Supporting study for the implementation of the ETS Directive and MRV requirements for maritime transport

Report on monitoring the impacts of the EU ETS extension to maritime transport

Aleix Pons, Gareth Horton, Justin Wan, Martin Lopez Pavez, Tarania Amirthalingham (Ricardo)
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Directorate B — Carbon Markets and Clean Mobility
Unit B.4 — Mobility (II): Air, Rail, Water and Intermodal Policy

Contact: CLIMA B4 – MOBILITY (II)

E-mail: CLIMA-B04-ARES@ec.europa.eu

European Commission
B-1049 Brussels

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1. Introduction

Maritime transport plays an essential role in the European Union (EU) economy. It enables trade and contacts between all European nations. It ensures the security of supply of energy, food and commodities and provides the main vehicle for European imports and exports to the rest of the world. Almost 90% of the EU's external freight trade is seaborne. Short sea shipping represents one third of intra-EU exchanges in terms of tonne-kilometres and each year, around 400 million passengers embark and disembark at European ports.

While ships are one of the most efficient modes of transport over long distances (in terms of fuel consumption per tonne-mile, for example), they nonetheless emit a significant and growing amount of greenhouse gas emissions. At the EU level, maritime transport represents 3 to 4% of the EU's total CO_2 emissions, or 126.7 million tonnes of CO_2 in 2023[1]. As part of its wider efforts on reducing its impacts on the climate, including the EU Green Deal[2] and the Fit for 55 initiative[3], the EU adopted a series of measures to ensure that maritime transport contributes to the increased EU climate effort and to the Paris Agreement commitments, alongside continuing to push for global action at the International Maritime Organization. This basket of measures included the extension of the EU Emissions Trading System (ETS) to maritime transport, a new regulation to accelerate the uptake of sustainable alternative fuels and energy onboard ships (the 'FuelEU Maritime' Regulation), and a revision of existing directives on energy taxation, alternative fuel infrastructures and renewable energy.

The extension of the EU ETS to maritime transport was included in the 2023 revision of the ETS Directive[4] . It became effective on 1 January 2024. It comes with new obligations for shipping companies, which are, for the first time, being included in a GHG emissions trading system. By defining the maximum amount of greenhouse gases that can be emitted under the system, the EU ETS ensures that all the sectors covered under its scope contribute to the EU's climate objectives following a pre-defined trajectory. In addition, by sending a carbon price signal, it incentivises energy efficiency, low-carbon solutions, and reductions of the price difference between alternative fuels and traditional fuels. The revenues generated by the sale of EU allowances are also important enablers to encourage innovation and the shift to cleaner technologies.

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[1] CO_2 emissions under the MRV (i.e. excluding vessels below 5000 GT and some vessel types such as fishing vessels) extracted from THETIS-MRV on 19/09

[2] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

[3] https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55/

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32023L0959

While essential for addressing maritime emissions and reaching EU's climate objectives, the implementation of the EU ETS raises some uncertainties as regards its impacts. Since it is the first time that such a system has been put in place in the shipping sector, which includes a wide range of vessel types performing voyages that meet multiple trade needs, careful monitoring of its implementation and effectiveness is essential to ensure it delivers on emission reductions while avoiding unintended economic, environmental and operational risks. This is the reason why the EU ETS Directive (Article 3gg(3)) requires the Commission to monitor the implementation of the ETS extension to maritime transport and report its findings every two years.

One of the objectives of this monitoring clause is to detect possible changes in shipping companies' behaviours, notably implementing or seeking alternatives to evade the requirements of the EU ETS Directive, with the aim to prevent such behaviours at an early stage. If appropriate, the EU ETS Directive requires the Commission to propose measures to ensure an effective implementation of the ETS in shipping, in particular measures to address trends regarding shipping companies seeking to evade ETS requirements.

In addition, the monitoring clause covers more broadly the possible impacts of the EU ETS extension to maritime transport considering, inter alia, possible transport cost increases, the overall competitiveness of the maritime sector in the EU, and in particular impacts on those shipping services that constitute essential services of territorial continuity, including giving consideration to the EU outermost regions which represent the most remote parts of the EU.

The Commission initiated its monitoring activities soon after the adoption of the revised ETS Directive in 2023, starting with the development of a robust methodology, in consultation with representatives from EU Member States and the European shipping industry.

It is within this context that this report[5] describes the work undertaken so far to monitor the impacts of the extension of the EU ETS to maritime transport. The report notably focuses on the potential evasive behaviours that shipping companies may have adopted or may envisage to adopt to avoid or reduce their ETS compliance cost. The attractiveness of evasion behaviours depends on the trade-off between compliance costs (ETS payments) and evasion costs (additional costs associated with evasive behaviour, including vessel operating costs and port costs), among other factors (reputational considerations, time and capacity constraints, etc.). It also examines the broader impacts linked to the implementation of EU ETS to maritime transport.

In this section (Section 1), the report provides an overview of the implementation of the EU ETS, including its legal provisions and the state of play of its implementation. Section 2 describes the approach adopted for the monitored impacts of the extension, including what

[5] The current report has been prepared for the European Commission, DG CLIMA, under contract CLIMA/2023/OP/0023, to provide support on the monitoring of the costs and impacts of the extension of the EU ETS to maritime transport.

has been monitored, the data sources used and research questions identified and analysed (for the monitoring of potential evasive behaviours). Section 3 then provides a review of the evidence gathered so far on the risk of evasive behaviours. The results of the monitoring of other impacts of the extension of the EU ETS to maritime transport are described in Section 4, with a separate section on the impacts on outermost regions in Section 5. Overall conclusions are provided in Section 6.

1.1. Overview of the EU ETS extension to maritime transport emissions

The extension of the EU Emissions Trading System (EU ETS) to cover maritime transport was agreed through amendments to the EU ETS Directive that were published in the Official Journal in June 2023 and came into effect in January 2024. The EU ETS is a "cap and trade" system. The cap defines the maximum amount of GHG emissions that can be emitted by stationary installations, aviation and maritime transport sectors covered under the scope of the system. Each year, the cap is reduced in line with the EU's climate target, ensuring that overall EU emissions decrease over time. By drawing on market forces to determine the carbon price, the system creates an incentive to reduce emissions where it costs least to do so. In turn, carbon prices generate revenue that is earmarked by the EU ETS for investment in climate action. In this respect, the EU ETS is a cornerstone of the EU's climate policy and a key tool to reduce greenhouse gas emissions cost-effectively.

The EU ETS extension to maritime transport builds on the requirements of the MRV Maritime Regulation[6], which has required shipping companies to report their emissions on voyages to and from EU ports since 2018. In 2023, around 12,000 vessels of over 5,000 gross tonnage (GT) that visited EU ports during the year reported verified emissions under the THETIS-MRV system[7], with 126.7 million tonnes of CO_2 emissions reported[8].

The EU ETS extension to maritime transport, as well as the MRV Maritime Regulation, will apply to the European Economic Area (EEA).[9] That means that the new rules introduced for maritime emissions will also apply to countries in the EEA, i.e. Iceland, Liechtenstein

[6] Regulation (EU) 2015/757 on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport requires shipping companies to monitor their GHG emissions, fuel consumption and other relevant information linked to EU voyages. Its main objectives are to collect robust and verified GHG emissions data, stimulate the uptake of energy solutions with more transparency and support the implementation of climate mitigation policies, such as the recent extension of the EU Emissions Trading System to maritime transport.

[7] THETIS-MRV

[8] Data extracted from THETIS-MRV on 19/09

[9] The relevant legislative texts have been incorporated into the EEA Agreement (Annex XX).

and Norway.[10] Hence, for the purpose of the present study and unless otherwise specified, any reference to EU Member States should be understood as encompassing EEA countries.

The recent extension of the EU ETS to maritime transport is built around the following rules:

Geographical scope

The new system introduced in the Directive differentiates the percentage of emissions that must be surrendered, based on the ports at the start and end of the voyage leg:

- 100% emissions from ships performing voyages departing from a port under the jurisdiction of an EU MS and arriving at a port under the jurisdiction of an EU MS.
- 100% of emissions from ships within a port under the jurisdiction of an EU MS.
- 50% of emissions from ships performing voyages departing from a port under the jurisdiction of an EU MS and arriving at a port outside its jurisdiction, or vice versa.

The 50% factor applied to voyages between a port in an EU Member state and one in a non-EU country allows the non-EU country to implement its own measures on the remaining emissions.

Ship coverage

The EU ETS Directive applies to the following ships:

- From 2024: ships of or above 5,000 gross tonnage transporting cargo or passengers for commercial purposes;
- From 2027: in addition, offshore ships of or above 5,000 gross tonnage

GHG coverage

The EU ETS covers CO_2 (carbon dioxide), CH_4 (methane) and N_2O (nitrous oxide) emissions, but the two latter only as from 2026.

Surrendering requirements

Shipping companies performing maritime activities under the ETS scope must purchase and surrender EU ETS allowances for each tonne of CO_2 equivalent[11] they report. The inclusion of maritime transport is to be gradually phased in with shipping companies initially surrendering allowances covering:

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[10] https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector/faq-maritime-transport-eu-emissions-trading-system-ets_en

[11] GHGs covered by the EU ETS include CO_2, methane (CH_4) and nitrous oxide (N_2O); the latter two from 2026 onwards.

- 40% of their verified emissions from 2024,
- 70% of their verified emissions from 2025 and
- 100% of their emissions from 2026.[12]

As fewer EU ETS allowances (EUAs) will be surrendered in 2024 and 2025 compared to verified emissions for maritime transport during those years, any difference between verified emissions and the amount of EUAs surrendered will be cancelled rather than auctioned.

1.2. State of play of ETS implementation for maritime

Maritime transport forms a strategic sector for the EU economy and is a highly complex sector with a wide range of vessel types performing voyages that meet multiple trade needs. The implementation of the EU ETS for the sector also requires a complex data reporting process, particularly as the vessels are owned and operated by a large number of shipping companies (over 4,000). Some of these companies are large, operating many vessels, but most are small, with only a few vessels, and the system needs to accommodate them without an excessive administrative burden. There are also significant administrative requirements for the Member State administering authorities, although the use of a central reporting system (THETIS-MRV) and a central Union Registry is expected to ease the process.

It is important to note that the extension of the EU ETS for maritime transport is not implemented as an isolated policy but is part of the broader EU policy framework, notably the basket of measures that has been implemented at EU level to reduce shipping emissions, as part of the 'Fit for 55' measures, but also considering developments at the International Maritime Organization on global action to address emissions from maritime transport.

The extension of the EU ETS to the maritime sector, including all voyages to or from an EU port, is the first system that requires shipping companies to pay for their GHG emissions, via the need to purchase and surrender EU ETS allowances, building on the requirements of the maritime MRV Regulation, which has required vessel operators to report their emissions on voyages to and from EU ports since 2018. In 2023, almost 12,000 vessels of over 5,000 gross tonnage (GT) that visited EU ports during the year reported verified emissions under the THETIS-MRV system, with approximately 123 million tonnes of CO_2 emissions reported.

To support the implementation of the extension of the EU ETS to the maritime sector, the Commission has adopted several implementing and delegated acts, defining all the

[12] https://eur-lex.europa.eu/legal-content/EN/AUTO/?uri=uriserv:OJ.L_.2023.130.01.0134.01.ENG&toc=OJ:L:2023:130:TOC

necessary rules, templates, and methods to ensure the good functioning of the system and a timely inclusion of the shipping sector in the EU ETS from 1 January 2024. These concern the administration of shipping companies by administering authorities, the creation of maritime accounts in the Union Registry, specific rules in relation to monitoring, reporting and verification.

For more details on these acts, please refer to the 'Legislative Process' section on the Commission's dedicated maritime transport webpage as well as the list of legislative acts in the 'Documentation' section (see 'Strategy and legislation on maritime transport emissions')[13].

To prepare these acts, the Commission is assisted by a maritime formation within the existing Expert Group on Climate Change Policy (CCEG), involving experts from EU Member States. In addition, there are other consultation activities, also involving the industry through the European Sustainable Shipping Forum (ESSF). These acts are also prepared with the support of the European Maritime Safety Agency (EMSA).

The implementation of EU ETS to shipping is in full swing, with positive signs in terms of overall compliance so far. Feedback received from shipping companies, whether from the EU or outside, is generally encouraging. Most of them are genuinely willing to fulfil their legal obligations as soon as possible. At the time of writing this study, there were a bit more than 5,000 shipping companies with active ships registered in THETIS-MRV, and more than 15,000 ships had submitted their assessed monitoring plans to their responsible administering authorities.

These positive compliance signs are notably the outcome of a number of outreach activities carried out since the end of 2023, with the support of EMSA and with a view to reinforce stakeholders' readiness. Five webinars have been organised between December 2023 and March 2024 to explain the rules and the IT tools to shipping companies, with a high level of participation (around 500-700 attendants at each webinar). Those remain available online[14]. On top of these events, the Commission has published more than 100 Frequently Asked Questions[15] and a dedicated Helpdesk (co-managed with EMSA) has responded to more than 1 400 questions in less than a year.

Furthermore, two guidance documents have been published in July 2024. The first guidance is an extensive document explaining the MRV and ETS requirements for shipping companies. The second one is a guidance about the process of approval of monitoring plans by administering authorities. A third guidance document about verification activities is also under finalisation.

[13] https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en

[14] https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en#events

[15] https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en#faq

1.3. Main risks and concerns related to the ETS extension to maritime transport emissions

As commercial agents competing in a global market, shipping companies are expected to adopt measures to increase their competitiveness and therefore minimise their costs, including ETS compliance costs. These measures may typically include the implementation of operational solutions to reduce emissions (e.g., slow steaming, route optimisation), the use of renewable and low-carbon fuels or investments in energy efficient retrofits (e.g., wind propulsion assistance, improved hull design, etc.) or cleaner new ships. However, companies may also consider implementing practices that could be considered as evasive behaviours. Evasive behaviours can be defined in a broad sense as operational adjustments from shipping companies that impact on the GHG emissions under ETS scope, other than due to improvements in energy-efficiency or use of alternative fuels/cleaner ships, thereby reducing the demand for ETS allowances.

The vessel operator contemplating the implementation of evasive behaviours will typically perform a cost-benefit analysis to assess whether the additional costs entailed by a change in operation will offset the savings from reducing its obligations under the EU ETS. Additional costs could be of different nature and include, for example:

- fuel costs;
- operational costs (crew costs, insurance, stores, spares, lubricants, repair & maintenance, dry docking, management and admin);
- charter costs;
- port costs;
- opportunity costs (the revenue lost from the journeys which can no longer take place, due to the additional port call);
- EU ETS compliance costs;
- container handling costs.

Furthermore, when considering the costs incurred, shipping companies will reflect on their ability to pass the ETS cost to their final consumers. The capacity to pass through ETS costs is essentially inversely proportional to the elasticity of demand[16]. That is, in segments where the demand is more elastic (e.g., RoPax services facing competition from land-based transport), shipping operators may need to absorb part of the ETS costs.

Beyond the economic element, there are many other factors that will ultimately influence the behaviour of shipping companies and the decisions taken. These may include time implications of evasive behaviours (e.g., deviation time, waiting time), the characteristics

[16] Others factors play a role, cost-pass through rate increases with the elasticity of the supply curve and the number of firms in a market segment, see more details in cost_pass_through_en.pdf

and spare capacity of competing neighbouring transhipment ports (e.g., accessibility, berth availability, connectivity, broader investments strategy in port terminals and storage) or more operational aspects (e.g., delays, efficiency and quality of port services). In addition, geopolitics and global trade patterns are other factors affecting maritime behaviour, as illustrated currently by the disruptions in the Red Sea.

As an example, related specifically to risks associated with container transhipment activities, the following Table 1-1 presents the different criteria that are typically considered by shipping companies when selecting a container transhipment hub. As can be seen from these different criteria, the selection of a transhipment hub goes well beyond the monetary aspect.

Table 1-1: Criteria considered by shipping companies when selecting a container transhipment hub

Type	Category	Criteria
Quantitative	Monetary	Port charges
		Deviation cost
		Feeder link cost
	Time	Deviation time
		Vessel turnaround time
		Waiting time
		Feeder link time
Non-quantitative	Location	Location with other hub ports
		Hub port accessibility
		Location with feeder markets
	Operation	Port capacity
		Berth availability
		Frequency of delays
		Records of damages
		Port authority/custom policies/regulations
		Port infrastructures
		Port superstructures
		IT and advanced technology
		Logistics facilities
		Efficiency of navigational services
		Efficiency of husbandry services
		Professional employees
		Marketing efforts
		Port's flexibility on shipping line requests
		Financial clearance capability
		Frequency of ship visits

Type	Category	Criteria
		Number of services calling at port
	Liner-related	Availability of dedicated/own terminal
		Personal contacts
		Special preferences on shipping lines
		Availability of customer/captive cargo
		Availability of feeder services
		Opinions/preferences of shippers and forwarders
		Location of hub port with shipping line's services

Source: Chathumi Ayanthi Kavirathna, Tomoya Kawasaki, Shinya Hanaoka, Transshipment Hub Port Competitiveness of the Port of Colombo against the Major Southeast Asian Hub Ports, https://doi.org/10.1016/j.ajsl.2018.06.004.*

From an EU ports point of view, the implementation of evasive behaviours comes with a number of concerns. The additional costs to vessel operators arising from the EU ETS when calling at EU ports can be seen as reducing the competitiveness of these ports in comparison with neighbouring non-EU ports, in particular if shipping companies are not able to pass over their ETS costs to their end customers.

The changes in traffic and port calls that can result from evasive behaviours can potentially have significant impacts on the levels of activity at EU ports, with associated impacts on the port's economics, and hence social impacts on the workforce. The loss of connectivity that can result from evasive behaviours can also impact businesses adversely, with reduced, or more expensive, access to important overseas markets and further impacts on the port's competitiveness, with reductions in opportunities to forward cargo to other ports.

A particular impact of evasive behaviours that has been of concern to EU ports, particularly those in the Mediterranean, is the loss of container transhipment services to non-EU ports. This potential loss of business has been of significant concern to the large EU transhipment hub ports as they rely heavily on transhipment activity for their business and the increase in operators' costs following the extension of the EU ETS is seen as having a potentially significant impact on their competitiveness. Compared to gateway and mixed terminals, the terminals predominantly focused on transhipment activities tend to reach significantly lower levels of profitability for the same operational performance. They also have a lower ability to create a positive cash flow and income compared to gateway

and mixed terminals[17] and their throughput volatility is much higher than for other container ports[18].

From a Member State point of view, ports are of strategic nature, in particular for insular Member States, where the maritime industry is undoubtedly a vital source of connectivity. Ports are critical gateways for international trade, important hubs of economic activity, and central logistics and distribution nodes allowing access to essential resources and commodities. They bring significant income, with commensurate benefits to the local population, notably in the form of jobs, as well as economic benefits to the Member State. The potential impact of changes in transhipment activity has therefore been of significant concern to EU Member States that have transhipment ports on their coasts. This has, therefore, been a key focus of the monitoring performed.

From an ETS point of view, the implementation of evasive behaviours would allow shipping companies to surrender less ETS allowances, even if not reducing their emissions. As a result, it would make more EU ETS allowances available to other ETS sectors, leading to a reduction in the environmental impact of the system. In some cases, evasion mechanisms could also lead to increased GHG emissions for equivalent transport activity (e.g., if they increase sailing distances to include an additional port call or move part of the operation to other transport modes with higher emissions). Further to this, evasion mechanisms can lead to reduced ETS revenues, resulting in less money available to support the decarbonisation of the maritime transport sector or the wider EU's climate objectives.

As a way to mitigate evasion risks, the ETS Directive already includes specific anti-evasion measures, which include a strict definition of a "port of call", imposing obligations on operators to load or unload cargo, or embark/disembark passengers, to prevent operators making artificial port calls for evasion purposes. The Directive also excludes "neighbouring container transhipment ports"[19] from the "port of call" definition. This means that stops at these non-EU ports cannot be considered under the Directive as the beginning or the end of a voyage, thereby reducing the incentive to stop at these non-EU hubs before or after calling at EU ports. Based on the criteria set out in the ETS Directive, the Commission has

[17] Theo Notteboom, Giovanni Satta, Luca Persico, Bianca Vottero, Alessio Rossi, Operational productivity and financial performance of pure transhipment hubs versus gateway terminals: An empirical investigation on Italian container ports, Research in Transportation Business & Management, Volume 47, 2023, https://doi.org/10.1016/j.rtbm.2023.100967.

