ETS Observatory

Report 1 version 2.2 EN

January 2026

Puertos del Estado

Table of Contents

Table of Contents

Executive Summary

- The **Report examines global container traffic from January 2021 through September 2025**, drawing on data from the ETS Observatory and applying a methodology that combines indicator-based analysis with a discrete choice modelling framework.
- The **EU Emissions Trading System (EU ETS) introduces additional costs for shipping companies**. The Report assesses two potential avoidance strategies: (1) route transformation—that is, calls at ports in neighbouring non-EU countries when entering or exiting the EU maritime area; and (2) route splitting—the division of an original service into two distinct legs, whereby deep-sea vessels call at hub ports located in countries neighbouring the EU.
- **To detect possible carbon leakage, the analysis follows a multi-stage approach**. The first stage (detection) examines shifts in traffic patterns at both port and national level, identifies different forms of carbon avoidance, and reviews selected routes and shipping lines. The second stage (attribution) evaluates, on a case-by-case basis, the potential drivers behind observed route changes, including congestion, costs, and other relevant factors.
- To identify changes in traffic patterns, the **Report introduces the TEU-mile indicator** at port level, defined as the carrying capacity of vessels calling at a given port multiplied by the distance sailed on their inbound or outbound leg. This metric is closely correlated with vessel emissions and port connectivity. Variations over time therefore provide an early signal of potential carbon leakage or losses in connectivity.
- **A discrete choice model is currently being developed to assess statistically the extent to which the additional costs generated by the EU ETS have influenced observed route reconfigurations**. At this stage, the analysis has focused on Spanish ports. Other European sea regions will be examined in future activities of the Observatory. (Northem Europe, Atlantic region, and the entire Mediterranean basin)
- **Alongside the entry into force of the EU ETS for maritime transport, the analysis takes into account two major developments that have disrupted trade flows between Europe, Asia, and the Middle East**: (i) the disruption of traffic through the Suez Canal, linked to the Houthi conflict from late 2023 onwards, which coincided with the application of the EU ETS to maritime transport in January 2024; and (ii) the expiry of the Consortia Block Exemption Regulation (CBER), which became effective on 25 April 2024.
- The initial indicator-based results show that **the market share of Europe's main gateway ports, measured in long-haul TEU-miles, declined from 67% in 2023 to 56% in 2025, with the strongest signals observed in Northern Europe and the Eastern Mediterranean.**
- In terms of kTEU-miles in the North Sea region, the United Kingdom accounted for 17.5% of the combined TEU-mile share of the United Kingdom, Germany, France, Belgium, and the Netherlands in 2023, rising to 32.1% by July 2025 (almost doubling its share). **The UK's 15-percentage-point gain in TEU-mile share is nearly symmetrical to the combined losses recorded by the Netherlands and Germany.**

Executive Summary

- **In the Eastern Mediterranean, Egyptian ports have recorded the strongest growth in the region in terms of kTEU-miles**, increasing their market share from 35% in 2022 to 52% in 2025, while Greece has experienced a sharp decline from 45% to 12% on the same period.
- Regarding maritime services in 2025 by shipping alliances, **there is a marked increase in the role of UK ports and Eastern Mediterranean ports across most newly structured alliances.**
- **Significant new investments in port capacity are planned in the United Kingdom (Port of Southampton, London Gateway, and the Port of Felixstowe), as well as in the Eastern Mediterranean, notably in Israel, Turkey, and Egypt**. Planned investments in Eastern Mediterranean ports represent a 43% increase in current port capacity, measured in million TEUs handled per year. In the United Kingdom, new investments are expected to expand capacity by 21%.
- The closure of the Suez Canal and the termination of the CBER have led to a reorganisation of maritime routes and shipping alliances. However, **these factors alone cannot account for the growth in transoceanic connectivity currently being observed in countries such as the United Kingdom and Egypt.**

  Nor does this growth appear to be attributable to congestion, service quality issues, or capacity constraints at EU ports, or to a sharp rise in import and export activity in neighbouring countries. Equally, there is no clear evidence of a significant reduction in operating costs at non-EU ports — particularly not at UK ports — that might explain this development.

  On the contrary, the substantial investments undertaken to expand port capacity in the United Kingdom and the Eastern Mediterranean point towards structural shifts rather than cyclical or short-term adjustments.
- In this context, transshipment operations for deep-sea services carried out at EU ports are subject to additional EU ETS-related costs, reducing the competitiveness of EU transshipment hubs relative to those located in neighbouring countries. This loss of competitiveness, combined with the development of new container terminals and the expansion of existing facilities outside the EU**, increases the risk of a gradual erosion of connectivity at EU ports in favour of ports in the United Kingdom and North Africa.**
- This loss of connectivity at EU ports could ultimately translate **into a broader decline in the competitiveness of the EU economy**, as well as a **reduced degree of direct control over the maritime supply network** that currently serve the European Single Market.

Table of Contents

Introduction

Since 1 January 2024, merchant vessels with a gross tonnage of 5,000 GT or above have been brought within the scope of the EU Emissions Trading System (EU ETS). The aim is to internalise, within their operating costs, the impact associated with greenhouse gas emissions and thereby to encourage the adoption of measures capable of reducing those emissions.

For large container vessels operating on transoceanic routes, the implementation of this regulation is expected to increase navigation costs by around 20 per cent. On Asia–Europe services operated by ships with a capacity exceeding 20,000 TEU, the additional cost per rotation (round trip) may exceed €669,000 on the Suez Canal route and rise to more than €950,000 when routing via the Cape of Good Hope (see the ETS cost case studies on p. 9).

Given the scale of this additional cost, there is a tangible risk that shipping lines may adjust their container service networks to avoid or reduce exposure to the EU ETS. *Such reconfiguration could take shape in two principal ways. First, port rotations might be amended so that the first and/or last EU port of call is relocated to a neighbouring non-EU country. Secondly, services could be segmented, with the main deep-sea legs shifted to extra-EU hub ports, from which cargo would then be consolidated and distributed to and from EU ports by means of feeder services.*

These scenarios appear plausible for the following reasons:

- *Market competition*. The container shipping market is highly price-competitive, encouraging shipping companies to adopt cost-optimisation strategies to improve tariff competitiveness. Shipping lines will therefore seek strategies to avoid or minimise the additional costs introduced by the EU ETS, which—as noted above—can be particularly significant on deep-sea routes.

- *Mobility of transhipment traffic*. Transhipment flows are only weakly linked to local import and export activity. This confers considerable geographical flexibility, enabling such traffic to be relocated between ports based on relative cost efficiency.

- *Limited availability of alternative fuels*. While low-carbon fuels can partially mitigate EU ETS costs, their limited availability and uncertain price competitiveness in deep-sea trades encourage carriers to seek alternative operational solutions to reduce regulated emissions.

- *Port capacity in neighbouring third countries*. Investments in ports in countries such as the United Kingdom, Morocco, Egypt and Türkiye have improved their ability to handle ULCVs and expand terminal capacity, facilitating the development of transhipment HUBs connected to major deep-sea corridors on EU neighbouring countries.

Introduction

The potential reconfiguration of container shipping networks in order to avoid or minimize the impact of the EU ETS could generate several adverse effects:

- Environmental effectiveness. A potential reduction in the effectiveness of the EU ETS as an emissions-mitigation instrument.
- Maritime connectivity. A loss of direct connectivity between EU ports and the main deep-sea trade lanes.
- Port competitiveness. A deterioration in the competitiveness of EU ports, resulting from a possible reduction in direct services and an increase in logistics costs and freight rates.
- Logistical autonomy. Increased dependence on extra-EU hub ports, entailing a loss of control over critical segments of the supply chains serving the EU market.

In this context, the Observatory is intended to complement the analyses currently being carried out by the European Commission, aimed at identifying and anticipating potential changes in container shipping networks attributable to the extension of the EU ETS to maritime transport.

The Observatory comprises both a monitoring service and a predictive service.

The monitoring service tracks developments in maritime routes using Automatic Identification System (AIS) data from vessels underway, together with data on container traffic and the structure of container fleets. These datasets are analysed statistically in order to detect route changes consistent with strategies aimed at avoiding exposure to the EU ETS.

The predictive service seeks to estimate the probability of route configurations relative to alternative options. To that end, discrete choice models are calibrated, considering the generalised utilities associated with each potential configuration. The purpose of the modelling service is to anticipate potential changes in routing patterns, to assess the impact of new container terminals entering into operation in neighbouring countries, and to evaluate policy measures aimed at preventing route adjustments designed to circumvent the EU ETS.

This initial study of the Observatory focuses on transoceanic container shipping services, as this segment of maritime transport is both capable of modifying its operational patterns to reduce exposure to the EU ETS and particularly significant in terms of greenhouse gas emissions at a global scale.

Introduction Case studies

MSC AURIGA (2020)

Cat 4 New Panamax | MSC | 13,632 TEU | 149,525 GT | 778 kg CO2/nm

Scenario A: Suez routing (2023)

	SGP → Rotterdam (Suez)	SGP → Felixstowe (Suez)	Δ
Miles (nm)	8.354	8.288	-66
Fuel consumption (t)	2.087	2.071	-16
Emissions (t CO2)	6.499	6.448	-51
Fuel cost (€)	907.914	900.741	-7.173
ETS cost (€)	**259.976**	**0**	**-259.976**
ETS / Fuel	28,6%	0,0%	

Scenario B: Cape of Good Hope routing (2025)

	SGP → Rotterdam (Cape GH)	SGP → Felixstowe (Cape GH)	Δ
Miles (nm)	11.896	11.833	-63
Fuel consumption (t)	2.972	2.956	-16
Emissions (t CO2)	9.255	9.206	-49
Fuel cost (€)	1.292.859	1.286.012	-6.847
ETS cost (€)	**370.204**	**0**	**-370.204**
ETS / Fuel	28,6%	0,0%	

Cape routing amplifies ETS cost by +42% vs Suez (259,976€ → 370,204€)

EVER GREET (2019)

Cat 5 ULCV | EVERGREEN | 19,982 TEU | 219,688 GT | 1,001 kg CO2/nm

Scenario A: Suez routing (2023)

	SGP → Rotterdam (Suez)	SGP → Felixstowe (Suez)	Δ
Miles (nm)	8.354	8.288	-66
Fuel consumption (t)	2.685	2.664	-21
Emissions (t CO2)	8.362	8.296	-66
Fuel cost (€)	1.168.152	1.158.923	-9.229
ETS cost (€)	**334.494**	**0**	**-334.494**
ETS / Fuel	28,6%	0,0%	

Scenario B: Cape of Good Hope routing (2025)

	SGP → Rotterdam (Cape GH)	SGP → Felixstowe (Cape GH)	Δ
Miles (nm)	11.896	11.833	-63
Fuel consumption (t)	3.824	3.804	-20
Emissions (t CO2)	11.908	11.845	-63
Fuel cost (€)	1.663.434	1.654.625	-8.809
ETS cost (€)	**476.316**	**0**	**-476.316**
ETS / Fuel	28,6%	0,0%	

Cape routing amplifies ETS cost by +42% vs Suez

Parameters: VLSFO €435/t ($500 @ 1.15 USD/EUR) · ETS €80/tCO2 · 50% of voyage emissions (SGP stand for Singapore)

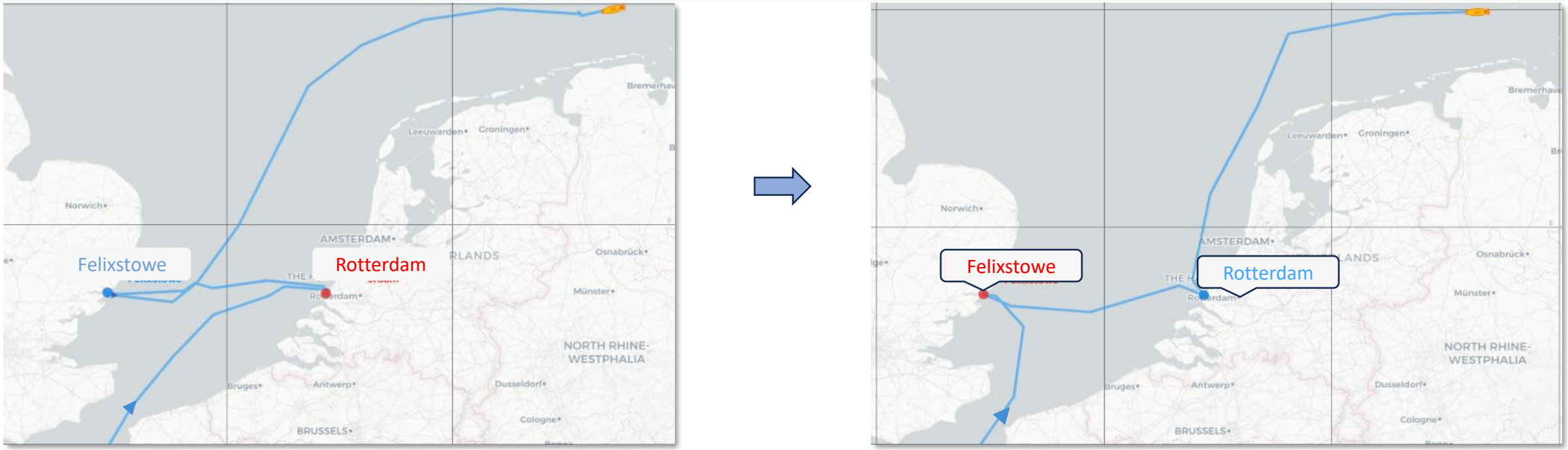
Table of Contents

EU ETS avoidance strategies

Identify EU ETS avoidance strategies: structural modifications of container shipping routes intended to circumvent or mitigate the impact of the EU ETS on carrier operating costs

Route Transformation: Port calls at neighbouring-country ports when entering or exiting the EU maritime area. This strategy do not break the continuity of the service, as the same vessel covers both the transoceanic leg and the EU access or exit leg.

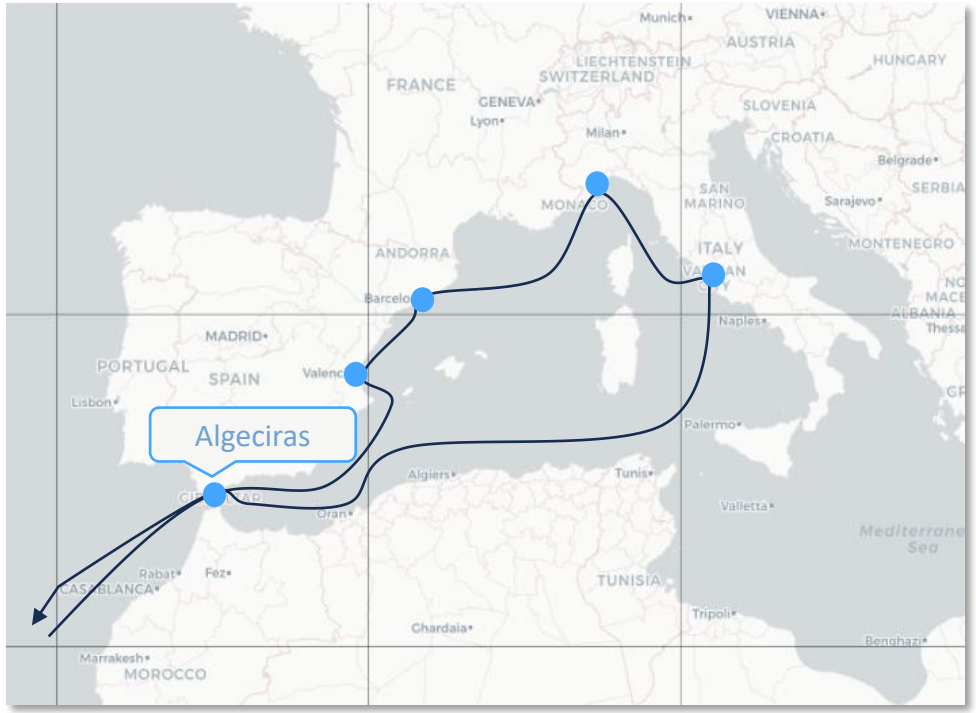
In certain cases, this practice may be discouraged by designating ports located in third countries as “neighbouring container transhipment ports,” in accordance with the procedure laid down in Article 3ga of Directive 2003/87/EC, as inserted into that Directive by point 7 of Directive (EU) 2023/959.



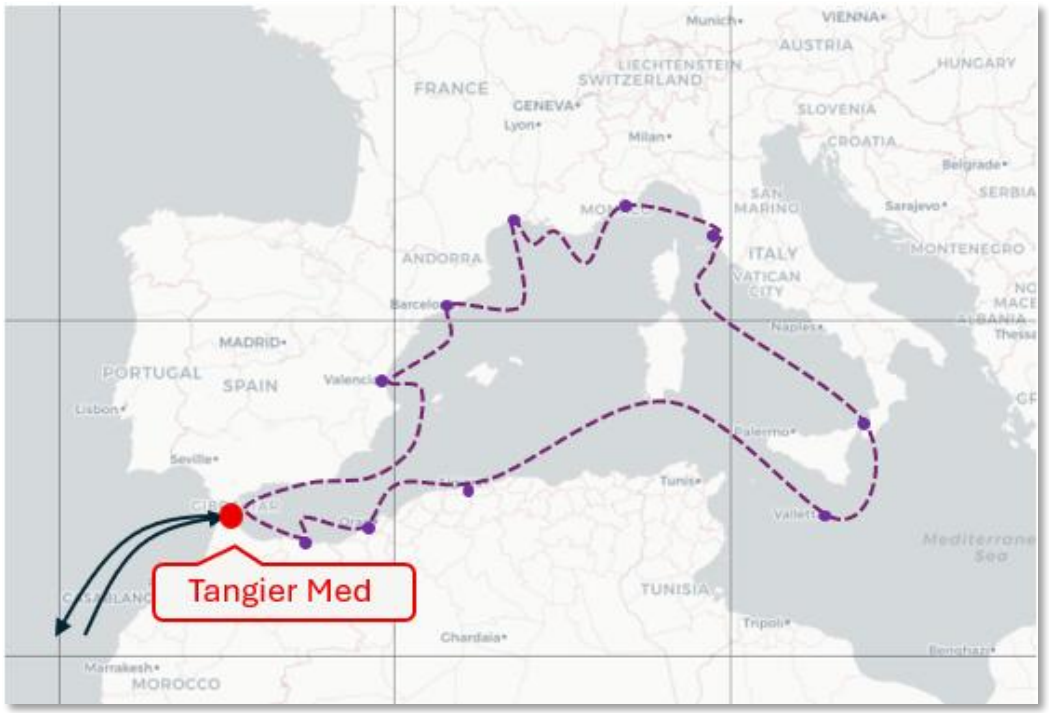
EU ETS avoidance strategies

Route Rupture: The strategy consists of splitting the original route into two distinct legs. Transoceanic vessels call at hub ports in neighbouring countries. From these locations, cargo is distributed to or consolidated from neighbouring countries via feeder vessels. This setup decouples EU-ports from the main deep-sea routes.

This strategy allows transoceanic (deep-sea) services to operate entirely outside the scope of the EU, thereby falling outside not only the EU ETS but also the rest of the regulatory obligations under the Fit for 55 legislative package. Moreover, this form of evasion cannot be neutralized through the designation of neighbouring container transshipment ports.



- Hub
- Deepsea call
- Feeder call



EU ETS avoidance strategies

Additional factors influencing the Detection of EU ETS avoidance strategies

Expiration of the CBER

Effective April 25, 2024, the European Commission discontinued the renewal of the Consortia Block Exemption Regulation (CBER). This framework previously permitted shipping lines to establish cooperation agreements that, under specific conditions, were exempt from the antitrust regulations applicable within the European Union.

Red Sea Crisis

In late 2023, following attacks on maritime traffic in the Red Sea, shipping lines diverted from the Suez Canal to the Cape of Good Hope route.

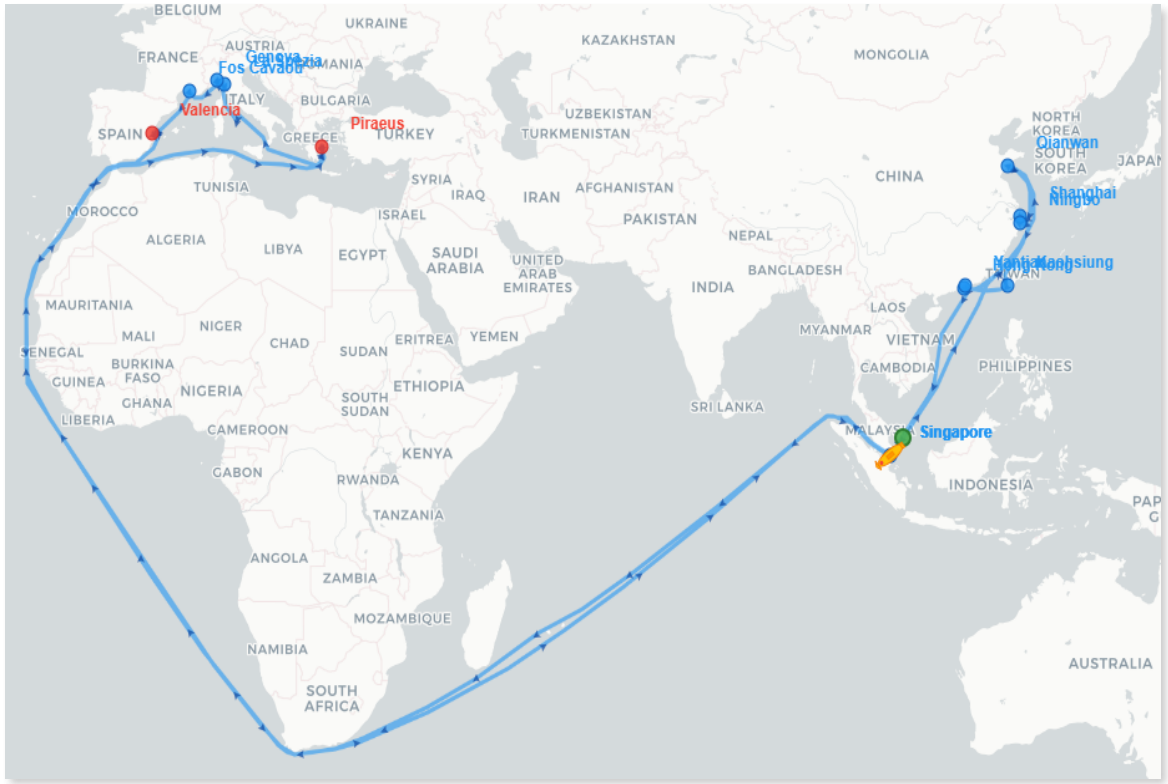


Table of Contents

Conceptual Framework & Methodology

To effectively monitor the impact of the EU ETS, the Observatory employs a methodology structured in two sequential phases: **Detection** and **Attribution**. This structure is designed to move from the identification of anomalies compatible with carbon leakage to the verification of their causes

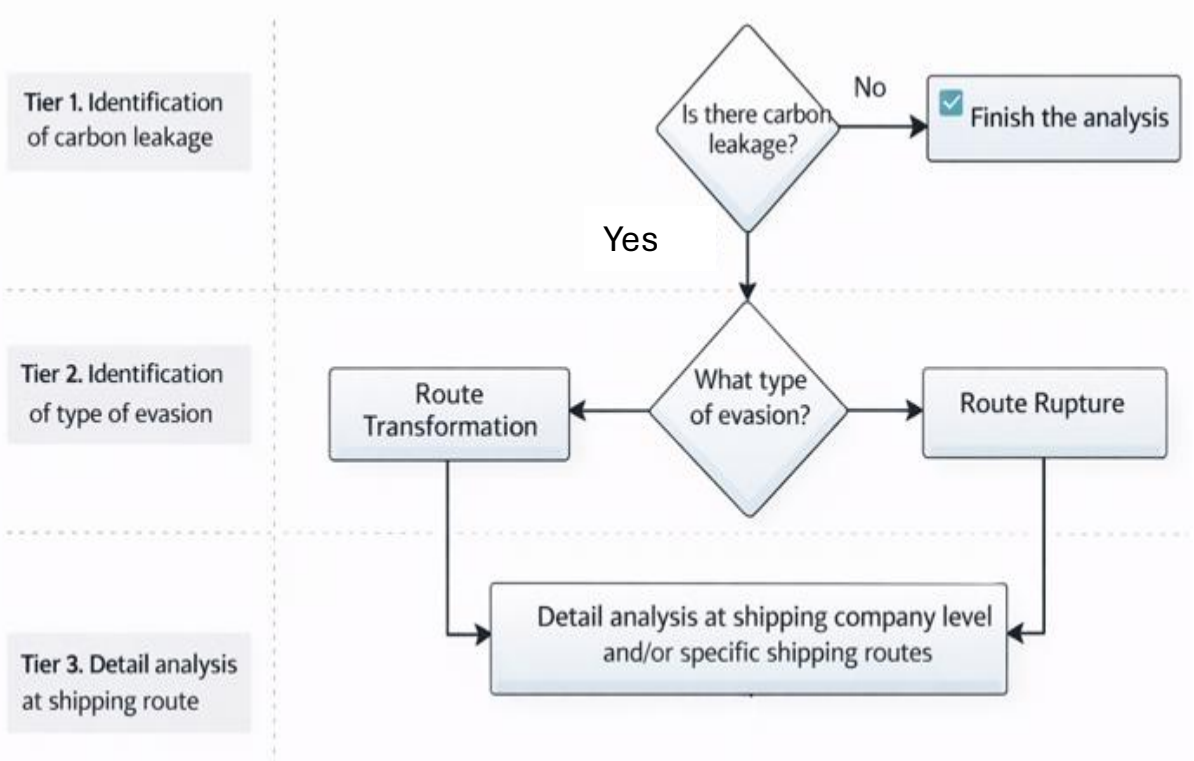
Phase I - Detection

A dynamic monitoring system designed to systematise the identification of potential carbon leakage in a structured manner.

Tier 1: **High-Level Port activity.** Flags significant shifts in cargo flows, vessel traffic, and throughput volumes between EU ports and neighbouring non-EU competitors to identify the existence of carbon leakage.

Tier 2: **Network Level structural metrics.** Analyses the underlying changes in the shipping network, such as transshipment ratios, LSCI, and hub-and-spoke configurations. The main goal of this step is to identify the type of EU ETS avoidance strategy.

Tier 3: **Voyage-Specific behavioural metrics.** Provides granular real-world illustrations of the detected trends by analysing individual ship voyages (e.g., relay calls) to confirm hypotheses and facilitate dissemination.



Conceptual Framework & Methodology

Indicators

Tier	Objective		Methodology	Indicator	Expected trend in case of carbon leakage		Geographical Area
					European	Non-European	
1	High-Level Activity Metrics	Identification of potential carbon leakage	Historical Traffic Analysis	KTEU-mille=Σ (TEU_i × $Miles_i$) × 10^{-3}	∇	Δ	Europe and Europe +
2	Network-Level Structural Metrics	Route Transformation	Historical Traffic Analysis	Transhipment Ratio (*)	∇	Δ	Ports
				Number of port calls of vessels coming directly from outside of Europe	∇	Δ	
		Route Rupture	Historical Traffic Analysis	Transhipment Ratio	-	Δ	Ports
				kTEU-mile non-European	-	Δ	
				Port Centrality Measure	-	Δ	
				kTEU-mile	∇	-	
				Transhipment	∇	-	
3	Voyage/Shipping company-Specific Behavioural Metrics	Examples of specific routes of shipping companies	Based on the available information	Based on the available information			Ports / Shipping Companies

The indicators used in each tier for the detection phase. (*) It is only applicable when a European hub port is replaced by a non-European one, but the configuration itself (hub-and-spoke) has not changed because of the ETS application.

Conceptual Framework & Methodology

Phase II - Attribution

A validation framework to differentiate organic market dynamics from regulatory arbitrage, recognizing that correlation does not imply causation. Therefore, this second phase systematically analyses alternative factors (e.g., economic trends, infrastructure changes, or labour disputes, etc.) that could independently explain the observed deviations. Two main approached will be used:

Level 1: **Expert Assessment.** To systematically map observed anomalies against known confounding factors to isolate the ETS effect: Economic Activity, Operational Costs, Port Infrastructure, Congestion, Geopolitical and Regulation and ETS Cost Savings.

Level 2: **Advanced Quantitative Verification**. Identified cases will be simulated by a discrete choice transport model to further qualify ETS attribution with a certainty level of statistical certainty.

EU ETS as a main reason or main driver

It is relevant to distinguish between situations in which ETS avoidance constitutes the primary driver of route-related decisions and those in which the ETS influences the choice among alternative solutions without being the main underlying cause.

The implementation of the ETS has coincided with significant structural shifts in the maritime transport sector, including the formation of new shipping alliances and disruptions to traffic through the Suez Canal, among other developments. In this context, the Red Sea crisis has been the immediate trigger for the reconfiguration of many routes. The EU ETS, therefore, cannot be regarded as the root cause of those changes; however, it may well have played a meaningful role in shaping the final service configurations, which were almost certainly designed to optimize overall operating costs.

Accordingly, it is necessary to clearly differentiate between cases where the ETS constitutes the principal explanatory factor for changes in maritime services and cases where it acts as a secondary or enabling factor influencing route adjustments that are predominantly driven by other structural elements, such as the new shipping alliances.

