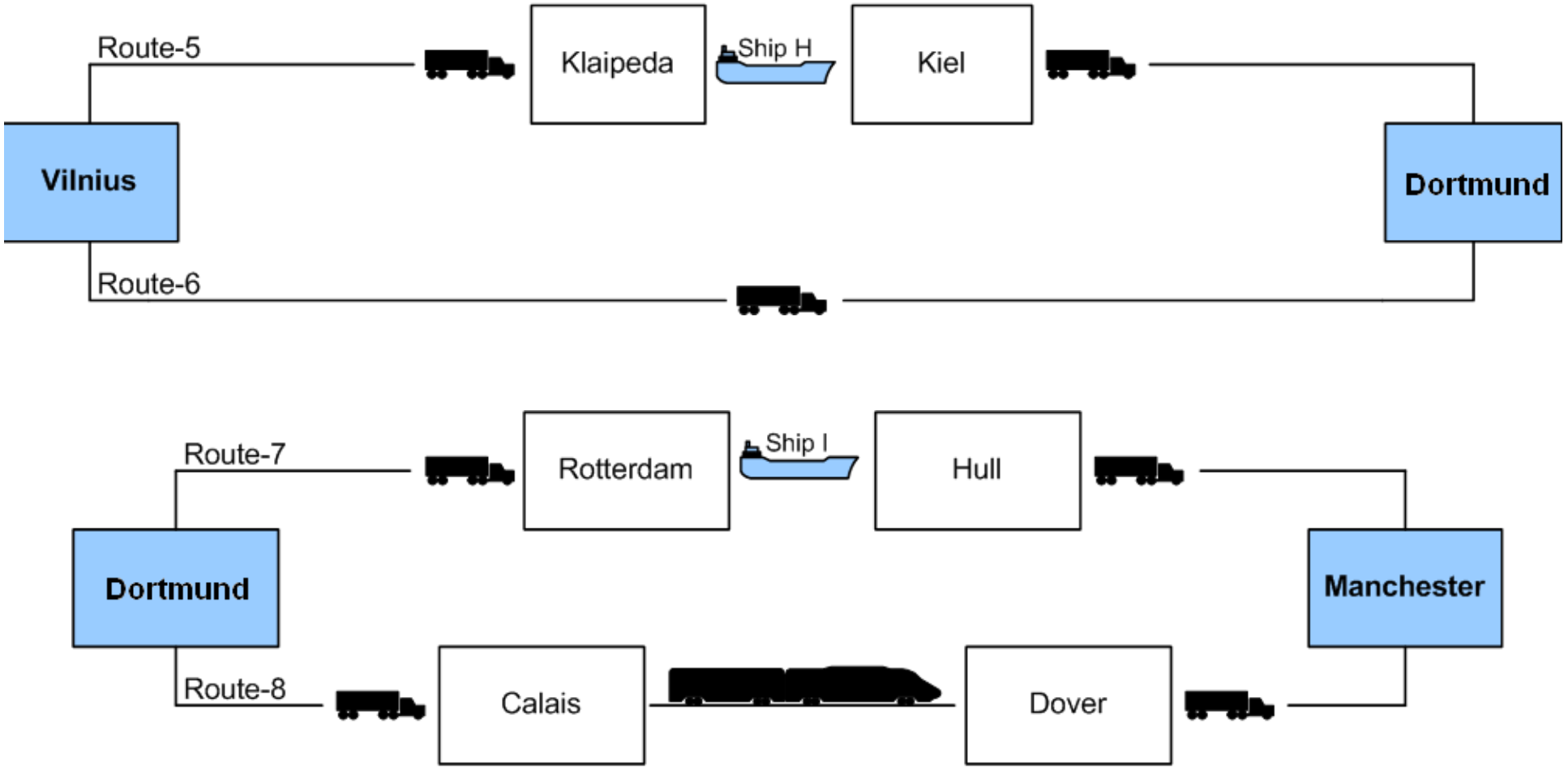
- Determine impact of MARPOL Annex VI on the relative competitiveness between SSS and road haulage.

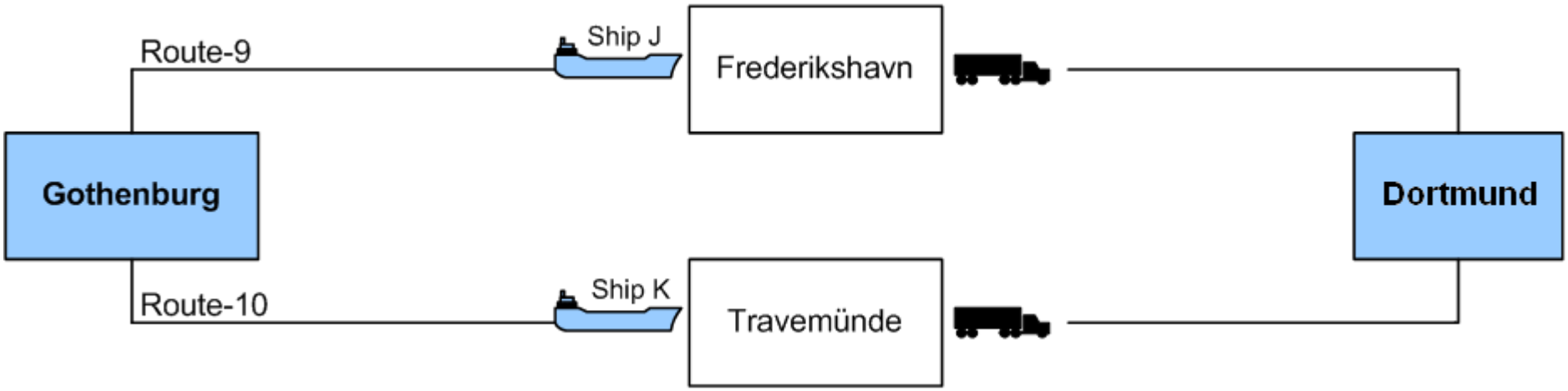
Sub Objectives:

- Assess the impact of MARPOL Annex VI through the modelling of selected services in the Baltic and North Sea ECA (Emissions Control Area).
- Determine the cost impact of utilising sulphur emissions abatement technologies (scrubbers).
- Determine the cost impact of the Eurovignette Directive, incorporating EURO VI standards.

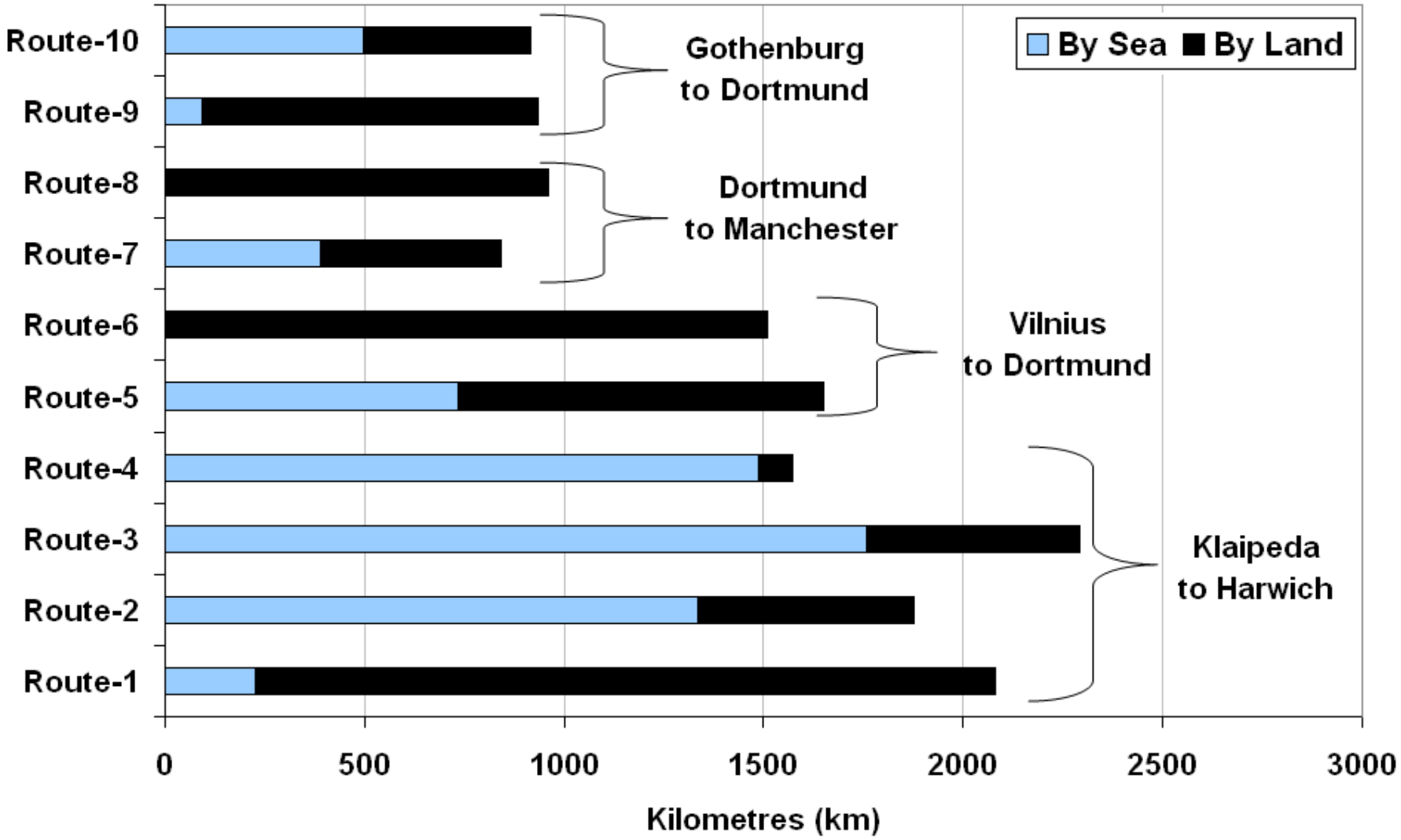
10 Routes susceptible to changes in modal-split were identified