[18] Notteboom, Theo E. & Parola, Francesco & Satta, Giovanni, 2019. "The relationship between transhipment incidence and throughput volatility in North European and Mediterranean container ports," Journal of Transport Geography, Elsevier, vol. 74(C), pages 371-381.

[19] Defined in Article 3ga(2) of the EU ETS Directive as ports where 1) the share of transhipment of containers exceeds 65% of the port's total container traffic, 2) the port's location is outside the EU but less than 300 nautical miles from a port under the jurisdiction of a Member State, 3) the port is located in a non-EU country for which that non-EU country does not effectively apply measures equivalent to this Directive.

already established the list[20] of such neighbouring container transhipment ports, which will be updated every two years. Currently, the list includes the ports of East Port Said in Egypt and Tanger Med in Morocco. The Directive also includes monitoring and review clauses to ensure that the risks of evasive behaviours can be monitored and addressed.

Beyond the risk of evasion, another concern is the risk of increased shipping costs for shippers and consumers. The cost of ETS allowances purchased by shipping companies as well as the cost of emission abatement measures are indeed likely to be at least partially passed through into the final transport price. Given the importance of maritime transport as the backbone of global trade but also for the connectivity of some islands or other remote territories, in particular EU outermost regions, such an increase in transport costs could lead to unintended impacts.

The Directive includes specific measures to mitigate potential impacts on connectivity of remote regions by exempting specific voyages until 2030 including:

Voyages between a port in outermost regions and a port within the same Member State;

Certain voyages by passenger ships between a Member State with no land connection and other closest Member State in the context of a transnational public service contract/obligation (PSC/PSO);

Certain voyages by passenger ships between ports in islands with fewer than 200,000 permanent residents of a Member State with no road or rail link with the mainland[21] and other ports within the same Member State.

[20] Commission Implementing Regulation (EU) 2023/2297 of 26 October 2023 identifying neighbouring container transhipment ports pursuant to Directive 2003/87/EC of the European Parliament and of the Council, OJ L, 2023/2297, 27.10.2023, ELI: http://data.europa.eu/eli/reg_impl/2023/2297/oj

[21] List with respective small islands published in Implementing Decision (EU) 2023/2895: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02023D2895-20240101

2. Approach to monitoring of potential evasive behaviours and other impacts of the EU ETS

This section provides an overview of the approach adopted for monitoring impacts of the extension of the EU ETS to maritime transport, including potential occurrences of evasive behaviour (Section 2.1) and other impacts (Section 2.2). When it comes to the analysis of evasive behaviours, this includes the identification of specific behaviours that would represent evasion at certain ports identified in the EU[22] and outside the EU. Other impacts considered include impacts on transport costs and possible market distortions, with a specific focus on EU outermost regions.

2.1. Evasive behaviours

2.1.1. What is being monitored

Evasive behaviour in the context of this report refers to an operational adjustment from shipping companies that impact on the GHG emissions under ETS scope, other than due to improvements in energy-efficiency or use of alternative fuels/cleaner ships, thereby reducing the demand for ETS allowances. More context on issues related to evasive behaviours is provided in Section 1.3.

Table 2-1 presents the six potential evasive behaviours that were identified and monitored under this study, each with a brief description. It is noted that none of these behaviours are illegal. While from a shipping company point of view, these could reduce their ETS exposure and belated compliance costs, from a systemic point of view, they could however lead to different types of negative impacts, being environmental, economic or social.

[22] As stated above, the implementation of the EU ETS to maritime shipping affects all voyages by relevant ship types to and from ports in EU Member States and in EEA countries. Although the ETS Directive has relevance to EEA countries, this report will refer to the EU throughout; reference to the EU should be taken as including EEA countries as well.

Table 2-1: Overview of key risks of evasive behaviour

Risk category	Explanation
Relocation of transhipment activities	The risk that vessel operators may decide to relocate their container transhipment activities from EU ports to non-EU ports. Container transhipment is the practice of offloading containers from one vessel at a port and then loading them onto other container ships for onward delivery to a destination, which may be relatively close ('feeder transhipment') or may involve longer voyages ('relay transhipment'). Container transhipment is an activity that has grown considerably in recent years. A number of ports, in particular in the Mediterranean, have recently expanded their capacity to be able to play a role in the transhipment market. Vessel operators may decide to relocate their container transhipment activities from EU transhipment ports to non-EU neighbouring ports as a way to reduce their ETS compliance costs. In some cases, this would bypass payment for emissions altogether if origin and destination of cargo are both non-EU. When the final destination of cargo is in the EU, cargo would need to be transported by feeder vessels from the non-EU transhipment port to the EU transhipment port or directly to the final destination (or the other way around when the origin is in the EU).
Addition of evasive port calls at nearby non-EU ports	The risk that shipping companies may decide to add an extra port call to reduce the length of the last leg before calling at an EU port (or the length of the first leg after leaving an EU port). It should be noted that under the EU maritime MRV Regulation, a port call requires a shipping operator to load or unload cargo. As such, it would be necessary for a shipping operator to perform business operations in these additional port calls.
Changes in order of port calls	The risk that operators may change the order of calls at ports along their route to minimise the length of the last leg before calling at an EU port (or the length of the first leg after leaving an EU port). As the effect of this risk is very similar to that of additional evasive port calls, the analyses presented consider the two risks together.
Shifting demand to other transport modes with higher environmental impacts	The risk that freight companies may move freight transport from maritime to other modes (in particular road transport), which have higher emissions than maritime.
Assigning best performing vessels to EU routes	The risk that vessel operators may decide to use their most efficient vessels (with lowest emissions per tonne-mile) to routes that include calls at EU ports and use their less well-performing vessels on other routes. This could have environmental benefits for the EU, including for air quality, but not reduce total greenhouse gas emissions.
Use of ships below size threshold	The risk that vessel operators, particularly those that operate smaller vessels (but still above 5,000 GT), may choose to use vessels (slightly) below the 5,000 GT threshold that are excluded from the ETS scope. Using smaller vessels would result in more voyages being needed to transport the same quantity of goods or number of passengers.

Risk category	Explanation
Use of ship-to-ship transfers outside EU ports	The risk the vessel operators may use ship-to-ship transfers outside EU's ports (particularly of liquid cargoes) to avoid making EU port calls and thereby reduce their obligations under the EU ETS.

Source: Ricardo analysis

The analysis of each risk, and the presentation of quantitative and qualitative evidence on whether the risk is being seen in practice, are covered in Section 3.

2.1.2. Research questions

To support the monitoring of potential evasive behaviours, a set of 'research questions' has been devised for each of the risks. The aim is that the research questions help identify specific answers to specific questions (supported by robust data analysis) which, taken together, can support the identification of whether the identified risk is occurring in practice.

A summary of the research questions that will be explored in this report are shown in Table 2-2. More details regarding indicators and data sources for answering these questions are provided in Appendix 1.

In relation to the analysis of the risk of transhipment relocation, research questions are defined covering the transhipment relocation risk at each geographical region (East, Central and West Mediterranean). Table 2-2 includes the questions presented for the East Mediterranean region (TREx); Section 3 also includes analyses of the same questions applied to Central (TRCx) and West (TRWx) Mediterranean regions.

Table 2-2: Research questions on evasive behaviours

Code	Question
Transhipment relocation by Mediterranean basin (Example for East Mediterranean)	
TRE1	How have container ships' port calls at EU transhipment hubs in the East Mediterranean evolved, particularly compared to the EU control groups and non-EU neighbouring ports (East Mediterranean)?
TRE2	How has traffic of specific container vessel categories (deep sea container ships used for relay transhipment, smaller container vessels used for feeder transhipment) evolved, especially compared to EU control group and to non-EU neighbouring ports (East Mediterranean)?
TRE3	How have container activities, including transhipment, evolved at EU transhipment hubs in the East Mediterranean, especially compared to EU control group and to non-EU neighbouring ports (East Mediterranean)?

Code	Question
TRE4	Is any such evolution associated with specific types of voyages (i.e. port call sequence non-EU/port/non-EU; and non-EU/port/EU; EU/port/EU)?
TRE5	Is there a change in port liner shipping connectivity index (PLSCI) for the EU transhipment ports and the non-EU neighbouring ports (East Mediterranean)?
General transhipment analysis	
TR6	Is there any intelligence showing a change of investment patterns in ports (i.e. investments being cancelled in EU ports and accelerated investments in competing non-EU ports, including planned investments)?
Evasive port calls and change in order of port calls	
EPC1	Is there an increase in calls at relevant UK ports by vessels before calling at EU ports or after departing from EU ports (particularly Northwest Europe)?
EPC2	Are there changes in direct traffic from North American ports to Northwest EU ports?
EPC3	Are there changes in direct traffic from outside the EU to Mediterranean Member States (Portugal, Spain, France, Italy, Malta, Cyprus, Croatia, Greece), and changes to indirect traffic from outside the EU to these ports with an intermediate port call at a Mediterranean non-EU neighbouring country (Morocco, Algeria, Tunisia, Libya, Egypt, Israel, Lebanon, Türkiye, Saudi Arabia)?
EPC4	Are there changes in (overall) direct traffic from non-EU ports to EU ports, and to (overall) indirect traffic from non-EU ports to EU ports but with an intermediate port call at a neighbouring non-EU country (within 300 nautical miles from an EU country)?
EPC5	Is there a decrease in the average distance travelled by vessels on the last leg of a voyage to an EU port, or the first leg of a voyage departing from an EU port?
EPC6	Is there a change in port liner shipping connectivity index (PLSCI) for the EU ports, notably compared to neighbouring non-EU ports (in particular in UK)?
EPC7	Are any changes in national legislation likely in the short to medium term that would affect the economics of calling at ports in the country relative to an EU port (for example, will the UK extend the UK ETS to maritime transport in a similar way to air transport)?
EPC8	Have vessel operators implemented or announced changes to routes that add extra port calls at nearby non-EU ports? (distinguishing whenever possible *new/extra* port calls vs *changes* in order of port calls)
Shifting demand to other transport modes with higher environmental impacts	

Code	Question
OTM1	Have there been changes in the transport of goods by RoRo and RoPax traffic from EU ports in the Mediterranean (e.g., Italy and Spain)?
OTM2	For ports in Bulgaria, has there been a reduction in the transport of goods to the ports of Burgas and Varna from ports in Georgia and Türkiye in 2024, relative to the same months in 2023?
Assigning best performing vessels to EU routes	
BPV	Has there been an increased use of more efficient vessels on routes to EU ports in 2024 compared to the same months in 2023?
Use of ships below size threshold	
BST	Has there been an increased use of vessels below 5,000 GT (in particular those just below 5,000 GT) on routes to EU ports (in particular for general cargo ships)?
Ship-to-ship transfers	
STS	Has there been an increase in the number of ship-to-ship transfers in EU waters since the start of the ETS maritime implementation?

2.1.3. Monitoring approach

Set of indicators

The assessment of the different research questions, as presented in Section 2.1.2, has focused on identifying relevant **key indicators** (changes in the numbers of port calls, numbers of containers transhipped, distances travelled on the final leg of a voyage to an EU port, etc.) that would enable the analysis and developing answers to the questions. The indicators used are described against each research question in Appendix 1.

The derivation of these indicators has drawn on a range of resources to identify relevant information and data (qualitative and quantitative). The resources used are described in Section 2.4.

In identifying the indicators, comparisons have been made with the same indicators in previous years and for different ‘groups’ of ports (including control groups), with the objective to help identifying whether changes observed could be attributed to EU ETS implementation or could be due to overall traffic patterns (e.g., due to the Red Sea crisis).

Comparisons over time

Due to the legal deadline provided in the Directive for this first report, the analysis is performed during 2024. This report builds on the most recent information and data available at the time of the analysis, which covers for 2024, the period from the entry into force of the EU ETS for maritime transport (January 2024), until the end of the third quarter of 2024 (September 2024). In some instances, however, data was only available for the first half of the year.

Data over the monitored period is compared against the situation before the entry into force of the EU ETS for maritime transport, covering 2022 and 2023 data. For this purpose, quarterly data over the period Q1 2022 to Q3 2024 is analysed to extract relevant trends. In addition, a year on year comparison is performed by analysing differences in Q1 to Q3 2024 data vis-a-vis Q1 to Q3 2023. This aims to control for the seasonality and volatility of maritime traffic data.

Comparisons between groupings of ports

Much of the focus of the analysis has been on activities at a 'short list' of key EU ports that were considered to be most at risk of being impacted by evasive behaviours. Indeed, much of the concerns expressed about evasive behaviours have focused on the transhipment relocation risk, with the largest impacts likely to be seen at ports in the Mediterranean, as that is where the major ports with high transhipment rates are located. To gain further insight into the impacts, and to help with the identification of the causes of such impacts, these ports have been grouped into East, Central and West Mediterranean regions.

With the aim to ensure that any conclusions correctly identify potential evasive behaviours, rather than overall trends in the global or regional maritime sector, comparisons are also made with activity at ports in neighbouring non-EU countries (in the same region). These would be the most likely to benefit from increased traffic as a result of evasive behaviours (for example, transfer of container transhipment activity from EU transhipment hubs or increases in numbers of port calls from the 'evasive port calls' risk).

Furthermore, activities at EU ports that were considered to be less at risk of being impacted by transhipment relocation evasive behaviours, such as mixed gateway ports and those located further from non-EU ports, have also been monitored to confirm whether any impacts seen at ports 'at risk' are specific to them (so may be a consequence of evasive behaviours) or wider changes in maritime activity. The 'control groups' of ports have also been split between Southern Europe (mostly in or around the Mediterranean) and Northern Europe, to further interpret the causes of changes seen.

Case studies

Additionally, case studies are considered where relevant to focus the analysis on specific geographies or market segments likely to be most impacted. These include a case study looking at EU – United States (US) flows (i.e. expected to be less affected by the Red Sea crisis) for the monitoring of the risk of evasive port calls and two additional case studies

looking at evidence of modal shift towards road transport between Spain and Italy and between some Black Sea non-EU countries and Bulgaria, respectively.

2.2. Other impacts of the EU ETS

2.2.1. What is being monitored

The analysis of other impacts (i.e. other than evasive behaviours) of the extension of the EU ETS to maritime transport has focused on the ETS associated costs to vessel operators (and, ultimately, the passing through of those costs to consumers). This also encompasses a consideration of potential market distortions that may have arisen from the additional costs on voyages calling at EU ports (whether intra-EU or extra-EU).

A particular feature of this analysis has been a review of the impacts on essential shipping services to ensure territorial continuity (principally services from the EU mainland to islands) and impacts on EU outermost regions.

Table 2-3: Other possible impacts from the EU ETS for maritime transport being monitored

Other possible impact	Explanation
Impacts on transport costs	The purchase of allowances by shipping companies to ensure compliance with EU ETS are expected to increase overall shipping costs. At the same time, shipping companies are expected to at least partially pass through ETS costs to their customers in the forms of ETS surcharges.
Impacts on essential services for territorial continuity	Increased shipping costs could lead to changes in the supply and price of ferry (RoPax) services connecting EU islands and remote territories to the mainland.
Impacts on outermost regions	Increased shipping costs could lead to changes in the supply and price of shipping services connecting outermost regions. At the same time, services to outermost regions could be impacted by evasive behaviours.

2.2.2. Monitoring approach

To monitor the ETS associated costs for shipping companies, estimations were made based on the maritime emissions under the scope of the EU ETS, emissions data reported to the EU for previous years under the THETIS-MRV system, combined with updated data on port visits and traffic flows to derive estimates of emissions for 2024. These are combined with EU ETS allowance prices in 2024 to identify the additional costs for operators for complying with their obligations under the ETS.

The monitoring of the impacts on essential services and outermost regions has drawn on reviews of the traffic on those routes, together with case studies on individual locations (such as the outermost regions).

2.3. Ports included in analyses

Section 2.1 described the key risks of evasive behaviours that have been identified, and the research questions being used to assess whether those risks are occurring in practice. The assessments for each of the research questions depend on different sets of data (or literature research) as inputs. For several of the questions, the analyses were based on activity data for specific ports, or sets of ports (with geographic groupings in some cases), to provide quantitative results. See below a summary of the ports considered in the analysis for the different types of risks:

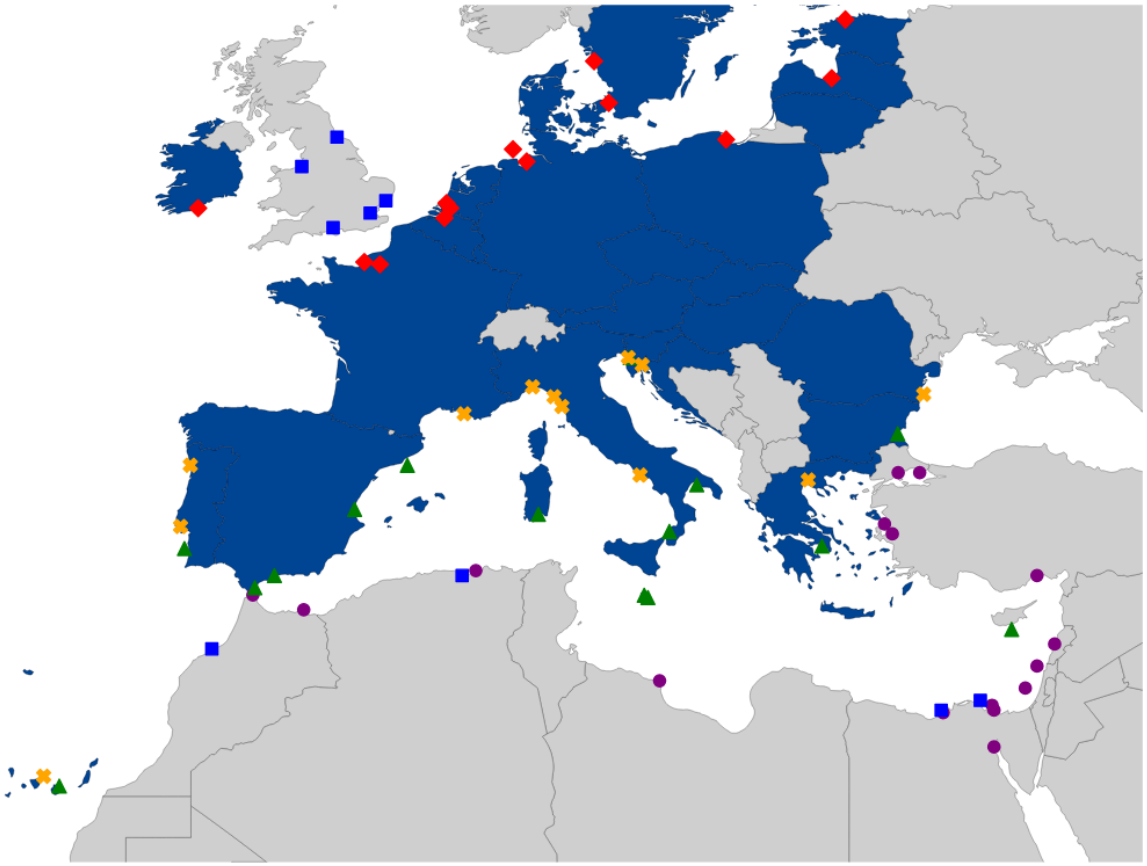
- For RQ on container transhipment relocation (TRE1 to TRE5, similarly for Central and Western Mediterranean and TR6), the analysis considers activity (port calls, container transhipments, dwell times, connectivity) at EU transhipment ports at risk, compared to that at neighbouring non-EU transhipment ports and EU control groups - grouped separately by East, Central and West Mediterranean region.
- For RQ on evasive port calls (EPC1 to EPC6), the analysis considers activity (port calls, voyage distances, connectivity) at all EU ports and at selected groups of neighbouring non-EU ports as relevant (UK, Türkiye, North Africa, etc.).
- For RQ related to shifting to other transport modes (OTM1 to OTM3), the analysis considers activity (port calls, quantity of goods) at specific ports/case studies in the EU and non-EU countries.
- For RQ on assignment of best performing vessels (BPV1) and use of ships below the size threshold (BST1), the analysis considers activity (port calls, numbers of vessels) at all EU ports.

The analysis of indicators for the different evasive behaviours, therefore, considered different groups of ports identified through a review of EU ports identified as being most at risk of being impacted by transhipment relocation (‘EU transhipment ports at risk’) and ports in other countries that were considered to be in a position to benefit from such behaviours (e.g., ‘neighbouring non-EU port – transhipment risk’ and ‘neighbouring non-EU port – evasive port calls risk’). Also included were other EU ports that were considered to be less likely to be impacted (through their geographic position or through being ‘mixed gateway’ ports with low levels of container transhipments, for example) and which can form “control groups” to support the identification of the causes of the impacts identified.