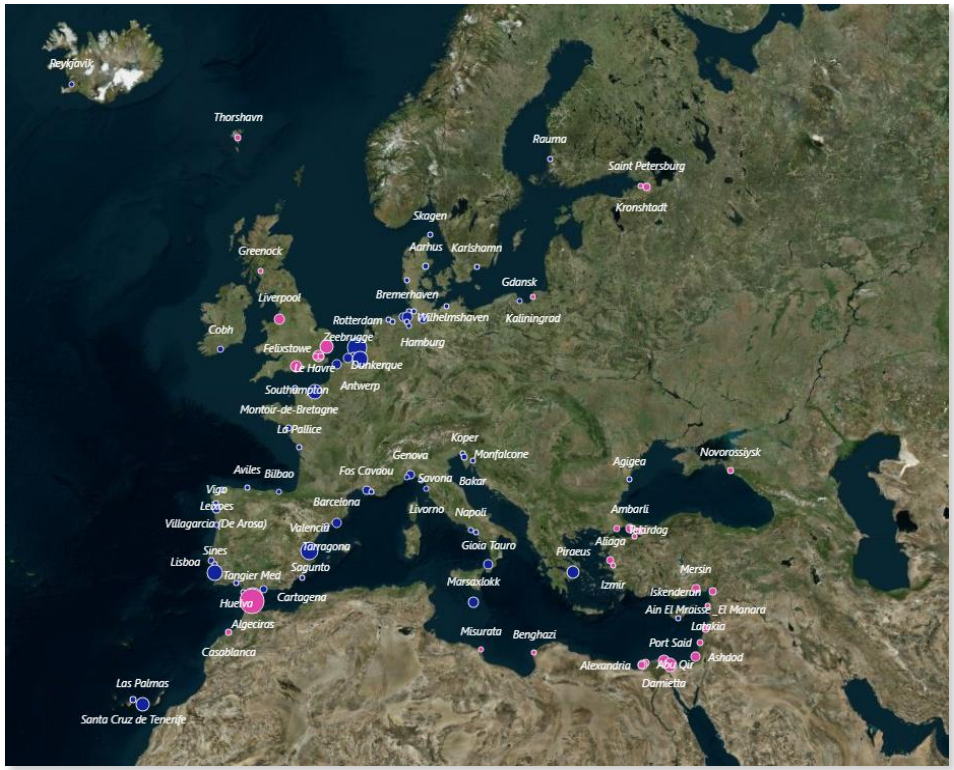
Conceptual Framework & Methodology

In the attribution phase the following approach will be applied to figure out the main reasons for the route changes

Level	Attribution	Macroeconomic Control Indicators	Objective
1	Economic activity	World Bank, FMI, UNCTAD, COMTRADE	Analyse economic fundamentals, country and regional comparison
	Operational Costs	Market research	Detect alterations on port operational costs: labour, THC, port services, port dues
	Port Infrastructure	Market research	Identify infrastructure and superstructure investments, and plans
	Congestion	Data Platform Market research CPPI	Ability to execute planned schedules on time not distorting the line committed lead times, nor incurring in extra costs
	Geopolitical and Regulation	Market research	Other external causes that could influence the route design or the port choices
	ETS cost savings	Data Platform Market research	Identify the ETS cost savings for a certain service under current market conditions
2	Quantitative verification	ETS Observatory simulation model	Validate potential evasion strategies using the internal calibrated logit model

Conceptual Framework & Methodology

EUROMED and EUROMED GATEWAYS



Top 100 EEA and EEA+ ports in the EUROMED by TEU capacity

Geophical Scope

For ETS analysis at Tier 1, ports are grouped in three regions **EEA** (countries participating of EU ETS regulation), **EEA+** (EU neighbour countries , whose ports are candidates are within the 300-mile distance to an EU port) and **RoW** (rest of the world ports).

EUROMED is the aggregation of EEA and EEA+ ports, while **EUROMED GATEWAYS** are those ports that act as entry/exit points for external trade into the EUROMED region.

In the charts presented in this report, the analyses referred to as **EUROMED GATEWAY** consider exclusively those routes linking Euromed with ports located outside the area, which account for the greater part of transoceanic services. These routes are of particular interest, as they are the ones most exposed to the risk of reconfiguration because of the EU ETS.

- **EEA** Ports of EEA countries
- **EEA+** Ports of neighbouring countries.
  All neighbouring ports are within 300 miles.

Table of Contents

ETS Data Monitoring System

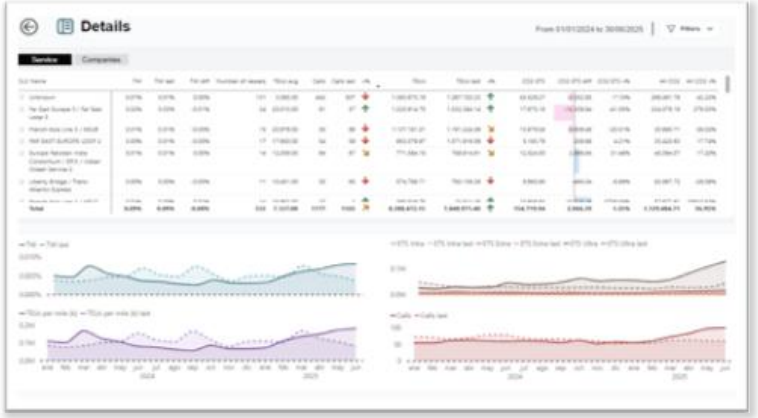
The system integrates global AIS and port geofencing with vessel master databases to establish a real-time digital twin of the fleet. Crucially, it layers official carriers' details and reported emissions collected by EMSA/MRV to create a baseline for operational and regulatory auditing

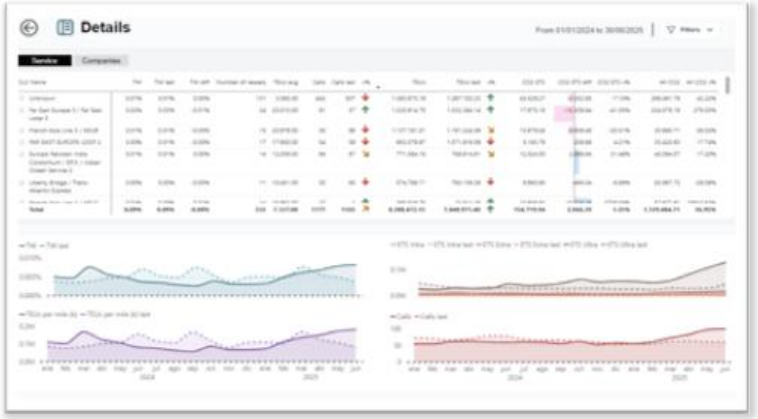
Core Data Platform

- **Global AIS Positioning:** Real-time worldwide vessel tracking (Automatic Identification System).
- **Vessel Master Database:** Comprehensive registry of vessel characteristics and static data.
- **Port Geofencing:** Precise location data for port boundaries and terminals.
- **Reported Emissions (EMSA):** Vessel-specific emissions data based on European Maritime Safety Agency standards declared per vessel operator.
- **Carrier & Service Intelligence:** Detailed information on shipping lines and their specific service loops and alliances.

Proprietary Algorithms & Data Processing

- **Port Call Detection:** Automated identification of vessel arrivals and departures.
- **Distance Sailed:** Calculation of actual nautical miles travelled.
- **Technical Stops:** Identification of non-commercial stops (e.g., bunkering, maintenance).
- **Route Classification:** Categorization of vessel movements by trade lane or route.
- **ETS Emissions Modelling:** Calculation of CO2 emissions and associated costs under the Emissions Trading System (EU ETS) rules.





ETS Data Monitoring System

Indicators

Indicator	Formula	Description
Calls	$\sum_{time,i} (IMO + start\ Date)\ i$	Unique vessel port visits over a period, excludes non cargo stops, bunkering, shipyard, etc. Port calls are identified by imo number and call start date.
Gateway Calls	$\sum_{time,j\ gateway} (IMO + start\ Date)\ j$	Gateway call arrived from or departed to a port outside the EUROMED (North Europe, Atlantic, West Med and East Med), for example Asia, North America, etc.
TEUs	$\sum_{calls} (vessel\ TEU\ Capacity)$	Total TEU capacity of the vessels calling a port, not the actual TEU throughput measured in terminal operations.
Miles	$\sum_{calls} \frac{(previous\ Leg + Next\ Leg)}{2}$	Distance sailed: for each port call, the distance sailed from previous port and towards next destination. It's divided by 2 to avoid double counting.
kTEUmile	$\sum_{calls} \frac{(TEU \times miles)}{1000}$	Defines the transport work, for every call accounts the TEU capacity of the ship times the distance travelled. It's shown in thousands to reduce figure size.
kTEUmile share	$\frac{kTEUmile_i}{\sum kTEUmile_{Total}}$	Transport work share: transport work of a port as % of the transport work of a set of ports over time.

ETS Data Monitoring System

Indicators.

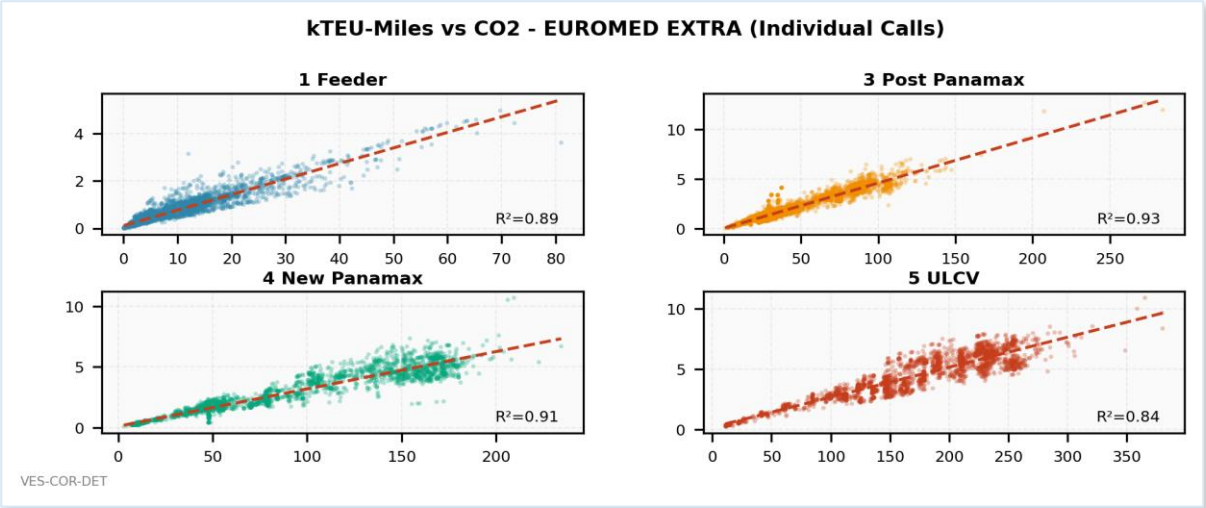
Indicator	Formula	Description
CO2nm	$\frac{vessel\ CO2\ emissions}{miles\ sailed}$	Emission factor reported annually by vessels visiting EU ports according to MRV regulation and Delegated Acts. This value is published by EMSA. The system projects values for non reported years based on last report or similar vessel characteristics.
CO2	$\sum f(CO2\ nm, year) \times miles$	A calculation of actual CO2 emission combining annual reported (or estimated) emission factor multiplied by actual (AIS recorded) miles sailed . From 2024 onward CO2 refers to CO_{2eq}
ETS cost	$f(EU\ Allowances, Year, CO2)$	The ETS cost uses a fixed annual value for carbon allowances (€/t), the CO2 emissions and the ETS rules applied to the vessel port of origin and destination and transparent ports.

ETS Data Monitoring System

K TEU mile or Transport Work (TW)

A useful indicator to identify potential carbon leakage:

- The **kTEUmile is a proxy for CO2 emissions** since it maintains a direct correlation with emissions. Energy consumption is proportional to the distance travelled and is directly related to vessel size. In turn, energy consumption has a direct relationship with emissions.
- The metric is also very sensible to modifications in shipping routes or the type of vessels deployed, is **an indicator of long-distance connectivity**.
- Ports involved in long distance voyages with transoceanic destinations will show high values of kTEUmile, while not necessarily rank high in TEU capacity. Germany, for instance, ranks first in TEU capacity but is fourth in kTEUmile among the North European countries.

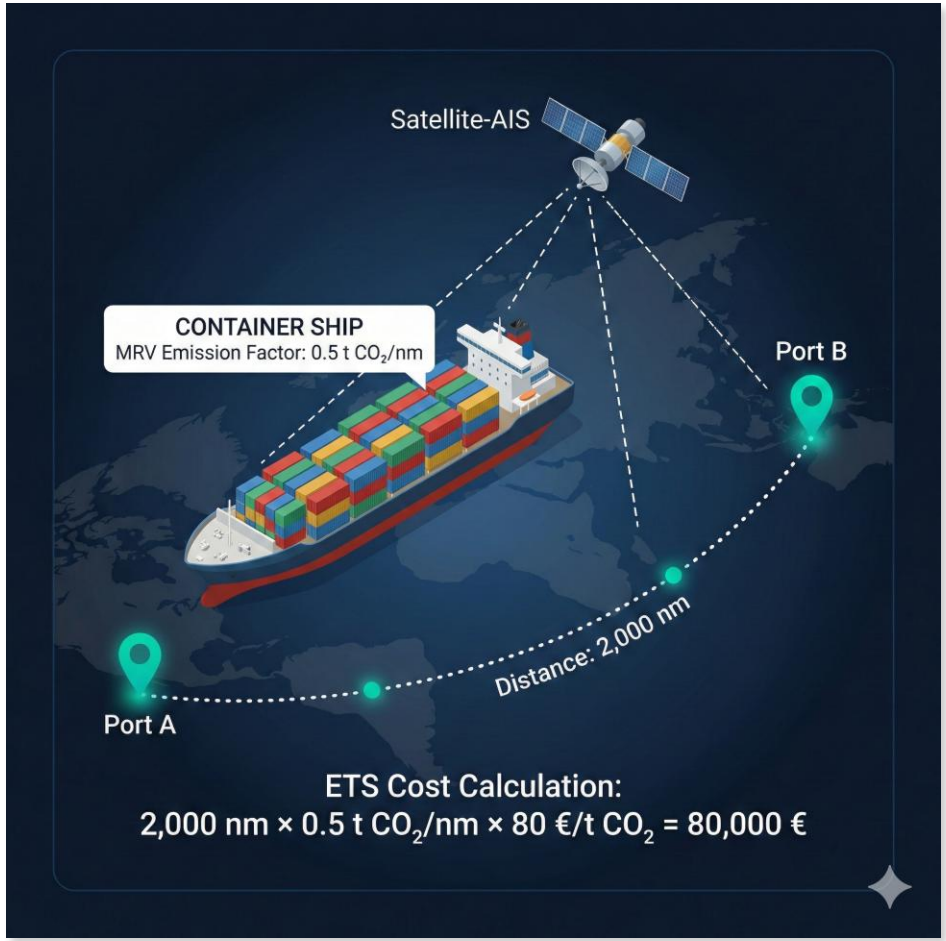


Regression lines of kTEUmile vs CO2 emissions per vessel category
EU ETS Observatory own elaboration

The dimensionless measure **TW share (or share TEU_mile),** expressed as TW_i / TW_n reflects the relative weight of an element i, over a set of n elements. Useful to track relative weights of when either TEU capacity is changing (due to economic activity or seasonality) or the distance is changing (as is the case with the closing of the Suez channel. It helps for instance identify a port losing transport share among its group while its TW is growing.

ETS Data Monitoring System

Emission modelling and ETS Cost estimates



The Observatory's Data Platform leverages real-time AIS tracking to calculate actual distances sailed by every vessel, enabling precise CO_2 emissions estimation and EU ETS cost projections at any level of granularity, from a single ship to a shipping company or the entire European trading system, for container ships and other fleets.

Tracking & Distances

- AIS position recording for all vessels.
- Actual nautical miles calculated between each port call.
- Foundation for emissions estimation.

Emissions Data Source

- Latest MRV data published by EMSA.
- Currently using 2024 data; 2025 applies previous year's emissions.
- Automatic correction of 2025 values and 2026 projections when 2025 data is published.
- The Data Platform **is calibrated against each MRV annual publication.**

ETS Methodology

- Cost factor: €80/ton CO_2 (from 2023, applicable 2024-2025).
- Calculation per EU ETS regulation.
- Includes transparent port adjustment.

Calculation Capabilities

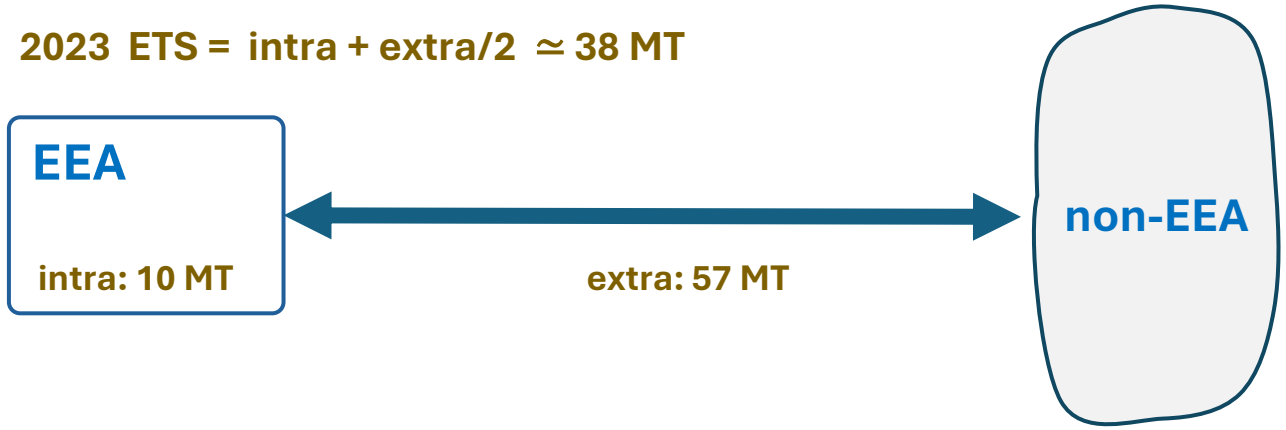
- CO_2 emissions: All vessels operating in Europe and worldwide.
- Granularity: Vessel → Fleet → Company → Zone → Full ETS system.
- Daily emissions tracking.

Table of Contents

Understanding reported ETS: Volumes and source of ETS emissions in 2023

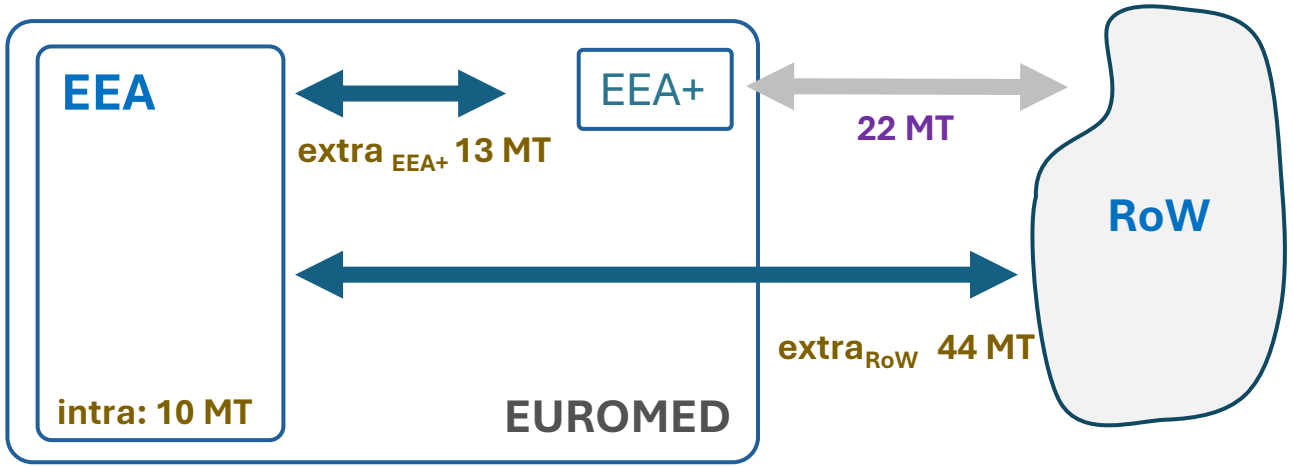
Total MRV container ships emissions reported by EMSA processed by the ETS Observatory . CO2 values in million tons

2023 ETS = intra + extra/2 ≃ 38 MT



- Fleet emissions operating at European ports are classified into intra-EU and extra-EU categories.
- The scope of EU ETS includes 100% of intra-EU emissions (between EU ports) and 50% of extra-EU emissions (between EU and non-EU ports).
- In 2023, container vessels accounted for approximately 38 million tons of CO2 subject to the ETS framework.

2023 ETS = intra + (extra $_{EEA+}$)/2 + (extra $_{RoW}$)/2 ≃ 38 MT



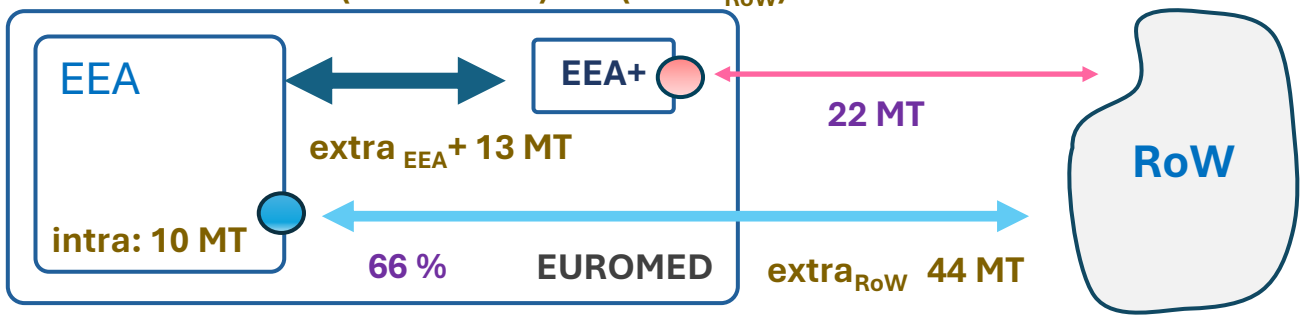
- Analysis indicates that the 57 million tons (MT) of extra-EU emissions can be disaggregated into 13 MT from voyages involving neighbouring ports (EEA+) and 44 MT from the Rest of the World (RoW).
- Furthermore, emissions between neighbouring ports and the RoW totalled 22 MT in 2023; these are excluded from EU ETS calculations.

Values Reported to EMSA/MRV
Values Estimated by the EU Observatory

Understanding reported ETS: ETS emissions in 2023-2024 and estimations for 2025

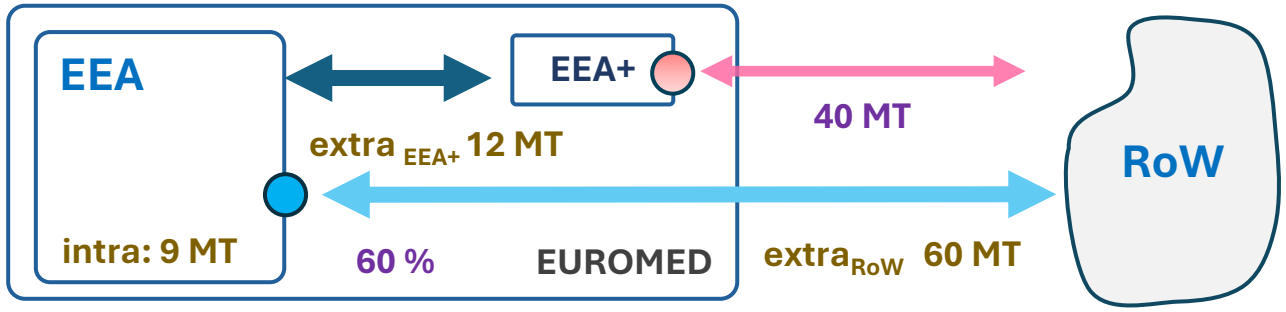
Mapping emissions by EUROMED gateway ports (EEA vs EEA+). Share of EU ports reduced from 66% in 2023 to 56% in 2025

2023 ETS = intra + (extra EEA+)/2 + (extra $_{RoW}$)/2 ≃ 38 MT



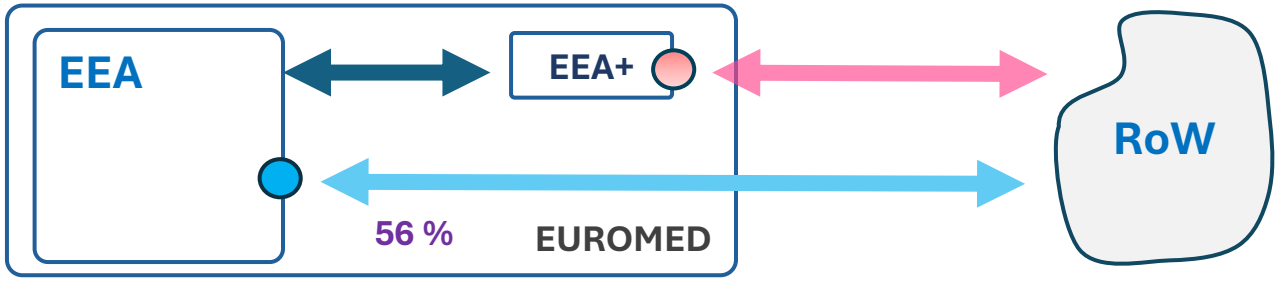
- EUROMED gateways are defined as the entry/exit points for trade with the Rest of the World (RoW). Gateways between the RoW and EEA+ are represented in red, while gateways between the RoW and the EEA are indicated in blue.
- In 2023, emissions between EEA gateways and RoW ports accounted for 66% of the total EUROMED emissions. *[44 MT EEA / (44 MT EEA + 22 MT EEA+) = 66%]*

2024 ETS = intra + (extra $_{EEA+}$)/2 + (extra $_{RoW}$)/2 ≃ 45 MT



- In 2024, following the Red Sea crisis, the increased distance to the Rest of the World (RoW) has led to a 50% surge in emissions bound to both European ports and their neighbours
- However, growth was not proportional; the relative share of EEA gateways declined from 66% to 60% as more traffic entered/exited the EUROMED area via EEA+ gateway ports. *[60 MT EEA / (60 MT EEA + 40 MT EEA+) = 60%]*

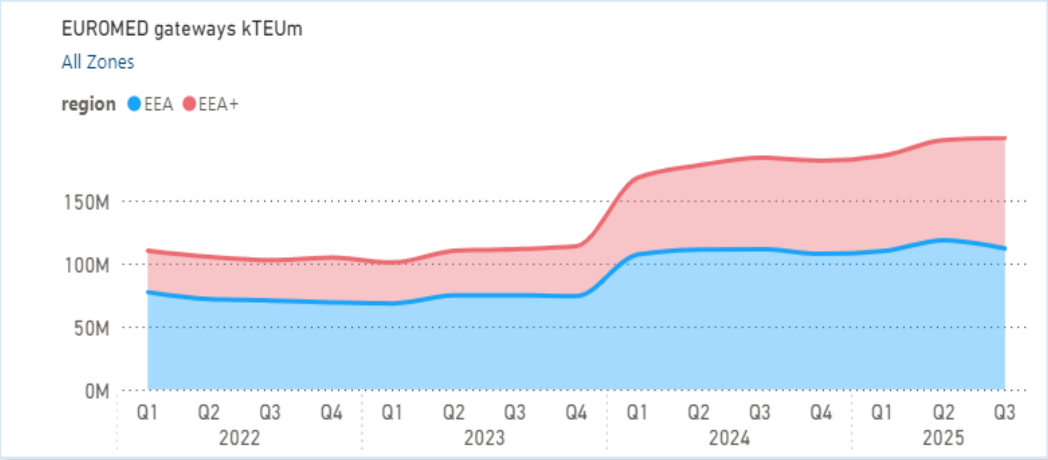
2025



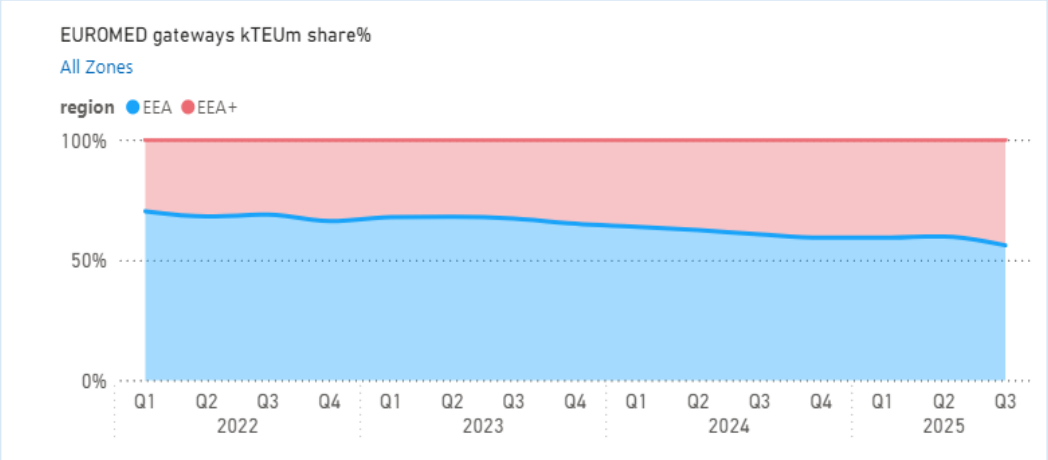
- More critically, **observations from the third quarter of 2025 indicate that the market share of European gateways has further contracted to 56%.**
- Actual 2025 figures will be presented in next ETS Observatory Report.