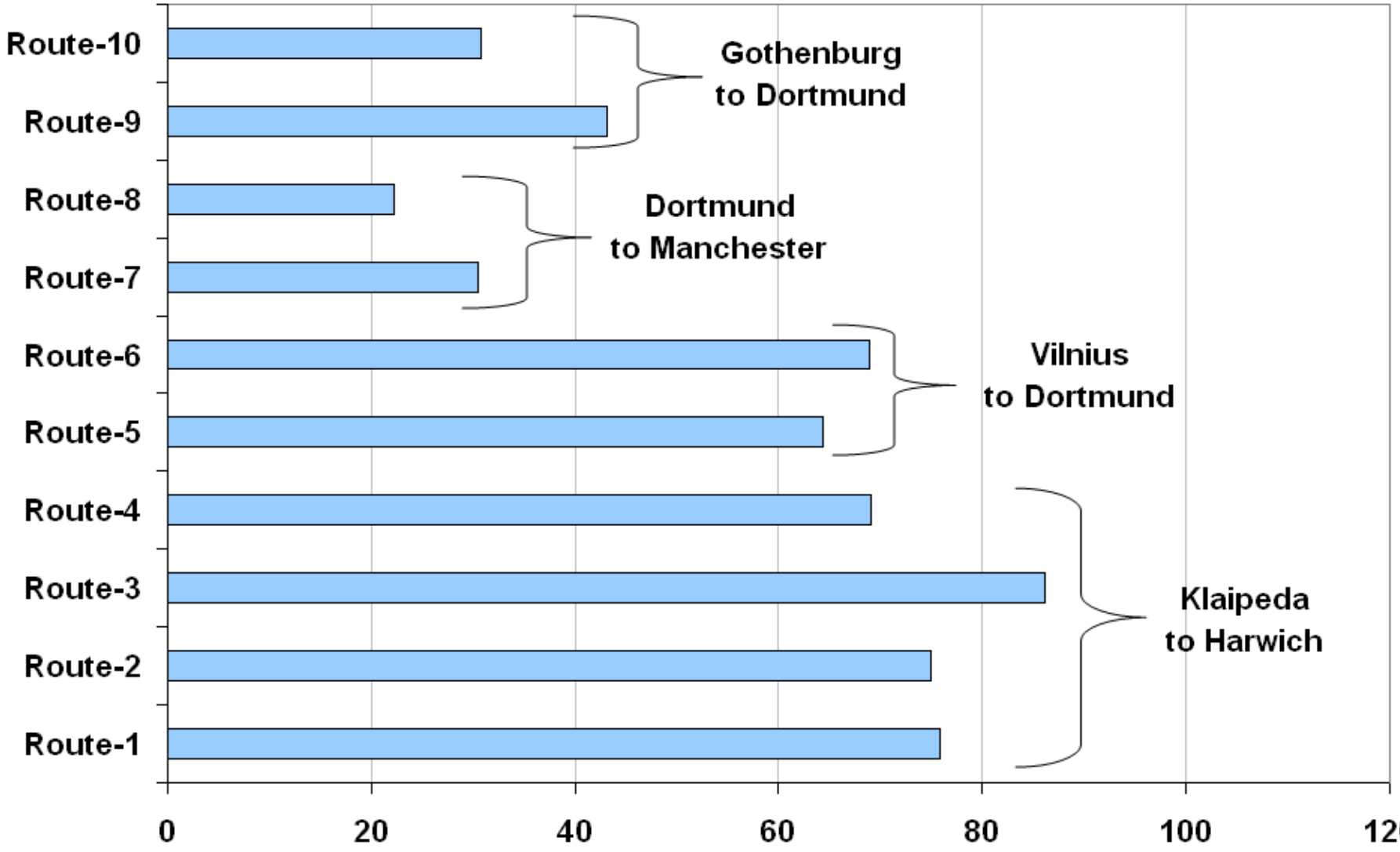

Route-5
Klaipeda
Ship H
Kiel
Vilnius
Dortmund
Route-6
Route-7
Rotterdam
Ship I
Hull
Dortmund
Manchester
Route-8
Calais
Dover


Route-9
Ship J
Frederikshavn
Gothenburg
Dortmund
Route-10
Ship K
Travemünde

Modal Allocation for Routes



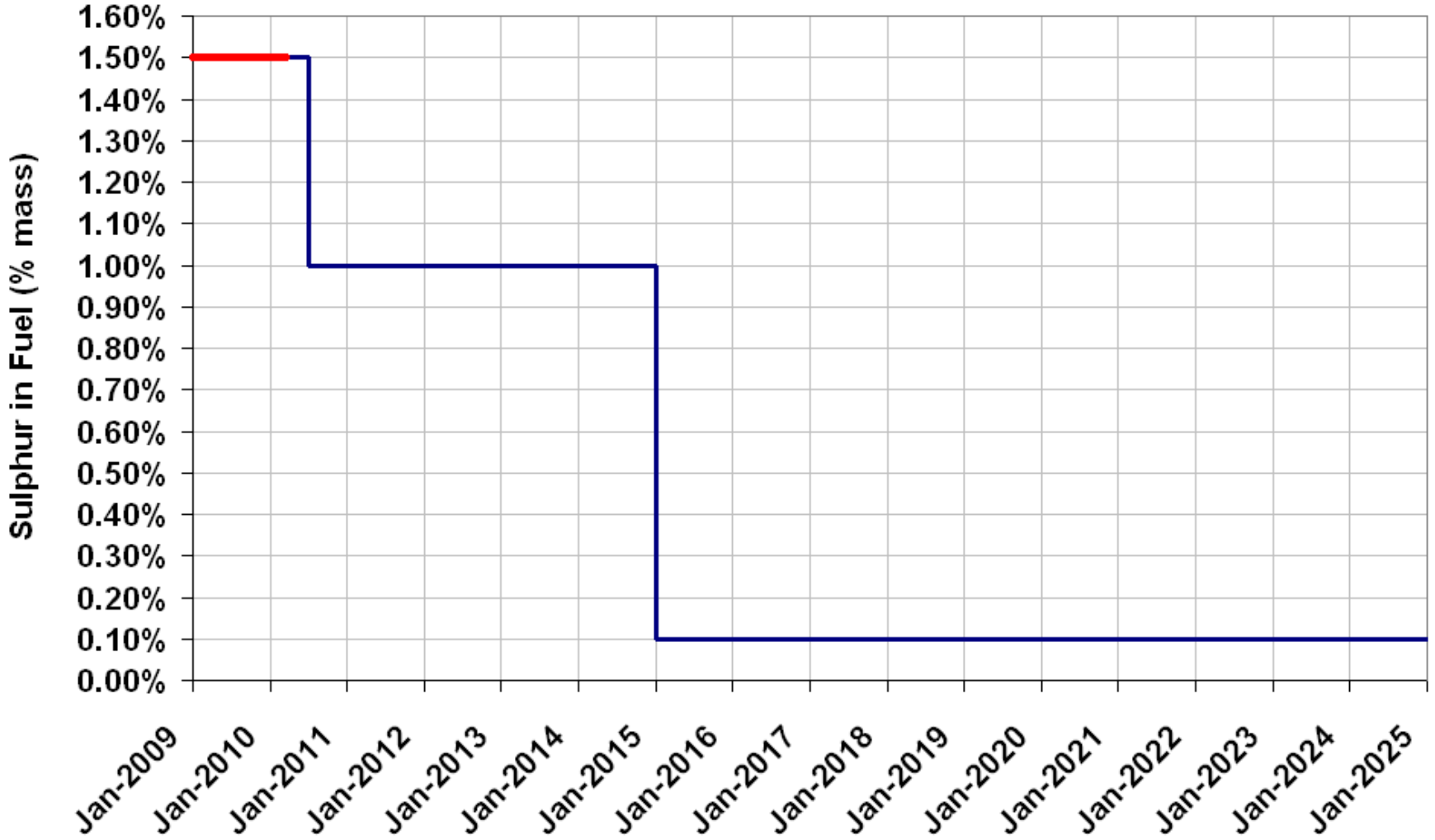
Route Transit Times (hrs)



Study Scenarios

BC	Sulphur Limit Remains at 1.5%
S1	Current MARPOL Annex VI Amendments
S2	S1 + 100% Eurovignette (EV) Infrastructural Toll
S3	S2 + 100% EV Environmental Toll
S4	S3 + Installation of Sea Water Exhaust Scrubber
S5	S1 + Increased 2015 Limit to 0.5% Sulphur
S6	S1 + Truck Drivers on Reduced Wages

MARPOL Annex VI Amendments: Sulphur Limit in ECAs



EV: Infrastructural & Environmental

- Eurovignette currently provides a framework for charging road users for infrastructural costs.
- A framework for charging road users for environmental costs is currently at the proposal stage.

Infrastructural Tolls

Truck Classification	Average Charge (€/vkm)
EURO 0	€0.015
EURO I	€0.013
EURO II	€0.011
EURO III	€0.010
EURO IV	€0.009
EURO V	€0.009

Environmental Tolls

Truck Classification	Average Charge (€/vkm)
EURO 0	€0.146
EURO I	€0.096
EURO II	€0.094
EURO III	€0.074
EURO IV	€0.053
EURO V	€0.034

Scrubbers

MARPOL provides for the use of abatement technologies such as Scrubbers to remove Sulphur from engine exhausts, thereby allowing the use of higher sulphur fuels.