This list of ports, as well as the wider analysis methodology, was discussed with Member States as part of interactions with the Climate Change Expert Group (Maritime) and was updated following feedback from the group. The locations of the final set of ports, including

their categories, are illustrated in Figure 2-1. The full list of ports for this analysis is presented in Appendix 2.

Figure 2-1: Locations of ports included in analyses



Port categories	
●	Neighbouring non-EU ports (transhipment)
■	Neighbouring non-EU ports (evasive port calls)
▲	EU transhipment ports at risk
◆	Northern control group
✖	Southern control group

Source: Ricardo analysis

To support the analysis of the wider impacts of the implementation of the EU ETS (to provide a more comprehensive coverage of voyages to and from EU ports in 2024, and hence emissions under the EU ETS) the data provided by EMSA (extracted from the MARINFO database) also include 768 additional ports in the EU, 78 ports in outermost regions and 26 additional non-EU ports. The additional ports in the EU and outermost regions were included to ensure a comprehensive coverage of maritime activities in the

EU and how they have evolved since the extension of the EU ETS. The additional non-EU ports included some in West Africa (to provide more understanding of the impacts of the situation in the Red Sea on traffic in that region) and some close to EU outermost regions to assist in understanding any changes in activities at outermost regions' ports. The analyses of evasive behaviours focused on the ports in the short list, while the additional ports were included in the analyses of other impacts of the EU ETS.

2.3.1. EU transhipment ports at risk

As was identified previously, the potential relocation of container transhipment activity was identified as a key concern of several EU Member States, particularly those around the Mediterranean. Therefore, a key focus of the identification of ports for analysis of evasive behaviours was on those with transhipment activity, or those that could develop transhipment capabilities. The EU ports included in this analysis were those with significant levels of transhipment activity that were considered at potential risk of losing that activity to another port.

From discussions within the Commission, as well as feedback from Member States through meetings of the Climate Change Expert Group (Maritime), it was concluded that the shortlists of EU ports at risk should focus on the transhipment ports in the Mediterranean, split between:

- Western Mediterranean basin;
- Central Mediterranean basin;
- East Mediterranean

The ports included in the 'EU ports at risk (transhipment)' category were identified considering those ports with high levels of container transhipment activity, generally those with more than 100,000 transhipped TEU in 2023, or over 40% transhipment incidence in the same year. Historically, these have largely been ports in the Mediterranean, as container ships coming through the Suez Canal offload their cargo at Mediterranean ports for distribution to other EU ports or, for example, for onward transport to North America. To refine the analysis, these ports have been distinguished by their relevance to East (Cyprus and Greece), Central (Italy and Malta) and West (Spain and Portugal) Mediterranean. Additionally, recognising that the current situation in the Red Sea has led to changes in the major service routes being followed by container ships travelling to Europe, the list includes a port in the Canary Islands (Gran Canaria).

2.3.2. Neighbouring non-EU ports (transhipment risk)

The list of non-EU ports considered to potentially benefit from additional activity arising from the transhipment relocation risk was developed to support the identification of whether, and where, activities at non-EU ports may increase at the same time as activity at EU ports may decrease (which would be indicative of relocation of transhipment activities).

The approach taken to develop the list of non-EU transhipment ports was based on a set of indicators, including:

- Non-EU ports in the neighbourhood of EU transhipment ports. Ports within 300 nautical miles distance from an EU port were considered, but for the current analysis some other non-EU ports further away have been considered, to provide additional insight into the evolution of transhipment activity (such as ports around the Red Sea).
- Ports with existing container transhipment capability (and significant levels of transhipments), or which are considered as being able to develop that capability in the short term.

The identification of relevant ports fulfilling the criteria above drew on sources of data on port activity, including MARINFO (Section 2.4.2) and econdb (Section 2.4.4), together with literature searches.

The majority of the non-EU transhipment ports identified were in the Mediterranean basin and they were categorised along the same lines as the EU ports at risk (i.e. non-EU transhipment ports were also separated by their relevance to the East, Central and West Mediterranean regions). As well as the two ports already identified by the EU as 'neighbouring transhipment ports' pursuant to Article 3ga(2) of the EU ETS Directive, East Port Said (Egypt, East Mediterranean) and Tanger Med (Morocco, West Mediterranean), the list includes other Middle East and North African ports that currently have significant transhipment activity, but lower than the threshold for inclusion in the EU list. These include ports in Egypt, Israel, Lebanon and Türkiye, which were considered able to provide competition to EU ports in the East Mediterranean for container transhipment services, in particular. For the West Mediterranean, the list includes two ports in Algeria and two ports in Morocco, in addition to Tanger Med. For the Central Mediterranean basin, only the port of Qasr Ahmed (Libya) was identified under the Central Mediterranean to be likely to provide direct competition to the EU ports in Italy and Malta category. However, East and West Mediterranean non-EU ports could also compete with EU ports in Central Mediterranean; therefore, for the purpose of the analysis, comparisons were sometimes also used against other regions as relevant.

2.3.3. Neighbouring non-EU ports (evasive port calls risk)

The shortlist of ports used in the monitoring activities also includes non-EU ports that have the highest potential to be used for the evasive port calls behaviour, on top of those related to the risk of relocation of transhipment activities. This includes ports that are close to existing shipping routes (so adding an extra call would not lead to significant extra distance travelled and hence additional fuel costs), but which do not have high levels of transhipment activity (so are not included under the transhipment risk category).

Similarly to the identification of ports in the other categories, the approach was to use available data on port activities plus literature reviews, to identify large non-EU ports (that

could accommodate the large ocean-going vessels used on the transoceanic routes) that were not already included in the transhipment risk list. The resulting list of ports includes some in Egypt, which are of relevance to vessels arriving in the Mediterranean (or departing from it) via the Suez Canal, plus ports in Algeria and Morocco (relevant to voyages to EU ports in the West Mediterranean, whether arriving through the Suez Canal, round the Cape of Good Hope or from North or South America) and the UK (relevant to voyages to and from Northern Western European ports).

2.3.4. EU control group ports

Two EU control groups were also used for the purpose of this analysis. These control groups consider ports with lower levels of transhipment activity, which are considered as being less likely to be impacted by the risk of transhipment relocation. Hence, comparisons of the changes in activity at those ports with those in the 'EU ports at risk (transhipment risk)' and 'non-EU transhipment ports' categories could further support the identification of the causes of the potential trends identified.

As the main focus of the analysis of the transhipment relocation risk was on ports in the Mediterranean, two control groups of ports were included. The Southern control group, which includes EU ports in the Mediterranean for whom container transhipment is not the major contribution to their activities, was included to capture changes in overall traffic patterns in the Mediterranean for comparison with those identified at the EU transhipment ports. The Northern control group included ports in Northern Europe that would be expected to be largely unaffected by changes to traffic patterns in the Mediterranean due to transhipment relocation.

The Southern control group included ports such as Lisboa and Marseille in the Mediterranean plus an additional port in the Black Sea and were separated along the same geographic lines (i.e. East, Central and West Mediterranean) as the ports at risk (of transhipment relocation) to enhance comparisons. The EU ports in the Northern control group cover ports in Belgium, Estonia, Finland, Germany, Netherlands, Poland and Sweden.

The analyses of Research Questions other than those on transhipment relocation also drew on the same lists of ports. For the Research Questions on switching to other transport modes, an additional port in the Black Sea (Burgas, Bulgaria) was also included.

2.4. Data sources used

The monitoring methodology has utilised data from a combination of publicly available sources (e.g., Eurostat, UNCTAD, THETIS-MRV, official national or port statistics, and other relevant websites), data reported at Member State or port authority level via a dedicated survey and data from commercial sources. A summary of these different sources is provided below.

2.4.1. Publicly available sources

Eurostat[23], UNCTAD[24] and THETIS-MRV[25] are the main public data sources that have been used, to provide information at both the port and country level. Data used from these sources is described in Table 2-4.

Table 2-4 Publicly available sources

Source	Relevant data
Eurostat	Container throughput (in TEUs or tonnes) in EU ports and Türkiye (quarterly, by country of origin/destination) Port calls at EU ports (quarterly, by country of origin/destination) International road freight data (quarterly, by country of origin/destination)
UNCTAD	Port liner shipping connectivity index (EU and non-EU ports) (quarterly)
THETIS-MRV	Vessel technical efficiency data and emissions (at port, intra-EU voyages and extra-EU voyages) for vessels of and above 5,000 GT visiting EU ports (annually)

Other data on port activities, for example those for Spanish ports published by Puertos del Estado[26], have also been used to support the analysis and to provide cross-checks on some of the data provided by commercial organisations (e.g., econdb).

Websites from key container shipping lines have also been used to provide data or information on liner routes. An example is the information provided by Maersk (Maersk, 2023) and MSC (MSC, 2023) on their official website, where it is possible to identify information about the routes operated by the company. This includes identifying routes between pairs of specific ports or identifying a particular port and capture the vessels arriving each day. In the case of CMA CGM (CMA CGM, 2023) and COSCO (COSCO, 2023), it is also possible to obtain information about routes between two ports, obtaining details about the types of ships that operate and which ports form the complete route. The website also allows searching by ports and reviewing the ships that will arrive within a specific period of days. In the case of Evergreen, data is provided at the level of the route network, identified by geographic area, showing all the ports that are part of a particular

[23] https://ec.europa.eu/eurostat

[24] https://unctadstat.unctad.org/datacentre/dataviewer/US.PLSCI

[25] https://mrv.emsa.europa.eu/#public/emission-report

[26] https://www.puertos.es/en-us/estadisticas/Pages/estadistica_mensual.aspx

route, and information is also provided on sailing schedules, also by geographic area. Hapag-Lloyd (Hapag-Lloyd, 2023), provides information at the route level, categorised by geographic areas, showing the ports that are part of the route. Additionally, it adds information about the vessels that operate and arrive at each port, such as their maximum capacities and other characteristics.

2.4.2. Other available sources

One of the key sources of data for quantitative analysis of port calls and voyage data have been extracts from the MARINFO database. MARINFO is a vessel traffic monitoring and information system hosted by EMSA, established to enhance maritime safety, port and maritime security, marine environment protection and efficiency of maritime traffic and maritime transport. It has been set up as a network for maritime data exchange, linking together maritime authorities from European Union Member States, Norway, and Iceland. It is based on Automatic Identification System (AIS) data.

For the purpose of this monitoring methodology, under agreement with DG CLIMA, EMSA provided extracts from the MARINFO database on vessel voyages, including EU ports as origin and/or destination. This has been relevant for the following indicators:

- Total port calls by port and vessel type;
- Distance travelled by vessels;
- Order and number of EU port calls;
- Distance travelled under the ETS scope.

2.4.3. Data collected at Member state or port level

In collaboration with the Commission, a survey questionnaire was developed to enable main EU ports to report relevant statistics (including on transhipment), information on activities at their port and any changes seen in recent months. The survey included five sections covering:

- information provided to the respondent (including confidentiality statement);
- the profile of the respondent (including the port that they were responding on behalf of);
- information on the port activities (including statistics on import/export/transhipment when available, numbers of port visits and cargo throughput, both separated by vessel type and size and by month);
- information on port investments;
- any changes in operations, routes, etc., observed in 2024.

The survey was distributed via Member States' representatives during Summer 2024. When sending the questionnaire to the Member State representatives, it was accompanied by a list of ports that they were asked to distribute it to, including 43 ports in 20 Member States, building on the list of ports (those at risk and those belonging to 'control groups') as explained in Section 2.2 of this study. Member States were also free to distribute the survey to other ports, including those in outermost regions, for example. Responses were received from 39 ports in total, although with varying levels of data and inputs provided.

2.4.4. Commercial data

Under subscription[27], access was also provided to data collected by econdb database[28]. This included data concerning container traffic by service and statistics by port (including transhipment rate) and vessel operator, relevant to:

- Total container imports and exports (in TEU);
- Total port calls;
- Transhipment share;
- Dwell time.

Econdb obtains data from three key sources:

- AIS data for tracking vessel movements, including their coordinates and draft when entering and exiting ports;
- Information from operators;
- Container movements data.

When analysing port calls by vessels, econdb use the vessel's draft at port entry and exit to estimate the mass of cargo carried (and hence the net onloading/offloading of containers). They track a sample of containers loaded and unloaded; this includes approximately 800,000 containers globally, with approximately 2 million voyages covered in the past two years. They noted that, while the sample of containers they track is only a small percentage of the global fleet (around 2%), they consider that they are distributed representatively, so the overall results give a good view of container movements. There may be some delays in acquiring all data, so at a given time, the data for the past month or two could be liable to change.

[27] The subscription was purchased by DG CLIMA; under the terms of the subscription, Ricardo was able to access and analyse the data.

[28] https://www.econdb.com/home

To provide confidence in the results of the analyses of data from econdb, comparisons have been with container movement data for Spanish ports[29]. These comparisons showed good agreement on the overall trends of container movements, including transhipments, but lower accuracy in the absolute values (numbers of containers).

From these discussions and assessments, it was concluded that container movements (including transhipments) data from econdb may not be fully accurate when considered at an individual port and month level; however, they provide a useful overview of trends over time and across regions.

2.5. Constraints of the analysis

The analysis of the impacts of the extension of the EU ETS to maritime transport, including potential evasive behaviours and other impacts, the approach to which is described in the preceding sections, has been applied during 2024 – for the months for which data was available at the time of drafting this study. In addition to the implementation of the EU ETS, this has also been a time of considerable geopolitical tensions, which have had a significant impact on international shipping. This section considers those impacts, together with limitations of the analysis due to the timing and data availability, with a view to understanding limits on conclusions that can be drawn from the present results.

2.5.1. Analysis timing

As noted above, the analysis described in this report has been performed during 2024, relying to a large extent on data for maritime activity up to the end of the third quarter of the year – although in some instances, data was only available for the first half of the year.

Hence, the analysis period provides only a limited time in which to identify changes to vessel operations that could indicate the occurrence of evasive behaviours. Given the high volatility of maritime traffic, particularly in transhipment operations, this partial coverage limits the ability to reach definitive conclusions from traffic data analysis.

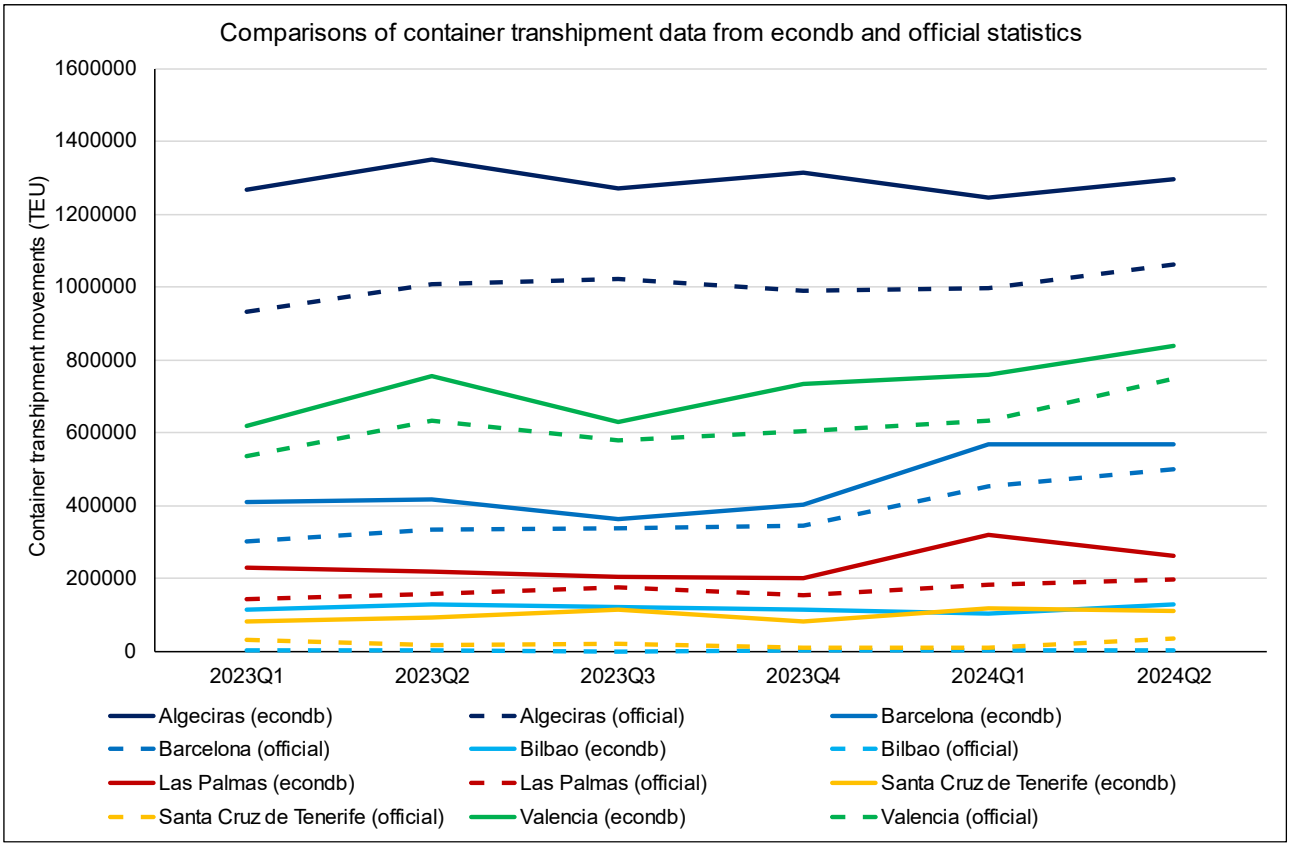
Further, the implementation of the EU ETS requirements for surrendering allowances includes a phased approach, with operators only required to surrender allowances for 40% of their 2024 in-scope emissions and 70% of in-scope 2025 emissions. This phased approach may reduce the pressure on vessel operators to implement any changes in operations (that they may ultimately wish to implement) at an early stage; therefore, in some cases, operators may plan to implement changes (that may be considered as evasive behaviours) in 2025 or 2026.

[29] https://www.puertos.es/en-us/estadisticas/Pages/estadistica_mensual.aspx

2.5.2. Transhipment data availability

Details of the sources of data that have been used to assess changes in maritime activities were given in Section 2.4. Due to the manner in which data are collected on international shipping and, in particular, container movements, there are limitations to the ability to capture accurately all global movements – in particular regarding transhipment volumes. In some cases, additional data are available (e.g., Puertos del Estado[30] from Spain and responses to the survey of ports described above). To help understand such limitations on data accuracy comparisons have been made with the data provided by econdb in Figure 2-2.

Figure 2-2: Comparisons of container transhipments at Spanish ports



Source: Ricardo analyses of econdb data and data from Puertos del Estado

In general, the trends of the official data are well captured by the econdb data, although it appears that econdb over-estimates the actual transhipment values. For Barcelona and Las Palmas, econdb appears to indicate a peak in activity in Q1 2024, which is not present in the official data, although the econdb values are closer to those in the official data in Q2.

[30] https://www.puertos.es/en-us/estadisticas/Pages/estadistica_mensual.aspx

Of note is the observable, although low, levels of transhipment activities at the ports of Bilbao and Santa Cruz de Tenerife in the econdb data, although official statistics suggest that transhipment activity at these ports is very low (or zero in some months).

The conclusions from these comparisons are that econdb data are useful for illustrating trends of container activity, but that the absolute values provided are less reliable. Care is needed when assessing econdb trends for ports that have low levels of container transhipment activity.

2.5.3. The Red Sea situation

Context

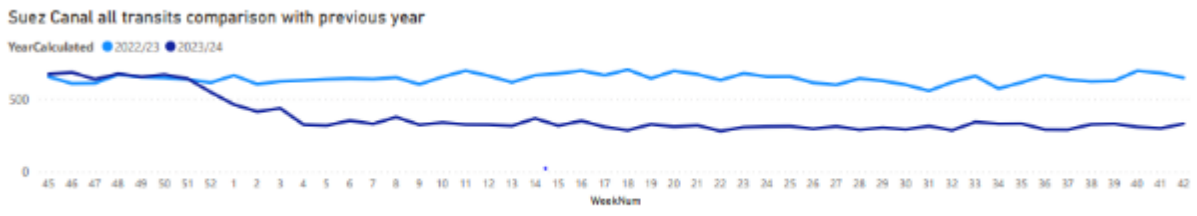
During 2024, there have been multiple geopolitical events that have impacted transport activities of multiple modes:

- Russia's invasion of Ukraine;
- The Middle East crisis;
- Attacks on shipping in the Red Sea.