Detection of Potential Carbon Leakage

Monitoring the relative share of EEA and EEA+ **in k TEU miles** over time at EUROMED gateways or how do long distance vessels enter or exit the EUROMED zone



- In December 2023 the Huties crisis that meant practically the closing of the Bab el-Mandeb strait, created a shock on maritime transport affecting directly the Asia, India and Middle East trade with Europe.
- The top chart shows the **impact in kTEUmile** in both the EEA and the EEA+ ports after the crisis. The **new route required between 2 and 3 additional sailing weeks to connect the Asian markets with Europe**. The shipping companies managed to respond not only increasing the fleet employed and incrementing sailing speed but also restructuring many of the services.



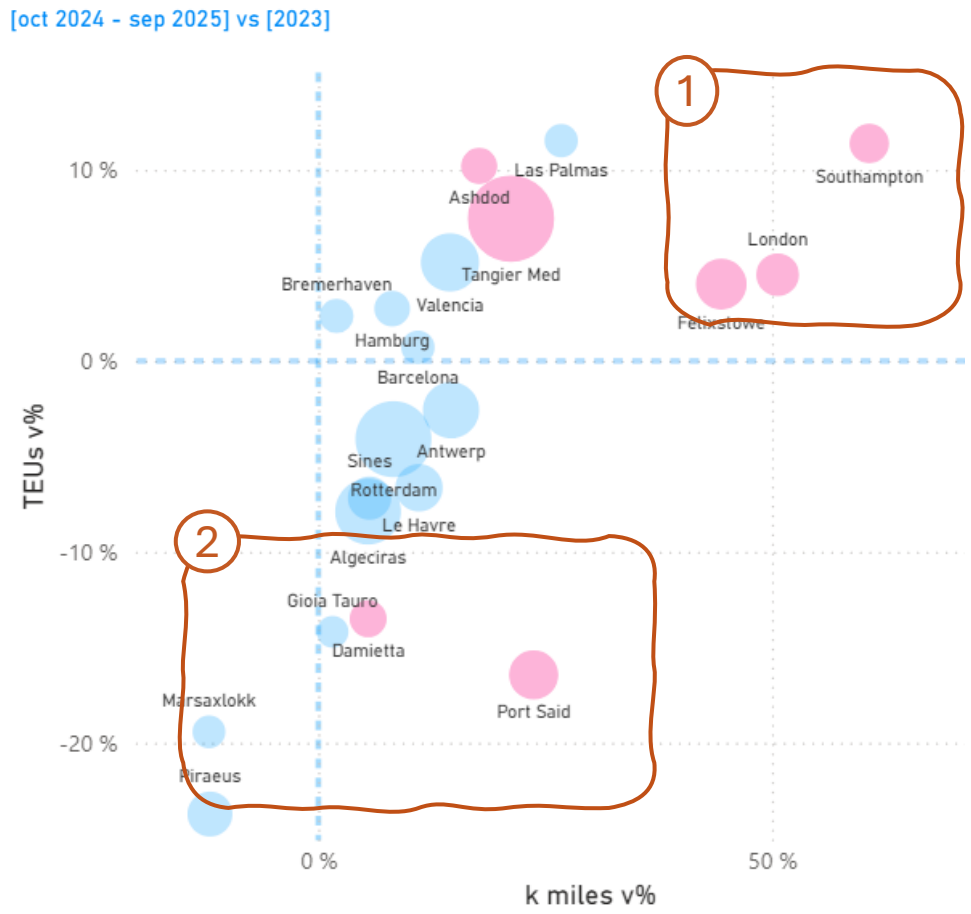
- If we take a look of the share of transport work (shared TEU_mile) supported by the EUROMED gateway ports, both form EEA and EEA+ countries during the same period is observed that the transport work of the **non-European ports in the EUROMED region gains share** in relation with the EEA ports.
- The series starts in Q1 2022 with a share of 69% EEA, 31% EEA+ observing a slow decline towards 67% by Q2 2023 just before the Suez crisis started.
- While the shock wave of the crisis is clearly visible in the top chart, **the evolution of the TW share is a continues decrease**, from 67% just before the crisis to 56% by end of Q3 2025 losing 11pp.

Detection of Potential Carbon Leakage

Statistical divergences found from 2023 to 2025

Main EEA and EEA+ ports

TEU variance vs miles variance. Bubble size = k TEU mile



The chart on the left deconstructs the **kTEUmiles** metric into its two primary components: **distance (nautical miles)** on the x-axis and **vessel capacity (TEUs)** on the y-axis. Representing the growth with respect 2023

While most ports saw an increase in mileage due to the **Suez Canal rerouting**, the rate of growth varied significantly. Variations in TEU capacity — with some ports expanding and others contracting — have created **statistical anomalies** that demand detailed examination:

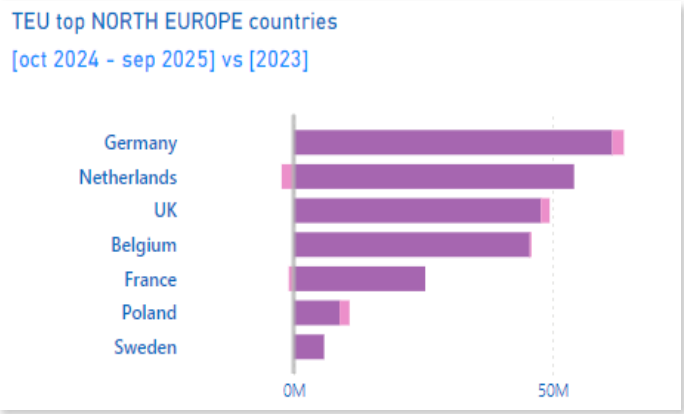
1. **United Kingdom:** The three major UK ports lead the growth in connectivity (miles), with **Southampton** also leading in TEU capacity. However, their total distance travelled increased at a significantly higher rate than their TEU gains.

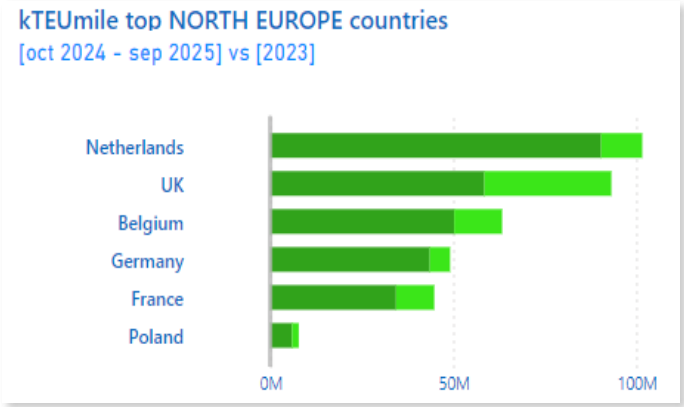
2. **East Mediterranean**: Piraeus exhibits a decline in both TEU capacity and distance. Conversely, Port Said, despite losing volume, managed to increase its mileage by 25% during the same period.

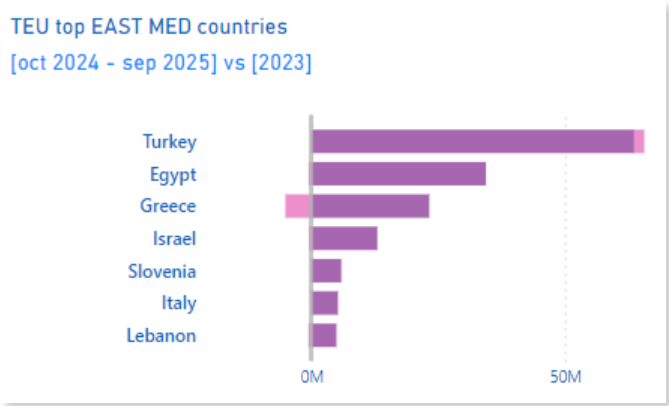
Both instances indicate a **transfer of maritime activity** toward **EEA+ ports**, which are gaining market share and increasing their strategic role as primary entry and exit points for long-distance **EUROMED** routes.

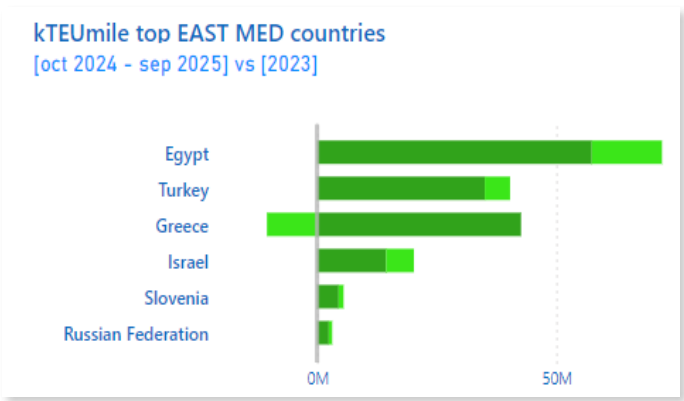
Detection of Potential Carbon Leakage

Statistical divergences found from 2023 to 2025









2023 value shown in dark color; increase in the period Oct. 2024–Sep. 2025 relative to 2023 shown in light color.

Comparing TEUs and kTEUmile in the two zones where divergence was detected.

North Europe. While most ports grew in terms of k TEU miles, UK ports did so much faster, at +59%, doubling the second-place country, France, which saw 30% growth. This allowed the UK to gain share against the Netherlands, which grew only 12%. This outstanding UK growth was not reflected in TEU growth (just 3.6%).

East Med. The region was severely impacted by the Suez closure, which doubled distances to Asia for routes diverted via the Cape of Good Hope.

However, the impact was not uniform. Greece—and specifically the port of Piraeus, the most important hub in the region—lost both TEU capacity and kTEUmiles. This loss was largely captured by Egypt and Israel in terms of long-distance connectivity, while Turkey led the growth in TEU capacity.

Table of Contents

Case Study I: United Kingdom

EEA Ports of EEA countries

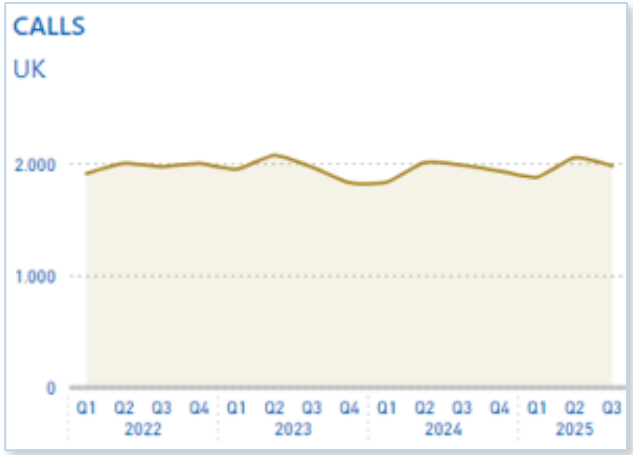
EEA+ Ports of neighbouring countries. All neighbouring ports are within 300 miles.

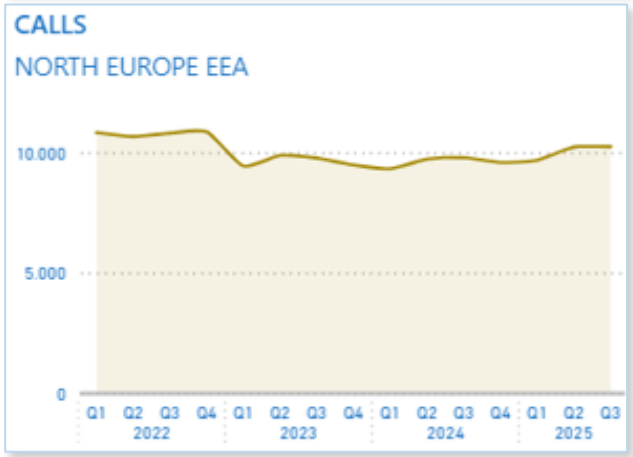
Case Study I: United Kingdom

Phase I – Detection / Tier 1 (high level scope)

EUROMED

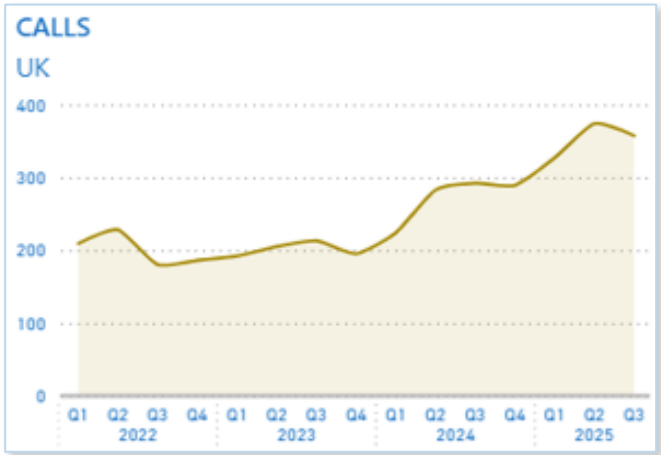
ALL CONTAINER SHIPPING ROUTES

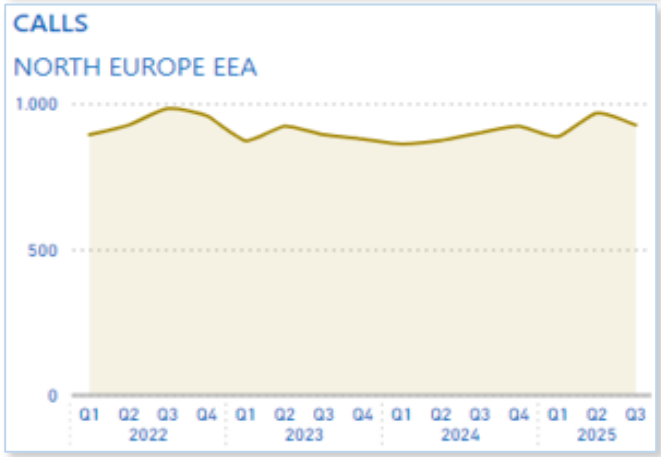




EUROMED GATEWAY

DEEP-SEA CONTAINER SHIPPING ROUTES





The analysis of the number of container ship calls at ports in the United Kingdom and at ports in Northern European EU countries — considering the full range of container shipping routes — reveals no significant changes since 2022.

However, when the focus is narrowed to calls on transoceanic (deep-sea) container shipping routes, UK ports have recorded sustained growth from late 2023 through to the second quarter of 2025.

The fact that this increase in calls at UK ports has not been accompanied by a corresponding decline at Northern European ports suggests that a growing number of vessels bound for Northern Europe are calling at the United Kingdom before proceeding on their route, or alternatively that vessels originating in Northern European ports are making a call in the United Kingdom prior to departing the region.

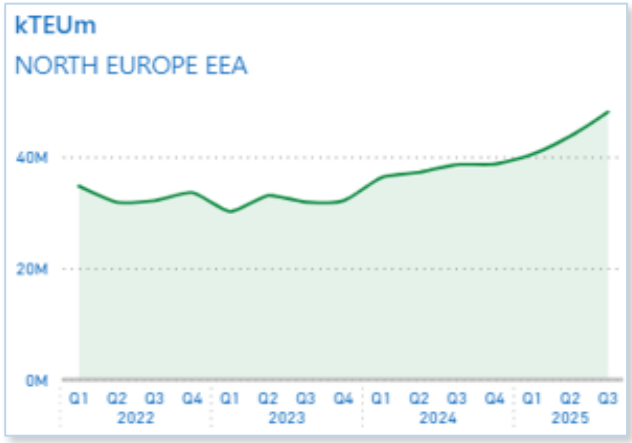
This analysis underscores the importance of concentrating on entry and exit routes to and from the EUROMED region, namely transoceanic (deep-sea) container shipping routes.

Case Study I: United Kingdom

Phase I – Detection / Tier 1 (high level scope)

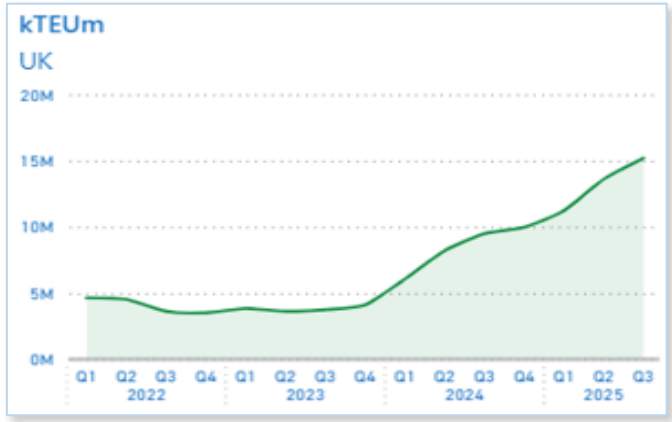
EUROMED

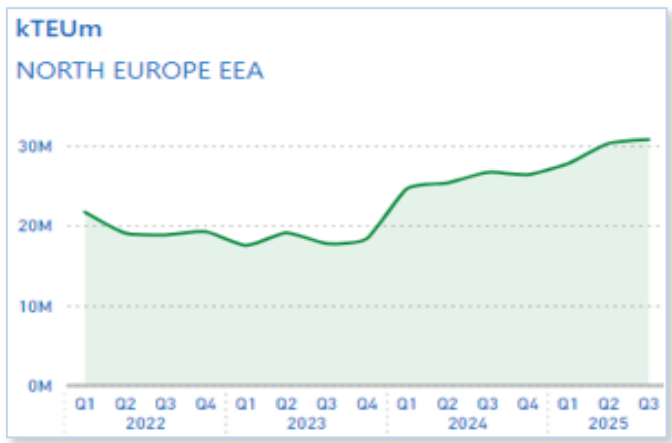
ALL CONTAINER SHIPPING ROUTES



EUROMED GATEWAY

DEEP-SEA CONTAINER SHIPPING ROUTES





The evolution of the kTEUmile indicator clearly shows the impact of the Red Sea crisis on maritime traffic from late 2023 onward.

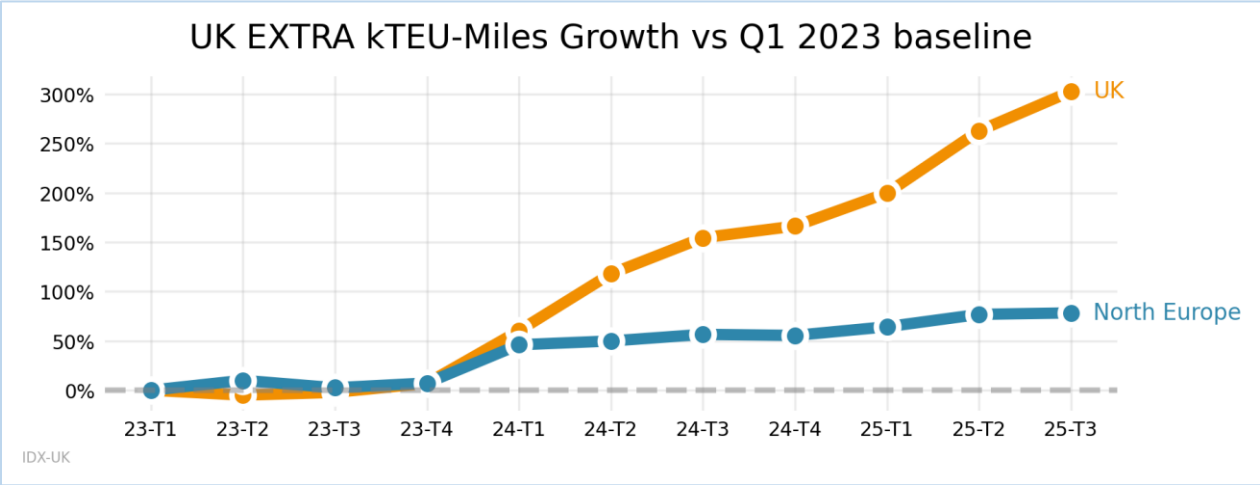
This event leads to a rapid increase in this indicator, both in total traffic and in transoceanic routes.

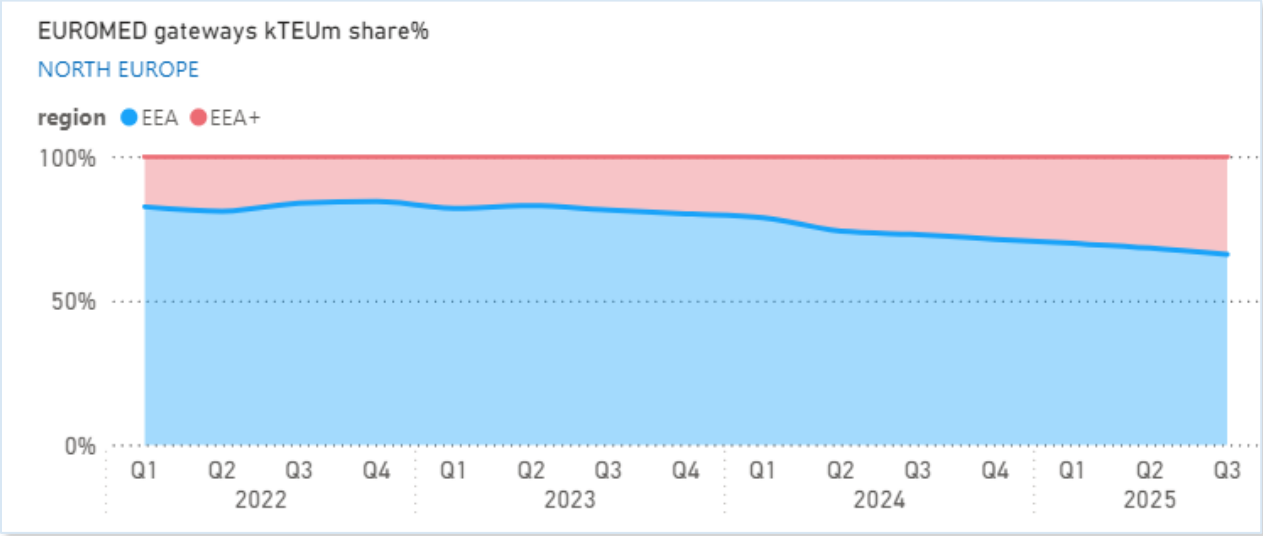
In the **United Kingdom, sustained growth is observed in both cases, with no sign of slowdown.**

In ports of **Northern European EU countries, growth in the TEU-mile parameter for transoceanic routes is slower** and comes to a halt during 2025.

Case Study I: United Kingdom

Phase I – Detection / Tier 1 (high level scope)





EUROMED GATEWAY

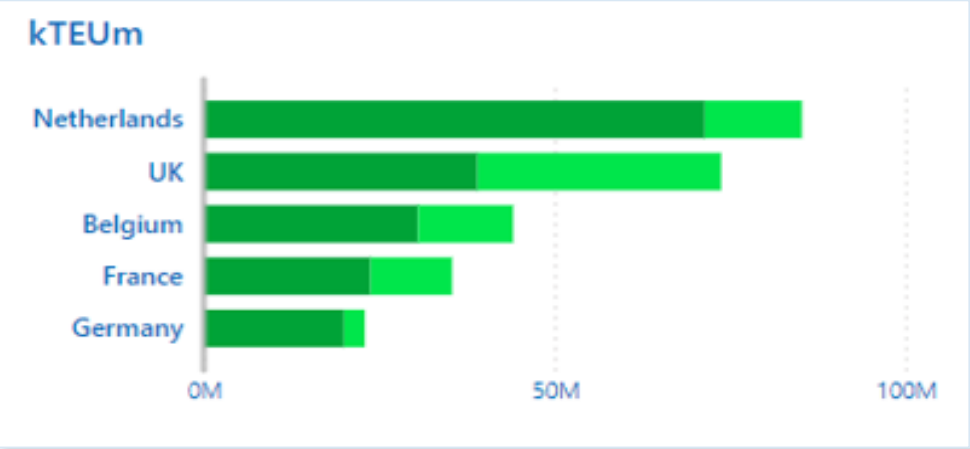
The top chart illustrates the growth of the TEU-mile indicator for transoceanic routes, expressed as a percentage increase relative to the first quarter of 2023. This visualization confirms two primary trends: first, **the accelerated growth of the kTEUmile indicator within British ports**; and second, **a distinct plateauing of growth for Northern European EU ports.**

The lower chart shows that the TEU-mile share of British ports has increased progressively since 2024 relative to the TEU-mile share of Northern European ports.

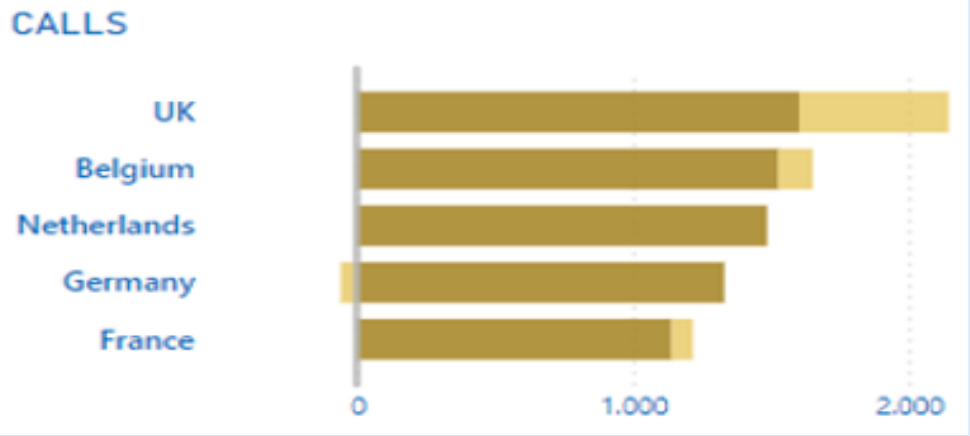
Case Study I: United Kingdom

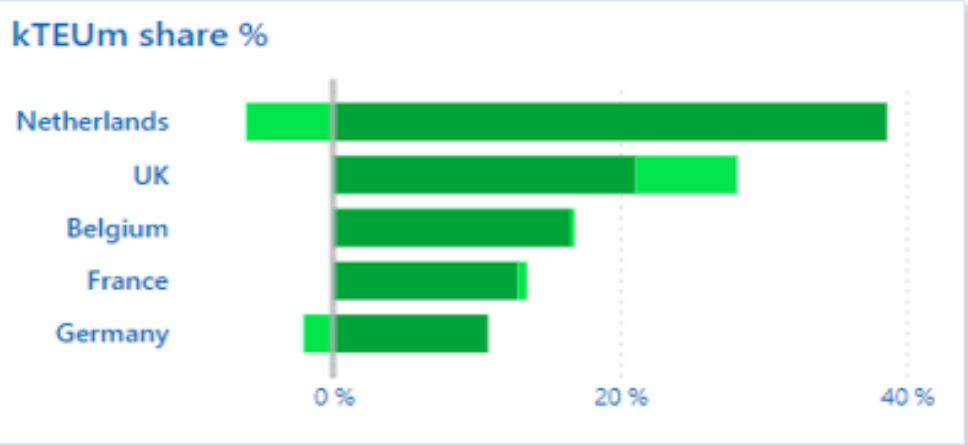
Phase I – Detection / Tier 1 (high level scope)

EUROMED GATEWAY (2023 vs oct.2024-sep2025)



Compared to 2023, **growth in the TEU-mile indicator is observed both in the United Kingdom and in the main surrounding EU countries**. However, this growth **is much stronger in the United Kingdom** than in the other countries, making it the **only country where the TEU-mile share increases significantly**. In Belgium and France, it barely rises, while in the Netherlands and Germany it declines.