Scrubber Issues:

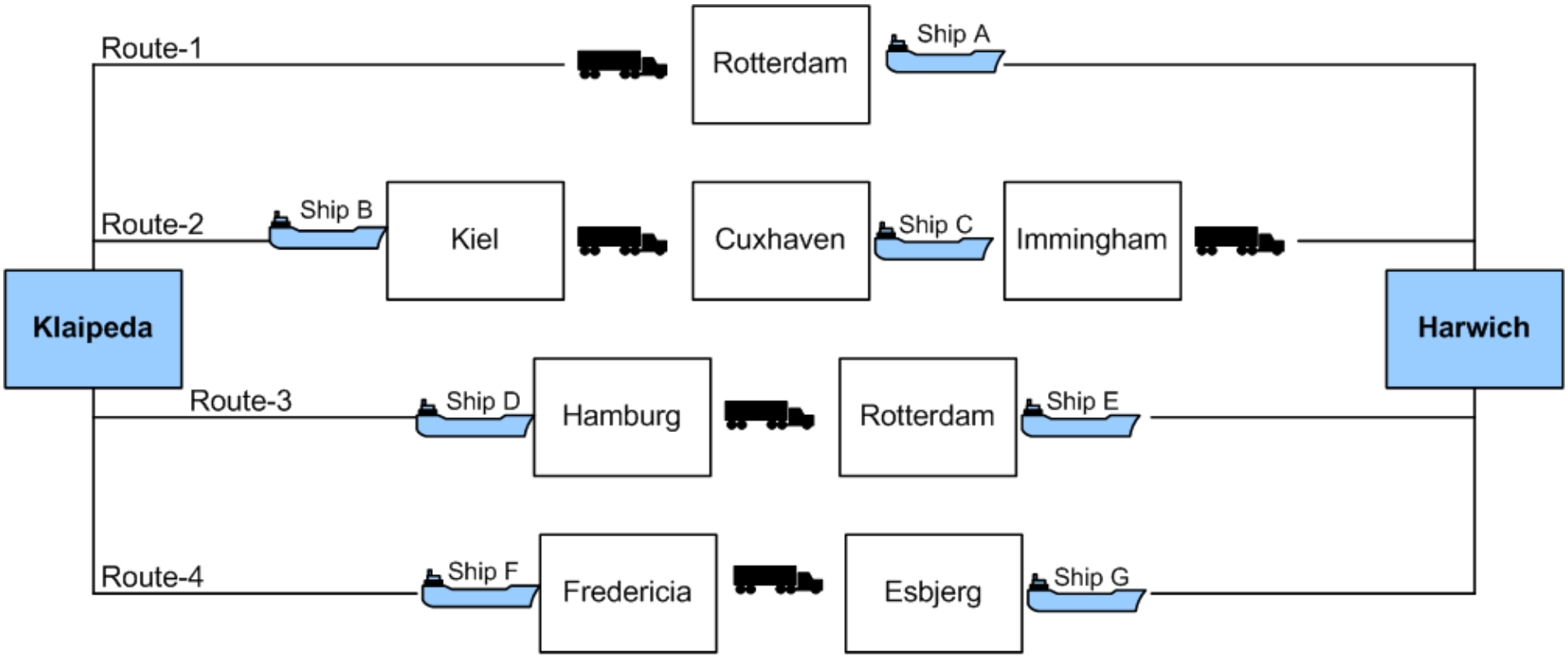
- –Not proven technology at sea.
- –Retro fitting constraints.
- –Running costs.
- –Waste disposal costs.
- –Sea Water Scrubber not permitted in Danish Waters.
- –Potentially insufficient yard capacity to retrofit ECA ships by 2015.

Study Models

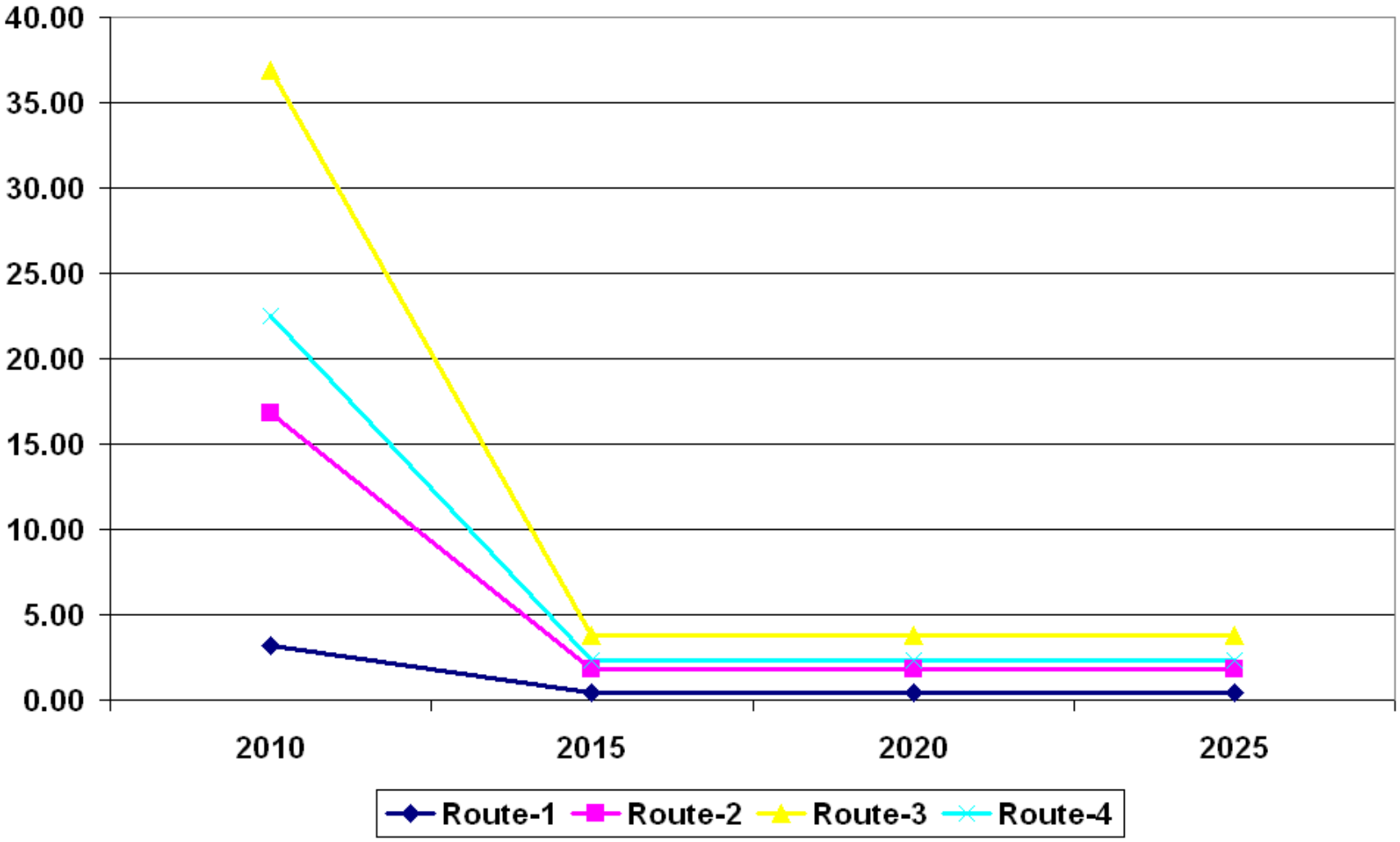
- NECL model for RoRo vessels examined:
  - Routes: 1 – 10
  - Scenarios: BC, S1, S2, S3, S4, S5 & S6
- TAPAS model for LoLo vessels examined:
  - Routes: 1 – 4
  - Scenarios: BC & S3