The most significant of these from the perspective of impacts on maritime transport activities are the attacks on vessels in the Red Sea.

As a result of the Houthi attacks, which commenced in November 2023, many of the vessels that previously transited through the Suez Canal (representing 10% of total global seaborne trade volume and 22% of global container trade[31]) re-routed around South Africa, via the Cape of Good Hope.

As shown in the graph below, the transits though the Suez Canal decreased by around 60% in 2024 compared to the situation in 2022/2023, with the decrease reaching close to 70% for containerships[32].



Source: EMSA

[31] UNCTAD Maritime report 2024

[32] EMSA analysis on the Impact of developments in the Red Sea on maritime traffic

The avoidance of the Suez Canal resulted in major disruptions to international shipping routes, creating pressure on the global supply chain and leading to changes in network configurations and trade patterns. In practice, the widespread re-routing around Africa led to longer sailing distances (around 4,500 nautical miles more) and longer transit times for goods (around 12 additional days), which resulted in several impacts:

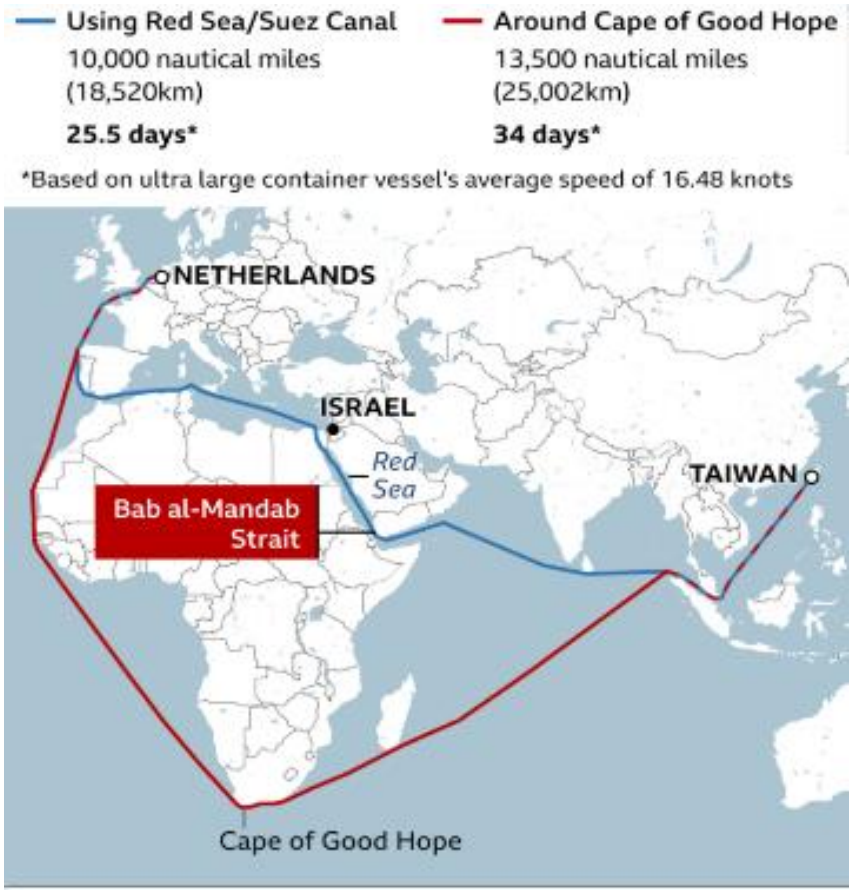
- **The need for more vessels**: to offer the same level of service to their clients in terms of volume of good transported and frequency, shipping companies had to engage more vessels on their line or increase speed. According to the literature, an additional 25 containerships were deployed for the Asia-Europe trade route in February 2024 compared to October 2023 and 28 additional containerships for the Asia-Mediterranean trade route[33]. By absorbing over capacity, this demand for additional ships affected to a certain extent the overall supply/ demand balance for container ships at global level, hence contributing to boosting charter markets, ship sales and purchases while lowering ship demolition levels[34]. Studies also showed that it negatively impacted the reliability of ship schedules (ITF, 2024).
- **Increase in shipping costs**: analysis done by UNCTAD shows that the Red Sea crisis was the most substantial factor behind the increase in container shipping freight rates observed in the first half of 2024[35]. Analysis on the impact of re-routing around the Cape of Good shows that it represents an additional cost of $272 per 40-foot container[36]. As a comparison, the ETS compliance costs applied to the same case study would result in EUR 20 additional cost of per 40-foot container (2 TEUs), considering a price of 64 EUR/tCO2 and the surrendering requirement applicable for 2024 emissions.

[33] Wei Yim Yap, Dong Yang, Geopolitical tension and shipping network disruption: Analysis of the Red Sea crisis on container port calls, Journal of Transport Geography, Volume 121, 2024, https://doi.org/10.1016/j.jtrangeo.2024.104004.

[34] UNCTAD – Review of maritime transport 2024: Navigating maritime chokepoints (unctad.org)

[36] ITF The Red Sea Crisis: Impacts on global shipping and the case for international co-operation (itf-oecd.org)

Figure 2-3. Shipping routes using the Red Sea, vs. re-routing around the Cape of Good Hope



Source: Veson Nautical

- **Change in shipping networks**: to maintain their service schedules with weekly calls, container shipping companies had to adapt their lines, by making changes to the ports-of-call and order of port-call. The overall impact was a net reduction in weekly port-calls and shipping capacity[37]. These new arrangements had direct impacts on ports. For instance, ports in the Red Sea and the East (and to a smaller extent Central) Mediterranean have seen a drop in port traffic, with large-tonnage vessels (> 15,000 TEU) almost exclusively sailing around the Cape of Good Hope. The restricted transit through the Suez Canal made the East Mediterranean a more difficult region to reach by sea, obliging many ships to enter and exit the Mediterranean through the Straits of Gibraltar. This has led to major consequences, not just at local ports, but in international shipping as a whole.

[37] Wei Yim Yap, Dong Yang, Geopolitical tension and shipping network disruption: Analysis of the Red Sea crisis on container port calls,

Journal of Transport Geography, Volume 121, 2024,https://doi.org/10.1016/j.jtrangeo.2024.104004.

Ports in the Red Sea have been the most impacted, in particular Jeddah and King Abdullah port[38]. From January 2024 onwards, carriers reportedly stopped calling at King Abdullah Port on deep-sea services, with Jeddah port seeing a decrease of 74% in port calls from December 2023 to January of 2024. Conversely, around the Cape of Good Hope, container traffic has increased by 182% over the same time frame.

In the East Mediterranean, a report assessing the port connectivity index[39] of several ports identified a decreasing trend in connectivity in seven out of the top ten ports, over the 12 months to Q3 of 2024. This change in connectivity is notably the result of the Red Sea crisis incentivising carriers to split services on core Asia–Europe routes by making more intensive use of transhipment hubs near the Straits of Gibraltar, possibly continuing on their way to the US East, and the large north European hubs[40]. With the restricted transit through the Suez Canal, carriers have looked to deliver cargoes bound for the East Mediterranean from ports in the West Mediterranean, to minimise disruptions.

When looking at specific ports in the region, analysis from the literature shows that significant reductions in port calls have been seen in Port Said East and Damietta, located in Egypt. Similarly, the port of Piraeus, a key East Mediterranean port in Greece, has reportedly experienced a drop in connectivity, specifically from Q1 of 2024 to Q3 of 2024, of almost 9%[41]. Although located less to the East, Malta's Marsaxlokk has also experienced a decline in volume and a decrease in port connectivity, as found per UNCTAD PLSCI data analysed in Section TRC5. However, other East Mediterranean ports have been less affected. This is for instance the case of Cyprus port of Limassol, which experienced a slight increase in connectivity from Q1 2024 to Q3, of almost 5%, reflecting steady improvements in the ports' operational capabilities and indicating that it is benefiting from increasing regional trade. Other non-EU East Mediterranean ports have also seen an increase in activity. Container volumes at Turkish ports, Asyaport, and Iskenderun, have reportedly recovered in Q1 of 2024[42,43], which may be driven by the restructuring of

[38] https://www.sea-intelligence.com/press-room/285-regional-impact-of-the-red-sea-crisis#:~:text=In%20East%20MED%2C%20Piraeus%20and,of%20Aden%20is%20still%20lagging.

[39] Also known as port line shipping connectivity index (PLSCI); an indicator of how well a port connects to other ports in a maritime network

[40] Notteboom, T., Haralambides, H. & Cullinane, K. The Red Sea Crisis: ramifications for vessel operations, shipping networks, and maritime supply chains. Marit Econ Logist 26, 1–20 (2024). https://doi.org/10.1057/s41278-024-00287-z

[41] https://container-news.com/eastern-mediterranean-ports-face-challenges-due-to-red-sea-disruptions/

[42] https://www.worldcargonews.com/news/2024/05/turkeys-container-ports-see-robust-traffic-growth/

[43] Ta nea dedomena sto limani apo tin katastasi stin erithra Thalassa (The new data in port from the Red Sea situation, February 2024)

MSC's services in the East Mediterranean in January 2024[44]; whereby, Piraeus has been omitted from the MSC route, but Istanbul and Asyaport continue to be served. Another Turkish port, Mersin, also saw an increase in connectivity. Similarly, Alexandria Port (Egypt) saw increased container volumes, due to these services being regional and short-sea trades, which were not affected by the Red Sea, in contrast to routes via the Suez Canal.

In the West Mediterranean, several ports have experienced an increase in traffic from January 2024 onwards, in contrast to ports situated in the East Mediterranean. Over the first half of 2024, the ports of Sines (Portugal), Valencia and Barcelona experienced increases in container throughput of 25%, 14% and 24% respectively. Ports in Italy and France have reportedly maintained relatively stable positions, due to the diversification their trade routes. According to UNCTAD analysis, during the second quarter of 2023 and the second quarter of 2024, Spain recorded for instance the largest increase in its Liner Shipping Connectivity Index score (3.8 per cent) among countries in the top 10. This was driven by increases in weekly calls and deployed capacity. Spanish ports such as Algeciras and Valencia serve as transhipment centres for containers that were previously shipped through the Suez Canal, yet now require feeder services from the Western to the Eastern Mediterranean Sea[45].

- **Increase in shipping emissions**: the ships re-routing through the Cape of Good Hope will release more GHG emissions, due to the greater fuel consumption and possible increase in speed.

Implications for the analysis

The maritime activities relevant to Europe, particularly those in the Mediterranean, have been significantly affected during 2024 by the attacks on shipping in the Red Sea and the consequent rerouting of large parts of the normal traffic around the Cape of Good Hope.

These changes in maritime traffic caused by the situation in the Red Sea create additional challenges in monitoring the impacts of the implementation of the EU ETS. When changes in maritime traffic are identified, it is important to be able to distinguish those changes in maritime traffic due to the implementation of the EU ETS from other causes. The following approach has been followed to disentangle, to the extent possible, effects of the EU ETS from those of the Red Sea crisis:

- Differentiation of Mediterranean basins (West, Central and East) to capture different impacts of Red Sea crisis on those.
- Comparison between EU and non-EU ports in the same Mediterranean basin to control for broader Red Sea crisis effects in the Mediterranean.

[44] https://www.maersk.com/news/articles/2024/01/24/red-sea-gulf-aden-service-updates

[45] Review of maritime transport 2024: Navigating maritime chokepoints (unctad.org)

- Two EU control groups, Southern (also differentiated by Mediterranean basin) and Northern control group (when appropriate) for comparison with EU transhipment ports to control for broader Red Sea crisis effects in the Mediterranean.

3. Review of evidence for evasive behaviours

The following sections consider the different research questions identified in Section 2.1 and present the results of a series of analyses to better understand market trends and provide insights in response to the questions raised.

3.1. Relocation of transhipment activities – East Mediterranean

3.1.1. TRE1 – How have container ships' port calls at EU transhipment hubs in the East Mediterranean evolved, particularly compared to the EU control groups and non-EU neighbouring ports (East Mediterranean)?

The purpose of this question is to understand whether there is any evidence of changes in port calls by container ships at EU transhipment hubs in the East Mediterranean, in particular any changes that are different to those experienced by other ports in the region (EU and non-EU) that could be indicative of transhipment relocation.

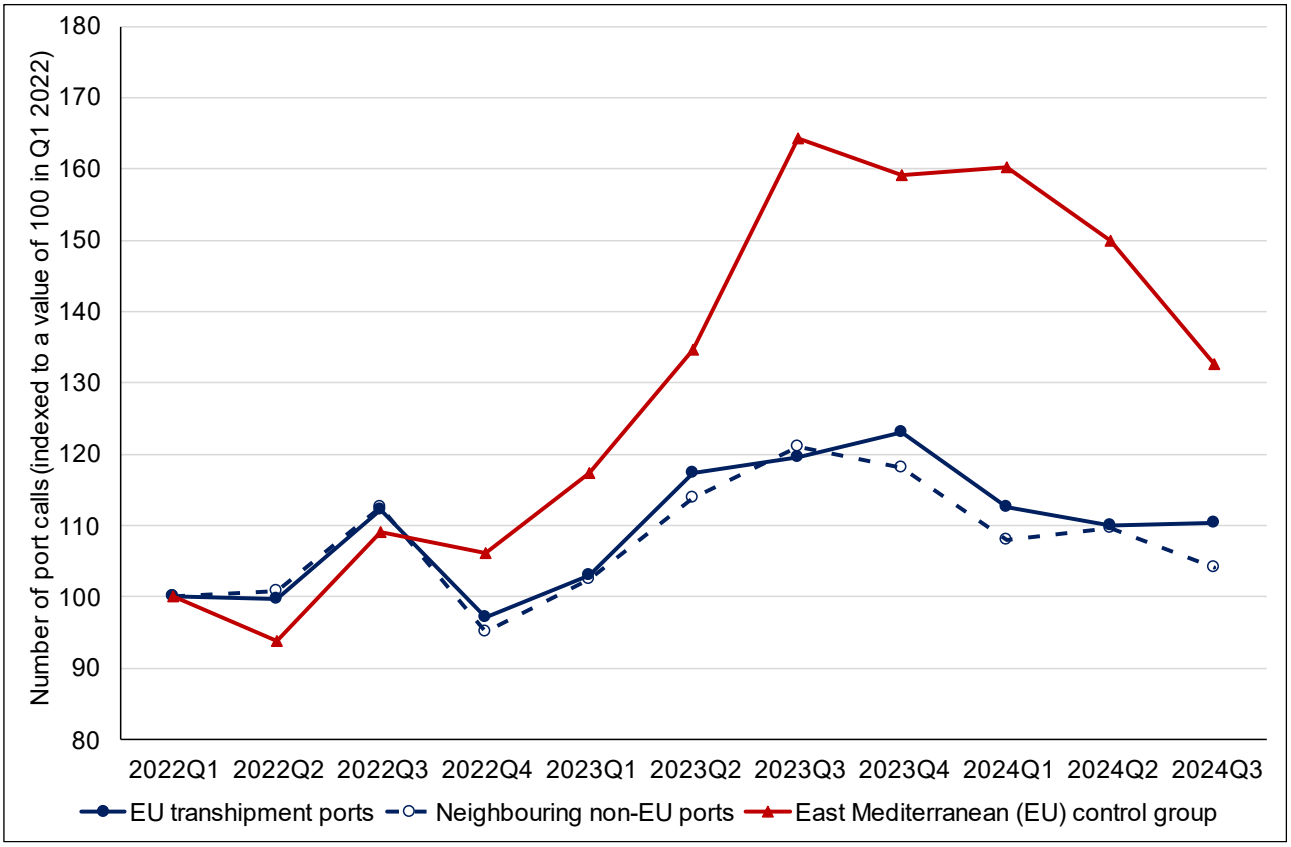
To investigate this question, EMSA MARINFO data was used to identify the number of port calls per quarter since the first quarter of 2022 at three categories of ports in the East Mediterranean region: at selected EU (East Mediterranean) transhipment hubs[46], at neighbouring (East Mediterranean) non-EU ports that could possibly benefit from ships avoiding stops at EU ports[47], and at other EU ports in the same region (East Mediterranean) that are less exposed to the risk of relocation of transhipment activities[48]. To enhance the presentation of trends over time, and to ease comparisons between different locations (EU and non-EU ports of relevance to transhipment activities in the East Mediterranean in this case), the numbers of port calls were indexed to a value of 100 in Q1 2022. The results are shown in Figure 3-1.

[46] Limassol (Cyprus), Piraeus (Greece). The selection of ports included in the different analyses are further described in Section 2.3 and listed in Appendix 2.

[47] Alexandria (Egypt), Ambarli (Türkiye), Ashdod (Israel), Beirut (Lebanon), Damietta (Egypt), East Port Said and West Port Said (Egypt), El Dekheila (Egypt), Haifa (Israel), Izmir (Türkiye), Mersin (Türkiye), Nemrut Limani Bay (Türkiye), Sokhna (Egypt), Tekirdag (Türkiye)

[48] Thessaloniki (Greece)

Figure 3-1: Numbers of port calls by container ships at EU and non-EU ports of relevance to the East Mediterranean, indexed to a value of 100 in Q1 2022



Source: Ricardo analysis of EMSA MARINFO data

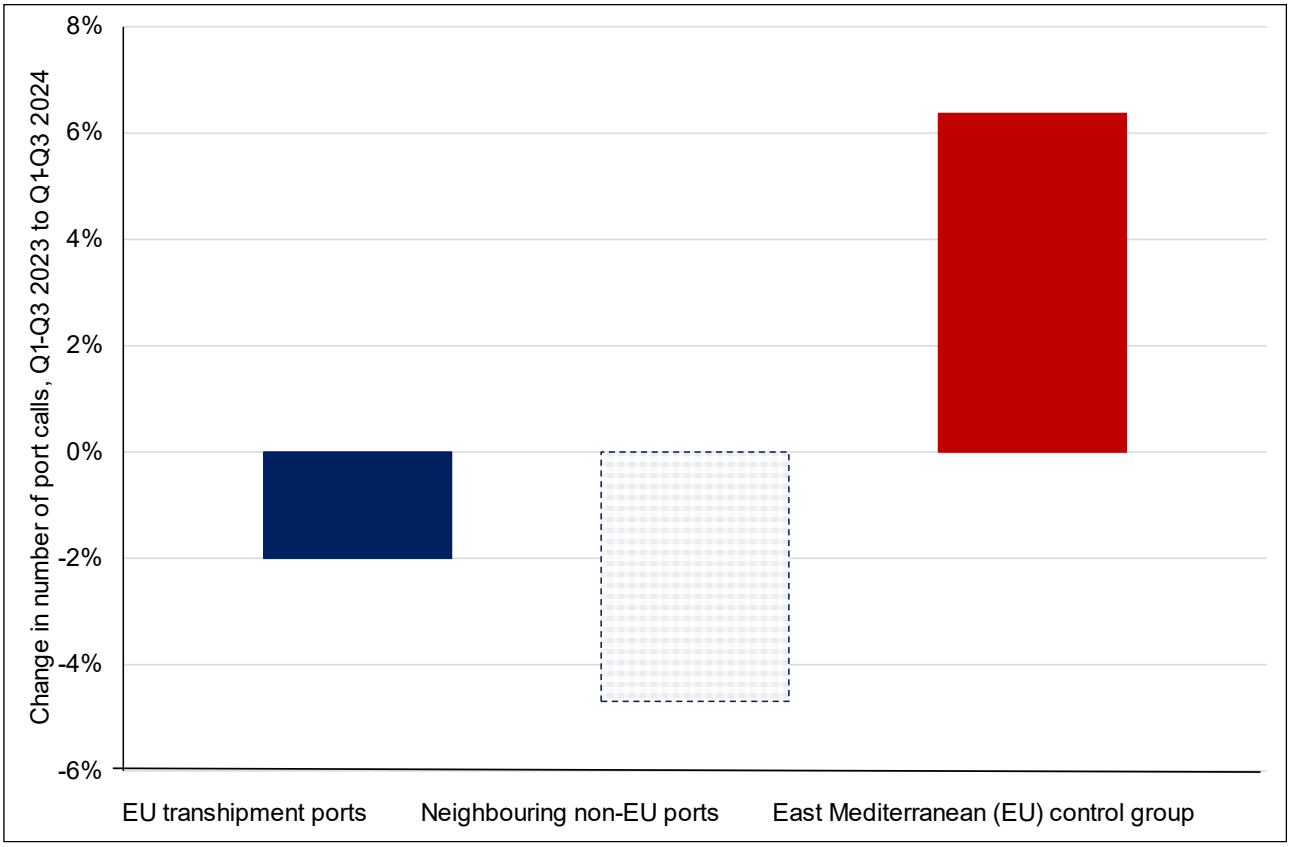
In general, there is a close match between the trends in the number of port of calls between EU transhipment ports and non-transhipment EU ports, with both showing a reduction in late 2022 before a gradual increase to the end of 2023. Both sets of ports then show a reduction to Q3 2024.