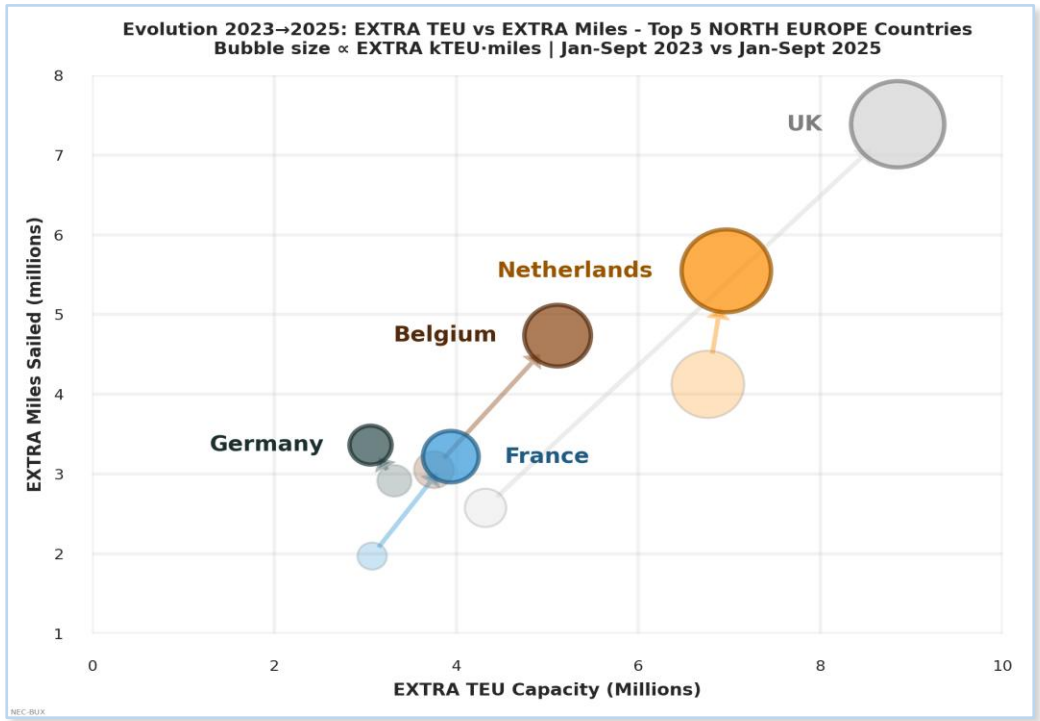


2023 value shown in dark color; increase in the period Oct. 2024–Sep. 2025 relative to 2023 shown in light color.

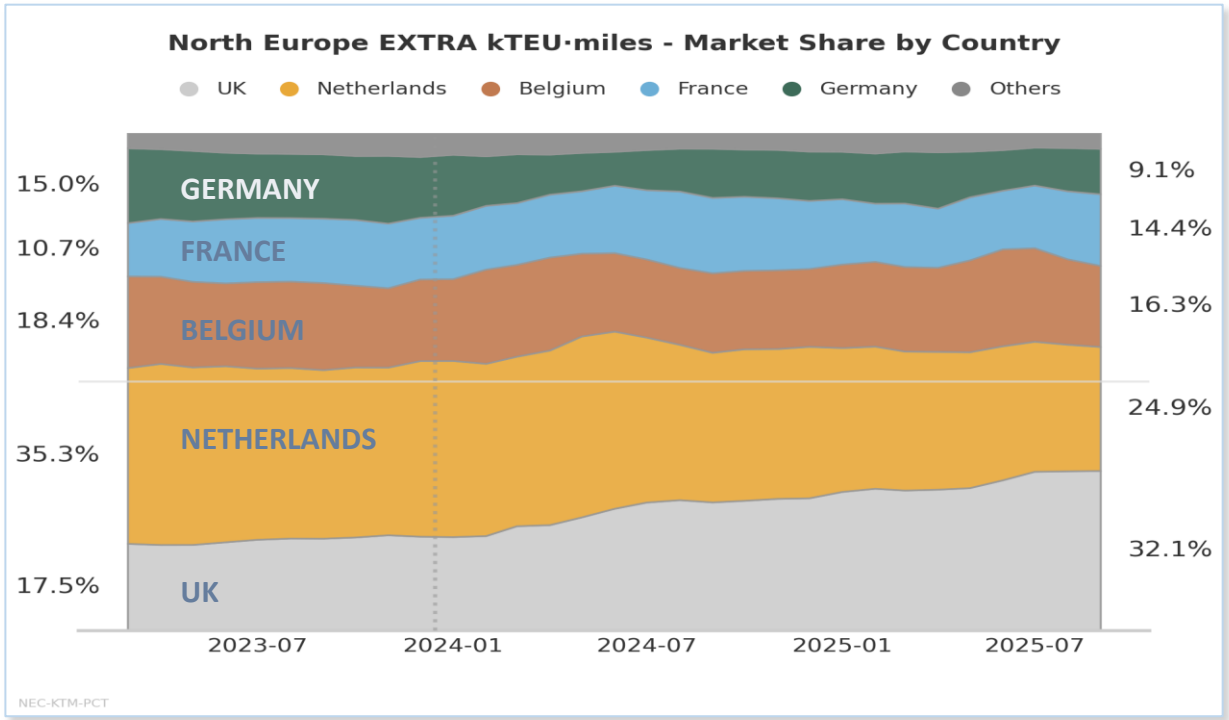
Case Study I: United Kingdom

Phase I – Detection / Tier 1 (high level scope)

EUROMED GATEWAY



The light circles show the status of each country in 2023. The dark circles show the status in oct.2024-sep.2025**. The UK surpasses the northern European countries in both capacity and nautical miles sailed from its ports.**

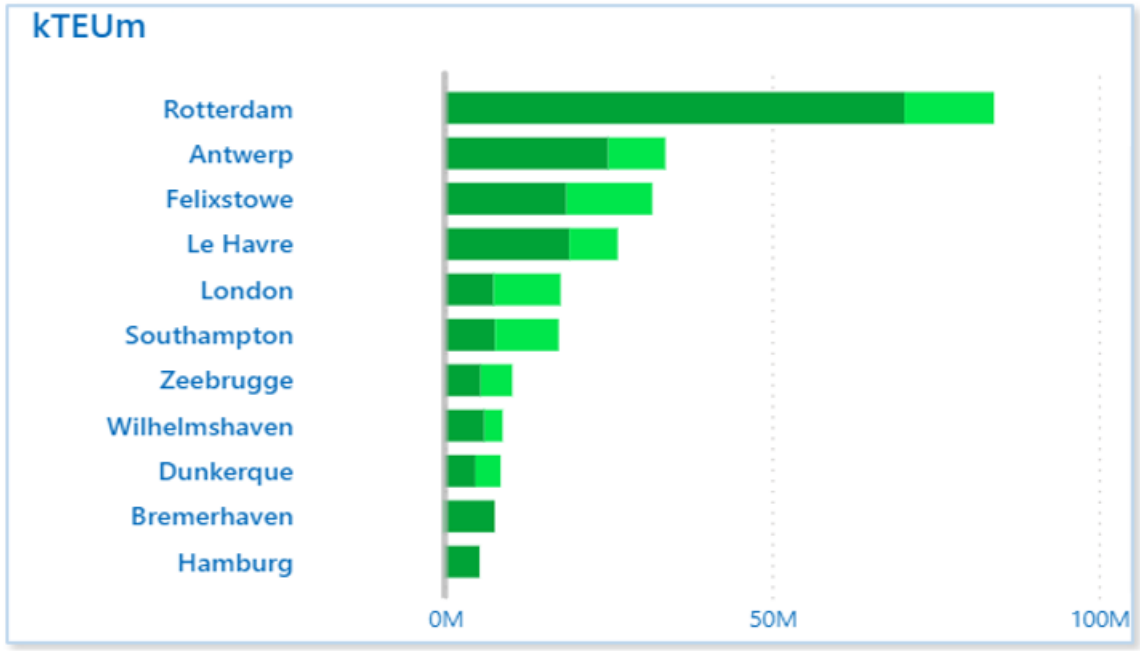


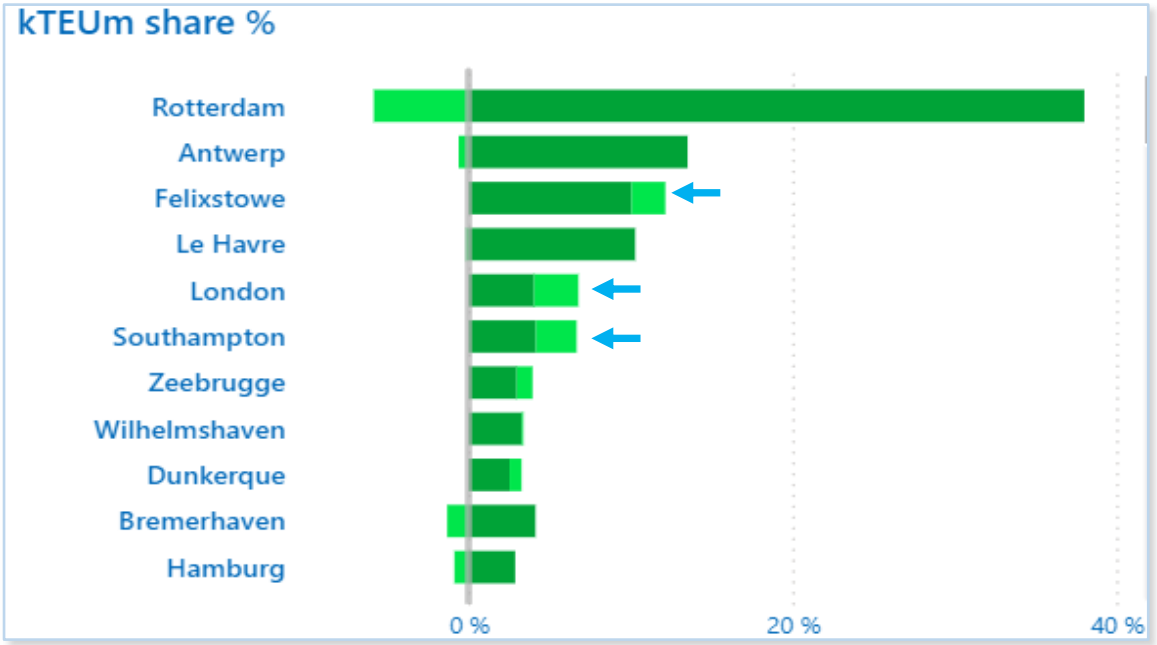
Time evolution of KTEU-mile share. The area chart evidences a direct market transfer: **the UK's ~15 percentage point gain in TEU-mile share is almost symmetrical to the combined loss of the Netherlands and Germany.**

Case Study I: United Kingdom

Phase I – Detection / Tier 1 (high level scope)

EUROMED GATEWAY (2023 vs oct.2024-sep2025)





Over the past year, the **TEU-mile parameter has increased significantly compared to 2023 in the three main UK container ports**. The relative growth of this indicator in these ports, compared to 2023, is higher than that observed in ports of surrounding EU countries.

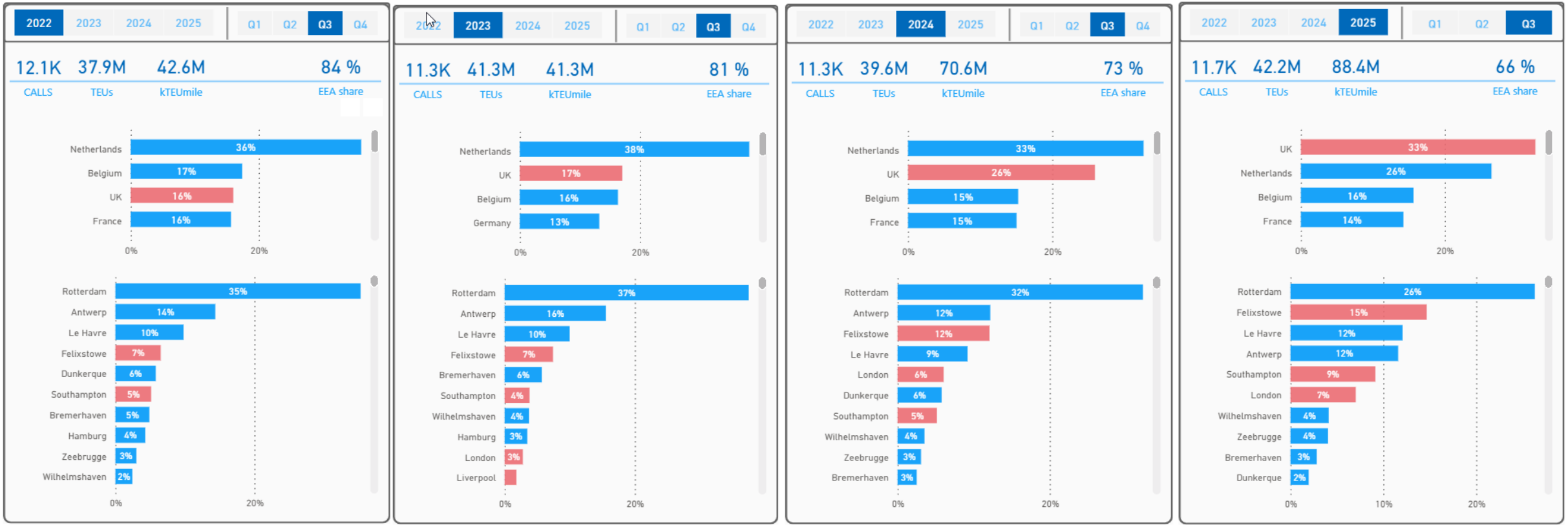
That is reflected in the TEU-mile share indicator, which **shows significantly higher growth in Felixstowe, London, and Southampton** than in EU ports. It is also noteworthy that the TEU-mile share of the Port of Rotterdam has declined significantly, although still leads clearly the north sea ports.

2023 value shown in dark color; increase in the period Oct. 2024–Sep. 2025 relative to 2023 shown in light color.

Case Study I: United Kingdom

Phase I – Detection / Tier 1 (high level scope)

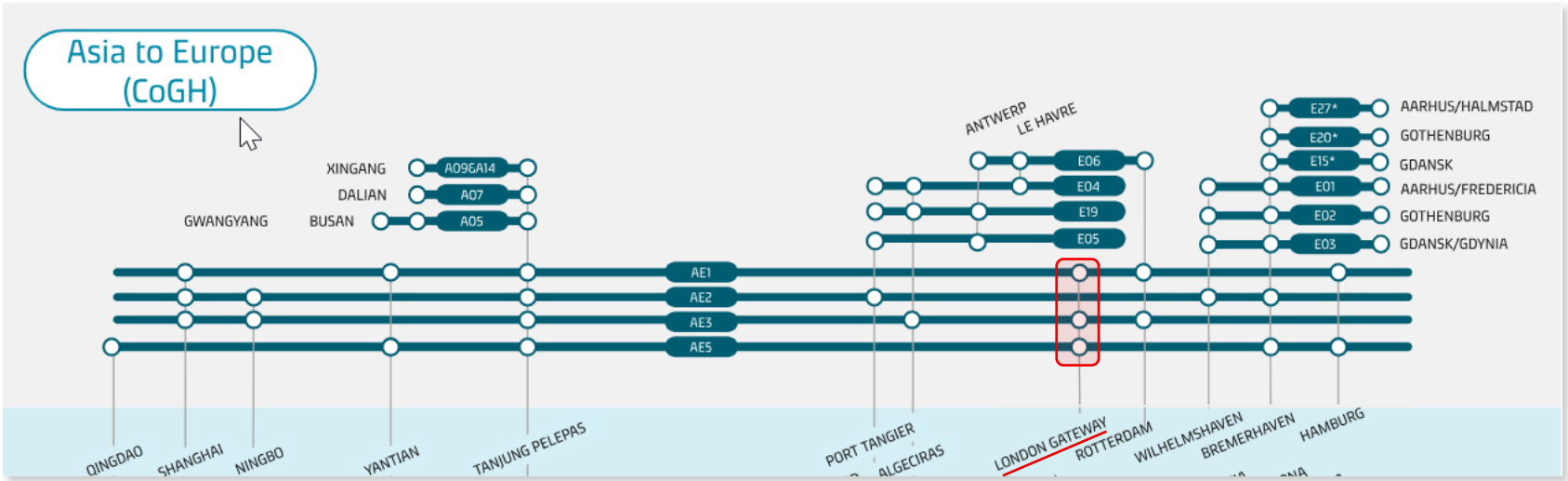
EUROMED GATEWAY

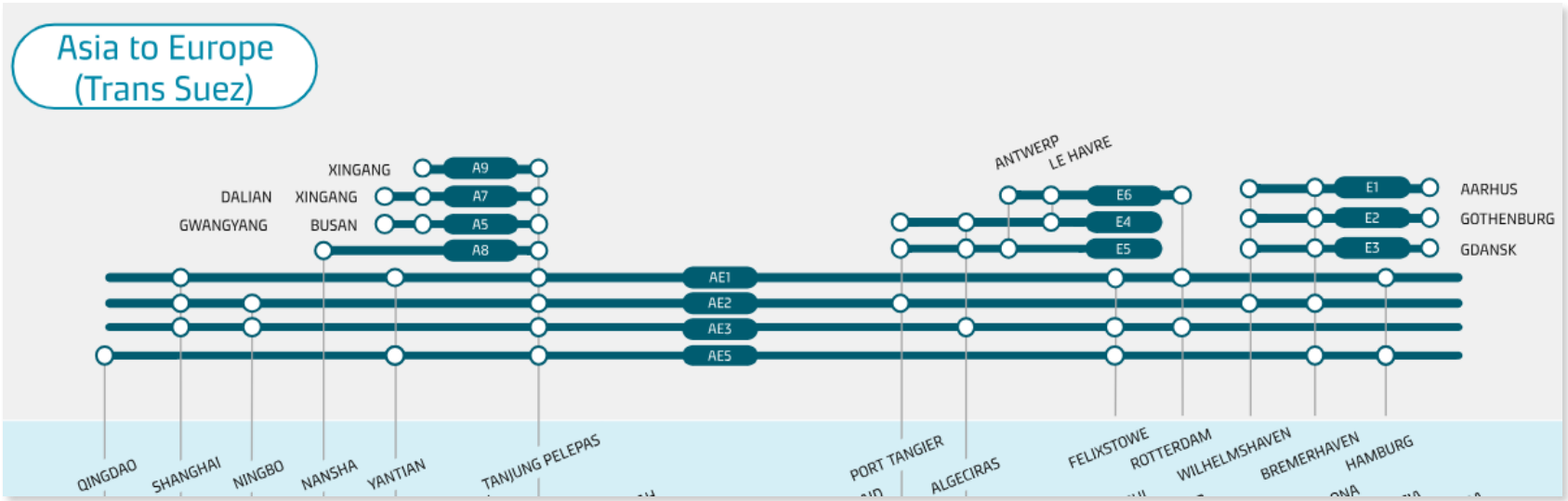


The TEU-mile share of British ports has grown from 16% in 2022 to 33% in 2025. As a result, the **UK has become the leading port area in Northern Europe in terms of TEU-mile share**.

Case Study I: United Kingdom

Phase I – Detection / Tier 2 (network level)





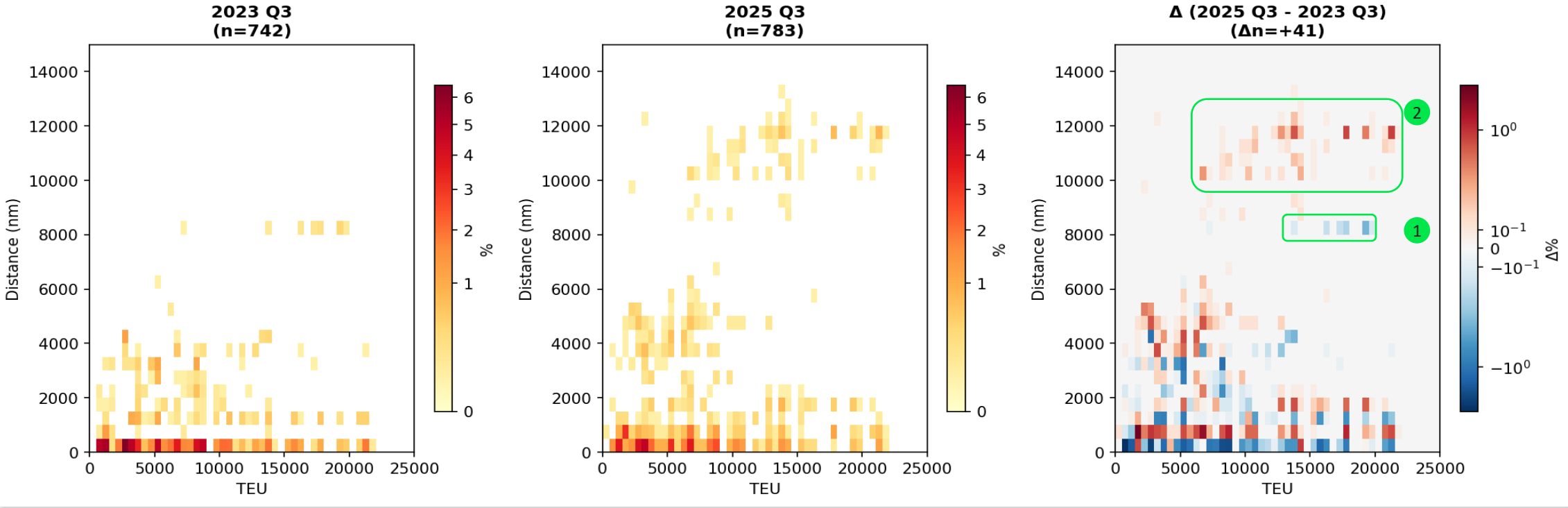
Role of London Gateway in new Gemini trunk network

- London Gateway is integrated into Gemini's main Asia–Europe corridors (Maersk and Hapag-Lloyd).
- Of Gemini's four Asia–Europe trunk lines, two will have their first call at London Gateway; of the other two, one will first call at Tangier and the other at Algeciras.
- This situation applies both in the Cape of Good Hope routing and in the return to the Suez route.
- London Gateway has no connectivity with Gemini feeder services.
- After London-Gateway, large vessels continue to Rotterdam and Hamburg, so these ports do not lose total numbers of calls.

These routes configuration may suggest a **route-transforming EU ETS avoidance strategy.**

Case Study I: United Kingdom

Phase I – Detection / Tier 2. Traffic crosstab of vessel capacity (TEU) vs distance (nm) for the three mayor UK ports: Felixstowe, London Gateway and Southampton



The X-axis represents vessel capacity in TEU; the Y-axis the distance sailed in miles; the color map shows the frequency (%) of each configuration in log-scale.

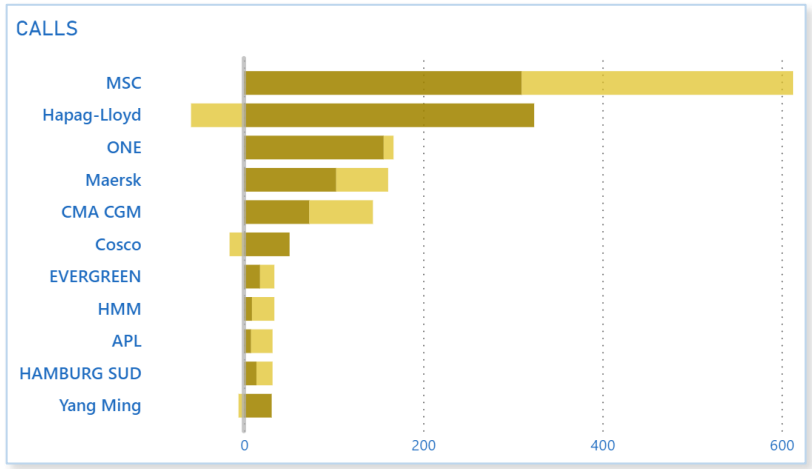
1 Clear evidence of Suez disruption: Q3 2023 had 12 calls via Med hubs, Q3 2025 just 2. This traffic shifted to Cape routing (~11,500-12,000nm) as shown in green rectangle (2).

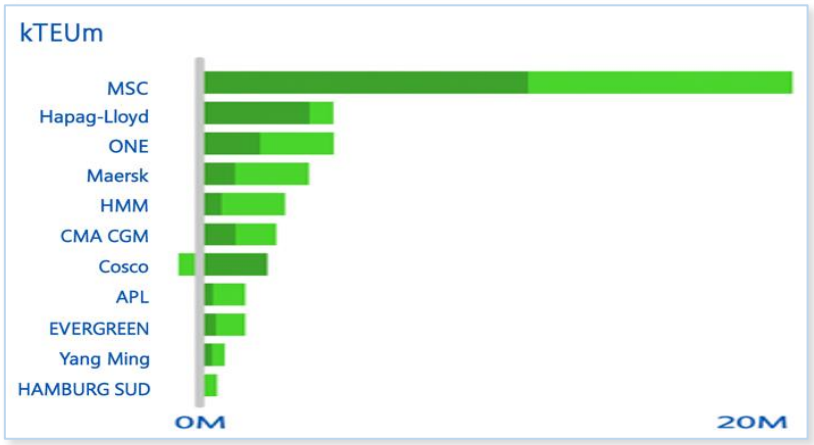
2 New Asia traffic via Cape: zero calls Q3 2023, 50+ calls Q3 2025 (4x Zone 2 loss). The ~11,700nm distance confirms Cape routing (+3,400nm vs Suez). Net gain suggests UK ports now serve more as first/last European call on Cape strings, where previously some services bypassed UK for direct Rotterdam or Antwerp calls.

Case Study I: United Kingdom

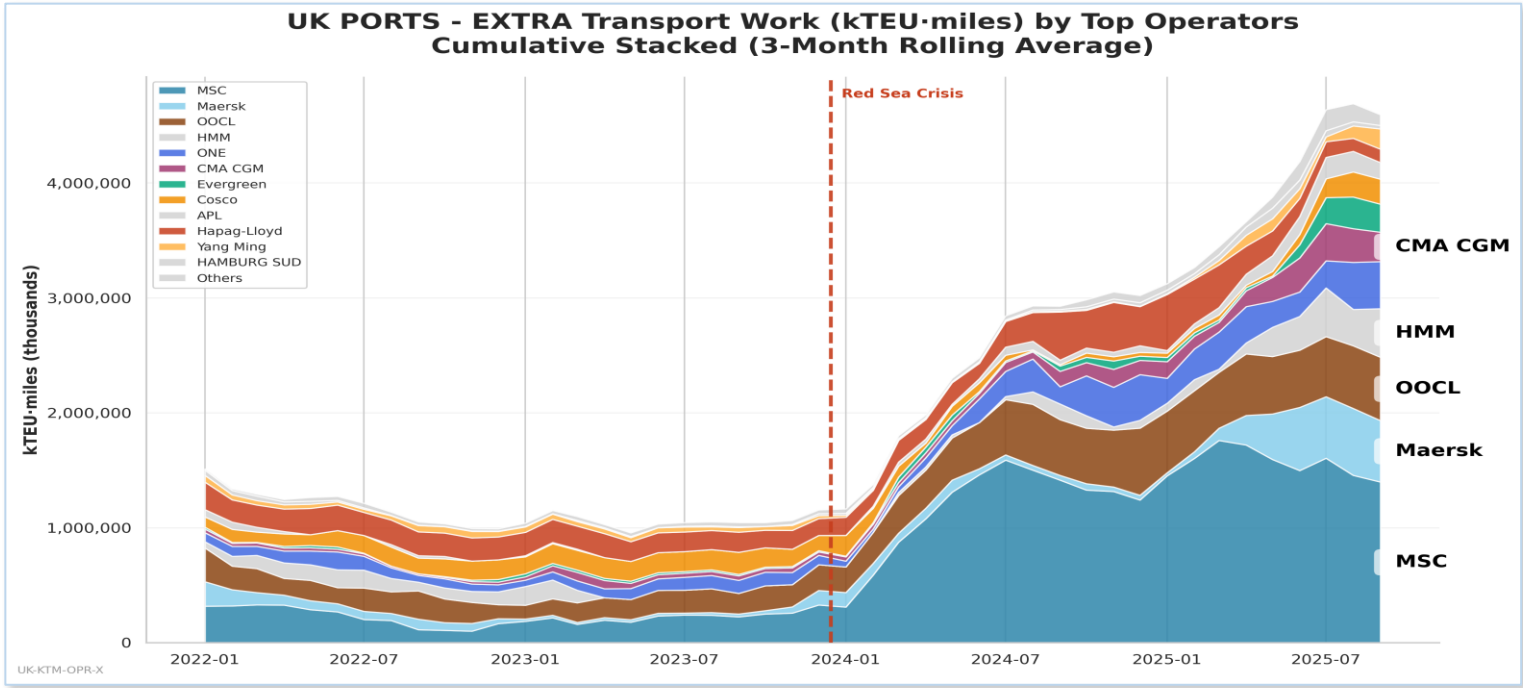
Phase I – Detection / Tier 3 (service/company level)

EUROMED GATEWAY (2023 vs oct.2024-sep2025)





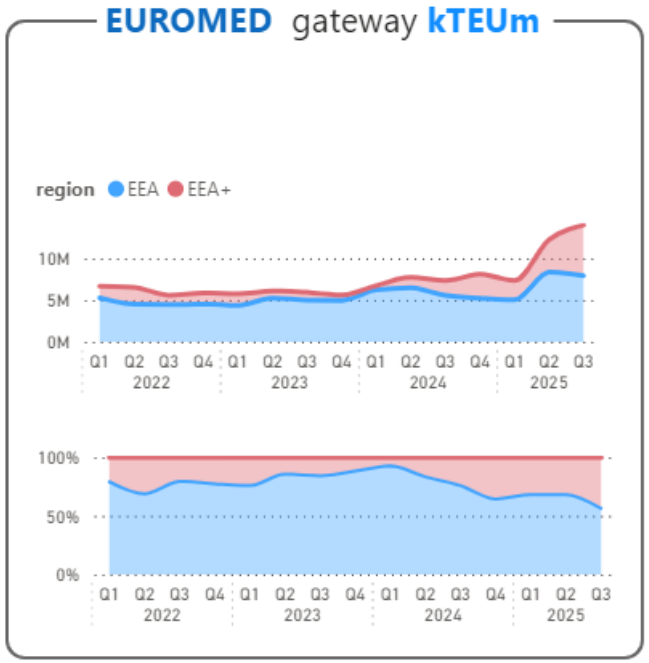
Compared to 2023, **all shipping companies, have grown significantly in British ports, both in the number of calls on long-haul routes and in kTEUmiles.** The significant presence and growth of MSC is noteworthy, as is the rapid growth of Maersk since the last half of 2025.