RoRo Vessels

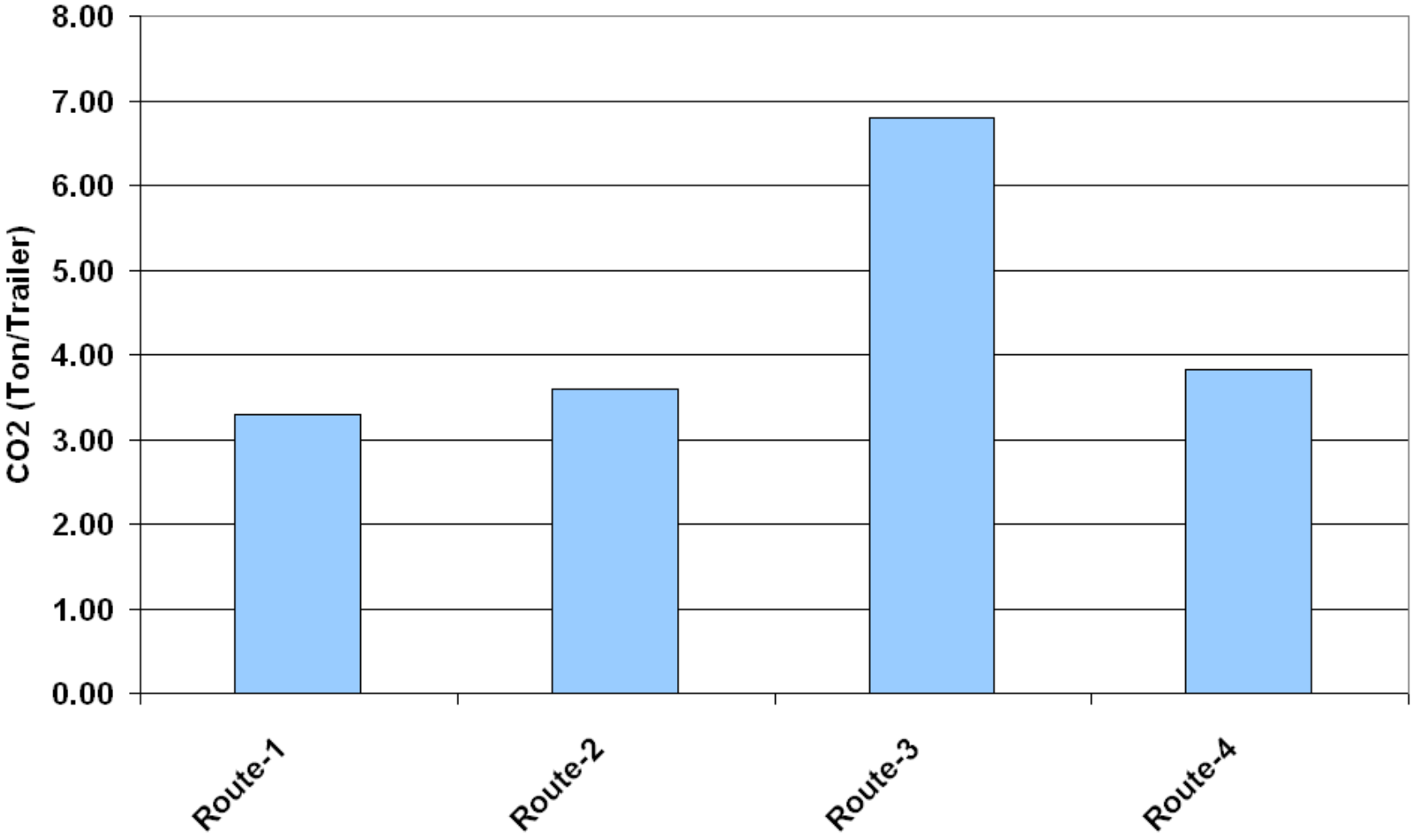
Results for Routes 1 - 4



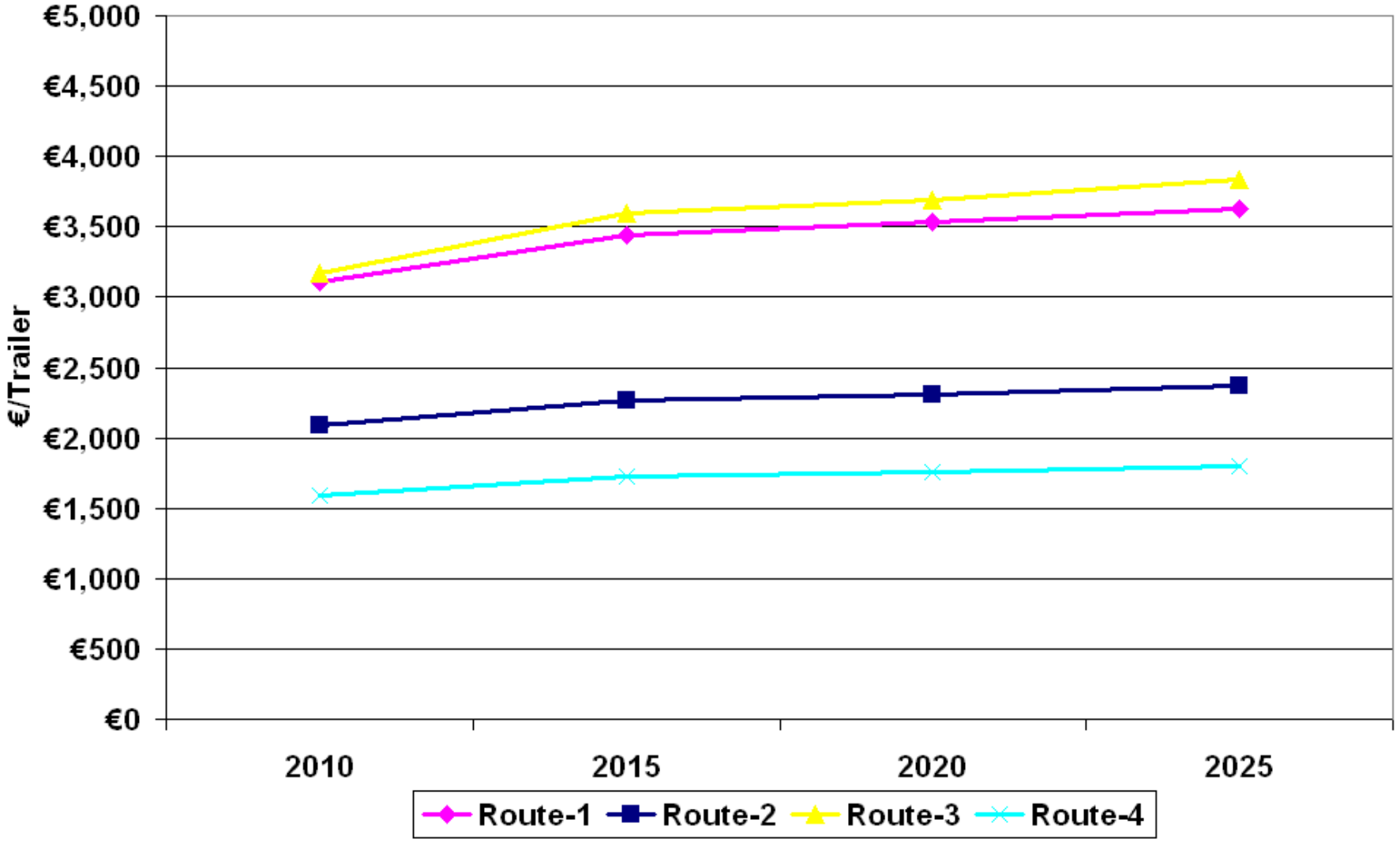
SO2 Emissions: Routes 1 – 4
Scenarios: S1, S2, S3 & S6



CO2 Emissions: Routes 1 – 4
Scenarios: S1, S2, S3 & S6



Example: Routes 1 – 4 (Scenario BC)



SSS & MoS Focal Points Meeting
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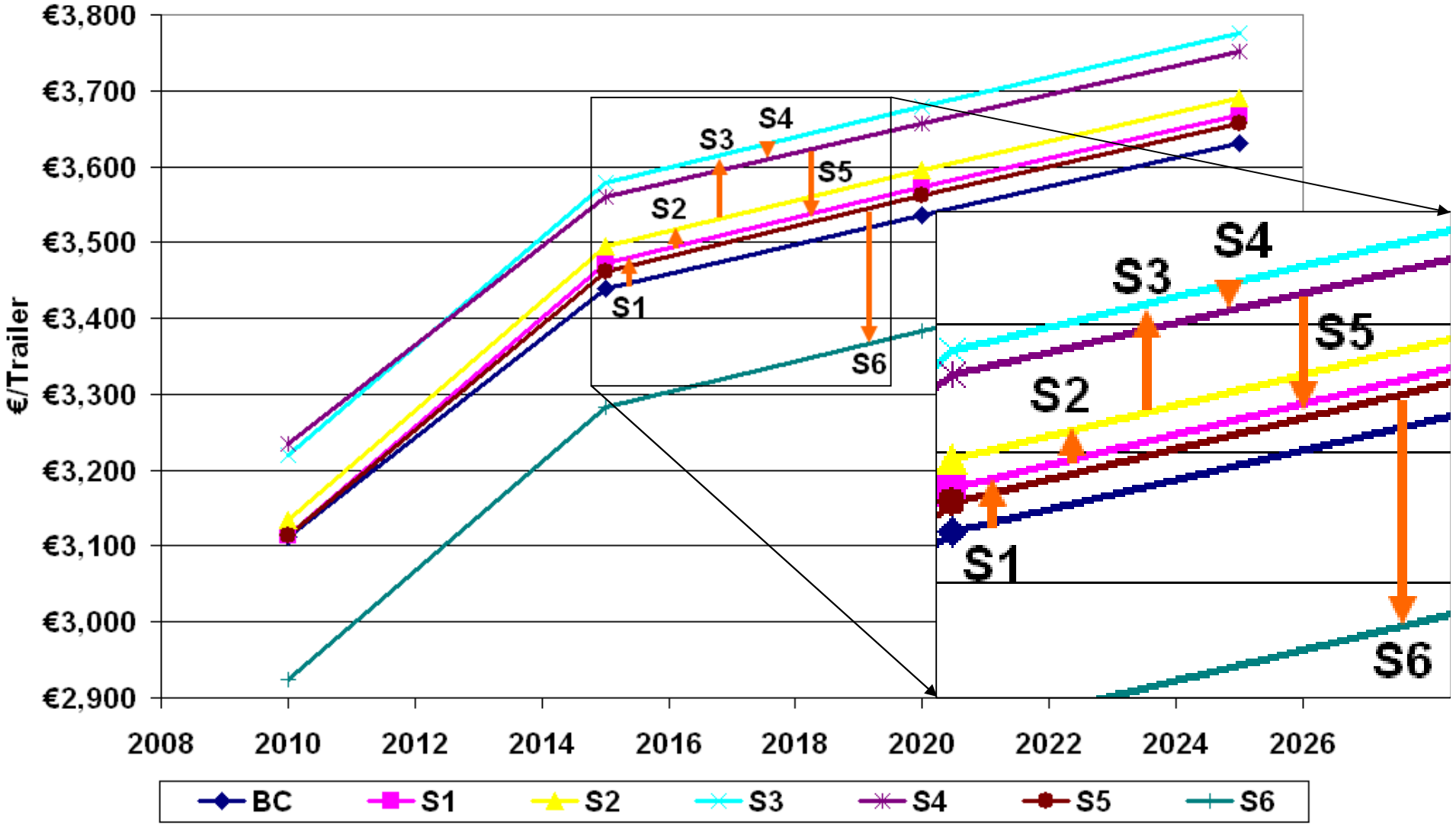
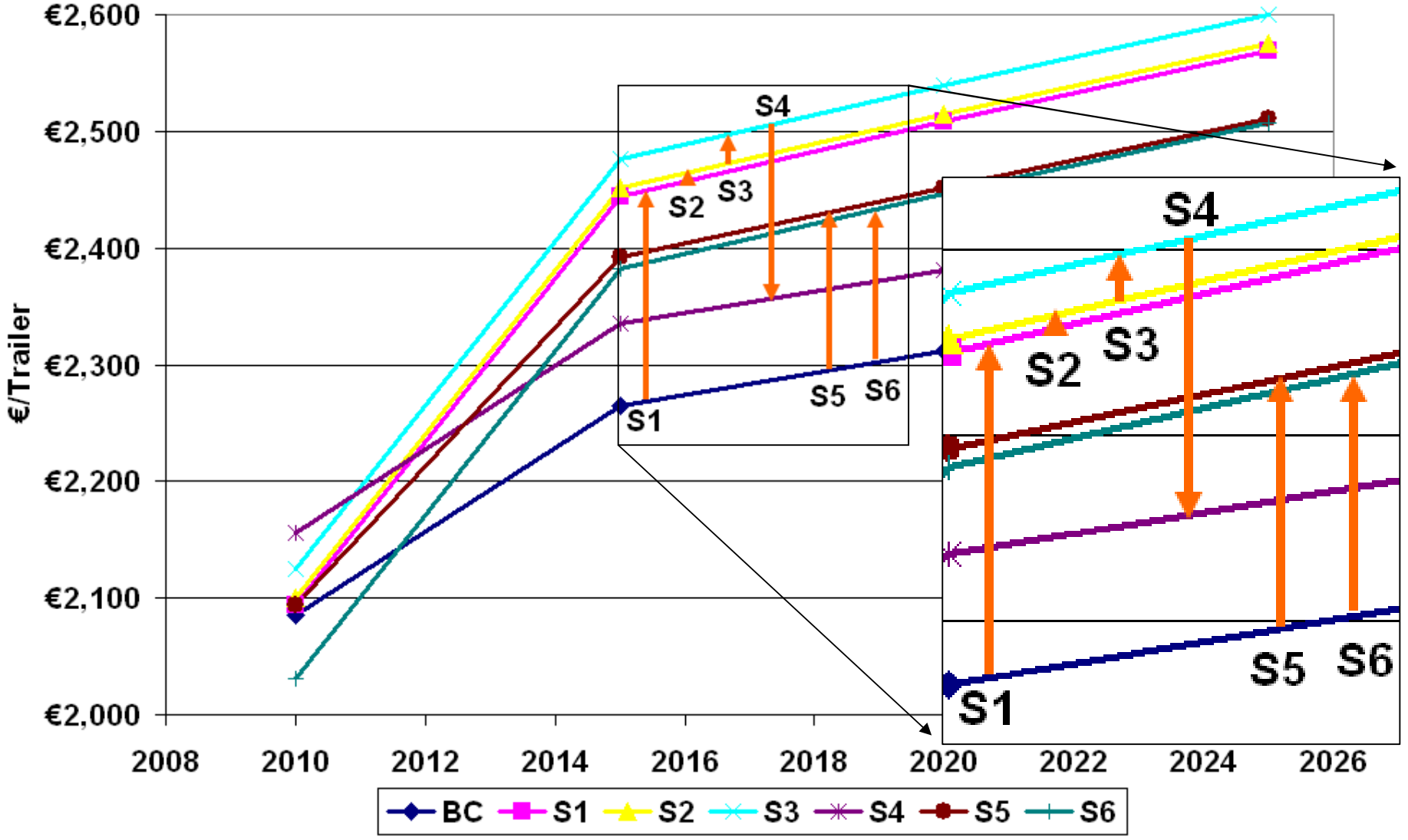
Example: Route 1 - All Scenarios