The East Mediterranean control group consists of a single port (Thessaloniki), so the results shown are sensitive to localised impacts there. The results show a strong growth in port calls at the port through to Q3 2023, followed by a levelling off to Q1 2024 and a subsequent reduction to Q3 2024. The reduction at this port to Q3 2024 is generally consistent (if slightly delayed) with that seen at the other ports in the region.

The consistency of the general trend in 2024 between the three port categories shown indicates no evidence of evasive behaviour being seen.

Further indications on the changes in port calls at the relevant ports are shown in Figure 3-2, in the form of the change in numbers of port calls between Q1 to Q3 2023 and Q1 to Q3 2024.

Figure 3-2: Percentage change in number of port calls for container ships between Q1 to Q3 2023 and Q1 to Q3 2024



Source: Ricardo analysis of EMSA MARINFO data

For the EU ports, the number of port calls has decreased by 2.0% between Q1 to Q3 2023 and the same period in 2024. The neighbouring non-EU ports show a greater reduction (4.7%). As expected from the results shown in Figure 3-1, the East Mediterranean control group (composed only by Thessaloniki) shows a significant growth in port calls, in comparison to those that occurred in mid to late 2023.

Overall, the results show a small reduction in container vessel port calls at East Mediterranean ports since the start of 2023. This affects both EU and non-EU ports but remains quite small considering the significant impacts of the situation in the Red Sea on vessels travelling through the Suez Canal.

Looking at individual ports in more detail (see Appendix 3), there is evidence of a reduction in port calls at the port of Limassol related to incoming extra-EU voyages, but the numbers of port calls vary significantly between quarters. For the port of Piraeus, there is evidence of a small reduction in incoming extra-EU calls, but this is largely balanced by an increase in calls associated with intra-EU voyages.

It should be noted that while container port call numbers remain relatively stable, this is not fully indicative of cargo activity; the cargo volumes loaded/unloaded and size of containerships calling at the ports are also important. For example, from the ports survey

data, a decrease of 27% has been seen in container transhipment volumes at a port in the region from H1 of 2023 to H1 of 2024. Further analysis of trends in cargo movements/activities is presented in section 3.1.2 (TRE2) below.

> Overall, the analyses of port activity in the East Mediterranean do not show any reductions at EU ports and increases at non-EU ports that would indicate transhipment relocation occurring.

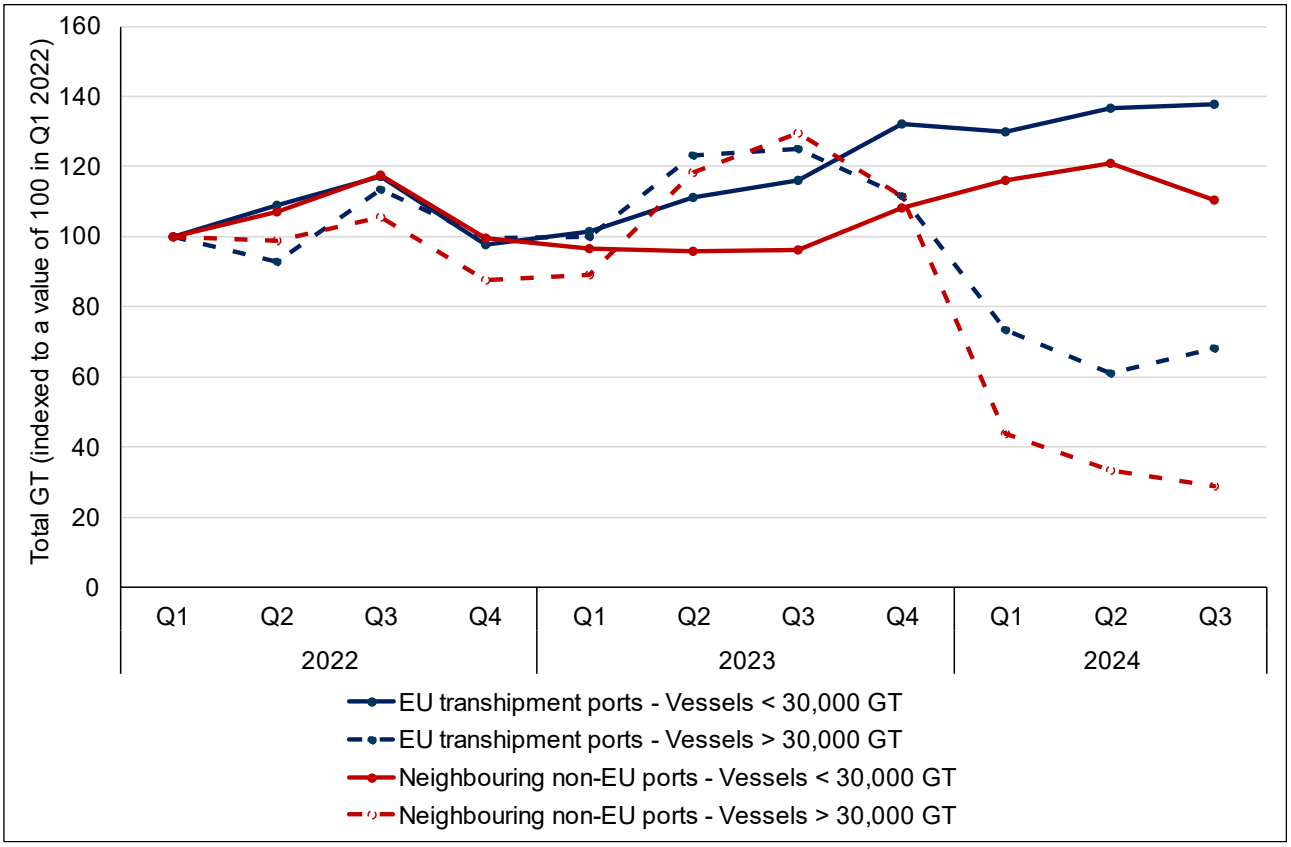
3.1.2. TRE2 - How has traffic of specific container vessel categories (deep sea container ships used for relay transhipment, smaller container vessels used for feeder transhipment) evolved, especially compared to non-EU neighbouring ports (East Mediterranean)?

The aim of this question is to understand whether there are any changes in relay transhipment and feeder transhipment activities in the East Mediterranean that could point to changes in the location of transhipment activities (i.e. relocation as a potential evasive behaviour).

To investigate this question, data from MARINFO have been used to assess the port calls by large container vessels (over 30,000 GT, being representative of container ships used for relay transhipment) and small container vessels (less than 30,000 GT, being representative of container ships used for feeder transhipment) in the East Mediterranean. To provide insight into the transport capacity represented by these port calls for small and large container vessels, the results are presented as time variations of the total GT of the vessels performing the port calls, indexed to a value of 100 in Q1 2022, in Figure 3-3.

The results show that the transport capacity of large container ships has reduced dramatically in port calls at both EU and non-EU ports in the East Mediterranean since the end of 2023. As discussed previously, this is consistent with the impacts of the situation in the Red Sea on container ship traffic through the Suez Canal. It appears that the impacts have been felt even more at non-EU ports than at EU ports in the region. In contrast, transport capacity of smaller container ships has been maintained in ports in the region in 2024. EU ports started experiencing a higher rate of growth of traffic than non-EU ports in late 2022; this was maintained through to the end of 2023, with growth rates being consistent for both port categories to mid-2024, since when non-EU ports in the region have shown a reduction in traffic for the small vessel category.

Figure 3-3: Total GT transported through ports in East Mediterranean by container vessels from Q1 2022 to Q3 2024, below and above 30,000 GT, indexed to a value of 100 in Q1 2022



Source: Ricardo analysis of EMSA MARINFO data

The year on year changes in transport capacity (GT) between Q1 to Q3 2023 and Q1 to Q3 2024 are shown in Table 3-1.

Table 3-1: Year on year changes (Q1 to Q3 2023 to Q1 to Q3 2024) of total GT for container ship port calls in the East Mediterranean

EU < 30,000 GT	EU > 30,000 GT	non-EU < 30,000 GT	non-EU > 30,000 GT
23.0%	-37.1%	17.4%	-66.8%

Source: Ricardo analysis of EMSA MARINFO data

Consistently with the time evolutions shown in Figure 3-3, there are large reductions in total GT between Q1 to Q3 2023 and the same period in 2024 for vessels over 30,000 GT for both EU and non-EU ports in the West Mediterranean. Both EU and non-EU ports had increased total GT for container ships below 30,000 GT, with the increase for EU ports being greater than for non-EU ports.

Overall, there are clear differences in the trends of total GT between small and large container ships in the East Mediterranean, due to the substantial impacts of the Red Sea

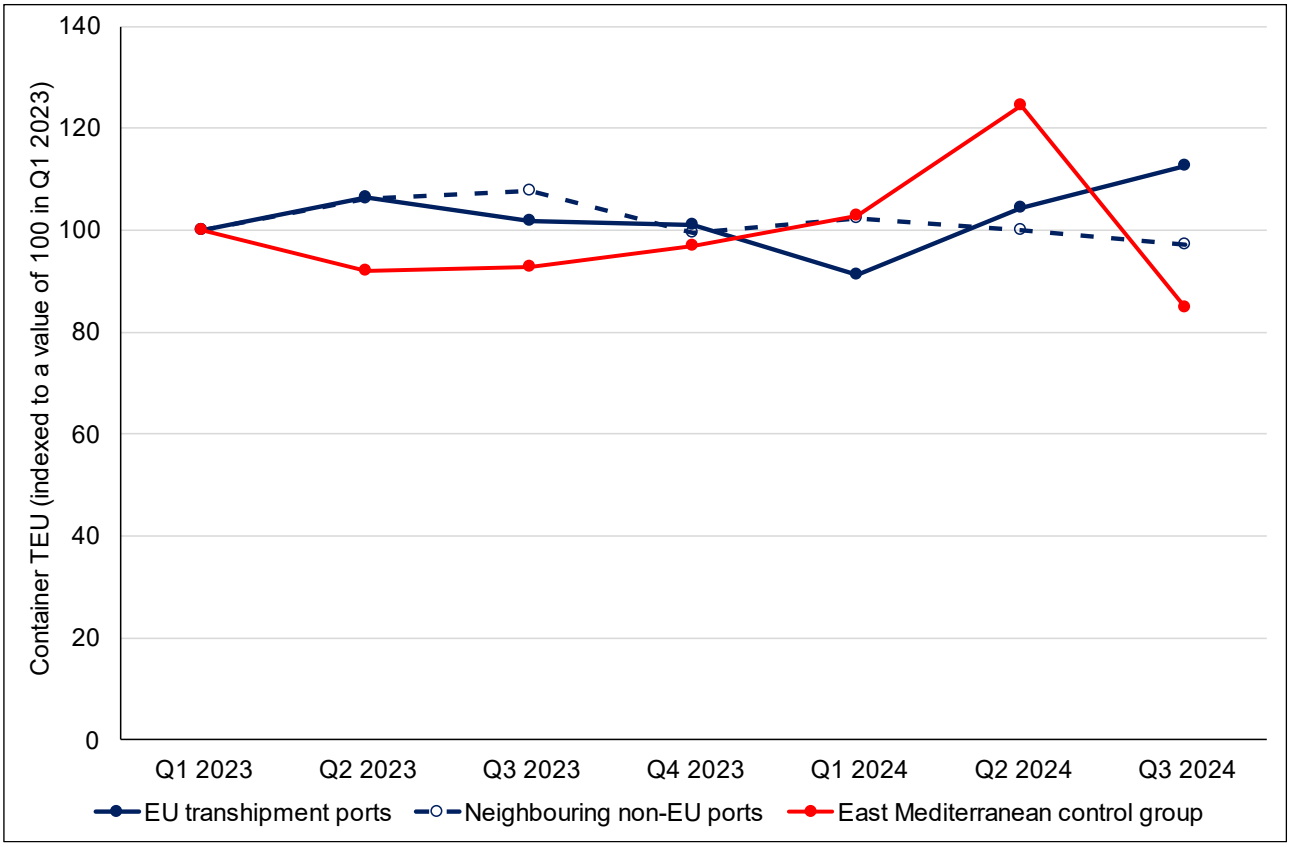
crisis on voyages of large container ships through the Suez Canal. While there are differences in the magnitude of changes seen, the trends are similar for EU and non-EU ports. These results do not indicate any trend of transhipment relocation as an evasive behaviour.

3.1.3. TRE3 - How have container activities, including transhipment, evolved at EU transhipment hubs in the East Mediterranean, especially compared to EU control group and to non-EU neighbouring ports (East Mediterranean)?

The aim of this question is to examine whether data on the transport of containers, particularly transhipment, indicates any shift from EU transhipment ports in the East Mediterranean to non-EU ports that could in turn indicate the occurrence of transhipment relocation as an evasive behaviour. To investigate the question, data on estimates of container movements for EU transhipment ports from econdb have been compared with those for neighbouring non-EU ports in the East Mediterranean. To provide an indication of whether any trends seen may be associated with changes in transhipment activity specifically, or more general changes in traffic in the region, comparisons have also been made with the East Mediterranean control group port (composed only by Thessaloniki).

The total container throughput obtained from analyses of econdb data for the port categories in the East Mediterranean, indexed to a value of 100 in Q1 2023, are shown in Figure 3-4.

Figure 3-4: Estimations of total container throughput at EU and non-EU ports relevant to the East Mediterranean from Q1 2023 to Q3 2024, indexed to a value of 100 in Q1 2023



Source: Ricardo analyses of econdb data

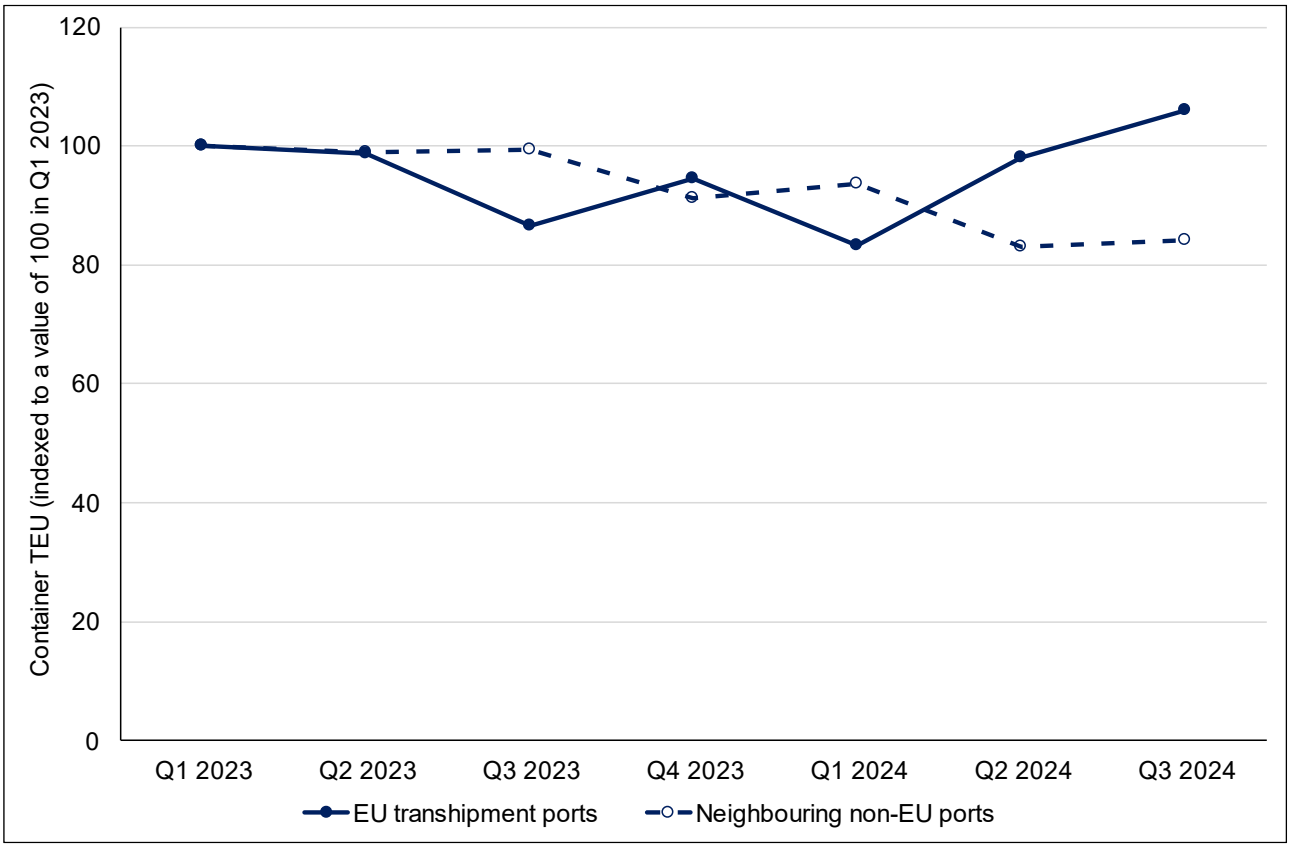
The results show only small variations in container throughput in East Mediterranean ports through the period to mid-2024. Between Q1 and Q2 2024, both the EU transhipment ports and the East Mediterranean control group port experienced an increase in container throughput. This is not matched by the non-EU ports, where there was almost no change between late 2023 and mid-2024. From Q2 2024 to Q3 2024, the trend for EU transhipment ports continues to increase, while that for the East Mediterranean control group drops significantly. The trend for the non-EU ports continues with a slight reduction to Q3 2024.

As a result, the total throughput for the EU transhipment ports from Q1 to Q3 2024 is 2.4% lower than in the same period in 2023. The neighbouring non-EU ports show a 5.2% reduction in throughput between Q1 to Q3 2023 and Q1 to Q3 2024, while the East Mediterranean control group shows a 10.0% increase across the same periods; however, the large variations seen in Q2 and Q3 2024 indicate that this value is very sensitive to the periods chosen for the calculation.

Figure 3-5 below shows the trends for container *transhipment* activity during the same period, based on econdb estimates. The comparisons shown of transhipments between econdb and official statistics in Section 2.5 included both containers that are offloaded at a port and are stored for transhipment and those that are loaded onto a vessel for export

from transhipment. For the analyses presented here, to align with the data on port calls (which include only when the vessel arrives at the port, not when it departs), the calculations of 'transhipment' include only the containers that are offloaded from container ships for transhipment purposes.

Figure 3-5: Estimations of container imports for transhipment at EU and non-EU ports relevant to the East Mediterranean from Q1 2023 to Q3 2024, indexed to a value of 100 in Q1 202



Source: Ricardo analyses of econdb data

The transhipment results for EU transhipment ports are generally consistent with the total throughput, including the increase seen between Q1 and Q2 2024. This results in transhipment activity being greater in Q2 2024 than at any time since Q2 2023. However, the results for the non-EU transhipment ports show a gradual reduction in transhipments over time, with those in Q2 2024 being approximately 17% lower than in Q1 2023.

Overall, the results show an increase in transhipment activity of 4.2% at EU transhipment ports between Q1 to Q3 2023 and Q1 to Q3 2024, while neighbouring non-EU ports show a reduction of 13.6%.

Of the EU transhipment ports in the East Mediterranean, Piraeus has reported the most significant impacts of the changes in maritime traffic on its activities. For example, total calls at the port reduced by 19% during the first half of 2024 (relative to 2023), with calls by the largest container vessels (15,000 TEU) reducing by 60%. Similarly, the largest operator of container activity at the port has reported that container movements reduced

by 14.2% in the first six months of 2024[49]. Lloyds List, which reported those numbers, also reports that container vessel capacity calling at Piraeus in H1 2024 was 3.65 million TEU, a reduction of 19% compared to the 4.50 million TEU that called at the port in H1 2023. However, the data on container transhipments (as used to prepare Figure 3-5), indicate that transhipment activity at Piraeus recovered well in the second and third quarters of 2024, leading to the overall increase of 4.2% at EU transhipment ports between Q1 to Q3 2023 and Q1 to Q3 2024, as noted above.