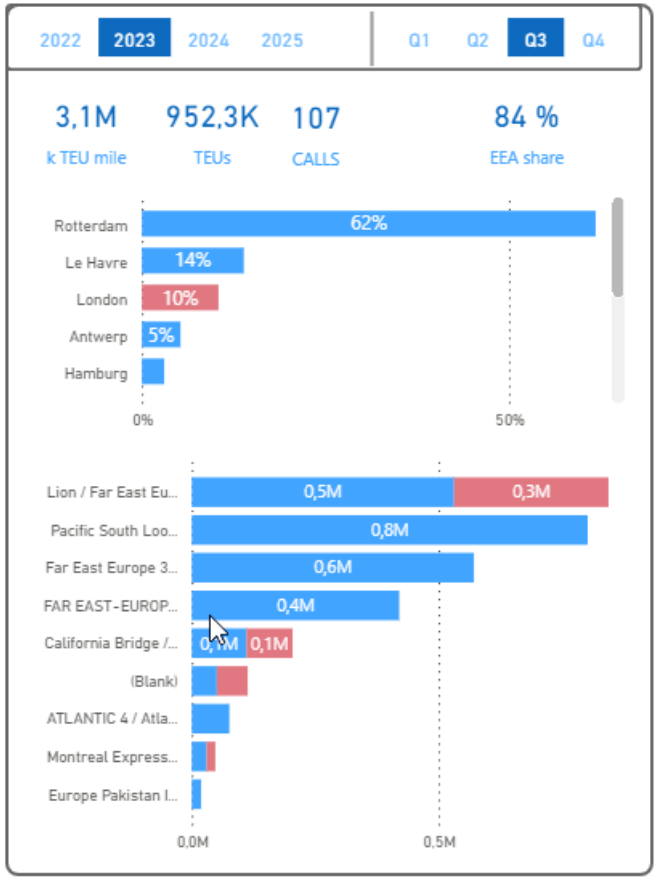


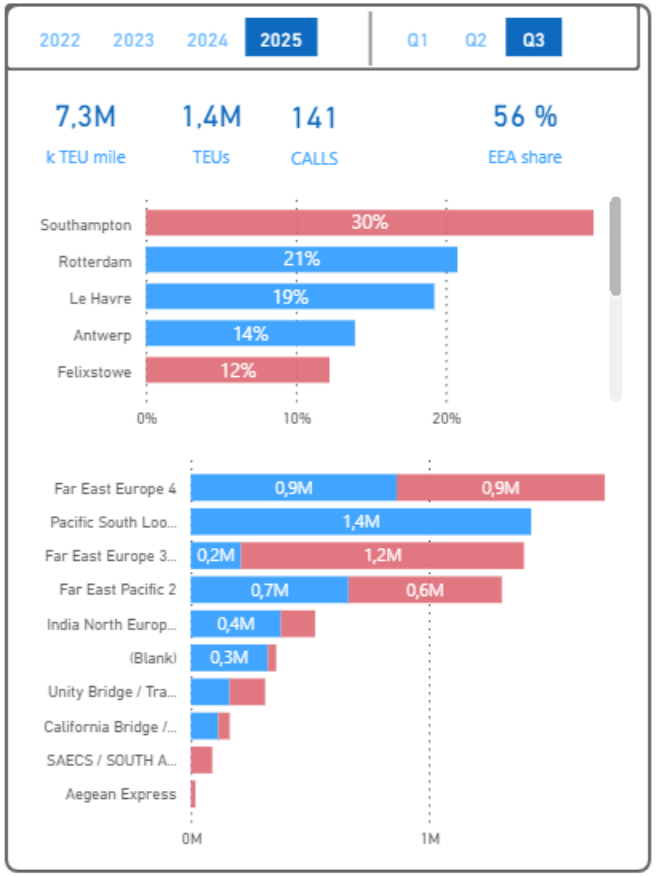
Case Study I: United Kingdom

Phase I – Detection / Tier 3 (service/company level)

PREMIER ALLIANCE strongly increases their deep-sea presence in the UK that becomes the base for 44% of their North Europe trade mainly from the port of Southampton that bypass Rotterdam.







ONE OCEAN NETWORK EXPRESS HMM YANG MING

Similar results can be detected in other shipping alliances.

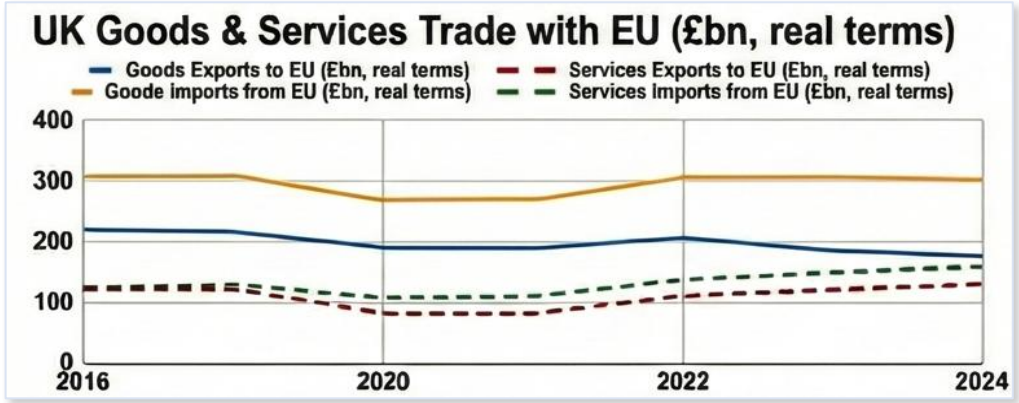
Case Study I: United Kingdom

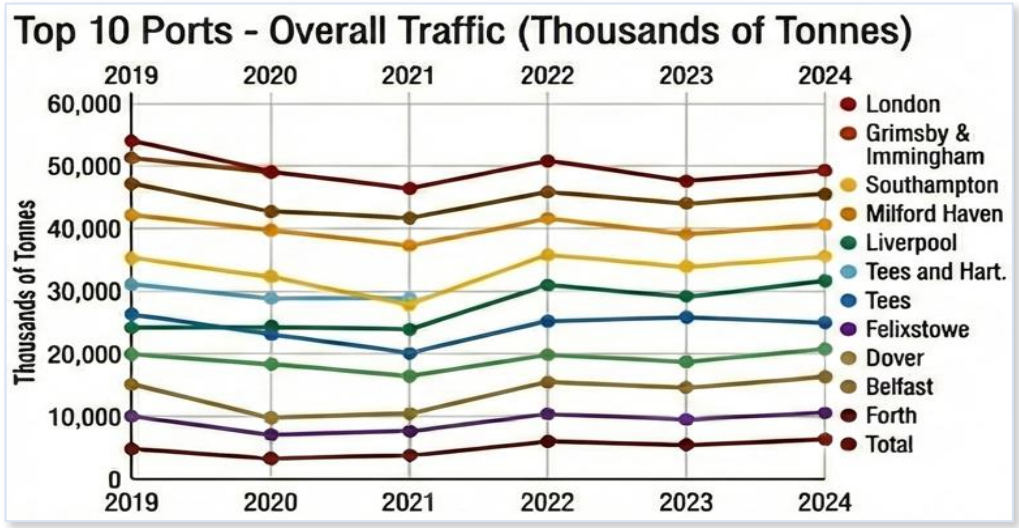
Phase I – Detection / Conclusions

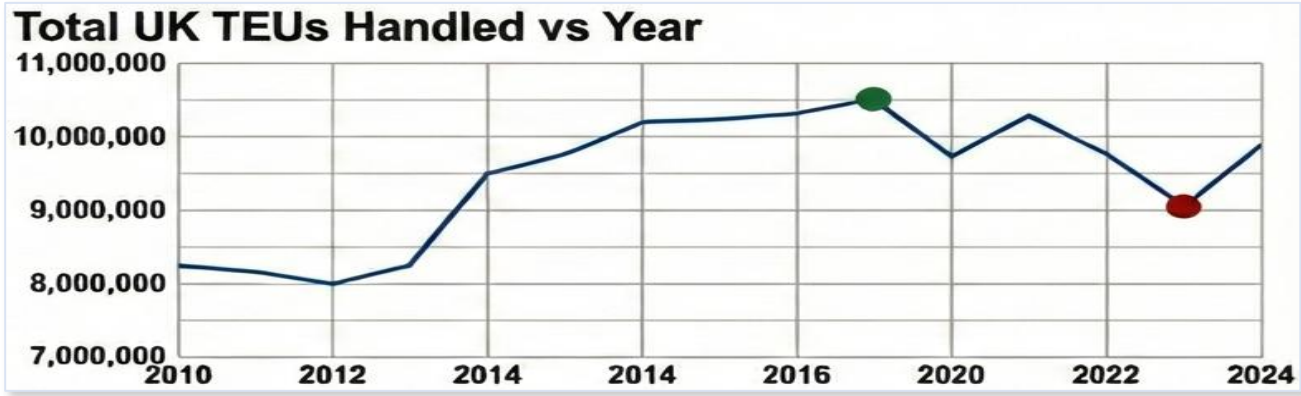
Tier	Detection	Findings
Tier 1	**Port level Activity**	It is estimated that in two years the **United Kingdom has gained a 15% TEU_mile share of transoceanic container shipping traffic relative to continental European ports, led by its three main container ports: Southampton, London Gateway and Felixstowe**. The trend continues: the third quarter of 2025 marked the highest point of the last four years.
Tier 2	**Network Level structural metrics**	**Analysis ongoing**. However, the first indications point to a reorganization of transoceanic container shipping services to include inbound and outbound calls to the Northern Europe region via the United Kingdom (**route transforming avoidance strategy**), without breaking the continuity of the routes.
Tier 3	**Voyage-Specific behavioural metrics**	Analysis ongoing. However, **there is evidence that all major alliances — Gemini, Ocean, Premier and MSC — are strengthening their presence in the United Kingdom** and contributing to the increase in the traffic share of its ports.

Case Study I: United Kingdom

Phase II – Attribution / Level 1/Economic Activity







Economic factors UK trade growth. Post-Brexit trade environment: a lasting impact on trade flows.

- The UK's departure from the EU single market introduced new non-tariff barriers that have had a measurable and lasting impact on trade flows.
- UK goods exports to the EU in 2024 were 18% below their 2019 level.
- Total tonnage handled by top UK ports in 2024 remained below 2020 levels.
- Focusing on the container sector, the trend is more complex. While total TEU throughput in 2023 were below the 2019 peak, a nascent recovery began in late 2024 and accelerated into 2025, driven by deep-sea hubs, as shown in the chart above.

Sources: Statistics on UK trade with the EU. UK Parliament. Transport Statistics Great Britain, UK Gov and MDS Transmodal

Case Study I: United Kingdom

Phase II – Attribution / Level 1/Economic Activity (Recent Investments in UK Ports)

Country	Port	Type of action	Start date of the action	Date of commissioning	Estimated investment Millions of euros	Port capacity before the action Million TEUs per year	Port capacity after action Million TEUs per year	Promoter	Shareholders and/or Operators
United Kingdom	London Gateway	New berth nº4	2021	2024	350	2,4	3,5	DP Word	DP Word
		Improvement of the facilities BOXBAY Project	2025	2028	190	3,5	3,5	DP Word	DP Word
		New berths nº5 and nº6	2025	2029	1150	3,5	5,25	DP Word	DP Word
	Felixstowe	Improvement of facilities. Increase in draught.	2021	2024	150	4,0	4,0	Harwich Haven Authority	Hutchinson

Case Study I: United Kingdom

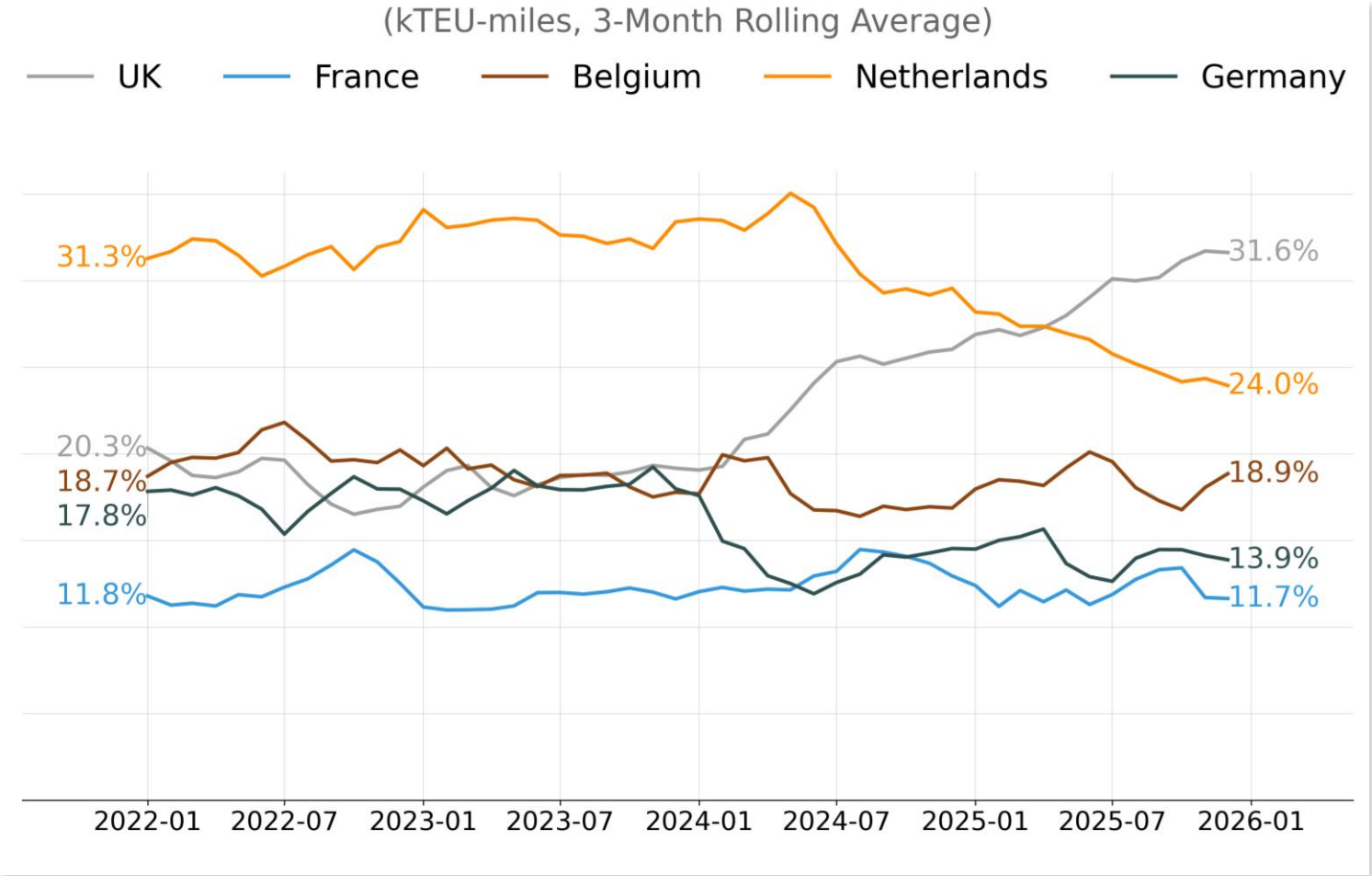
Phase II – Attribution / Level 1/Congestion: North European port congestion related to social unrest

Year	France	Germany	Belgium	Netherlands	UK
2022	REDUCED Intermittent inflation strikes in Jan/June; less intense than '23	SEVERE Historic 48h strikes in July broken after 40 years; massive summer backlog	REDUCED National general strikes in June, Nov & Dec halted ports for 24h each	NO UNREST Collective Labor Agreement concluded relatively peacefully	SEVERE Historic strikes at Felixstowe & Liverpool (Aug-Oct); >2 months disruption
2023	SEVERE Pension Reform strikes caused rolling "Dead Ports"; backlog > 1 mo	REDUCED March "Mega-Strike"; high intensity but short duration < 1 week	REDUCED June National Strike; barge congestion lasted ~3 week	REDUCED Feb–Mar FNV strikes; sporadic interruptions	NO UNREST (Post-2022 wage deals held; stable operations).
2024	SEVERE Persistent "Rolling Strikes" June–Dec; >1 mo cumulative impact	SEVERE Wage dispute waves June–Sept; backlog spanned > 3 months	NO UNREST Farmers' protests affected roads, no Docker strikes	REDUCED Hutchison Delta II strike Feb; impact < 2 weeks	NO UNREST
2025	SEVERE Continuation of 2024 disputes; long-term instability	NO UNREST Rail infrastructure issues, but no port strikes	SEVERE Oct Pilots' "rest" action + Nov National Strike; impact > 1 mo	REDUCED Oct Lasher Strike; resolved in ~1 week	NO UNREST

SEVERE Disruption impact lasting more than 1 month REDUCED Disruption lasting less than 1 month NO UNREST No significant strikes

Case Study I: United Kingdom

Phase II – Attribution / Level 1/Congestion: North European port congestion related to social unrest. Correlation to TEU_mile



Based on the social unrest scan from the previous slide, it is clear that French ports were the most affected, experiencing three consecutive years of severe operational impact.

In contrast, the UK has remained remarkably stable since its disruptions in 2022. Similarly, the Netherlands has avoided any severe conflicts (lasting more than a month).

Interestingly, the Transport Work data shows that France and Belgium have maintained their market share over the last four years.

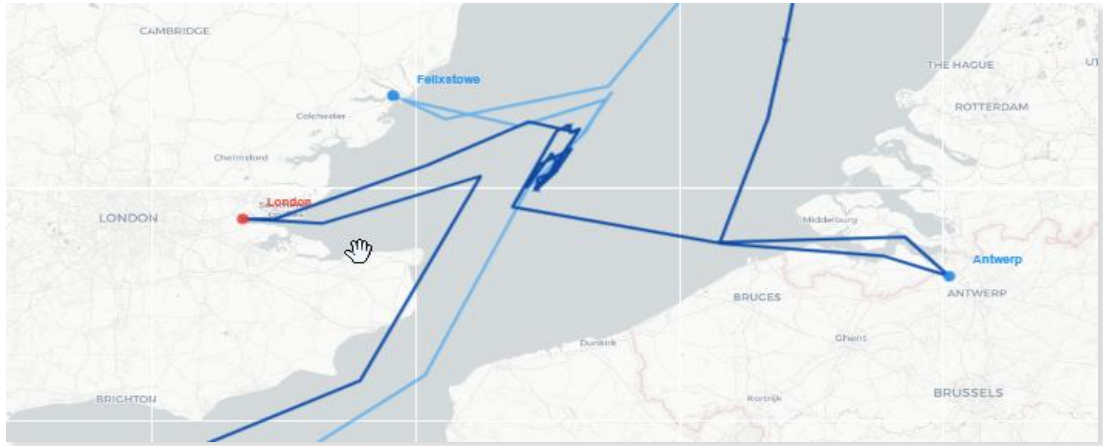
The significant gains made by the UK appear to have come directly from the losses in the Netherlands (-7.3 pp) and Germany (-3.9 pp).

Consequently, the evidence suggests that the market is not penalizing high-conflict ports.

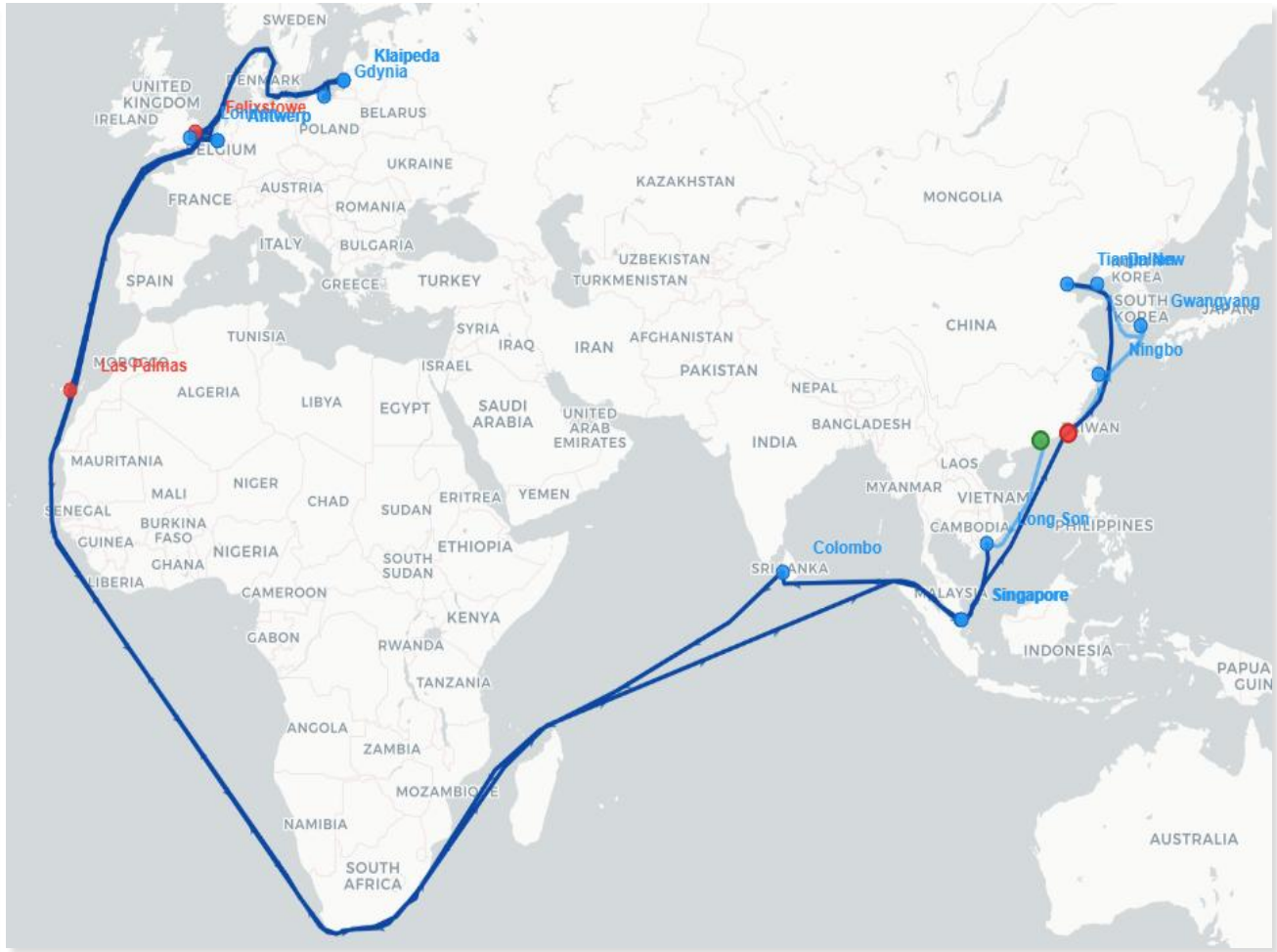
Case Study I: United Kingdom

Phase II – Attribution / Level 1/EU ETS Cost

An example of a route configuration



- MSC includes two UK ports in a new Asia–Europe service.
- Felixstowe and London Gateway are the first last port calls in Europe.
- It will have a 13-week rotation and will deploy 13 vessels ranging between 7,000 and 12,000 TEU.
- **The route design, allows for a reduction in EU-ETS–related costs. Based on 31 rotations, these savings are estimated at between €17 and €20 million, depending on the number of calls at Las Palmas**



Case Study I: United Kingdom

Phase II – Attribution / Conclusions

Level	Attribution	Finding
1	Has there been a significant improvement in the UK economic activity?	UK GDP and trade volumes have not grown significantly since 2022. The connectivity increase is not demand-driven but reflects a supply-side shift in how container traffic reaches UK destinations.
	Has there been a reduction in operating costs at UK ports?	In the current inflationary environment, there is no evidence that UK ports have reduced their operating costs relative to continental competitors like Rotterdam or Antwerp. Cost arbitrage at port level is not the driver.
	Do UK ports have better infrastructure or greater capacity?	UK ports (Felixstowe, London Gateway, Southampton) are actively investing in dredging and crane upgrades. This signals that ports were previously NOT adapted to receive ULCV vessels directly. Likewise, during the 2021–2024 period, the Port of London Gateway developed a new berth that increased its operational capacity from 2.4 to 3.5 million TEUs per year. This capacity will be further expanded with the development of two additional berths, enabling the port to reach 5.25 million TEUs per year by the end of 2029, which suggests that this port did not previously have the necessary capacity to become a key hub for the arrival and departure of containers in Northern Europe.
	Are there structural congestion problems at Northern European ports?	Structural congestion exists at major continental hubs (Rotterdam, Antwerp, Hamburg), but these are primarily caused by temporary factors (labour strikes, weather events, pandemic aftermath). This explains some short-term diversion but not the sustained 17%→33% market share shift observed.

Case Study I: United Kingdom

Phase II – Attribution / Conclusions

Level	Attribution	Finding
1	Could the expiration of the CBER have given any advantage to UK ports?	The EU's Consortia Block Exemption Regulation expired in April 2024, coinciding with UK's equivalent competition exemption ending.
	Could the closure of the Suez Canal have given any advantage to UK ports?	The increase in distance implied by routing via the Cape of Good Hope affects UK ports equally compared to North European ports.
	Is there any other factor that could increase the profitability of a transoceanic service if it makes an intermediate call at UK ports?	A ULCV sailing from Asia to UK directly (vs. transshipment via Rotterdam/Antwerp) can save approximately €1 million per voyage in EU ETS costs. UK ports remain outside ETS scope, creating a structural incentive for carriers to bypass EEA hubs when serving UK-destined cargo. This is the primary hypothesis for the observed traffic shift.
2	Quantitative verification	Not applied yet by the EU ETS Observatory.

Table of Contents

Case Study II: Eastern Mediterranean

EEA Ports of EEA countries

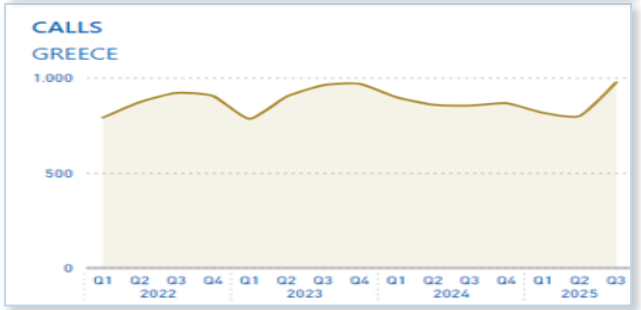
EEA+ Ports of neighbouring countries.
All neighbouring ports are within 300 miles.

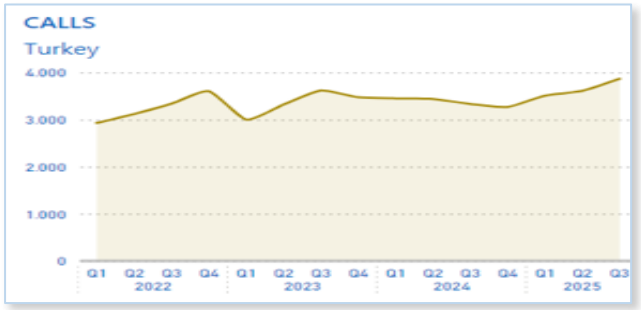
Case Study I: Eastern Mediterranean

Phase I – Detection / Tier 1 (High level analysis)

EUROMED

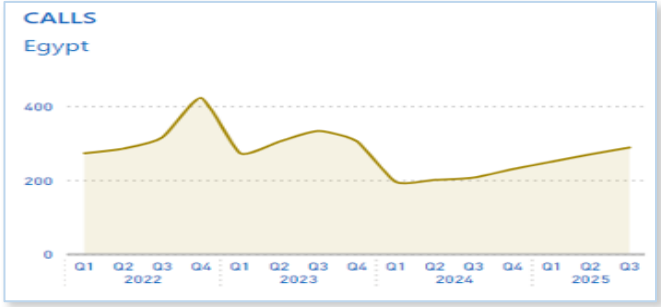
ALL CONTAINER SHIPPING ROUTES





EUROMED GATEWAY

DEEP-SEA CONTAINER SHIPPING ROUTES



When all routes are analysed, **the number of port calls remains stable in Greece and shows a slow but sustained increase in Egypt and Turkey.**

If the analysis focuses on **calls on transoceanic routes (deep-sea), a sharp drop in port calls is observed in Greece and Egypt at the end of 2023. In Egypt, after this decline, there is a sustained recovery** up to levels close to those of the first quarter of 2022. By contrast, in Greece port calls do not recover the level they had before the canal closure.

In Turkey, the canal closure triggers a rapid increase in deep-sea route calls, which levels off in the third quarter of 2024.