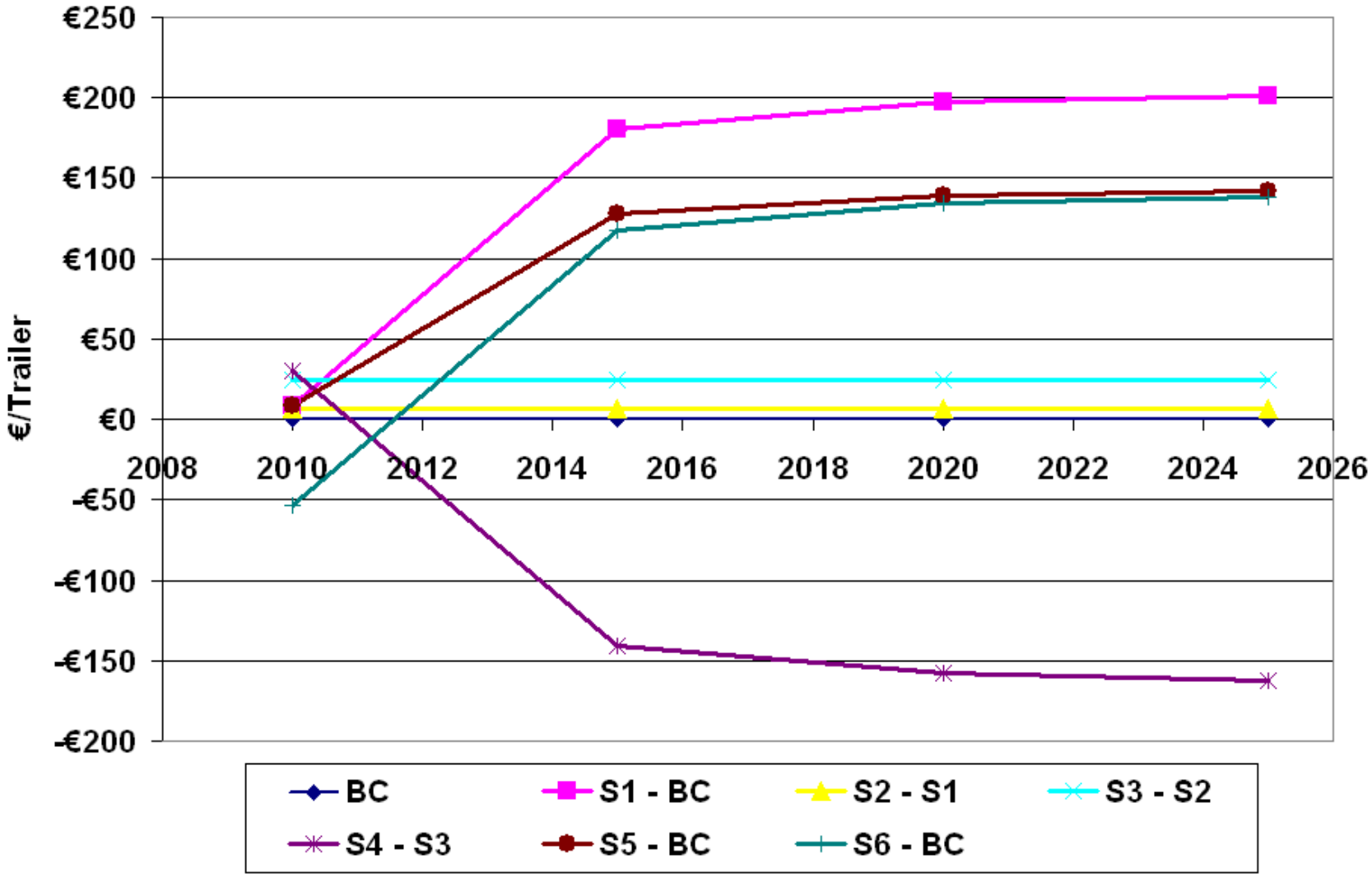


Example: Route 2 - All Scenarios



Directorate-General for Energy and Transport

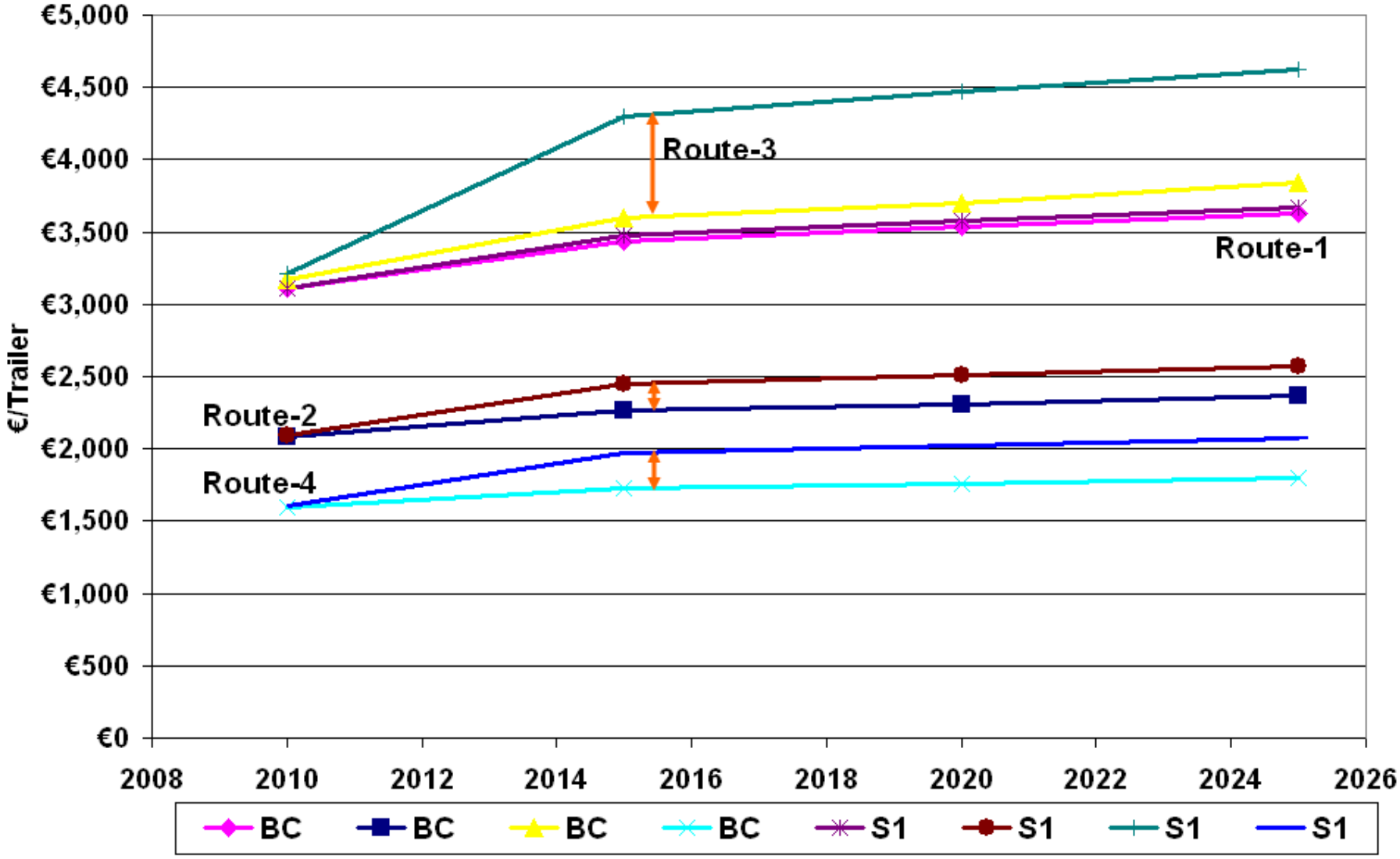
Example: Route 2 (All Scenarios)