Regarding container traffic at non-EU ports, there has reportedly been an increase in container throughput at Turkish ports[50],[51], in particular Tekirdag, Aliaga and Izmir. The references suggest that it is likely that the Red Sea crisis has contributed to this increase, with EU near-shoring also suggested as a driver.

The Turkish Minister of Transport has reported that container transhipment activity at Turkish ports grew to 1.2 million TEU in January to May 2024, representing a 54% increase over the same period in 2023[52]. When reporting this increase, it was also noted that it may be associated with carriers electing to transhipment containers at Turkish ports, rather than EU ports, to avoid paying EU ETS costs. However, other sources have suggested that the increase in activities may be due to the geopolitical situation in the area, including the crisis in the Red Sea and, perhaps more likely, the Israel-Hamas crisis[53].

> In conclusion, while the analysis of data available from econdb for container activity at EU transhipment ports in the East Mediterranean does not show any significant reductions in activity in 2024 (compared to the previous year), other information reported in the literature indicate that individual ports (e.g., Piraeus) have experienced significant reductions in activity in 2024. At the same time, ports in Türkiye have seen significant increases in transhipment activity, which seem most likely due to the impacts of the geopolitical situation in Israel and Gaza (and, more recently, Lebanon).

[49] https://www.lloydslist.com/LL1150516/Red-Sea-reroutings-uproot-traditional-transhipment-trends

[50] https://theloadstar.com/turkey-moves-to-close-eu-loophole-with-its-own-emissions-trading-scheme/

[51] https://maritime-executive.com/article/turkey-rolls-out-its-own-carbon-price-on-shipping

[52] https://trans.info/en/turkiye-ports-co2-393972

[53] https://www.worldcargonews.com/news/2024/05/turkeys-container-ports-see-robust-traffic-growth/#:~:text=Container%20traffic%20at%20Turkey's%20ports,with%20Iskenderun's%20throughput%20nearly%20doubling.&text=The%20volume%20of%20container%20traffic,the%20corresponding%20period%20of%202023.

3.1.4. TRE4 - Is any such evolution associated with specific types of voyages (i.e. non-EU/port/non-EU; non-EU/port/EU; EU/port/EU)?

This research question aims to gather evidence of whether there are any differences in the evolution of container activities at the East Mediterranean transhipment hubs related to specific types of voyages between EU and non-EU ports. If transhipment relocation occurs, it would be most likely to impact voyages that previously departed from a non-EU port, stopped at an EU transhipment port and then departed for another non-EU port, as it would remove such voyages entirely from the scope of the EU ETS. Relocating transhipment activity on a voyage from a non-EU port to an EU transhipment hub and then to another EU port (or vice-versa) would also remove the leg from (or to) the non-EU port from the scope of the EU ETS, but the leg between (previously) two EU ports (or between an EU port and the non-EU transhipment port, after relocation) would remain within its scope (although the requirement for surrendering allowances would be reduced to 50% of the emissions instead of 100%) – except if the non-EU port is one of the neighbouring container transhipment ports identified by the Commission[54]. Similarly, relocating the transhipment port on a voyage that (currently) includes three EU ports would leave both legs within the scope of the EU ETS, although only 50% of emissions on both would require to be matched by EU ETS allowances – again except if the non-EU port is one of the neighbouring container transhipment ports identified by the Commission. Hence, analysing the evolution of changes in these three types of voyages can provide insights into the extent to which transhipment relocation may be occurring and the drivers for it.

To address the question, the EMSA tool has been used to extract the number of voyages depending on their sequence. The voyage sequence types that have been examined are the following:

- Non-EU port to EU transhipment port to non-EU-port (NEN);
- Non-EU port to EU transhipment port to EU-port (including the other way around: EU port to EU transhipment port to non-EU port) (NEE and EEN);
- EU port to EU transhipment port to EU-port EEE).

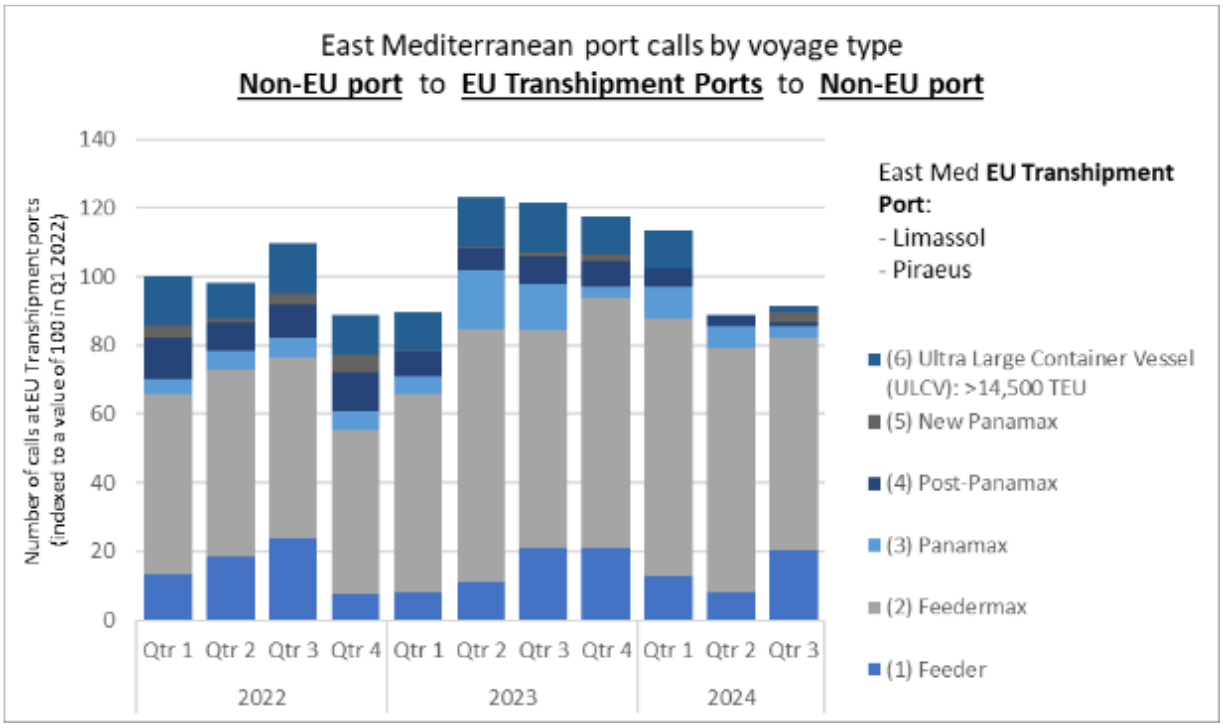
In this case, the EU transhipment ports being examined are Limassol and Piraeus, in line with the EU East Mediterranean transhipment ports group (also used in the other research questions in this section).

Figure 3-6 shows voyages starting at non-EU ports, stopping at EU transhipment ports, then to non-EU ports. For those, there appears to have been a surge in the number of voyages between Q1 and Q2 2023 followed by a steady reduction through to Q1 2024. There is then a sudden reduction in the number of voyages, in particular with large container vessels, which may be directly related to the Red Sea situation. The total port

[54] See Implementing Regulation (EU) 2023/2297

calls increase very slightly to Q3 2024; the distribution is largely similar to Q2, there is an increase in the share of the smallest (Feeder) vessel category and a corresponding reduction in the Feedermax category.

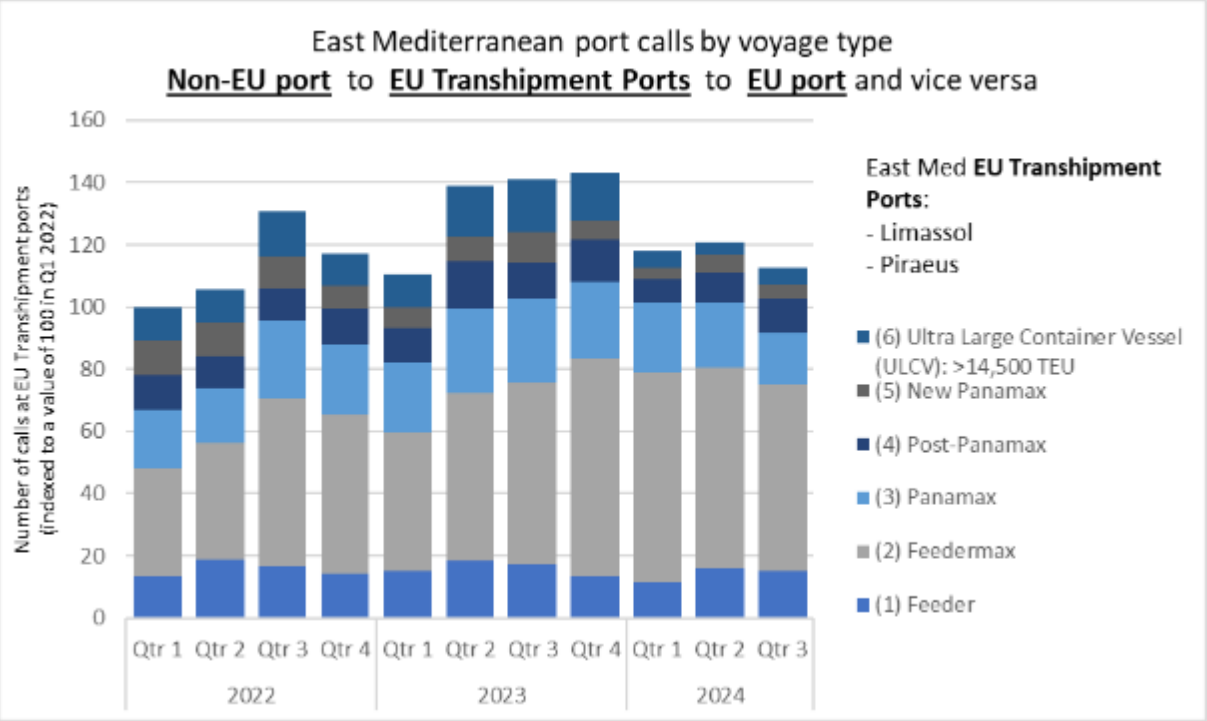
Figure 3-6: Voyages between non-EU ports, EU transhipment ports to non-EU port (case NEN)



Source: EMSA

Figure 3-7 shows voyages starting at non-EU ports, stopping at EU transhipment ports, then to EU ports; or the other way around. In these cases, there is again a sudden increase in voyages from Q1 2023 to Q2. Following this, there is a continuing increase in such voyages through to Q4 2023. There is then a sudden reduction to Q1 2024 (similar to that seen between Q1 and Q2 2024 in Figure 3-6, also mainly for the largest container vessels), followed by a small recovery in Q2 and Q3 2024.

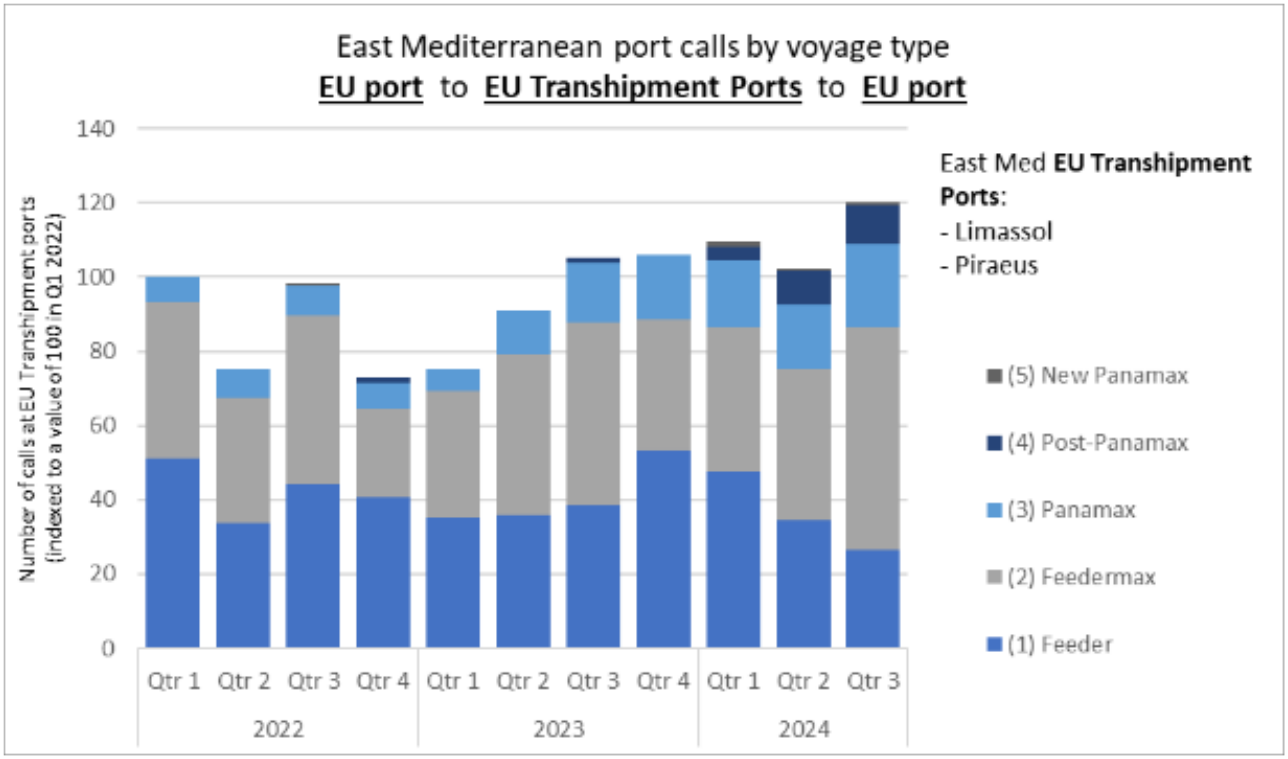
Figure 3-7: Voyages between non-EU-port to EU transhipment port to EU-port (including the other way around: EU port to EU transhipment port to non-EU-port) (case NEE, EEN)



Source: EMSA

Figure 3-8 shows numbers of port calls related to EU port to EU transhipment port to EU port voyages, which represent the intra-EU transhipment hub activity. This shows a steady and significant increase since the beginning of Q1 2023 to Q1 2024. Q1 and, more significantly, Q2 and Q3 2024 show a notable increase in the use of the largest container vessels on these routes. The results for Q3 2024 then show an overall increase in port calls, with a reduction in the port calls by the Feeder category and an increase by the slightly larger Feedermax category.

Figure 3-8: Voyages between EU-port to EU transhipment port to EU-port (case EEE)



Source: EMSA

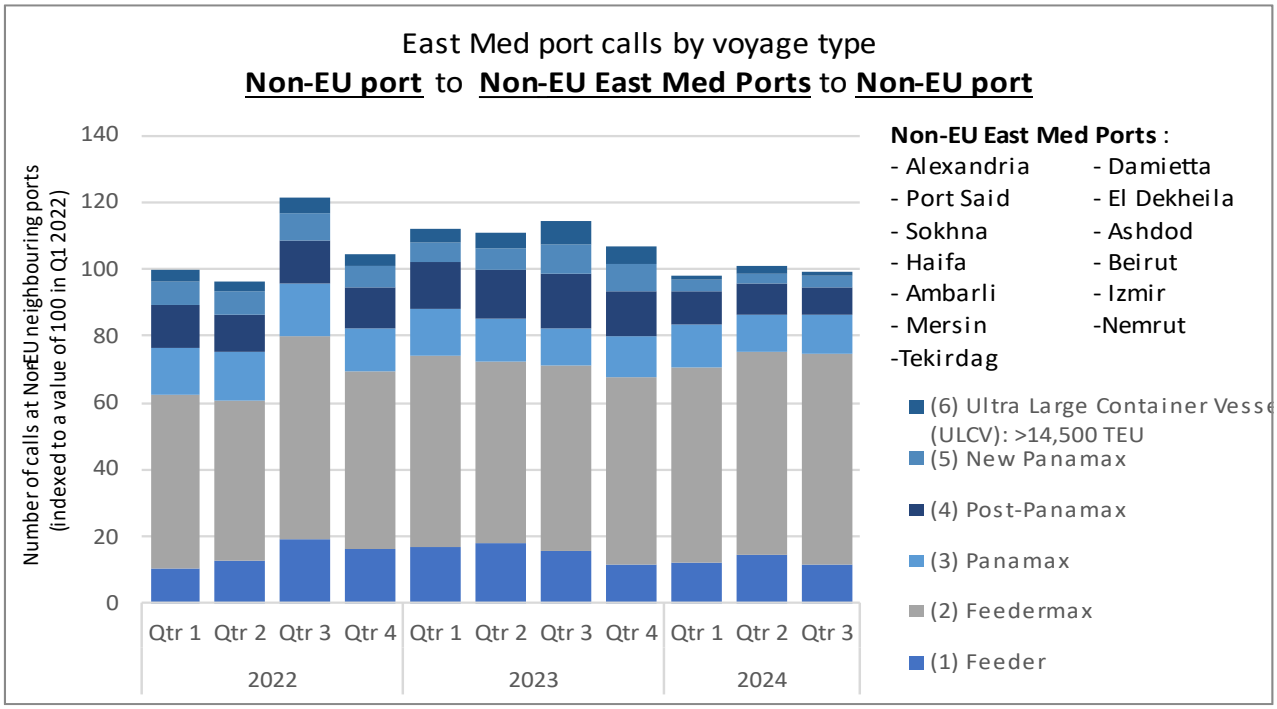
It is worth noting that the trend in 2024 for intra-EU sequence-type of voyages is for an overall increase in port calls, compared to significant reductions for voyages with one or two extra-EU legs. This is also consistent with what is observed regarding trends due to the Red Sea situation and also consistent with an increase in feeder traffic between EU ports, with a reduction in large vessels on deep sea routes following re-routing of incoming extra-EU routes because of the situation in the Red Sea.

To complement the above analysis of the trends in port calls at EU transhipment ports, the following charts show the results of similar analyses for the trends at non-EU transhipment ports in the East Mediterranean. Similarly to the EU ports, the results are presented for three voyage sequence types:

- Non-EU port to non-EU transhipment port to non-EU-port (NNN);
- Non-EU port to non-EU transhipment port to EU-port (including the other way around: EU port to non-EU transhipment port to non-EU port) (NNE and ENN);
- EU port to non-EU transhipment port to EU-port (ENE).

Figure 3-9 shows voyages from non-EU ports to non-EU transhipment ports in the East Mediterranean to another non-EU port.

Figure 3-9: Voyages from a non-EU port to a non-EU transhipment port to a non-EU port (NNN)

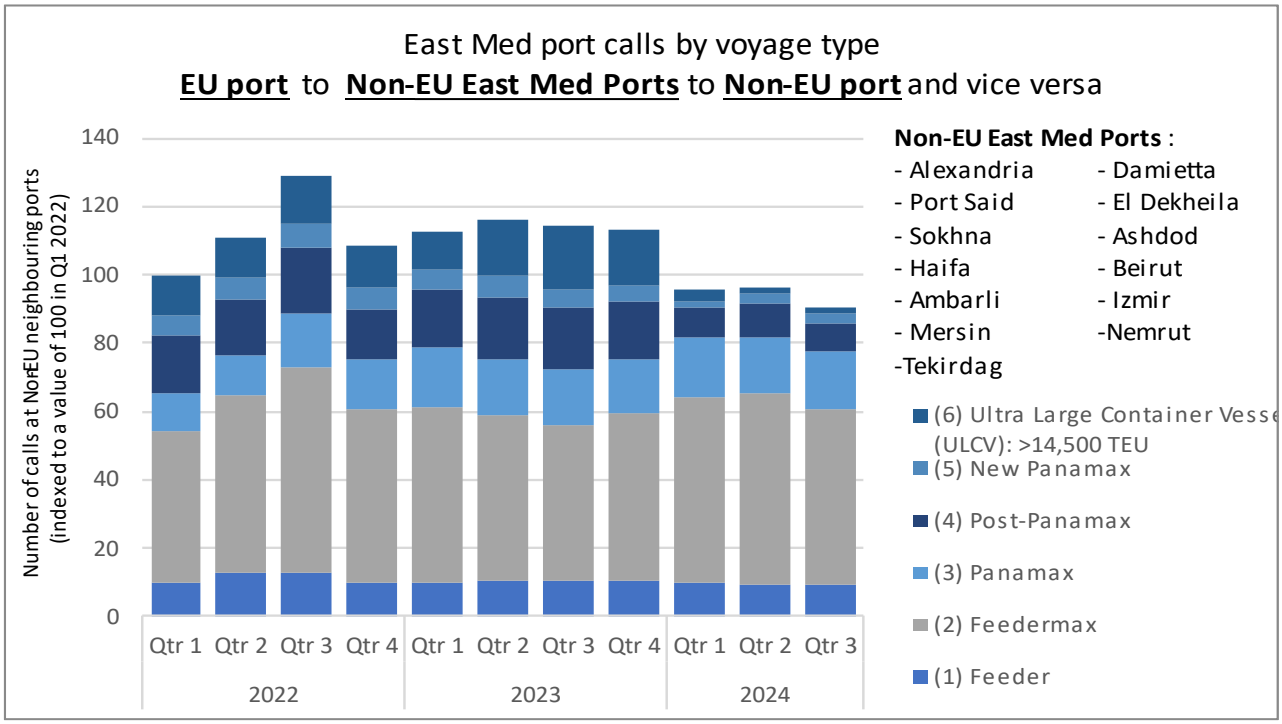


Source: EMSA

The number of port calls at a non-EU transhipment port in the East Mediterranean, between two other non-EU ports, shows quite a stable evolution since a spike in Q3 of 2022. From Q3 2023, there was a steady reduction in port calls to Q1 2024, since when there has been very little variation. The dominant vessel size for these port calls is again the Feedermax category.