Case Study I: Eastern Mediterranean

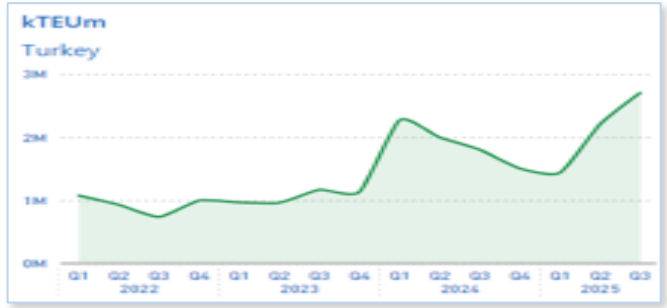
Phase I – Detection / Tier 1 (High level analysis)

EUROMED

ALL CONTAINER SHIPPING ROUTES

EUROMED GATEWAY

DEEP-SEA CONTAINER SHIPPING ROUTES



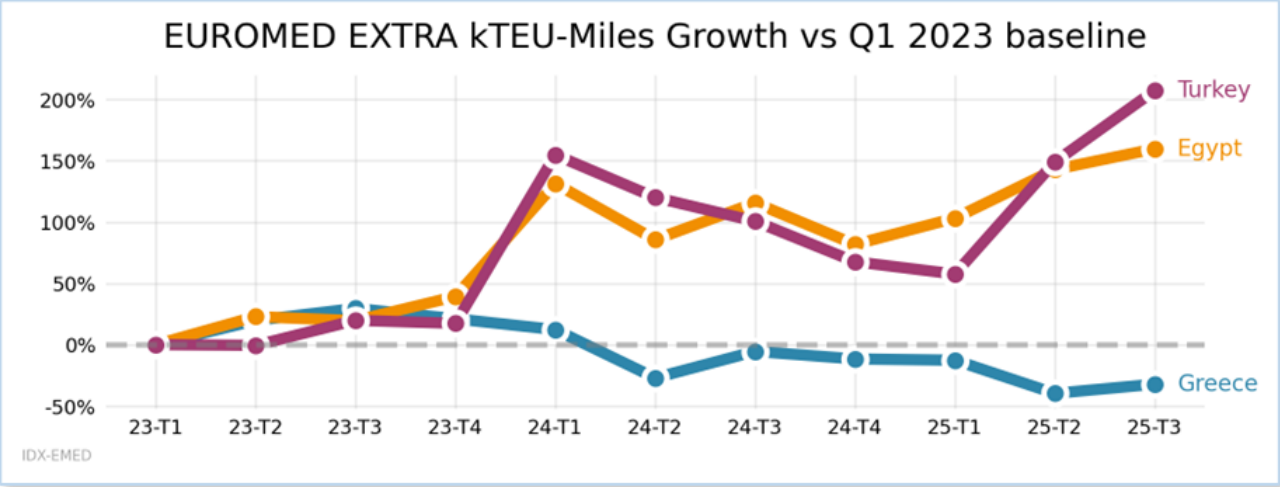
In **Greece, the TEU-mile indicator reacts to the Red Sea crisis with a sharp drop, followed by a slow and sustained decline in the indicator**.

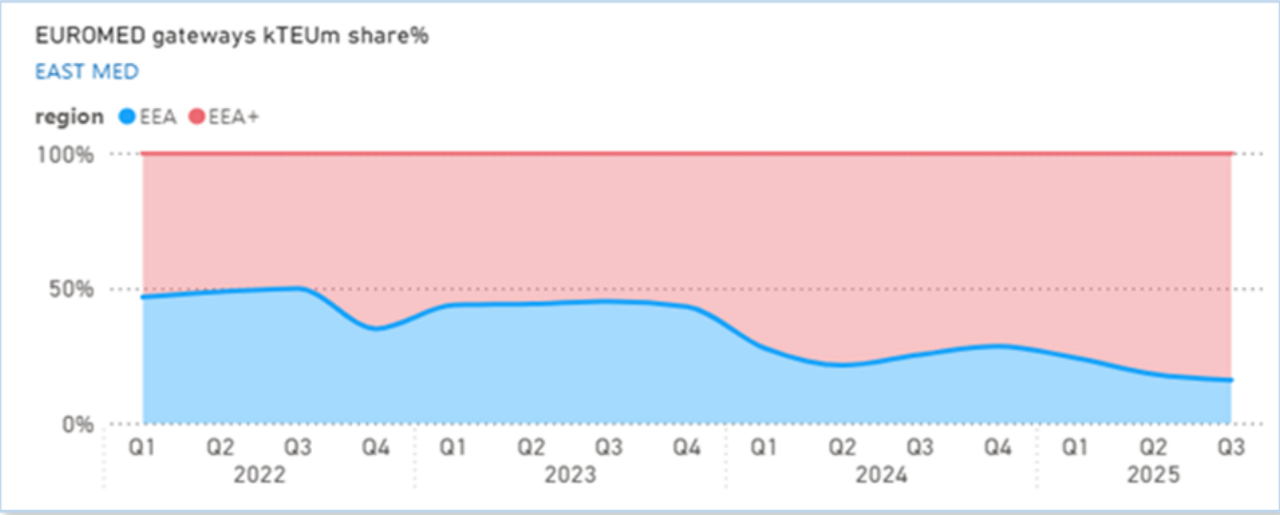
In **Egypt and Turkey**, the TEU-mile indicator on deep-sea routes responds to the canal closure **with sudden increases**.

In both Egypt and Turkey, after a correction, this **growth translates into a progressive and sustained increase in TEU-miles.**

Case Study I: Eastern Mediterranean

Phase I – Detection / Tier 1 (High level analysis)





EUROMED GATEWAY

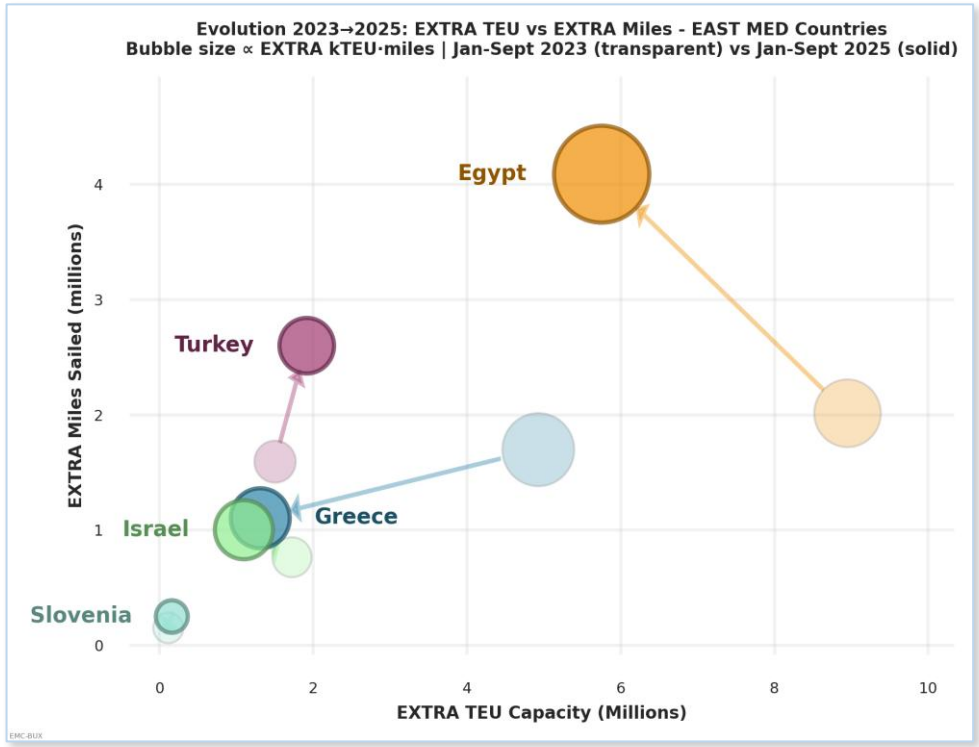
In the upper left-hand corner, the percentage growth of the **TEU-mile** indicator relative to the first quarter of 2023 is represented. **In Egypt, there is rapid and sustained growth of the indicator, and in Turkey, this growth is more erratic but reaches a similar order of magnitude**. Conversely, in **Greece, a progressive and steady reduction** in the value of the indicator is observed.

In the lower left-hand corner, the chart showing the evolution of the k TEU mile share illustrates this fact as a **constant and sustained loss of the TEU-mile market share for EU countries** in the Eastern Mediterranean relative to their neighbouring countries (primarily Egypt, Turkey, and Israel).

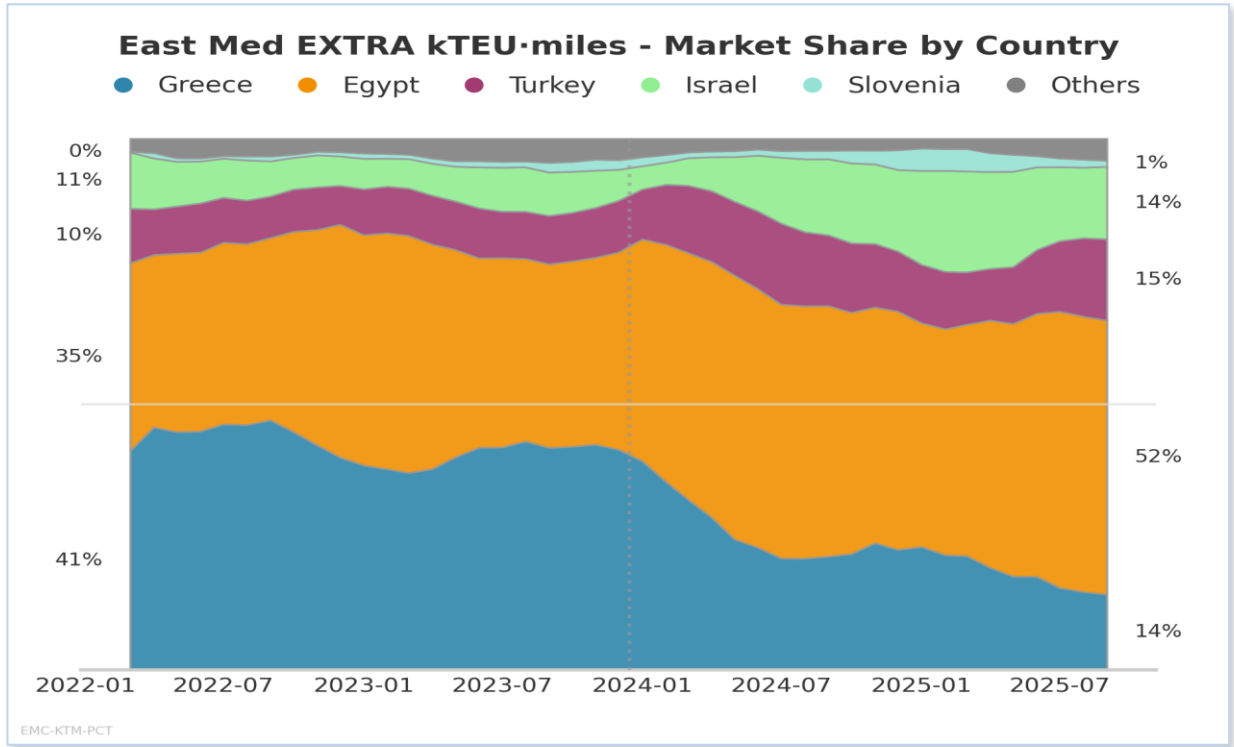
Case Study I: Eastern Mediterranean

Phase I – Detection / Tier 1 (High level analysis)

EUROMED GATEWAY



Greece is the country that loses the most connectivity, both in terms of capacity and distance (light circles, 2023 port status; dark circles, oct.2024-sep.2025 port status).

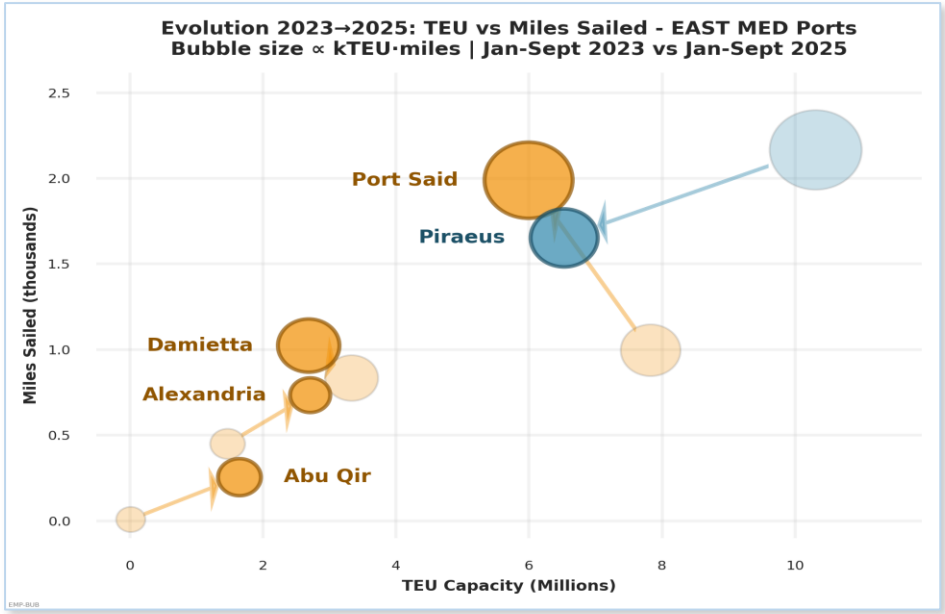


After the Red Sea crisis, Greece has progressively lost TEU-mile share, while Turkey, Israel and Egypt have gained TEU-mile share, with Egypt showing both the largest TEU-mile share and the strongest growth trend.

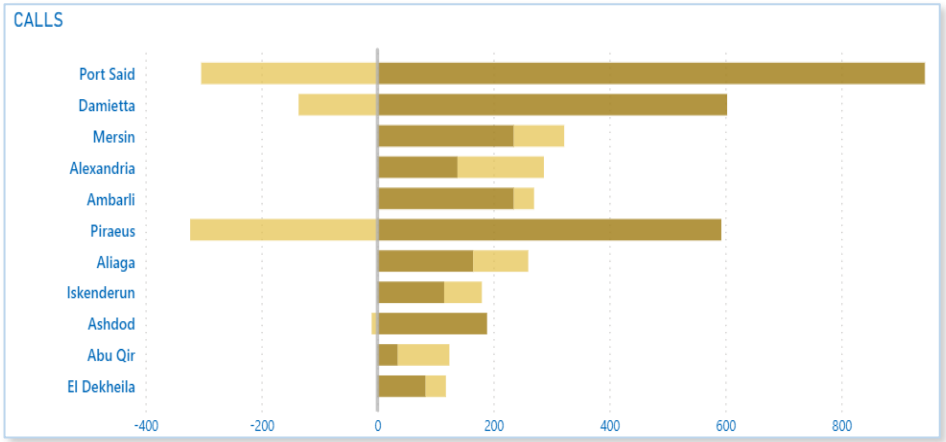
Case Study I: Eastern Mediterranean

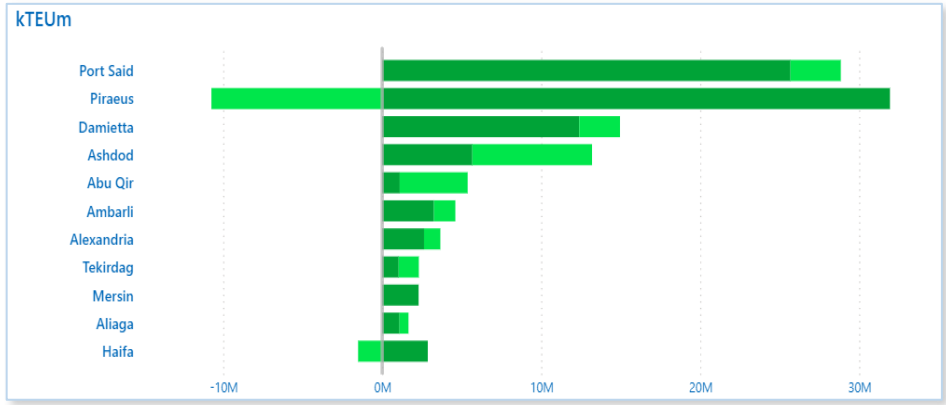
Phase I – Detection / Tier 1 (High level analysis)

EUROMED GATEWAY (2023 vs oct. 2024-sep.2025)



There has been rapid growth in both capacity and distance at the Egyptian ports of Abu Qir and Alexandria. Port Said has only lost capacity, while Piraeus has collapsed both in capacity and in distance. (light circles, 2023 port status; dark circles, 2025 port status)



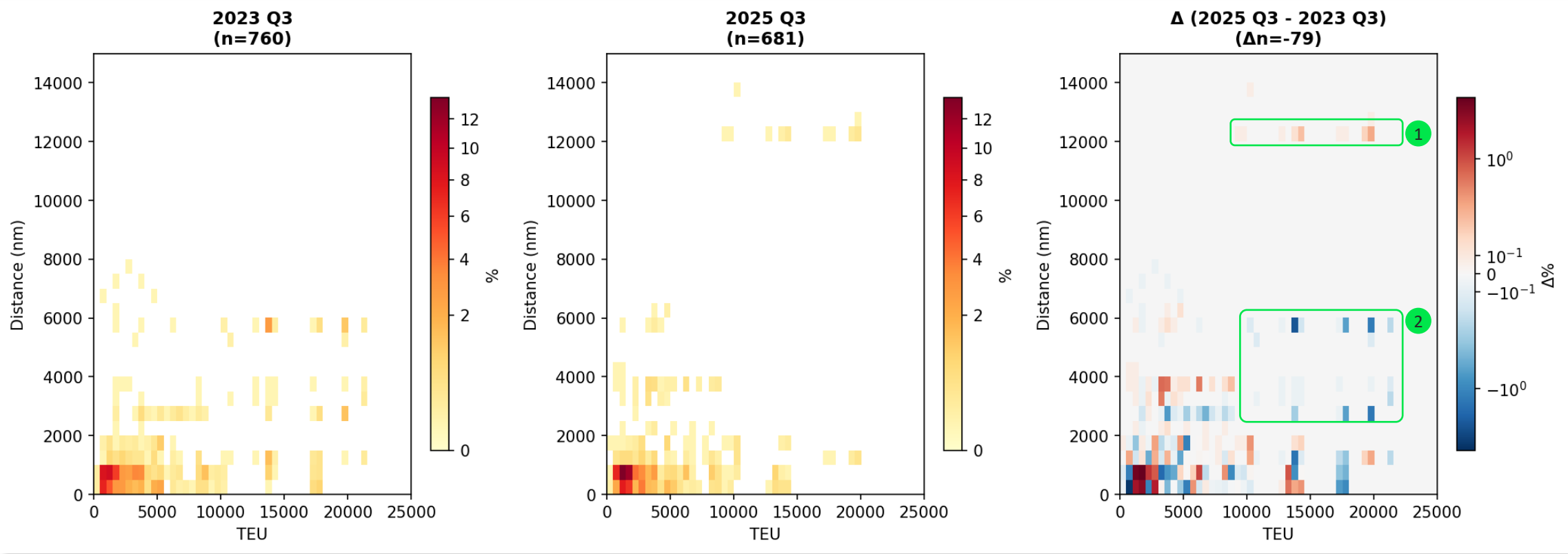


2023 value shown in dark color; increase in the period Oct. 2024–Sep. 2025 relative to 2023 shown in light color.

Piraeus has lost its hegemonic role as the primary gateway from Asia to Europe. The data shows **Port Said and Damietta** have not only absorbed the traffic lost by Piraeus but **have climbed the rankings,** becoming the new primary nodes for transshipment and break-bulk in the region, relegating Piraeus to a secondary feeder role.

Case Study I: Eastern Mediterranean

Phase I – Detection / Tier 2. Traffic crosstab of vessel capacity (TEU) vs distance (nm) for Piraeus



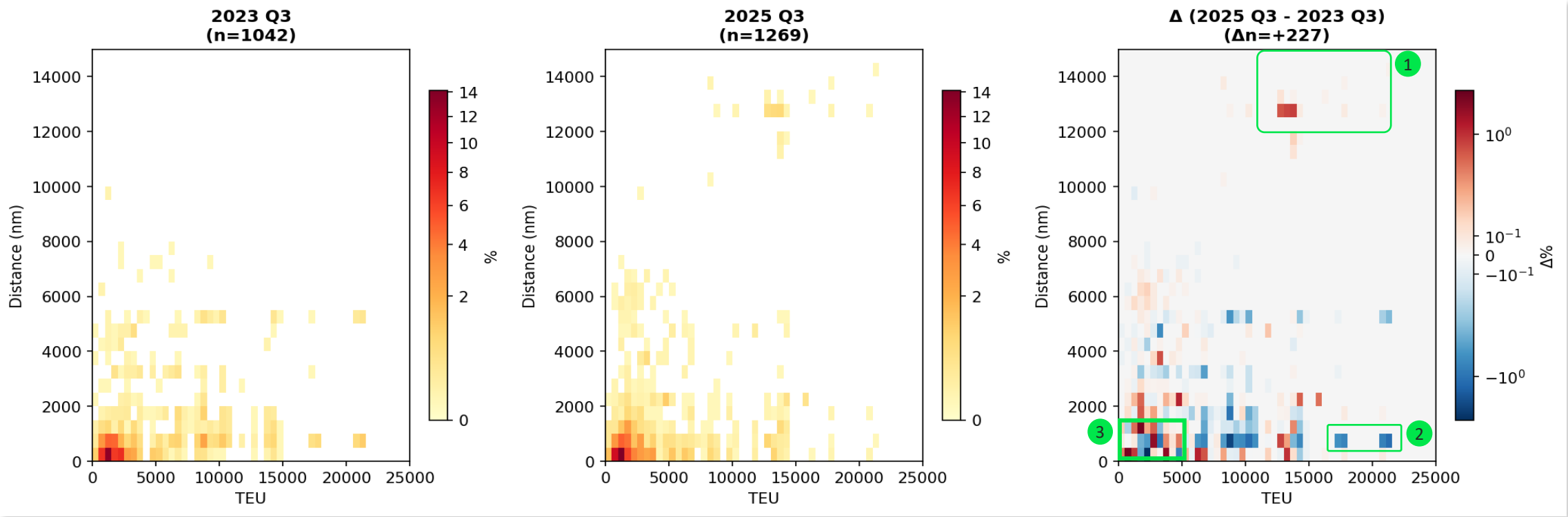
The X-axis represents vessel capacity in TEU; the Y-axis the distance sailed in miles; the color map shows the frequency (%) of each configuration in log-scale.

1 Piraeus experience a moderate growth on large container vessels on the long Cape route from 12.000 nm Asia. A total of 9 calls and 177.000 TEU in the 2025 quarter gained.

2 But the lost much more traffic, previously in the shorter route via Suez. The loss accounted for 39 calls or 760.000 TEUSs lost with regard the 2023 Q3.

Case Study I: Eastern Mediterranean

Phase I – Detection / Tier 2. Traffic crosstab of vessel capacity (TEU) vs distance (nm) for the four mayor Egyptian ports: Port Said, Damietta, Alexandria an Abu Qir



1 The Egyptian ports saw also an increase on the long-distance traffic with new Asia mainline services (+ 74 calls). These are large vessels (12,000-24,000 TEU) traveling ~12,000 nm from Far East.

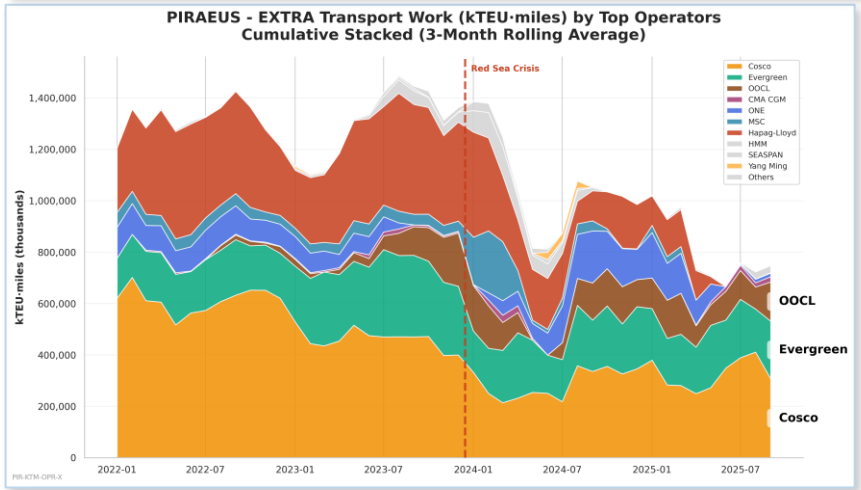
2 Egypt lost nearly 40 relay calls between King Abdulah (Saudia Arabia) and Piraeus or Gioa Tauro. Egypt gained significant direct connectivity to Asia that didn't exist in Q3 2023

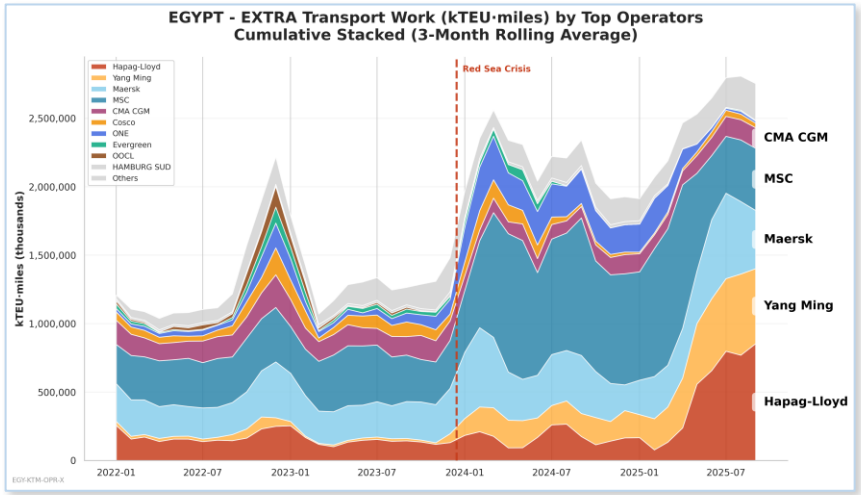
3 Feeder activity: vessels under 5.000 TEU on distances under 1000 nm grew +35% and should be further research.

Case Study I: Eastern Mediterranean

Phase I – Detection / Tier 3 (Service/company level)

EUROMED GATEWAY (2023 vs oct. 2024-sep.2025)





Greece: Since the channel closure, the TEU-mile indicator across all shipping lines — except ONE — shows downward trend.

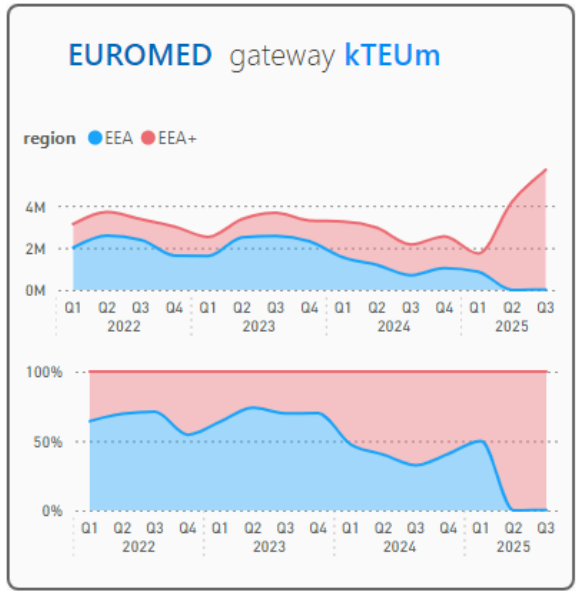
While COSCO maintains its presence in Piraeus (albeit with declining volumes), operators like **Hapag-Lloyd have aggressively shifted almost all transshipment activity to Damietta and Port Said.**

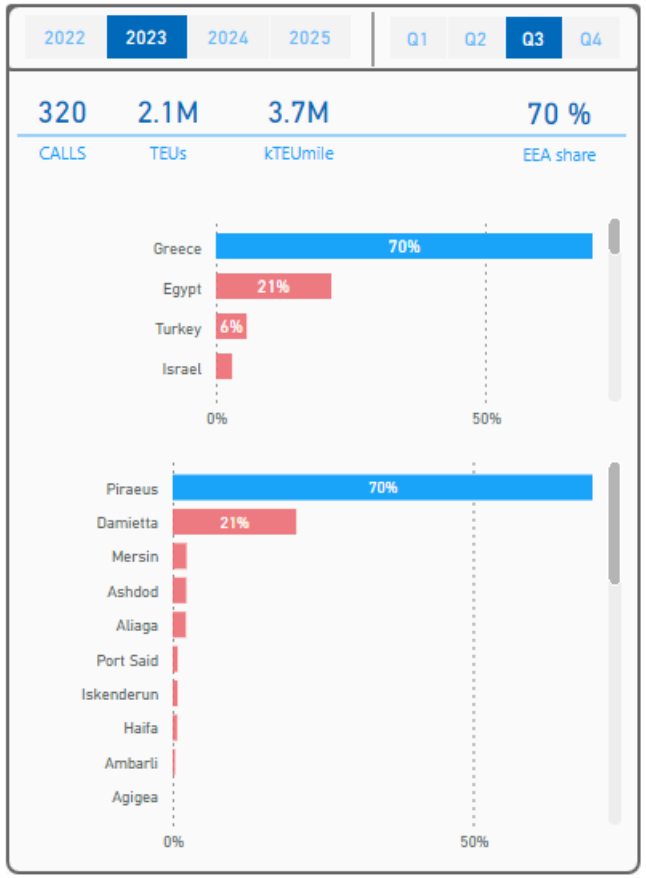
The entry of new players like Yang Ming directly into Egypt confirms **non-EU infrastructure is now the preferred choice for ULCV mother vessel deep-sea calls.**

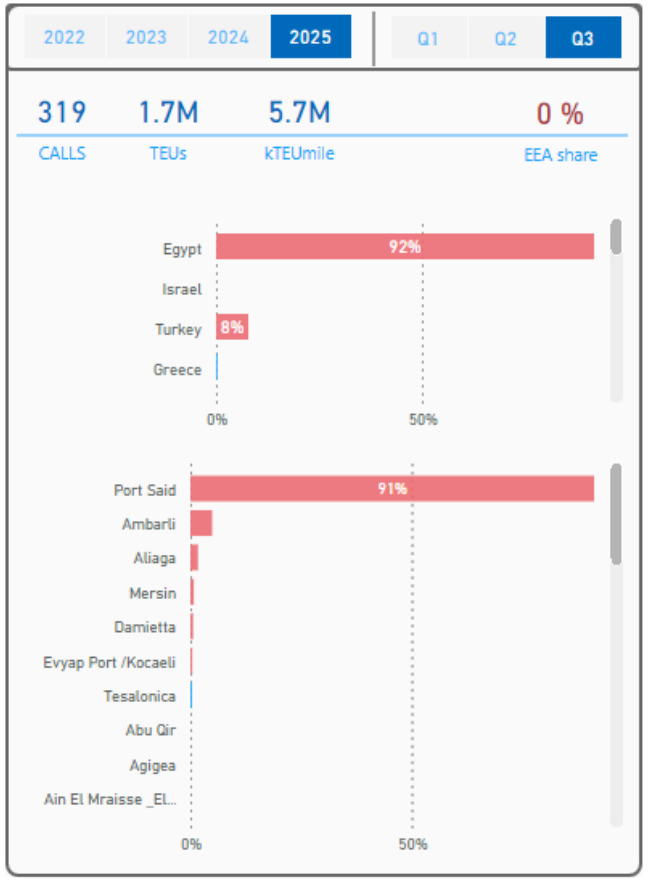
EGYPT: Most shipping lines are present in Egypt. MSC, Hapag-Lloyd and Yang Ming has experienced significant growth in TEU-miles

Case Study I: Eastern Mediterranean

Phase I – Detection / Tier 3 (Service/company level)







Hapag-Lloyd

Hapag Lloyd relocated all their long-distance operations off Piraeus to Port Said.