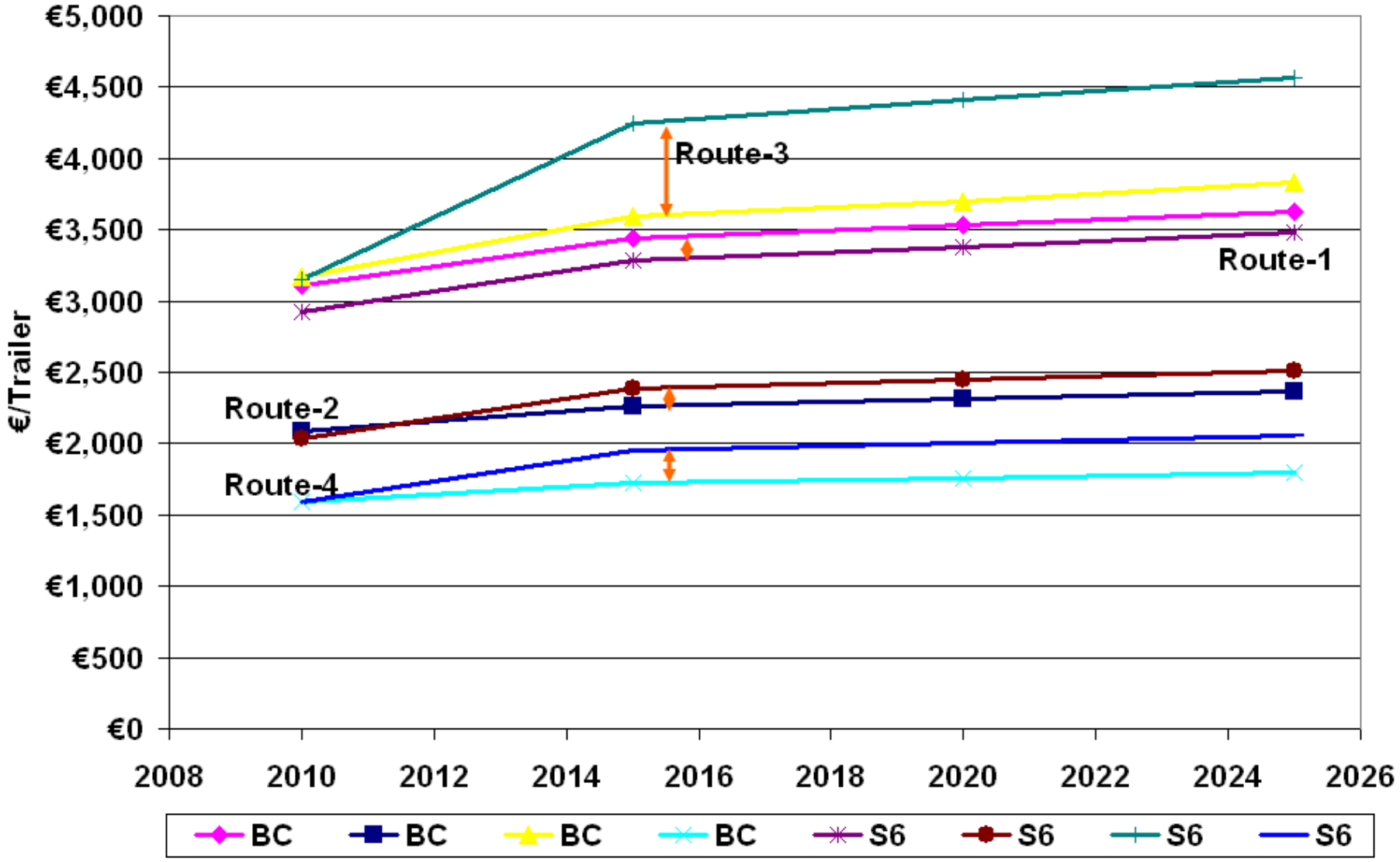
Most Probable Scenario(s)

- At present the most probable scenario for the European SSS industry is S1, with S6 in certain markets.
- S2 requires the full voluntary introduction of the EV Infrastructural Toll by member states.
- S3 requires the approval of the EV Environmental Toll by the European Parliament and the full voluntary introduction by member states.
- S4 represents the wide-scale adoption of a exhaust treatment technologies that are still in development.
- S5 represents a change to the MARPOL Annex VI Amendments.

Routes 1 – 4: Scenarios BC & S1



Routes 1 – 4: Scenarios BC & S6



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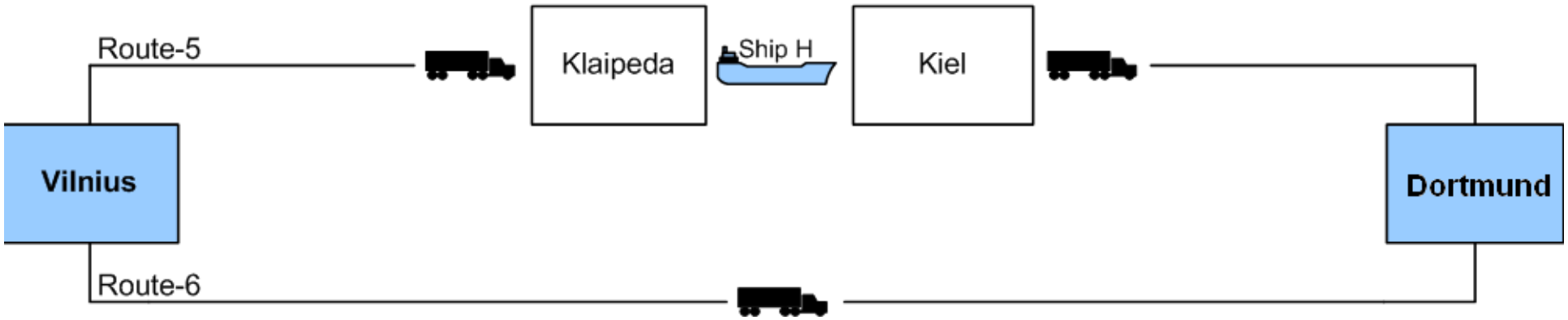
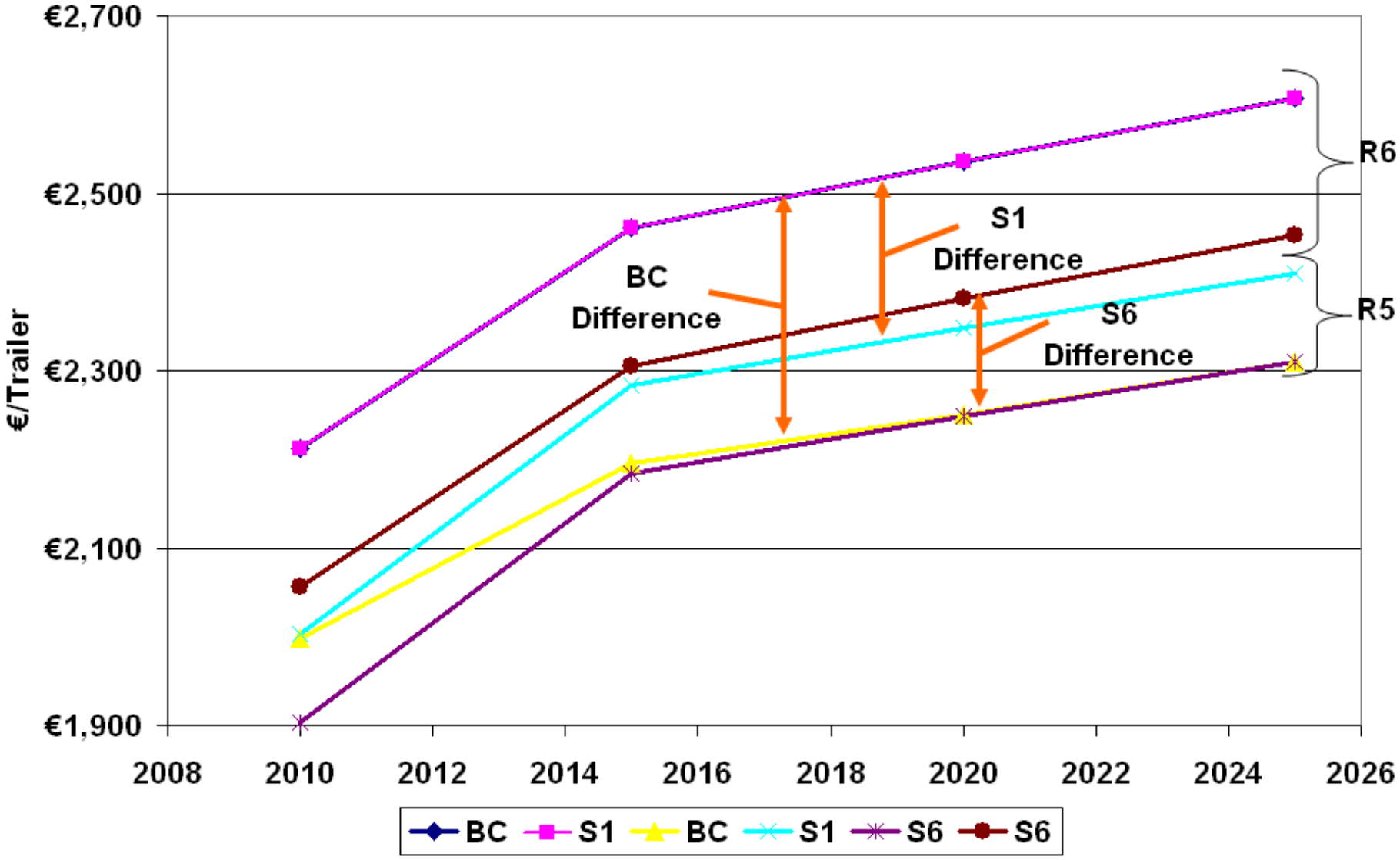
Probabilities of Modal Shift: Routes 1 - 4