Figure 3-10 shows voyages from an EU port to a non-EU transhipment port and then to another non-EU port, also including those from a non-EU port to a non-EU transhipment port to an EU port.

Figure 3-10: Voyages from an EU port to a non-EU transhipment port to a non-EU port (and vice-versa) (ENN)

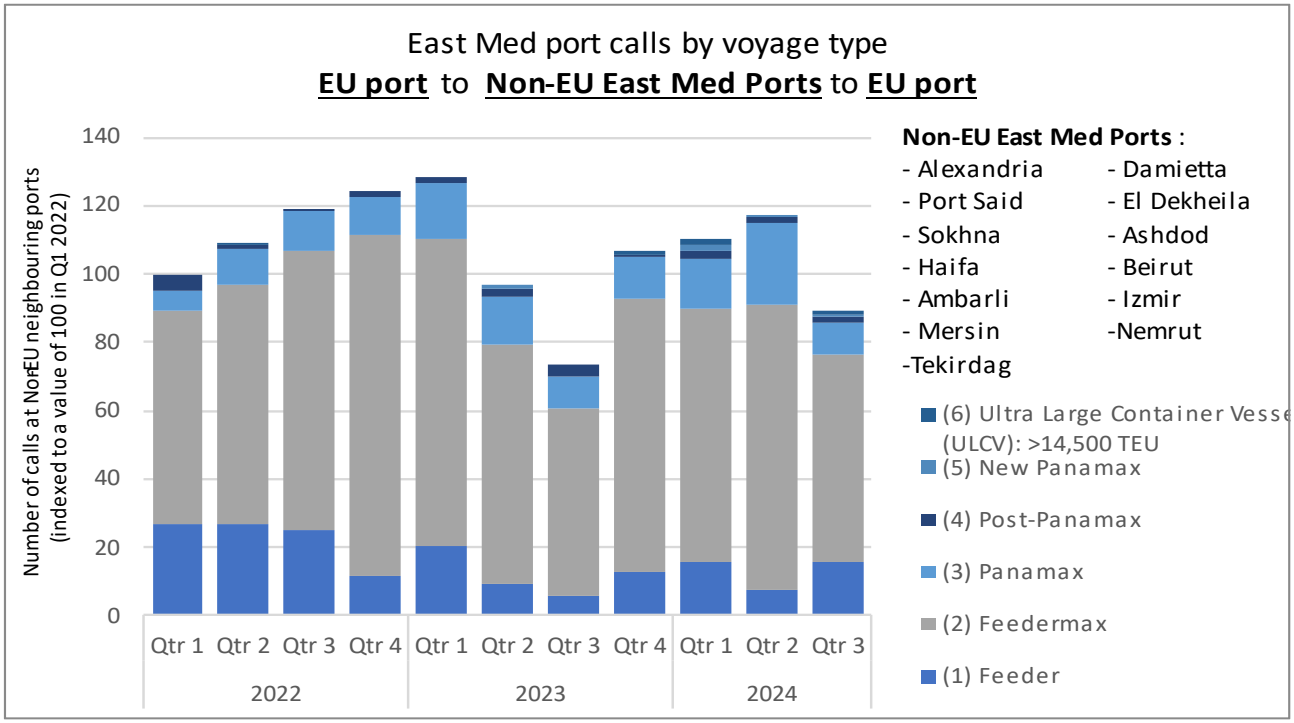


Source: EMSA

Port calls at a non-EU transhipment port in the East Mediterranean, between an EU port and a non-EU port show a significant decrease between Q4 2023 and Q1 2024, driven almost entirely by the near complete disappearance of the largest vessel sizes (particularly the ULCV and Post-Panamax categories). This is consistent with the onset of the attacks on shipping in the Red Sea that have led to many large vessels transiting via the Cape of Good Hope rather than through the Suez Canal. Conversely, port calls by other vessel sizes (Feeder to Panamax) remained largely stable through that period and have continued to do so through to Q3 2024.

The results of the analyses of voyages from an EU port to a non-EU transhipment port and then to an EU port are shown in Figure 3-11.

Figure 3-11: Voyages from an EU port to a non-EU transhipment port to an EU port (ENE)



Source: EMSA

Port calls at a non-EU transhipment port between calls at two EU ports show a much more volatile evolution than the preceding two charts. There was a very large reduction in such calls between Q1 2023 and Q3 of the same year. From then, there was a rapid recovery before steady growth to Q2 2024. Q3 2024 then showed another sharp reduction, although not as extreme as that experienced to Q3 2023.

The results of the analyses of port calls in the East Mediterranean show that there are noticeable differences in the evolution of port calls since early 2023, depending on the nature of the voyages.

Intra-EU transhipment voyages have maintained levels or increased over the period, particularly at the port of Piraeus. Voyages into EU ports from non-EU ports, whether the ongoing voyage is to another EU port or a non-EU port, have shown less good performance, with significant reductions in the first two quarters of 2024, which have not recovered in Q3.

Similarly, there have not been any significant increases in port calls at non-EU transhipment ports. On the contrary, there is rather a decreasing trend in calls at non-EU transhipment ports, especially in calls associated with voyages from an EU port to a non-EU port via a non-EU transhipment port.

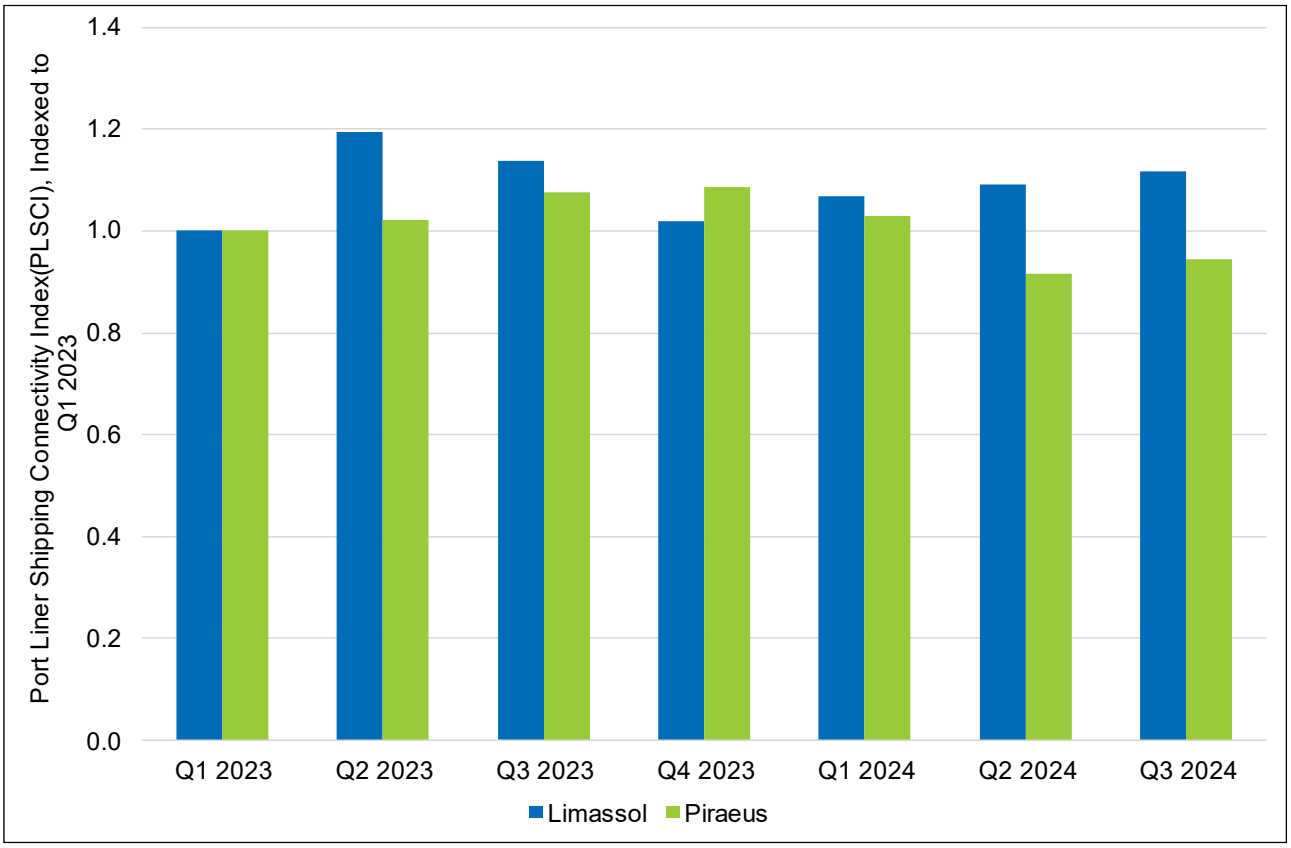
These effects are consistent with the impacts of the situation in the Red Sea on shipping in the region.

3.1.5. TRE5 - Is there a change in port liner shipping connectivity index (PLSCI) at the EU transhipment ports (and at the non-EU ports)?

The aim of analysing this question is to identify whether any changes in shipping activity, potentially as a result of the implementation of the extension of the EU ETS for shipping, have led to changes in connectivity for major EU and non-EU transhipment ports. If there have been any changes in vessel operations that impact activities at EU and non-EU ports (particularly the relocation of transhipment activities), it is likely that the ports that lose such activities would see a reduction in connectivity, while those that gain activity would see an increase. Comparing the evolution of connectivity at different ports can give an insight into the changes in operations that may have occurred.

Using the port liner shipping connectivity index (PLSCI) data published by UNCTAD, the variation in PLSCI since Q1 2023 has been monitored for the EU transhipment ports in the East Mediterranean (Figure 3-12).

Figure 3-12: Port liner shipping connectivity index evolution for EU transhipment ports in the East Mediterranean, indexed to Q1 2023, for Q1 2023 to Q3 2024

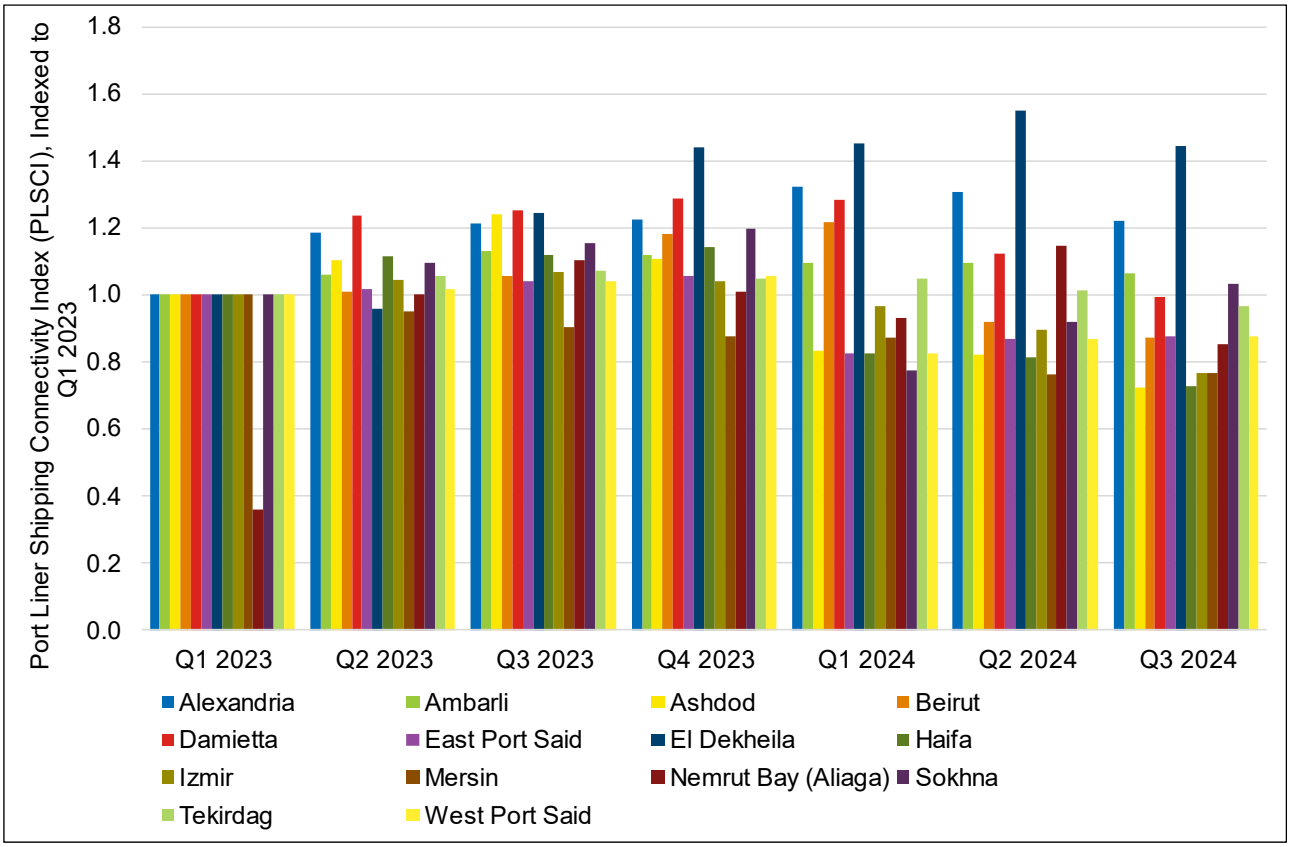


Source: Ricardo analyses of UNCTAD PLSCI data

The data shown have been indexed to a value of 1.0 in Q1 2023 to allow easier comparisons between ports. The results show that there have been some variations in connectivity over time. By Q3 2024, the value for Limassol remains about 12% higher than in Q1 2023, but 2% lower than one year previously in Q3 2023, while that for Piraeus is about 6% lower compared to Q1 2023 and 12% lower than in Q3 2023. As noted by Container News[55], the overall steady increase in connectivity could be indicative of improvements in the Limassol port's operational capabilities or that it is benefitting from its strategic location in the region (particularly given the current geopolitical situation there). Similarly, the reduction in connectivity at Piraeus could indicate that it is losing out to other ports because of the situation in the Red Sea or they may be facing operational challenges at the port.

The results of the analysis of connectivity for non-EU transhipment ports of relevance to the East Mediterranean are shown in Figure 3-13.

Figure 3-13: Port liner shipping connectivity index evolution for non-EU transhipment ports in the East Mediterranean, indexed to Q1 2023, for Q1 2023 to Q3 2024



Source: Ricardo analyses of UNCTAD PLSCI data

* *Note:* due to unusually low PLSCI values for the port of Nemrut Bay in Q1 2023, the data for that port have been indexed to a value of 100 in Q2 2023.

[55] https://container-news.com/eastern-mediterranean-ports-face-challenges-due-to-red-sea-disruptions/

The results show increases in connectivity for some ports over the year Q3 2023 to Q3 2024, particularly in Egypt (e.g., 16% for El Dekheila). However, the majority show reductions in connectivity over the same period (e.g., 42% for Ashdod and 35% for Haifa, both in Israel, or 29% for Izmir, Türkiye). Similarly to the case of EU transhipment ports in the region, the increase in connectivity at ports in Egypt may be indicative of their strategic location near the Northern end of the Suez Canal and may reflect the impacts of the ongoing geopolitical actions in the region. The reduction seen in other ports (e.g., those in Israel and Türkiye) may also reflect similar changes in the geopolitical situation, with the increase in routes using the Egyptian ports resulting in fewer routes being used directly to Turkish ports.

We observe quite large variations in the connectivity of non-EU ports relevant to the East Mediterranean in 2024, with some showing significant increases (relative to Q3 2023) and some significant reductions. These variations are also recognised in other reports. For example, Drewry[56] has noted that connectivity reduced in seven of the East Mediterranean's top ports, with the main cause being the reduction in the number of weekly connections due to the Red Sea situation. Some ports were able to mitigate these reductions through additional connections to North African ports. Similarly, Container News[57] reports that key ports in the region all lost connectivity due to the reduction in traffic through the Red Sea. Ports in the Red Sea itself suffered even more significant reductions in traffic, of up to 85% reduction in monthly port calls, with an associated reduction of about 40% in connectivity.

> Overall, considering both EU and non-EU ports in the East Mediterranean, there are significant variations seen in connectivity since Q1 2023, with some ports showing increases, but more showing decreases. These variations appear to be consistent with having been the result of the situation in the Red Sea, with different effects depending on the location of the port and its strategic importance to vessel operators. While evasive behaviours would not necessarily lead to a uniform reduction in connectivity at EU ports and increases at non-EU ports, the results to date do not indicate any systematic evasive behaviour taking place.

[56] Drewry Shipping Insight, November 2024 (https://www.drewry.co.uk/maritime-research-products/maritime-research-products/shipping-insight-annual-subscription)

[57] https://container-news.com/egypts-high-risk-and-fragility-create-challenges-for-east-med/

3.2. Relocation of transhipment activities – Central Mediterranean

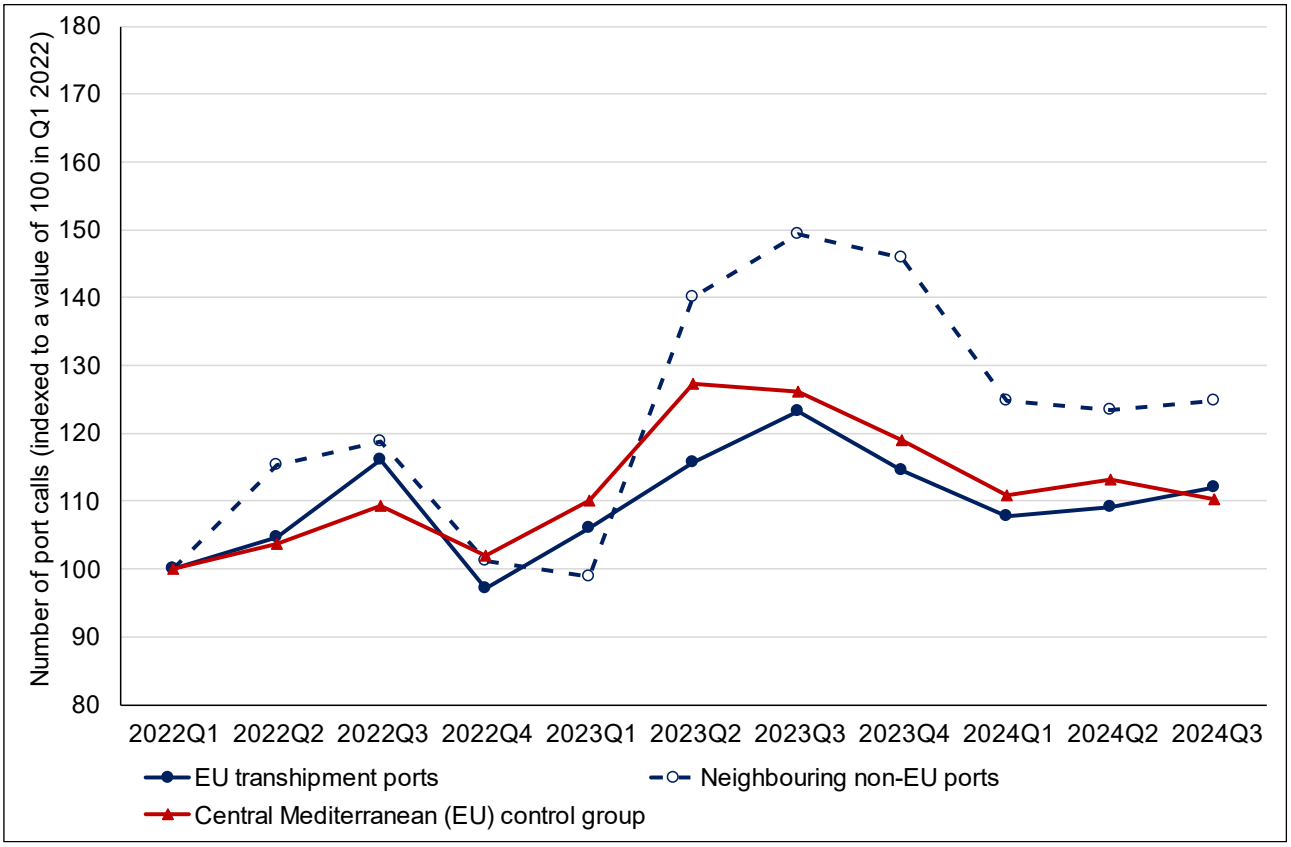
3.2.1. TRC1 – How have container ships' port calls at EU transhipment hubs in the Central Mediterranean evolved, particularly compared to the EU control groups and non-EU neighbouring ports (Central Mediterranean)?