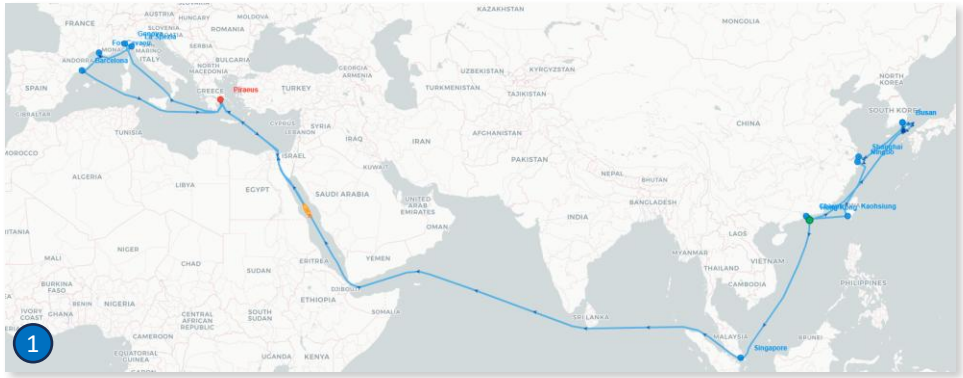
Case Study II: Eastern Mediterranean

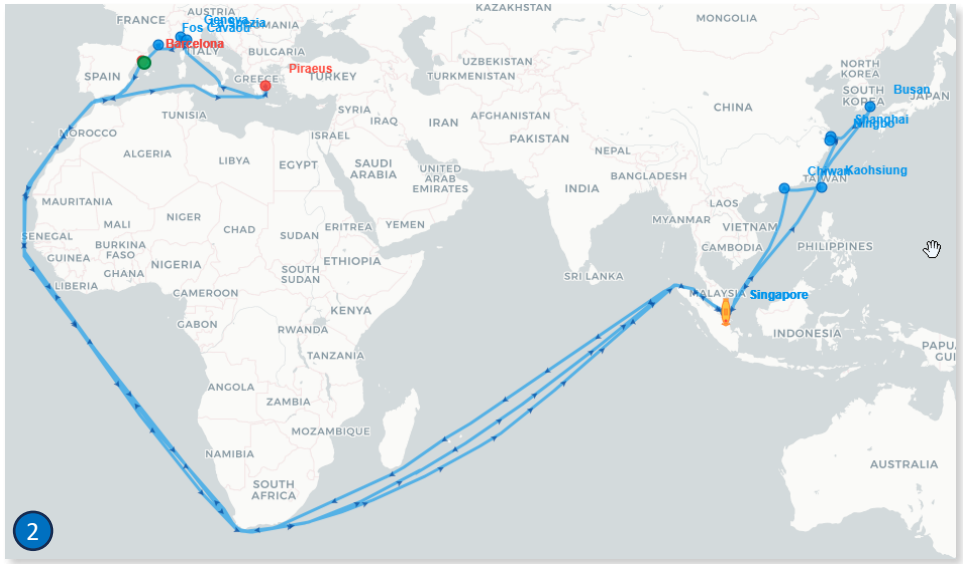
Phase I – Detection / Tier 3 (Service/company level)

The Red Sea crisis shaping the East Med shipping network: the case of AL DAHAIL, finding new ways to serve the region

AL DHAIL (9732307)

Hapag-Lloyd



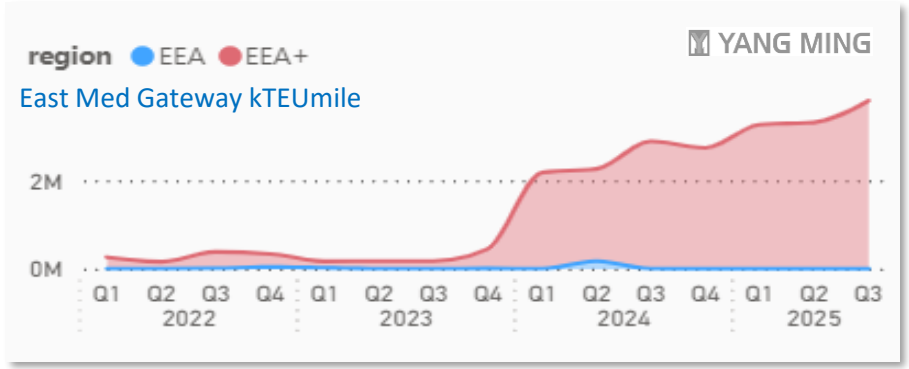


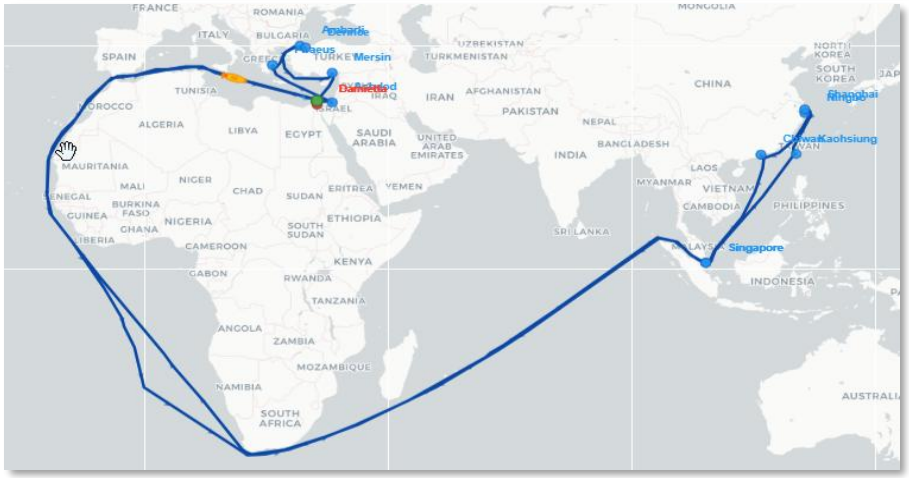
1. 2023: Suez-based loop → Piraeus as first Med hub
2. 2024: Cape of Good Hope loop → Piraeus retained but with reduced frequency
3. 2024 Hub shift → increased relay via Egypt/Turkey; Piraeus hub role lost, replaced by Port Said

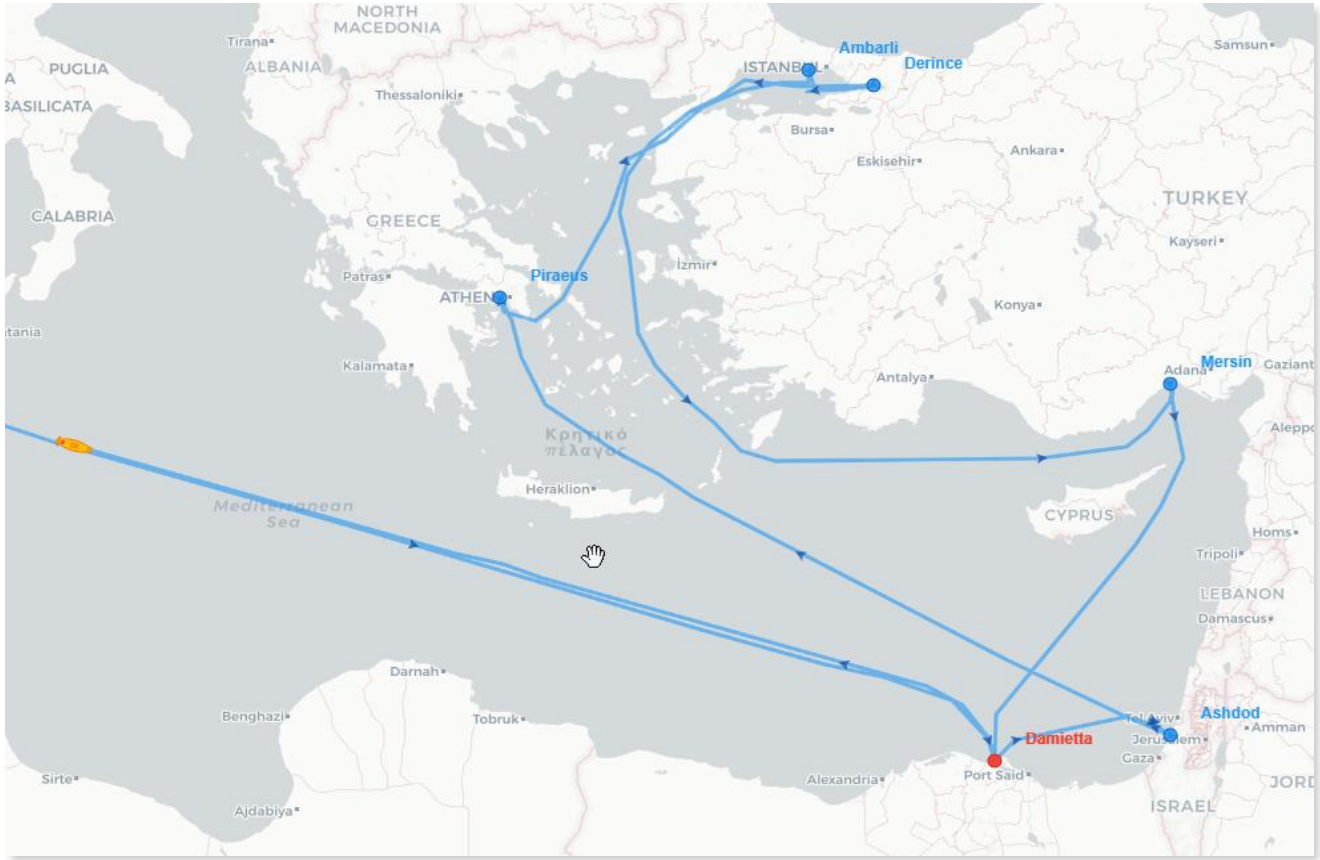
Case Study III: Eastern Mediterranean

Phase I – Detection / Tier 3 (Service/company level)

Yang Ming, the Taiwanese shipping line, seized the opportunity to expand into the Asia-East Med market in 2024, precisely when Piraeus was losing direct Asia services. Deploying a fleet of 14 New Panamax vessels (13,200-13,700 TEU), Yang Ming launched its FES (Far East-Suez) service with Damietta as gateway. Damietta is not included in the list of neighbouring transhipment ports. However, even if it were, the fact that the subsequent call (Ashdod) lies outside the scope of the EU would render this measure ineffective.







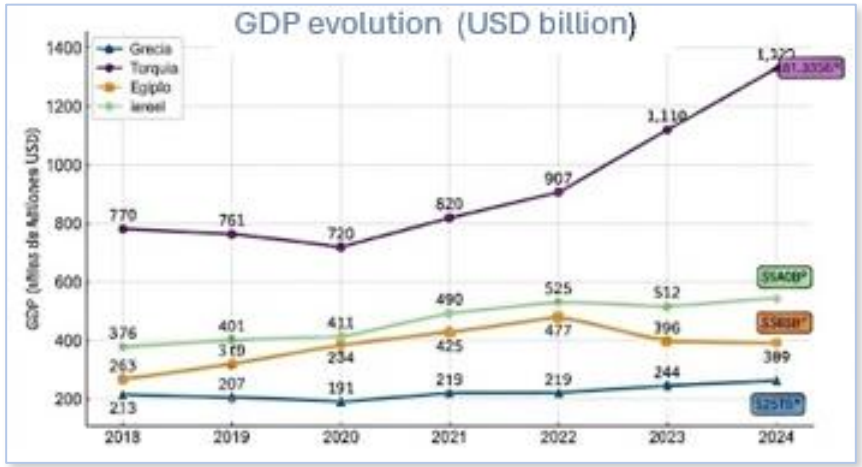
Case Study II: Eastern Mediterranean

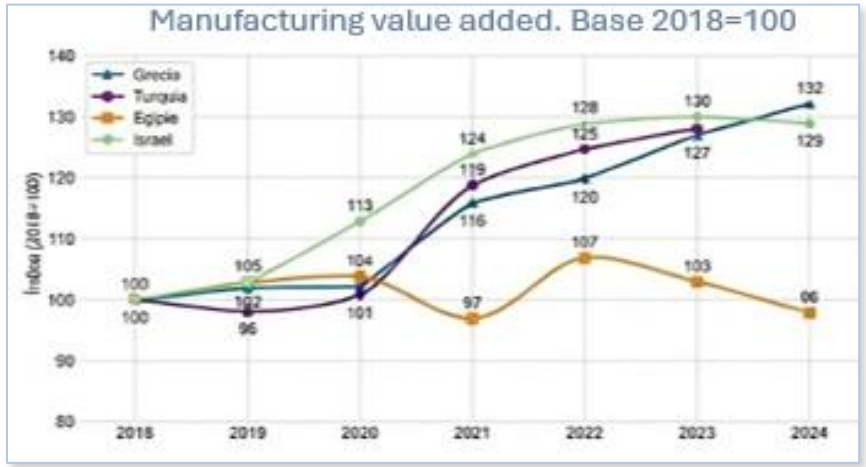
Phase I – Detection / Conclusions

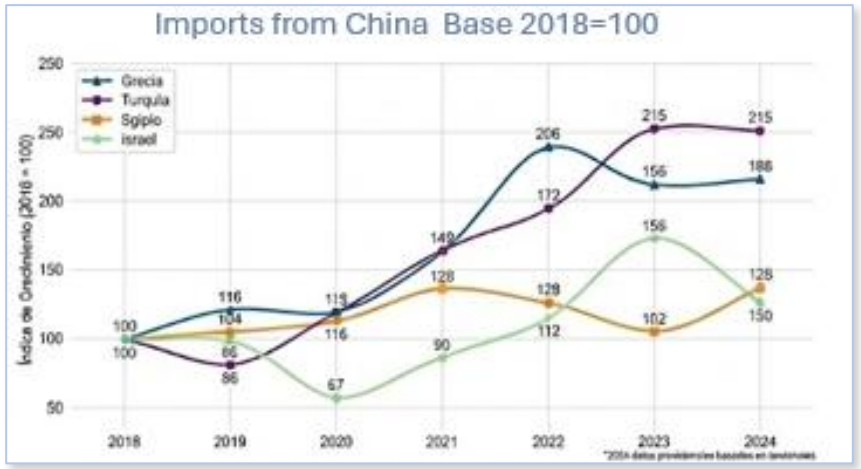
Tier	Detection	Findings
Tier 1	**Port level Activity**	**Significant loss of long-distance port calls at port of Piraeus** (42% -> 12%) **Market share gains mainly by Egyptian ports** (34% -> 50%) , also Israel and Turkey.
Tier 2	**Network Level structural metrics**	**Analysis ongoing**.
Tier 3	**Voyage-Specific behavioural metrics**	**Growth in Egypt supported by 5 top operators** : MSC, Maersk, Hapag-Lloyd, CMA CGM, Yang Ming. Piraeus held 42% of all EUROMED gateway traffic in the East Med region in 2023 lead by Cosco with his alliance partners and Hapag-Lloyd . Two years later Piraeus holds only 14%. Hapag-Lloyd moved its operations to Egypt, main winner, Israel and Turkey maintained their share. Yang Ming, a new regional entrant in 2024, gained 12% regional share operating from Egypt , calling Piraeus on a **regular basis with prior and subsequent call at non-EU ports.** The reorganization of shipping routes brought about by the closure of the canal has shifted transshipment activity, once concentrated at the Port of Piraeus in Greece, towards ports in third countries. Therefore, ports in Egypt have emerged as the principal transshipment hubs in the region, while Greece is apparently supplied via non-EU ports.

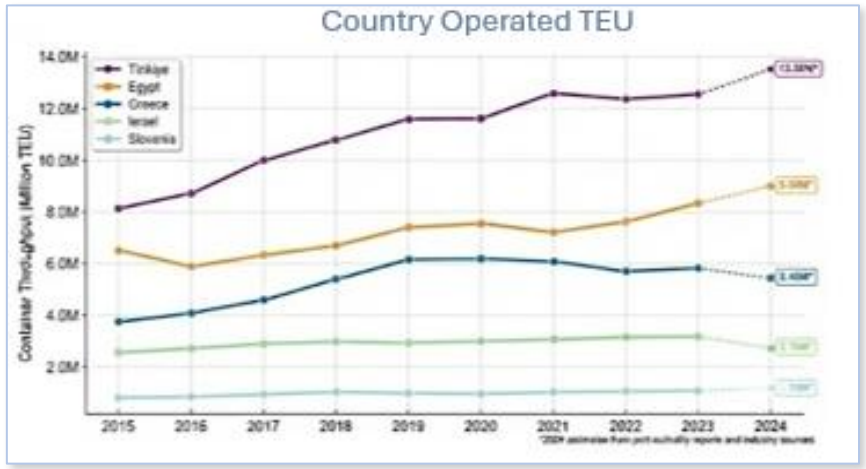
Case Study II: Eastern Mediterranean

Phase II – Attribution / Level 1/Economic Activity









Greece fundamentals remained strong entering 2024 except for operated TEU.

Egypt had weaker economic indicators, its growth in operated TEU and logistic dominance was not driven by internal demand.

Sources: World Bank (GDP, Manufacturing Value Added), UN Comtrade (China imports), UNCTAD (historical TEU throughput) and Ministries of Transport for 2024

Case Study II: Eastern Mediterranean

Phase II – Attribution / Level 1/Port Infrastructure

Country	Port	Type of action	Start date of the action	Date of commissioning	Estimated investment Millions of euros	Port capacity before the action Million TEUs per year	Port capacity after action Million TEUs per year	Promoter	Shareholders and/or Operators
Egypt	Damietta	New terminal (DACT)	2023	2026	570	2,0	5,3	Hapag-Lloyd, Eurogate, ContShip	Hapag-Lloyd, Eurogete, ContShip
	Abu Qir	New terminal (Hutchinson)	2021	2024	530	0	1,6	Egyptian Navy and Hutchinson	Hutchinson Ports
	Port Said	Improvement of SCCT´facilities	2023	2025	430	5,6	7,8	Suez Canal Container Terminal	APMT
	Alexandria	New Terminal (Tahya Misr2)	2022	2026	300	3,0	4,5	Hutchison, COSCO, CMA-CGM y TIL (MSC)	Hutchison, COSCO, CMA-CGM y TIL(MSC)

Case Study II: Eastern Mediterranean

Phase II – Attribution / Level 1/Port Infrastructure

Country	Port	Type of action	Start date of the action	Date of commissioning	Estimated investment Millions of euros	Port capacity before the action Million TEUs per year	Port capacity after action Million TEUs per year	Promoter	Shareholders and/or Operators
Israel	Ashdod	Improvement of Ashdod Port Company´facilities.	2024	2028	400	2,1	3,0	Ashdod Port Company (Government of Israel)	Ashdod Port Company
Türkiye	Ambarli	Improvement of Marport facilities	2021	2024	170	6,4	6,6	Marport	TIL (MSC) and Arkas Grop
	Mersin	New Terminal (EMH2T)	2023	2026	390	2,6	3,6	Mersin International Port	PSA, IFM, Akfen Holding.
	Aliağa	Improvement of SOCAR's facilities	2025	---	---	4,25	4,65	PUNCH	SOCAR, TIL (MSC)

Case Study II: Eastern Mediterranean

Phase II – Attribution / Level 1/Geopolitical and Regulation

The Red Sea crisis a global impact on world maritime trade, that hit the most in East Mediterranean.

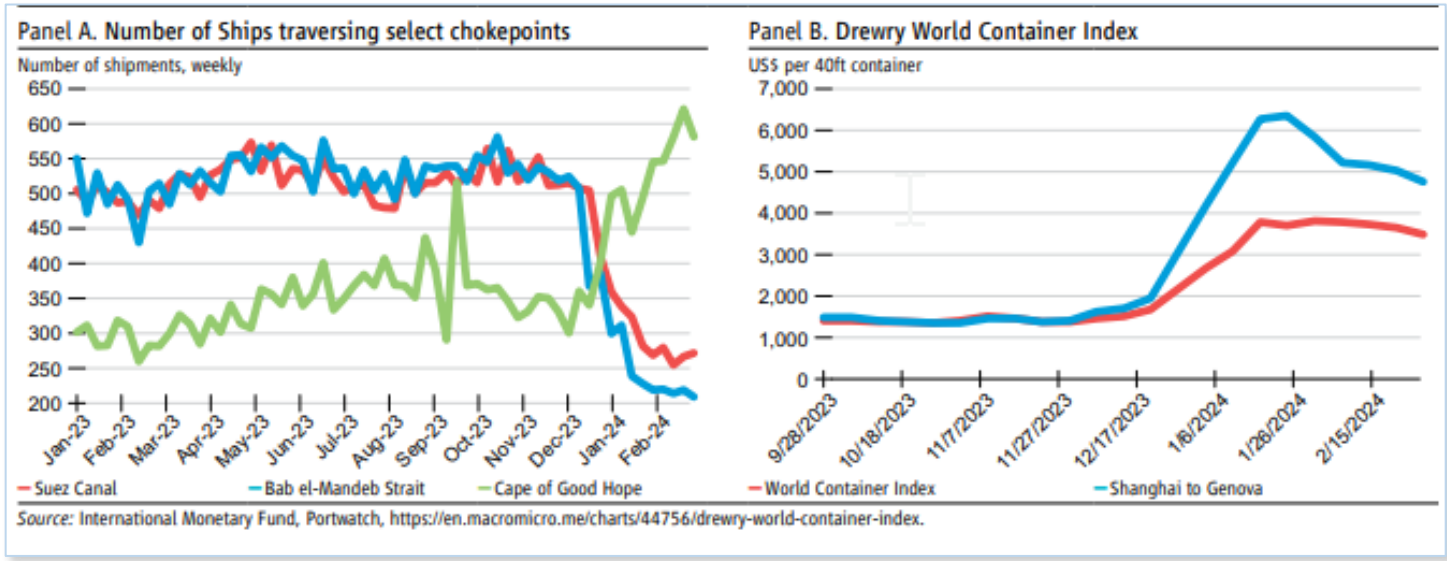
The crisis in the Red Sea, which began in November 2023, has radically transformed maritime traffic patterns in the Eastern Mediterranean (EAST MED), forcing the diversion of Asia-Europe routes via the Cape of Good Hope instead of entering the Mediterranean through the Suez Canal. Freight rates soared on the Asia-Europe routes and indirectly affected the rest of the traffic.

Magnitude of the Deviation: Singapore - Rotterdam

- Distance via Suez: 8,300 nautical miles.
- Additional Distance: +3,500 nautical miles (+40% of total distance).
- Additional transit time: +8-12 days per voyage.

Magnitude of the Deviation: Singapore - Piraeus

- Distance via Suez: 5,650 nm.
- Additional Distance: +6,800 nm (+120% of total distance).
- Additional transit time: +14-16 das per voyage.



The additional direct costs on the ASIA-EAST MED routes are estimated at around €100 per TEU, after discounting the approximately €32 per TEU in Suez Channel fees.

Shipping companies are applying even higher 'transit disruption surcharges': Maersk is applying $200-$500 per TEU, and MSC is applying $500 per TEU (as of January 2024).

Case Study II: Eastern Mediterranean

Phase II – Attribution / Level 1/Geopolitical and Regulation

The region before and after the Red Sea crisis

Ports EAST MED by EEA status (Jan-Sep 2023 vs Jan-Sep 2025)

Region	2023 Calls	2025 Calls	Δ Calls	2023 TEU	2025 TEU	Δ TEU	2023 kTEUm	2025 kTEUm	Δ kTEUm
EEA+ ports	18,567	20,674	+11.4%	53.2	55.4	+4.1%	37.4	60.1	+60.7%
EEA ports	6,038	6,143	+1.7%	19.2	15.3	-20.0%	23.2	15.1	-35.0%
Difference Δ (pp)			+9.7			+24.1			+95.7

Amidst a crisis that uniformly impacts the entire region (the closure of the Suez Canal), the response from ports has been radically divergent based on their regulatory status. From a geostrategic point of view all the zone was affected as shifting from a fast corridor to become a cul-de-sac.
In geographic terms, port of Piraeus was the closest port in the new eastbound route from Gibraltar strait.

EEA+ ports grew modestly in TEUs (+4.1%), while EEA ports collapsed (-20.0%), representing a divergence of 24.1 pp. that cannot be explained by geographical or market factors. Simultaneously, EEA+ ports increased their Transport Work (kTEUmile) by 60% thereby maintaining transoceanic services—while EEA ports saw a deep 35% drop in this key indicator.

Interpretation: with a common shock (Suez disruption), EEA+ ports expand long-distance exposure (+60% kTEUmile), while EEA ports lose transoceanic connectivity (-35% kTEUmile). This regulatory split is consistent with ETS-driven hub reallocation.

Case Study II: Eastern Mediterranean

Phase II – Attribution / Conclusions

Level	Attribution	Finding
1	Has there been a significant improvement in Egyp ´s the economic activity?	Egypt's GDP and trade volumes have not grown significantly enough to explain the surge in port activity. The increase is not driven by higher Egyptian import/export demand but rather reflects a structural shift in regional transshipment patterns away from Piraeus.
	Has there been a reduction in operating costs at Egyptian or other non-EU ports?	In the current global inflationary environment, there is no evidence that Egyptian ports have achieved meaningful cost reductions relative to Piraeus or other East Med competitors. Port tariffs and handling costs do not seem the differentiating factor driving the traffic shift.
	Do ports Egyptian or other non-EU have better infrastructure or greater capacity?	Piraeus is already a fully-developed hub with adequate capacity. Nevertheless, in Egypt investments have been approved either in new terminals (Abu Qir, Alexandria, and Damietta) or in the expansion of existing ones (Port Said), which will allow total capacity to increase from 10.6 million TEUs per year in 2023 to 19.2 million TEUs per year in 2026, as well as enabling the handling of vessels with capacities exceeding 20,000 TEUs
	Are there structural congestion problems at EU Eastern Mediterranean ports?	Piraeus has available capacity. EU ports in the Eastern Mediterranean have not presented congestion problems that would force carriers to seek alternatives. Congestion is not pushing traffic to Egypt.

Case Study II: Eastern Mediterranean

Phase II – Attribution / Conclusions

Level	Attribution	Finding
1	Could the expiration of the CBER have given any advantage to non-EU Eastern Mediterranean ports?	In Egypt there are laws and authorities aimed at protecting competition and prohibiting monopolistic practices.
	Could the closure of the Suez Canal have given any advantage to non-Eu ports?	With Suez closed, Piraeus should theoretically gain advantage as first Mediterranean call for Cape-routed services entering via Gibraltar—proximity to Suez becomes irrelevant. Yet Egyptian ports continue gaining share, suggesting the shift is driven by other factors beyond geography.
	Is there any other factor that could increase the profitability of a transoceanic service if it makes an intermediate call at Eastern Mediterranean ports?	ETS costs for a single Singapore-Piraeus ULCV voyage increased from €225k to €500k under Cape routing (+120%), more than doubling the regulatory incentive to call non-EU ports first.
2	Quantitative verification	Not applied yet by the EU ETS Observatory.