Scenario	Route-1	Route-2	Route-3	Route-4
S1	Low	Low	High	Low
S6	Low	Low	High	Low

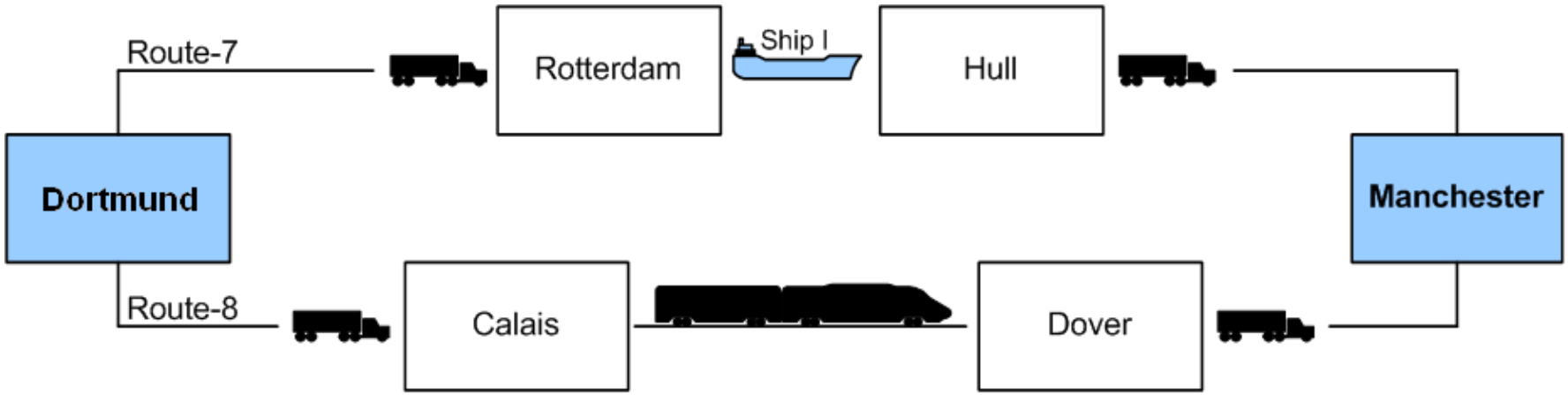

Route-5
Klaipeda
Ship H
Kiel
Vilnius
Dortmund
Route-6

Routes 5 & 6: Scenarios BC, S1, S6

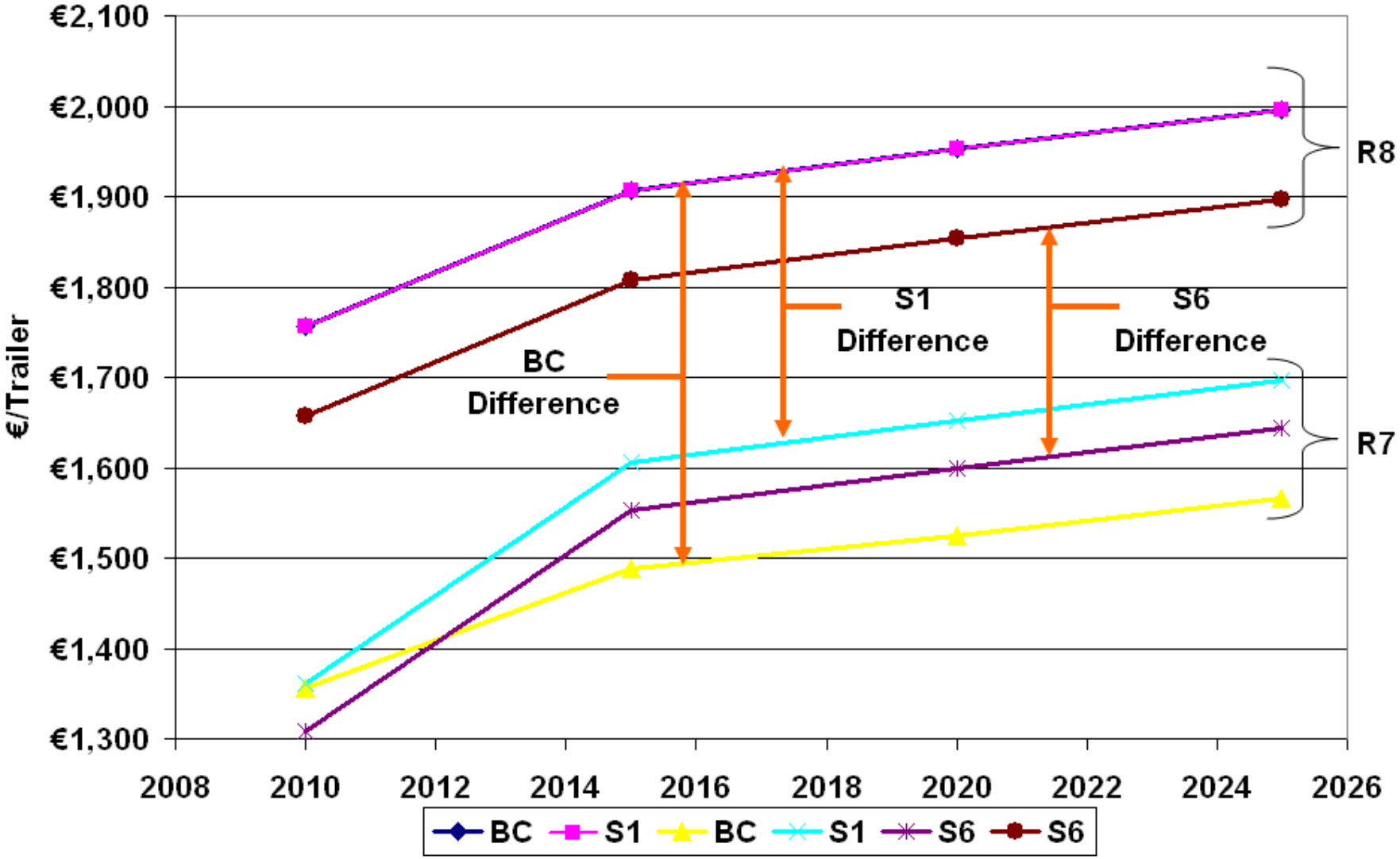


Probabilities of Modal Shift: Routes 5 - 6

Scenario	Route-5	Route-6
S1	Medium	Low
S6	High	Low

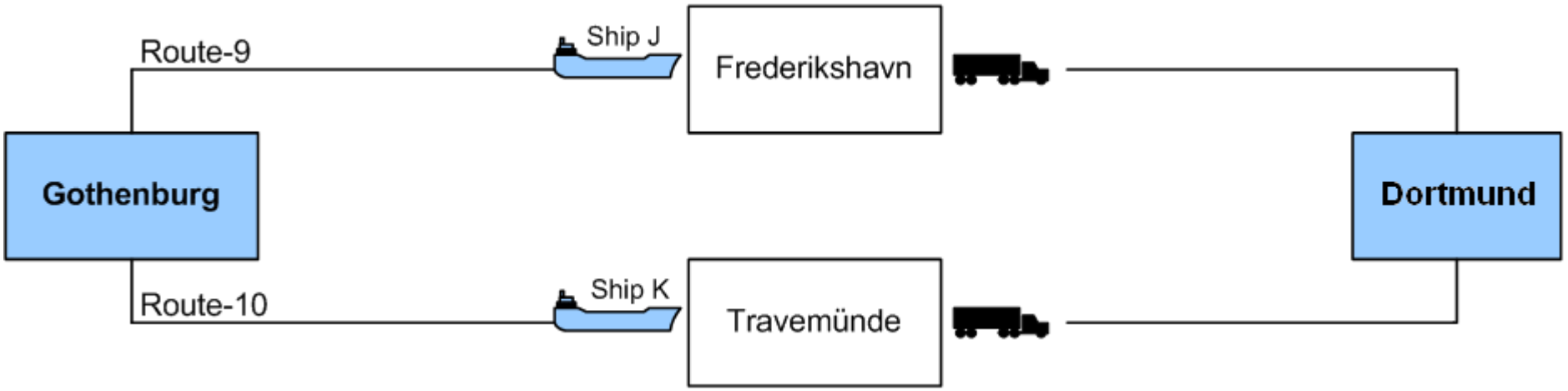

Route-7
Rotterdam
Ship I
Hull
Dortmund
Manchester
Route-8
Calais
Dover

Routes 7 & 8: Scenarios BC, S1, S6

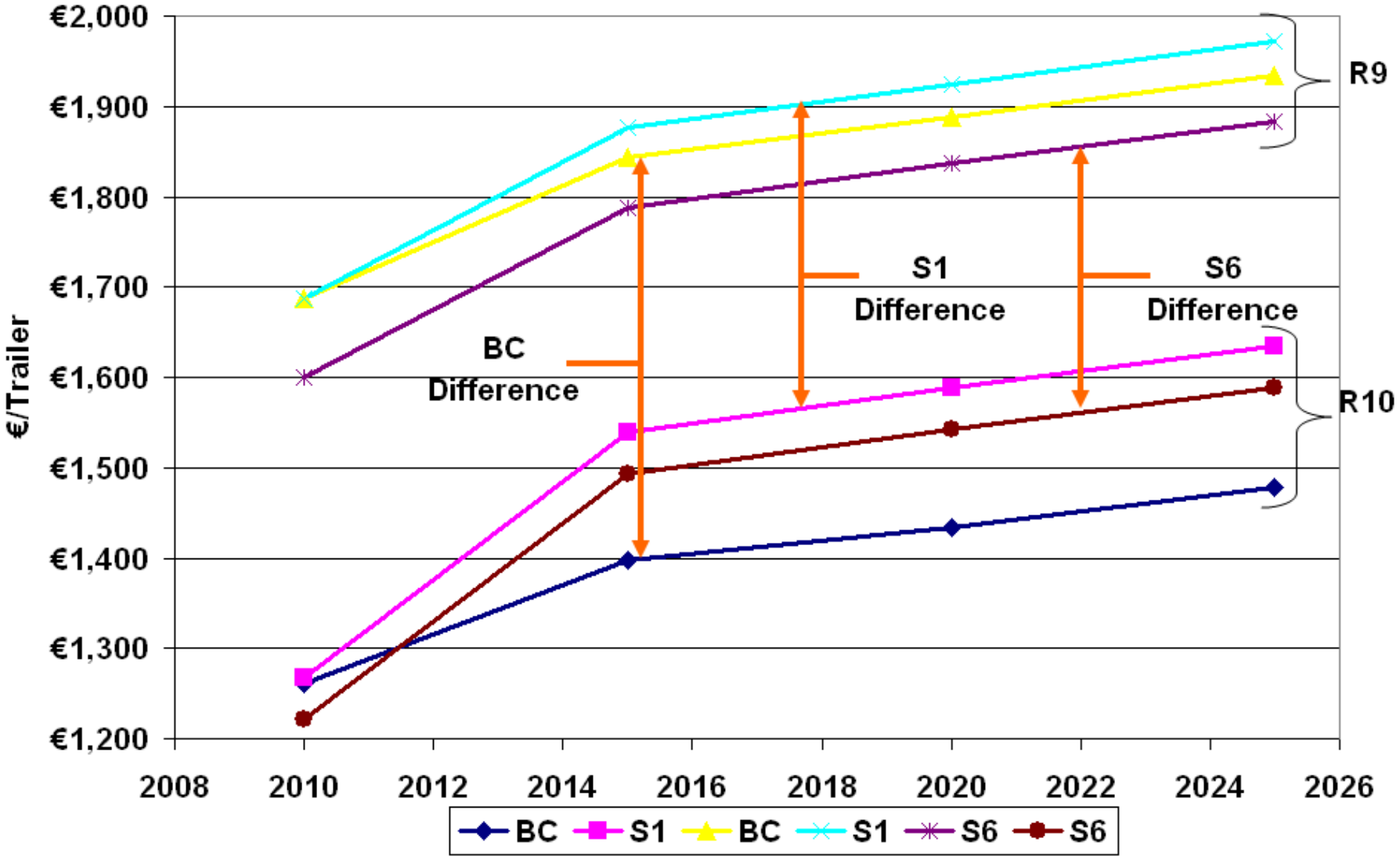


Probabilities of Modal Shift: Routes 7 - 8

Scenario	Probability of Change in Current Modal Split	
	Route-7	Route-8
S1	Medium →	Low →
S6	Medium →	Low →


Route-9
Ship J
Frederikshavn
Gothenburg
Dortmund
Route-10
Ship K
Travemünde

Routes 9 & 10: Scenarios BC, S1, S6



Probabilities of Modal Shift: Routes 9 - 10

Scenario	Probability of Change in Current Modal Split	
	Route-9	Route-10
S1	Low ←	Medium —
S6	Low ←	Medium —

LoLo Vessels

TAPAS Results

- TAPAS model predicts the route with the highest probability of being selected for transporting goods.

	2009	2010	2015	2025
Route	4	2	1	1

What does this mean for SSS in ECAs

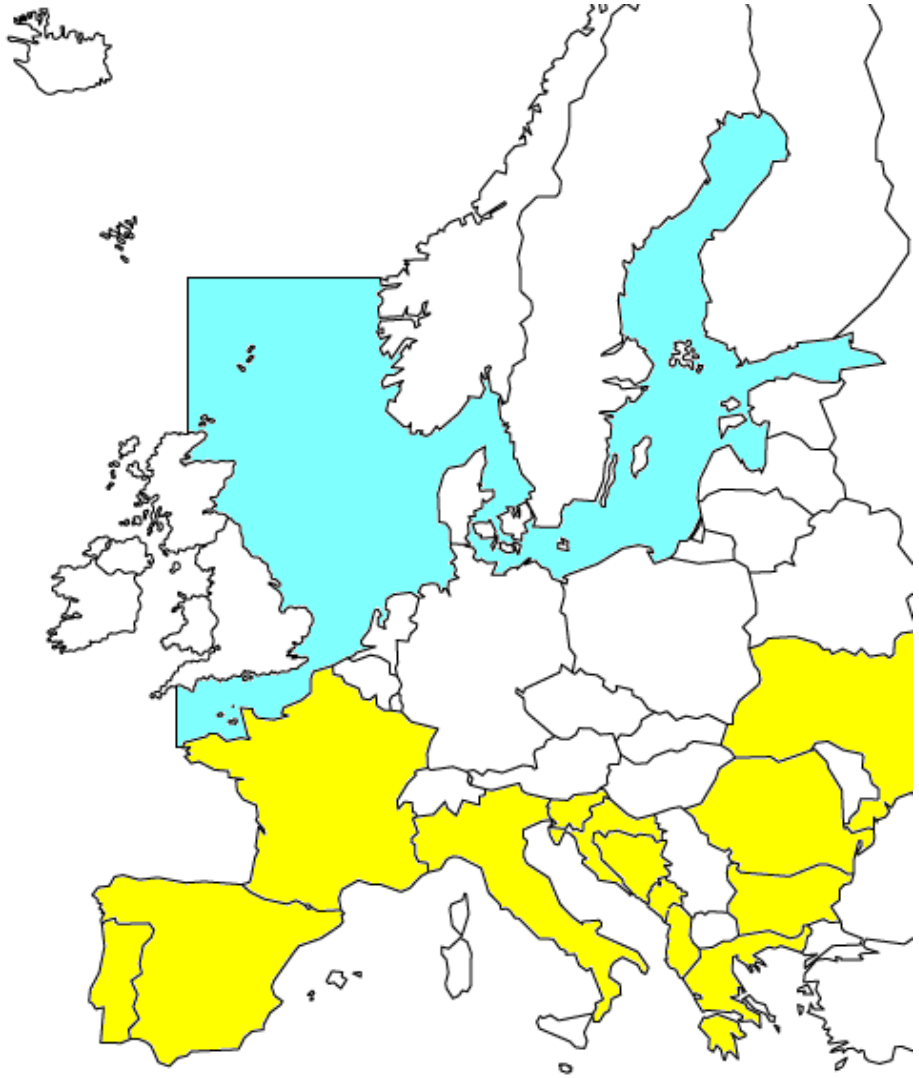
- All routes with sea legs will see an increase in transportation costs.
- Over longer distances the change in the costs difference between competing modes is less pronounced.
- If fully implemented the EV tolls do not increase road costs as much as MARPOL increases SSS costs.
- If wide scale adoption of scrubbers becomes a reality ships using scrubbers will require receiving facilities.
  - Storage & dispensing of caustic for neutralisation reaction within scrubber.
  - Receipt of and disposal of waste salts & slurries from closed system scrubbers.

Potential Actions

1. Full implementation of the Combined Eurovignette Tolls.
2. Application of exhaust scrubbers following:
   a. The determination of the long term environmental impacts of this technology.
   b. The determination of the true life cycle costs of this technology.
3. Offer discounts/incentives to ships with improved environmental performance characteristics.

Other Considerations of Note

- Potential shift of freight traffic from Northern to Southern Ports.
- Adoption by US of 0.1% or 0.5% Sulphur limit in 2011.
- Degree of compliance & enforcement.



New DG-ENV COMPASS Study

Title: Analysis Of The Competitiveness Of European Short Sea Shipping Compared To Road And Rail Transport

This is a 6 Month Study which commenced in Dec'09 and is led by Transport & Mobility Leuven (TML). The outcome of this study will be threefold:

1. A **quantitative assessment** of the likely evolution of the **relative competitive** situation of SSS and road/rail.
2. A **qualitative assessment** of the likely evolution of the **relative competitive** situation of SSS and road/rail.
3. An **assessment of the potential impact** on European imports and exports (especially regarding to trade in low value goods), by adding international trade considerations – probably medium to long term – to the results of 1. and 2.

Thank you for your attention

Route Selection:

- Limits of study.
- Consultation with stakeholders.