Table of Contents

Prediction Service

Introduction

The objective of the prediction service is to **analyse and anticipate the effects of including maritime transport in the EU Emissions Trading System (EU ETS) on shipping routes and Spanish ports**, providing strategic information to support decision-making.

Currently, the service has been implemented for the **four main Spanish ports: Barcelona, Valencia, Algeciras, and Las Palmas**. In the coming months, it will be extended to **all European ports at risk** due to the EU ETS implementation.

The results presented here correspond to a **first iteration**, meaning that findings may be updated in future releases as more data and scenarios are incorporated.

1. **Cost Model** – calculate savings and/or additional costs of reconfigured routes.
2. **Econometric and Predictive Model** – analyze shipping company decisions and predict impacts on ports.
3. **Scenario Simulation** – evaluate the effect of parameter changes and conduct sensitivity analysis.

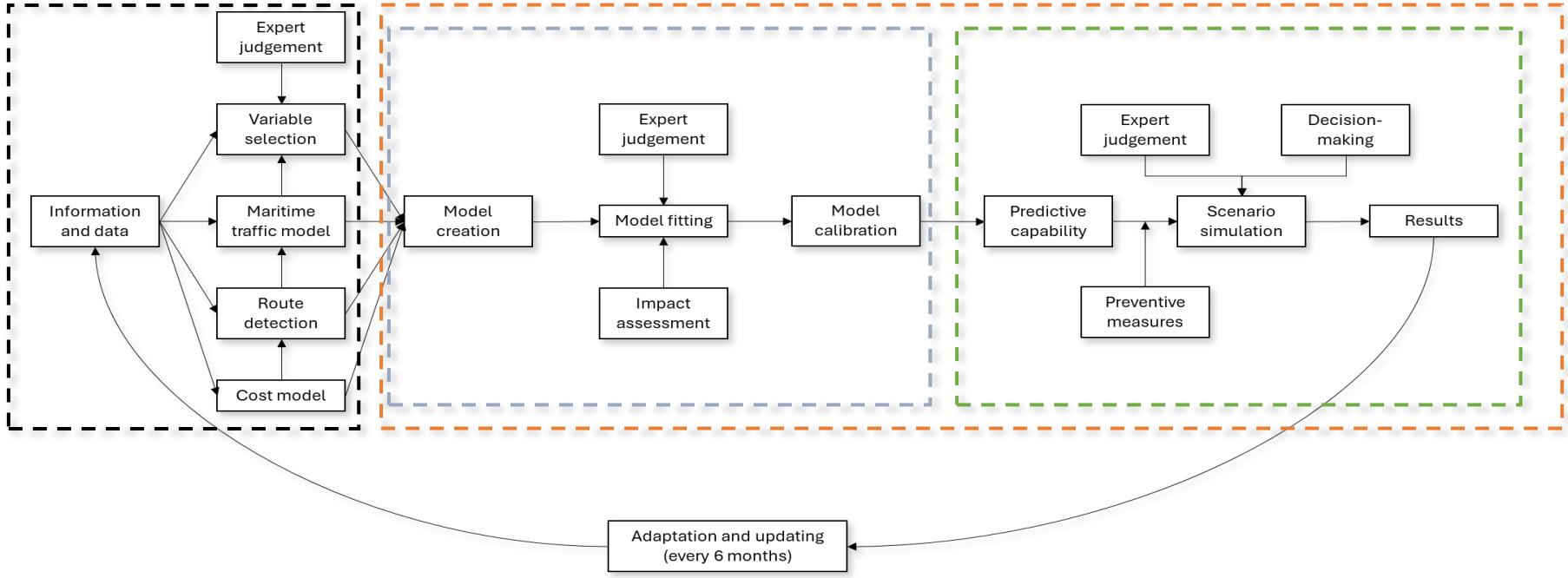
Prediction Service

Overview of the Work Stages

Stage 1: Information gathering and data structuring.

Stage 2: Modelling methodology.

- **Stage 2.1:** Modelling.
- **Stage 2.2**: Predictive application and scenario analysis.



Prediction Service

Methodology

- To evaluate the impacts of the EU ETS on shipping routes and Spanish ports, a **structured methodology** was implemented combining economic assessment, predictive modelling, and scenario simulation.
- This approach allows for a **quantitative evaluation of the economic implications** of potential route reconfigurations, while providing insights into how shipping companies make decisions under regulatory changes. At the same time, it anticipates **the effects on ports at risk** and on overall maritime traffic distribution. Finally, it enables the testing of **different "what-if"** scenarios to support informed strategic decision-making.

1. **Understand the regulatory and economic implications** of the EU ETS on shipping companies and port activity.
2. **Develop a robust predictive model** combining economic, technical, and traffic data with expert judgment to evaluate different scenarios.
3. **Identify vulnerable ports** and anticipate potential shipping traffic reconfigurations.
4. **Support strategic decision-making** for public authorities and private operators.
5. **Establish a dynamic, updatable tool** capable of periodically adjusting predictions in response to new data or regulatory changes.

Prediction Service

Cost Model

- The cost model evaluates the main expenses in maritime routes, including fuel, capital, operations, emissions, port fees, and crew costs. It compares the total annual costs between the current route configuration and potential route reconfigurations to assess savings or additional costs.

Main Costs

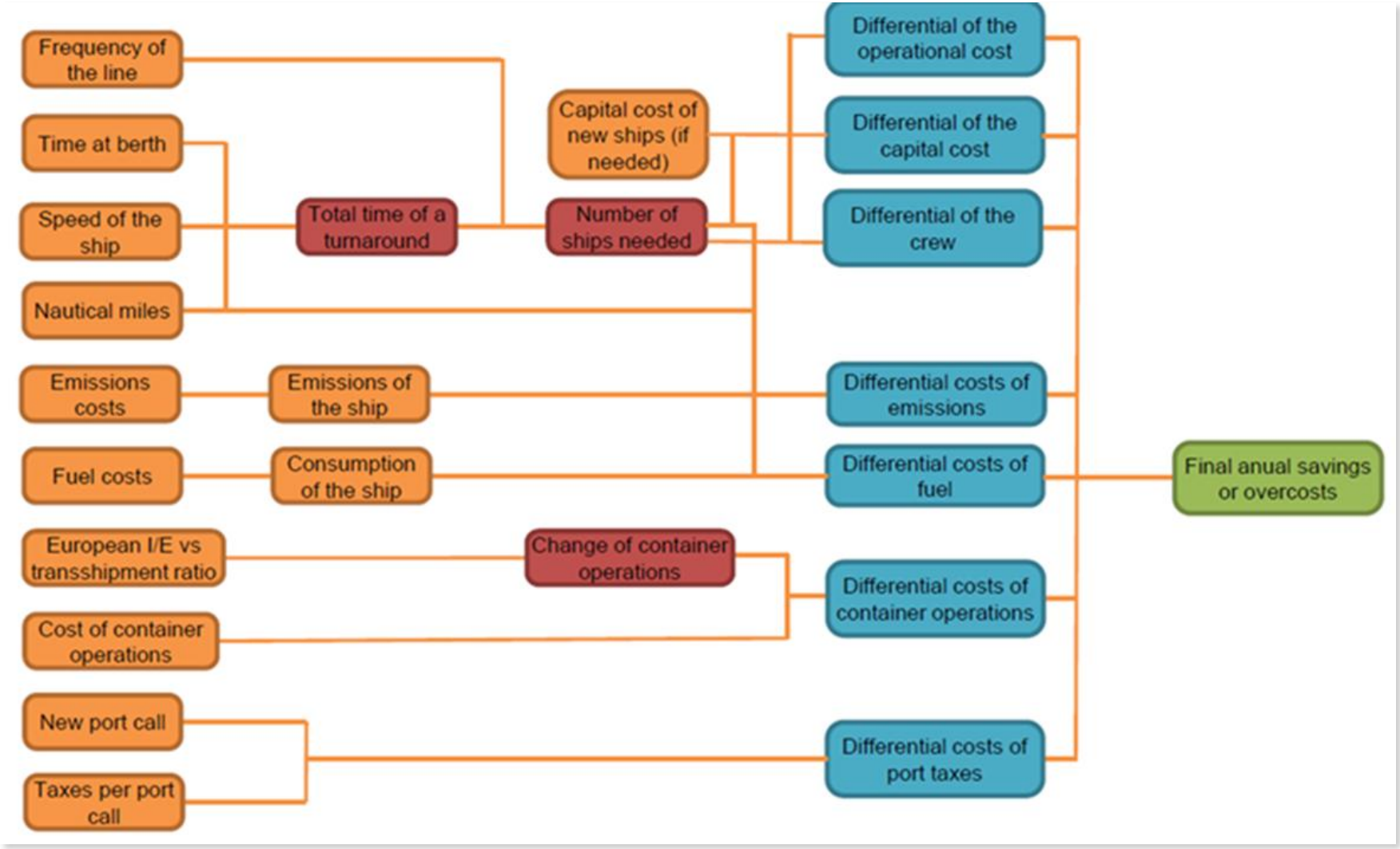
- Navigation Costs: Fuel costs, capital costs (CAPEX), and operating costs (OPEX).
- Emission Costs (EU-ETS).
- Operational Costs.
- Port Fees.
- Crew Costs.

Cost Analysis Methodology

- Base Scenario (Status Quo).
- Route Reconfiguration.
- Comparative Analysis (savings or additional costs).
- $CT = N_e R_e \cdot (OPEX_e + CAPEX_e) - N_n R_n \cdot (OPEX_n + CAPEX_n)$
- Where:
  - CT > 0 indicates the new route is cheaper (i.e., it reduces costs).
  - CT < 0 indicates the new route increases costs.
  - N_e, N_n: The number of existing (e) and new (n) vessels, respectively.
  - R_e, R_n: The number of rotations of the existing (e) and new (n) vessels, respectively, per year.

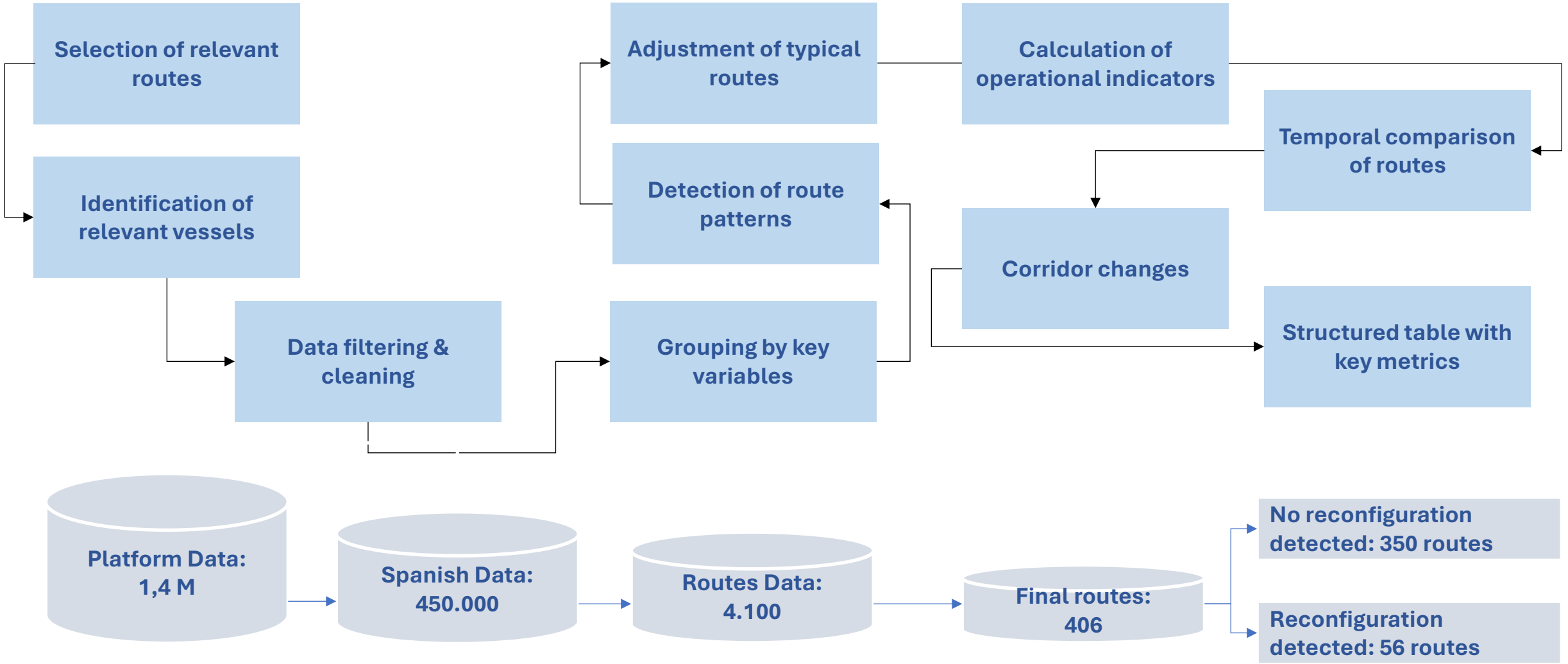
Prediction Service

Cost Model



Prediction Service

Route reconfiguration detection



Prediction Service

Selection of variables for the model

Dimension	Selected Variables	Description	Source
Identification and context	• Year • Service identifier • Group • Operator name	Basic information on maritime services and their operators. Enables longitudinal analysis and segmentation by actors.	Data platform
Technical and operational characteristics	• CATEGORY • GT • TEUs	They describe the nature of the service, the size of the vessels and their capacity, which are fundamental elements for estimating costs and elasticities.	Data platform
Costs	• Costs	Savings or additional costs of reconfiguring the route compared to the previous year.	Cost model
Recent changes and reconfiguration	• New ports • Reconfiguration (binary) • Total distance • ETS emissions	They enable the detection of recent adaptation patterns at the route and port level. The second is considered as a response variable of the model (whether or not there is route reconfiguration). And the total distance and ETS emissions for the entire route.	Algorithm: route reconfiguration detection
International economic and logistical environment	• GDP • LSCI • Total trade	Structural characteristics of countries of origin/destination, relevant for understanding decisions regarding scale and connectivity.	Model of traffic maritime volume

Prediction Service

Econometric and Predictive Model

- **Logistic regression model** (logit) to predict the probability that a shipping line will **change or not change** a maritime route:

$$logit(P) = \ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 \cdot X_1 + \beta_2 \cdot X_2 + \cdots + \beta_k \cdot X_k$$

Numeric variables considered in the model, with scaling applied where necessary:

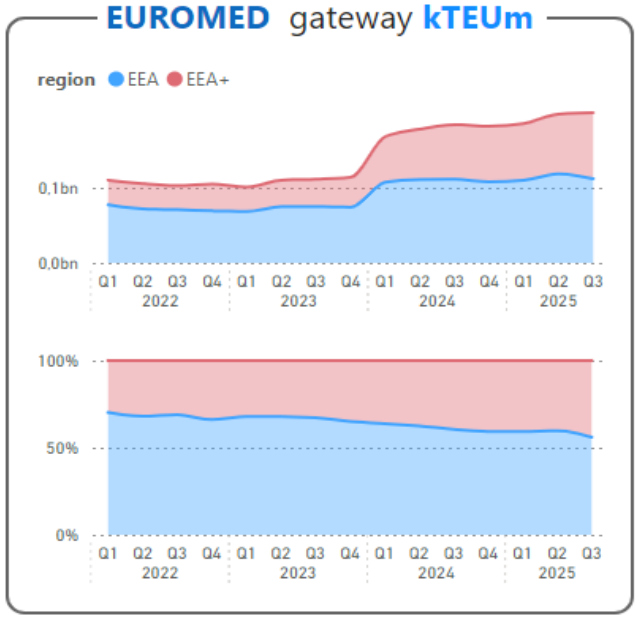
- **Year**: a constant value has been subtracted to centre the variable around zero, in this case 2022.
- **Costs**: the scale of the variable has been adjusted without changing its shape (dividing by 1 million).
- **ETS emissions**: the scale of the variable has been adjusted without changing its shape (dividing by 1 kiloton).
- **Distance:** the scale of the variable has been adjusted without changing its shape (dividing by 1.000 nautical miles).
- **PIB per capita:** already in standardized units, so no scaling is needed.
- **Evaluation of alternative routes:** If the decision is made to change the route, the model will calculate the probabilities of choosing different alternative routes, enabling an informed assessment.

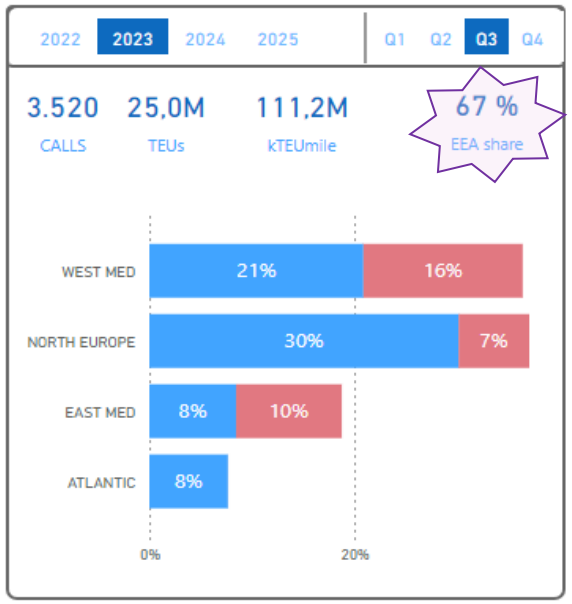
Table of Contents

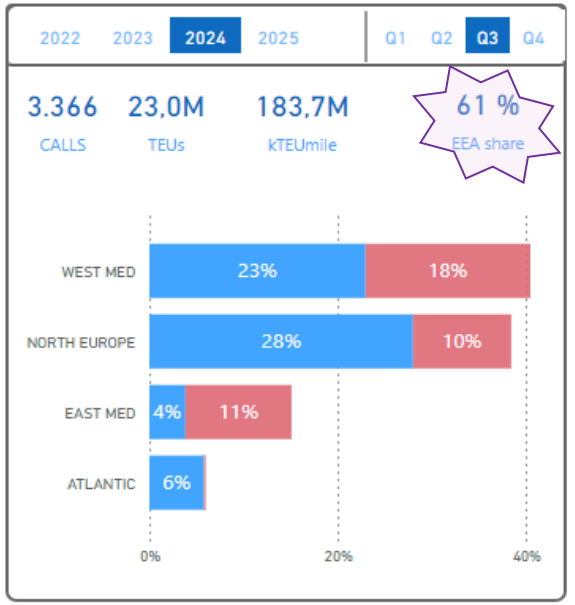
First results and conclusions: Monitoring service

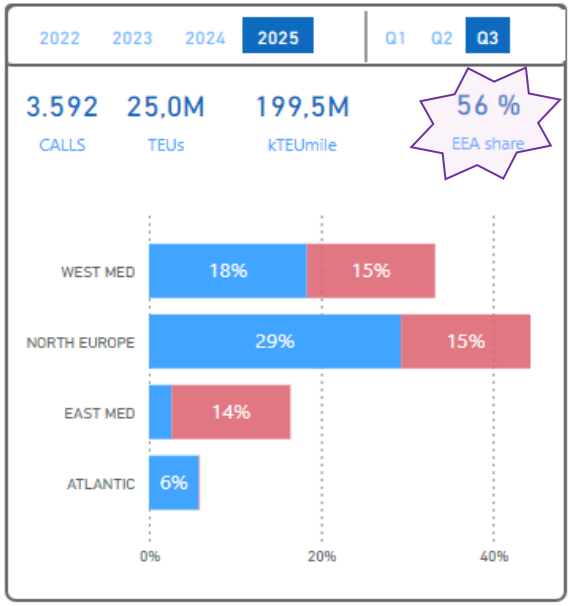
The **market share of the main gateway European ports in terms of long-distance kTEUmile decreases from 67% in 2023 to 56% in 2025**, with the **strongest signals in North Europe and East Med**, whereas the neighbouring non-EU ports (EEA+) increases their market share, from 33% in 2023 to 44%.

Given the relationship between the TEU-mile indicator, maritime connectivity and CO_2 emissions, a decline in the EU's share of TEU-miles entails, on the one hand, a **progressive erosion of connectivity at European Union ports**, with deep-sea activity increasingly shifting towards neighbouring countries — mainly the United Kingdom and Egypt — and, on the other, a net reduction in the proportion of emissions falling within the scope of the EU ETS, as part of the activity moves beyond its regulatory perimeter.









First results and conclusions: Monitoring service

- Detection results show a **sustained increase in the role of ports outside EU ETS regulation, mainly in UK and Eastern Mediterranean**, as gateways for long-distance routes. These ports are capturing Asia-Europe and transatlantic trades that previously called at EU ports as first or last European stop.

  - In term of kTEU-mile share, **UK represented in 2023 the 17,5%** of the market of UK, Germany, France, Belgium and Netherlands and represents 32,1% in July of 2025, nearly double. **The UK's 15% points gain in TEU-mile share is almost symmetrical to the combined loss of the Netherlands and Germany.**

  - In the Eastern Mediterranean, in **2022 Greek port of Piraeus handled the 41%** of the total kTEU-mile of the Eastern Mediterranean market (basically, Greece, Egypt, Turkey, Israel and Slovenia), a share that descreased to **14% by 2025. Egyptian ports have recorded the strongest growth** in the region in terms of kTEU-miles, increasing their market share from 35% in 2022 to 52% in 2025.

- In terms of maritime services in 2025 by shipping alliances, there is a marked increase in the role of UK ports and ports in the Eastern Mediterranean in most of the the new shipping alliances.

Some examples:

- **One-HMM-Yang Ming shipping alliance**. Their deep-sea presence in the **UK ports increases from 10% to 44%, in terms of TEU handled,** for their North Europe trade, mainly the port of Southampton that bypass Rotterdam.

- H**apag-Lloyd**. Ports in Egypt and Türkiye increased their share of operations, in terms of TEU handled, in the **Eastern Mediterranean from 27% in 2023 to nearly full coverage** by Q3 2025.

- Significant new investments are planned in UK ports—such as Port of Southampton, London Gateway and Port of Felixstowe—as well as in ports in the Eastern Mediterranean, including Port Said, Damietta Port, Port of Alexandria and Abu Qir Port. Planned new investments in Israeli, Turkish and Egyptian ports represent a 43% increase in current port capacity, measured in million TEU handled per year. The planned investments in British ports correspond to a capacity increase of 21%. These investments aim to accommodate larger vessels and to develop new terminal infrastructure.

First results and conclusions: Monitoring service

- The EU ETS introduces an additional cost that is particularly significant for transoceanic container routes operating under a transshipment model. This additional burden places operations carried out at European Union ports at a competitive disadvantage relative to those undertaken at ports in neighboring countries.

  This cost differential creates a clear economic incentive for the gradual relocation of connectivity and transshipment activity from EU ports to ports in nearby states. Until recently, however, such a shift was constrained by the costs associated with reconfiguring shipping routes and by the limited availability of suitable infrastructure outside the EU.

  The closure of the canal and the end of the CBR, together with the completion of major port expansion and modernization projects in neighboring countries, have nonetheless acted as catalysts for a broader reorganization of shipping networks. This restructuring appears, likely, to have been searching to minimize overall operating costs, including those arising from the application of the EU ETS.

  Against this backdrop, the growing gains in transoceanic connectivity recorded by ports in the United Kingdom and Egypt constitute a plausible outcome of this competitive adjustment, in which EU-ETS cost may have play a significant role. This development is difficult to attribute to alternative explanations such as congestion at EU ports, a sudden reduction in operating costs at neighbouring ports, or any deterioration in the quality of service or infrastructure within the EU. Nor do the closure of the Suez Canal or the termination of the CBER, in themselves, confer any evident competitive advantage on those countries.

  Moreover, the substantial investments undertaken to expand capacity and strengthen port provision in the United Kingdom and the Eastern Mediterranean suggest that the increasing prominence of these locations within global container shipping networks may reflect a structural rather than a cyclical or short-term shift.

  Taken together, these considerations underscore the need to review and adapt the regulatory design of the EU ETS to provide specific treatment for container transshipment routes and to avoid placing European Union ports at a structural competitive disadvantage vis-à-vis neighbouring countries.

First Results and conclusion: Predictive service

Model parameter and relative importance

Variable	Coefficient (β_i)	$OR = e^{\beta_i}$	Relative importance
Intercept	-6,05148	0,0023	12,5%
Year	0,76998	2,1597	31,3%
Costs	0,07283	1,0755	18,8%
ETS emissions	0,14542	1,1565	18,8%
Distance	0,06366	1,06573	18,8%

- First results of the predictive logit model indicate that time-related effects (Year) are currently the most influential factor, reflecting the absence of route reconfigurations in 2022 and the increasing number of changes observed in subsequent years. Therefore, this parameter captures the effect of the closure of the Suez Canal and the termination of the CBER.
- Costs, ETS-related emissions, and distance also show a positive influence on the probability of route reconfiguration, highlighting the combined economic and regulatory drivers behind shipping decisions. The ETS-relate costs represents almost the 19% of the decision.

- These findings correspond to preliminary results, based exclusively on routes passing through the four Spanish ports analyzed: Barcelona, Valencia, Algeciras, and Las Palmas.
- As the analysis is expanded to include all European ports at risk and additional updated data, the estimated coefficients and their relative importance may change.
- The model structure is expected to evolve over time, potentially incorporating new explanatory variables and removing others—such as the Year variable, whose current relevance is linked to the early phase of EU ETS implementation.

Areas of further research:

Leakage patterns: To deepen the Tier 2 (Network) analysis in order to quantify more rigorously the changes in the hub-and-spoke model, transshipment calls (relay calls) and overall connectivity, with a view to accurately identifying and mapping the various leakage mechanisms, whether manifesting as route transformation or as outright rupture.

Extension of scope: To broaden the analysis undertaken in the Eastern Mediterranean to encompass the entire Mediterranean area, providing a more detailed characterization of maritime traffic flows between ports across the region.

Reopening of the Suez Canal: To assess the evolution of maritime traffic in the context of the gradual reopening of the Suez Canal, identifying potential reversal effects or, alternatively, the consolidation of previously observed diversions.

Model recalibration: To recalibrate the discrete route choice model by incorporating data from Northern European ports and from across the Mediterranean, thereby strengthening its explanatory and predictive capacity. Additional variables will also be introduced into the modelling framework.

Impact of Nador West Med: To apply the recalibrated model in order to estimate the effects of the commissioning of the port of Nador West Med on route configuration and the distribution of connectivity.

Ro-Ro transport: To examine the potential impact of the EU ETS on Ro-Ro traffic, assessing whether the temporary absence of an equivalent measure in the road sector may be diminishing the competitiveness of Ro-Ro services relative to road freight.

Assessment of preventive measures: To analyze the potential effects of measures aimed at preventing the leakage of transoceanic routes, including the introduction of new selection criteria to classify “transshipment neighboring ports” based on parameters additional or complementary to transshipment intensity, as well as adjustment mechanisms — such as emissions discounts — targeted at transoceanic routes deemed at risk of reconfiguration.

Table of Contents

List of Acronyms

Acronym	Definition
CBER	Consortia Block Exemption Regulation
COMTRADE	United Nations International Trade Statistics Database
CPPI	Container Port Performance Index
EEA	European Economic Area
EMSA	European Maritime Safety Agency
EU ETS	European Union's Emissions Trading System
GHG	Greenhouse Gas
GT	Gross Tonnage
IMF	International Monetary Fund
LSCI	Liner Shipping Connectivity Index
MRV	Monitoring, Reporting and Verification
PP	Percentage Point
RoW	Rest of the World
THC	Terminal Handling Charges
UNCTAD	United Nations Conference on Trade and Development

Table of Contents

List of Definitions

Key	Definition
Transport work or kTEUmile	The sum of miles multiplied by the vessel capacity expressed in TEU for each individual voyage.
EEA	Region formed by EU Member States.
EEA+	EU neighbour countries whose ports are within the 300-mile distance ahead to an EU port.
EUROMED	Aggregation of EEA and EEA+
EUROMED GATEWAY	EUROMED ports connected to other regions of the world. The top 30 EUROMED ports account for 95% of the TEU-miles in this region.
logit	Logistic regression model to predict the probability that a shipping line will change or not change a maritime route.

Table of Contents

Puertos del Estado

ETS Observatory

- The European Union Emissions Trading System (EU ETS), recently extended to maritime transport, poses significant challenges for European ports. The requirement for shipping companies to purchase emission allowances may lead to route shifts toward non-EU ports, impacting the competitiveness, connectivity, and logistical sovereignty of the Spanish port system.
- In this context the Spanish organization **Puertos del Estado has launched the EU ETS Observatory**, an initiative whose aim is to analyse, forecast, and quantify the impact of this regulation on maritime traffic, carbon leakage, and emissions generation.
- Its objective is to support decision-making and anticipate potential adverse effects, contributing transparency and objective data to the ongoing review of the European regulatory framework.

Collaborating Companies

SBC Shipping Business Consultants

cenit Science for Transport An Innovation Unit of CIMNE

NEXTPORT