The purpose of this question is to understand whether there is any evidence of changes in port calls by container ships at EU transhipment hubs in the Central Mediterranean, in particular any changes that are different to those experienced by other ports in the region (EU and non-EU) that could be indicative of transhipment relocation.

To investigate this question, data for port calls at EU and identified non-EU ports[58] from the EMSA MARINFO database were analysed to identify the numbers of port calls per quarter since the first quarter of 2022. To enhance the presentation of trends over time, and to ease comparisons between different locations (EU and non-EU ports of relevance to transhipment activities in the Central Mediterranean in this case), the numbers of port calls were indexed to a value of 100 in Q1 2022. The results are shown in Figure 3-14.

[58] EU transhipment ports: Cagliari (Italy), Gioia Tauro (Italy), Marsaxlokk/Malta Freeport (Malta), Taranto (Italy), Trieste (Italy), Valletta (Malta). Neighbouring non-EU ports: Qasr Ahmed (Misurata) (Libya). Central Mediterranean (EU) control group: Genova (Italy), La Spezia (Italy), Livorno (Italy), Napoli (Italy), Rijeka (Croatia). The selection of ports included in the different analyses are further described in Section 2.3 and listed in Appendix 2.

Figure 3-14: Numbers of port calls by container ships at EU and non-EU ports of relevance to the Central Mediterranean, indexed to a value of 100 in Q1 2022

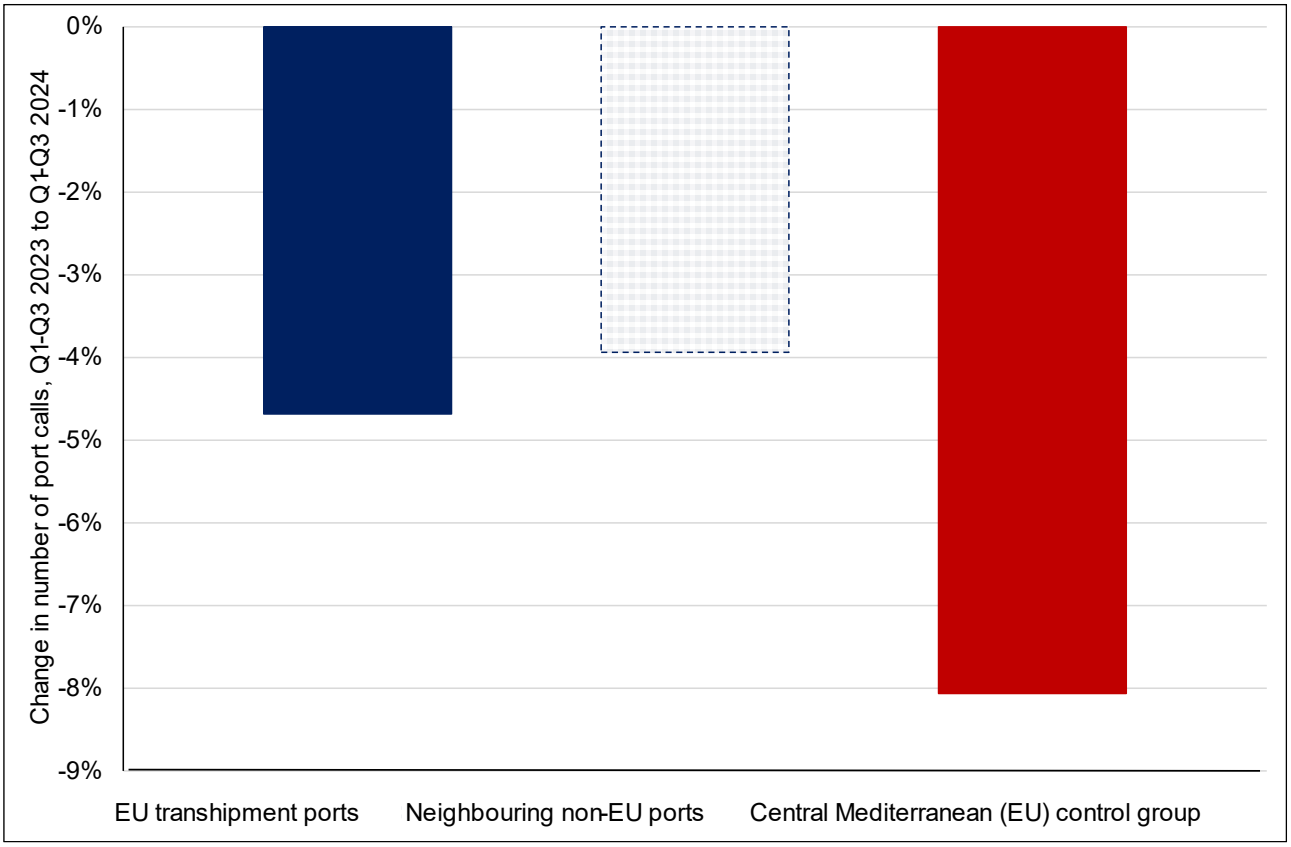


Source: Ricardo analysis of EMSA MARINFO data

The figure shows that the EU transhipment ports in the Central Mediterranean had a gradual increase in port calls from Q4 2022 to Q3 2024, they then reduced to Q1 2024, since when they have been quite stable. The neighbouring non-EU ports category in the Central Mediterranean is represented by a single port (Qasr Ahmed in Libya); as a result, this category shows greater volatility in the number of port calls, with a very sharp rise from Q1 to Q2 2023 and a rapid reduction (though of less magnitude) from Q4 2023 to Q1 2024. Since that time, similarly to the EU ports, the port calls for the non-EU port have been quite stable.

The percentage changes in port calls between Q1 to Q3 2023 and Q1 to Q3 2024 for these three port categories are shown in Figure 3-15.

Figure 3-15: Percentage change in number of port calls for container ships between Q1 to Q3 2023 and Q1 to Q3 2024



Source: Ricardo analysis of EMSA MARINFO data

Consistent with the results shown in Figure 3-14, the EU transhipment ports and neighbouring non-EU ports show similar reductions in port calls between Q1 to Q3 2023 and the same period in 2024, of 4.7% and 3.9%, respectively.

Overall, based on this analysis and the individual ports analysis (see Appendix 3), there is evidence of fewer container ships calling at EU transhipment hubs in the Central Mediterranean in 2024 than in 2023; however, the reduction is consistent with that seen at the non-EU transhipment port and the EU control group in the same region and is likely related to the impacts of the situation in the Red Sea.

3.2.2. TRC2 - How has traffic of specific container vessel categories (deep sea container ships used for relay transhipment, smaller container vessels used for feeder transhipment) evolved, especially compared to non-EU neighbouring ports (Central Mediterranean)?

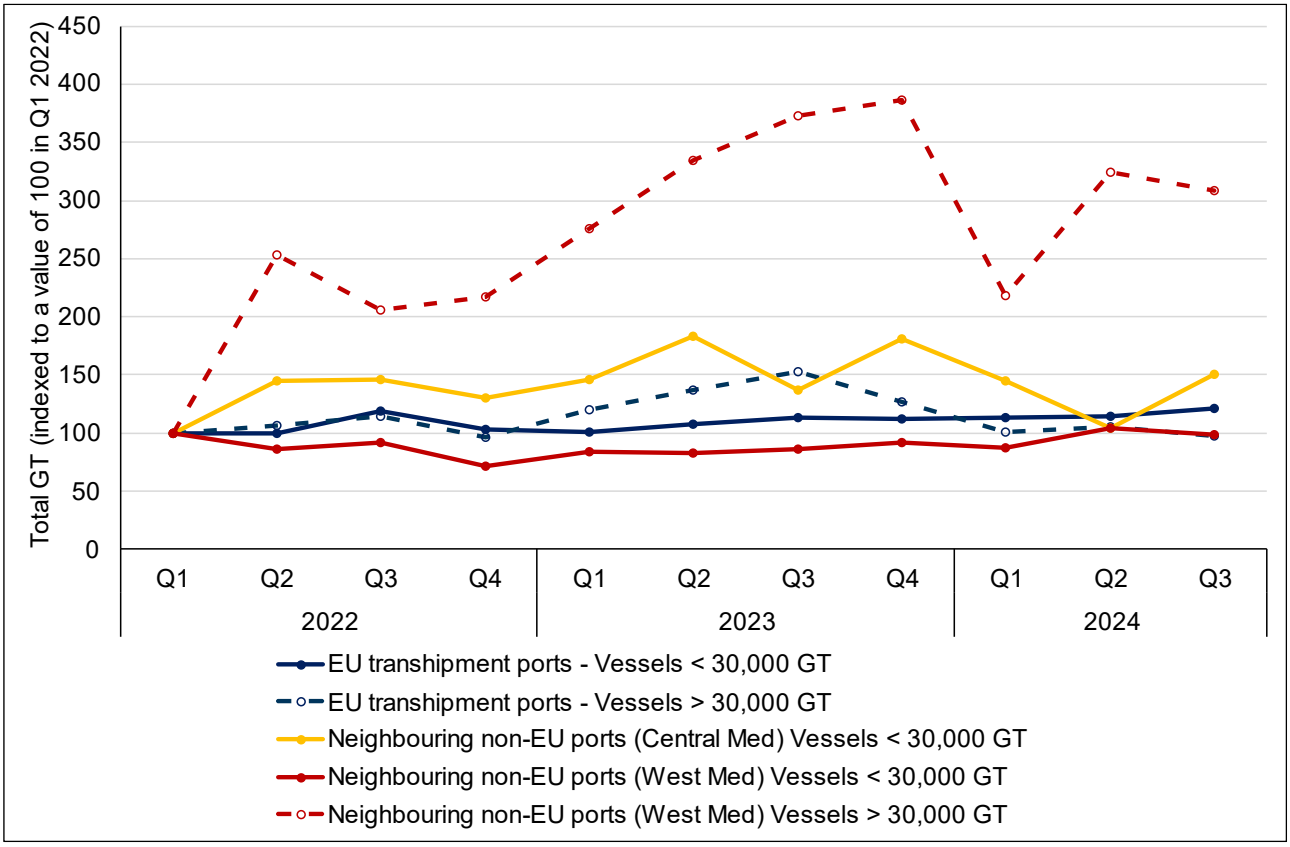
The aim of this question is to understand whether there are any changes in relay transhipment and feeder transhipment activities in the Central Mediterranean that could point to changes in the location of transhipment activities (i.e. relocation as a potential evasive behaviour).

MARINFO data has been used to assess the number of large container ships (>30,000 GT, a proxy for relay container vessels) and smaller container ships (<30,000 GT, a proxy for feeder container vessels) calling at ports in the Central Mediterranean, in Figure 3-16. As has been seen in other research questions related to activities in the Central Mediterranean, the inclusion of a single port in the neighbouring non-EU ports category in the region leads to some odd results; in particular, there are no port calls by container ships over 30,000 GT at the port (Qasr Ahmed) in the MARINFO data. Therefore, Figure 3-16 also includes results for the neighbouring non-EU ports in the West Mediterranean region as they provide a more robust comparison.

The results show consistent trends for total GT for vessels below 30,000 GT for both EU transhipment ports in the Central Mediterranean and neighbouring non-EU ports in the West Mediterranean. Both show a gradual increase in total GT since early 2023 (with the non-EU ports in the West Mediterranean having shown a reduction in GT through 2022, while that for the EU ports in the Central Mediterranean was more constant). As indicated above, the results for small container ships at the non-EU port (Qasr Ahmed) in the Central Mediterranean are not consistent with those for the EU transhipment ports or the non-EU ports in the West Mediterranean, with large variations in total GT seen throughout 2023 and 2024.

There are large differences seen in the trends for large vessels, with the total GT at EU ports showing a peak in Q3 2023, followed by a gradual reduction to Q3 2024. The neighbouring non-EU ports in the West Mediterranean experienced a significant rise in total GT of large containers between Q1 2022 and Q4 2023, followed by a sharp reduction in Q1 2024 and a recovery to Q2 2024. The reason for the reduction in Q1 2024 is not clear but could be associated with the delays in arrivals due to the increased duration of voyages starting in late 2023 due to the re-routing around the Cape of Good Hope.

Figure 3-16: Total GT transported through ports in Central Mediterranean by container vessels from Q1 2022 to Q3 2024, below and above 30,000 GT, indexed to a value of 100 in Q1 2022, including results for non-EU ports in the West Mediterranean



Source: Ricardo analysis of EMSA MARINFO data

The year on year changes in transport capacity (GT) between Q1 to Q3 2023 and Q1 to Q3 2024 in the Central Mediterranean are shown in Table 3-2.

Table 3-2: Year on year changes (Q1 to Q3 2023 to Q1 to Q3 2024) of total GT for container ship port calls in the Central Mediterranean, including results for non-EU ports in the West Mediterranean

EU < 30,000 GT	EU > 30,000 GT	non-EU < 30,000 GT	non-EU > 30,000 GT
9.3%	-27.3%	4.4%	N/A
Non-EU ports in West Mediterranean:		*9.2%*	*-18.7%*

Source: Ricardo analysis of EMSA MARINFO data

As expected from the results shown in Figure 3-16, EU transhipment ports in the Central Mediterranean and non-EU ports in the West Mediterranean experienced similar levels of growth over the period from Q1 to Q3 2023 to Q1 to Q3 2024, at 9.2% to 9.3%. Over the period being assessed, both EU and non-EU ports experienced significant reductions in the total GT of large container ships (the large increase in total GT at the non-EU ports

occurred before the comparison period), with the EU ports seeing a greater reduction than the non-EU ports.

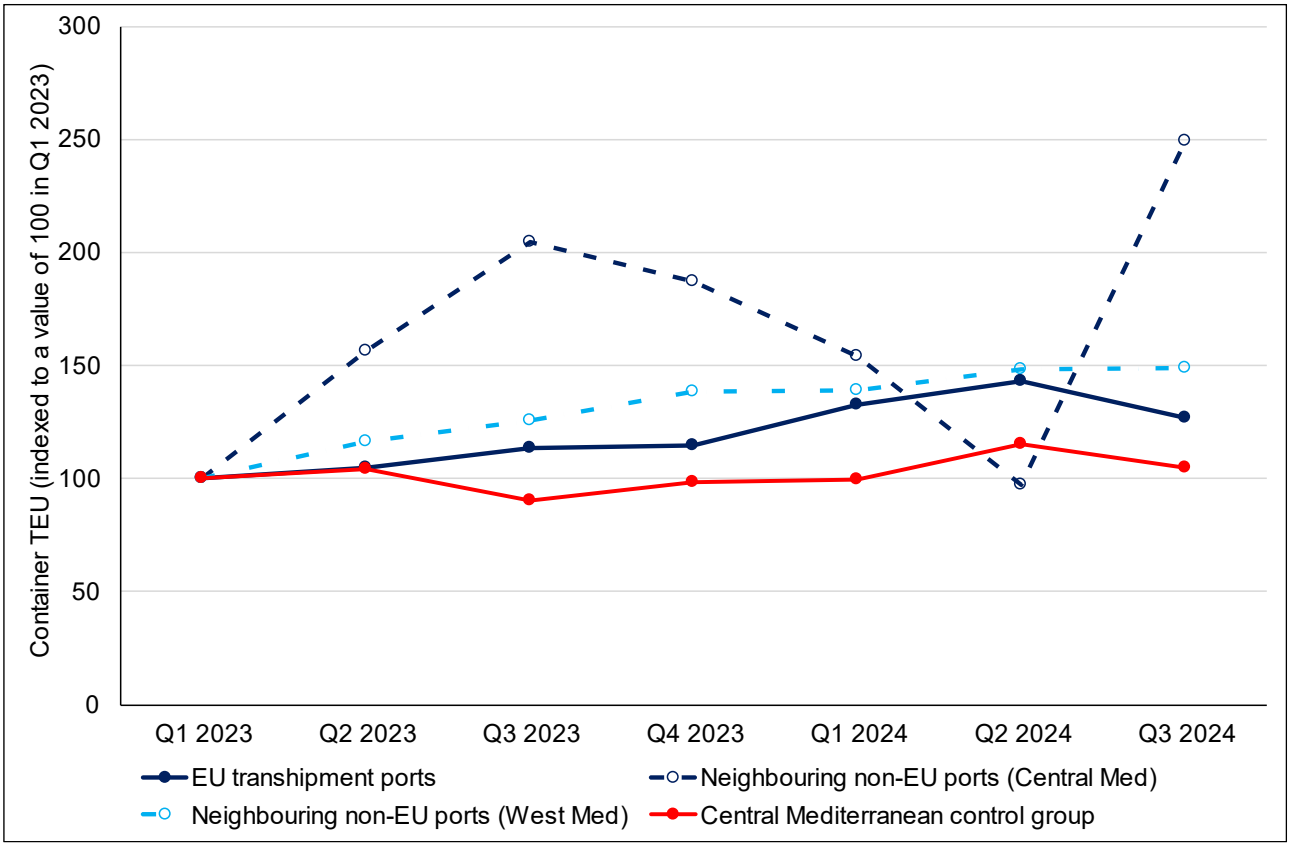
> Overall, the container transport capacity (as measured by total GT) of small (feeder) container ships calling at EU ports in the Central Mediterranean (and non-EU ports in the West Mediterranean) has continued to grow steadily (although slowly) through 2023 and 2024. The EU transhipment ports in the Central Mediterranean experienced significant reductions in transport capacity of large (relay) container ships in 2024. Neither of these trends indicates evasive behaviour in the form of transhipment relocation from EU ports in the Central Mediterranean to neighbouring non-EU ports has occurred. This trend is rather consistent with the Red Sea situation, associated re-routings and an extended duration of voyages leading to a reduction in arrivals at ports in early 2024.

3.2.3. TRC3 - How have container activities, including transhipment, evolved at EU transhipment hubs in the Central Mediterranean, especially compared to EU control group and to non-EU neighbouring ports (Central Mediterranean)?

The aim of this question is to examine whether data on the transport of containers, particularly transhipment, indicate any shift from EU transhipment ports in the Central Mediterranean to non-EU ports that could suggest the occurrence of transhipment relocation as an evasive behaviour. To investigate the question, data on container movement estimates from econdb for EU transhipment ports have been compared with those for the neighbouring non-EU port in the Central Mediterranean. To provide an indication of whether any trends seen may be associated with changes in transhipment activity specifically, or more general changes in traffic in the region, comparisons are also made with the Central Mediterranean control group ports.

The total container throughput at EU transhipment ports in the Central Mediterranean region from analyses of econdb data is shown in Figure 3-17, in comparison with non-EU transhipment ports and the EU Central Mediterranean control group ports.

Figure 3-17: Estimations of total container throughput at EU and non-EU ports relevant to the Central Mediterranean from Q1 2023 to Q3 2024, indexed to a value of 100 in Q1 2023



Source: Ricardo analyses of econdb data

As the group of non-EU transhipment ports in the Central Mediterranean consists of a single port (Qasr Ahmed), Figure 3-17 also shows the results for the non-EU transhipment ports in the West Mediterranean.

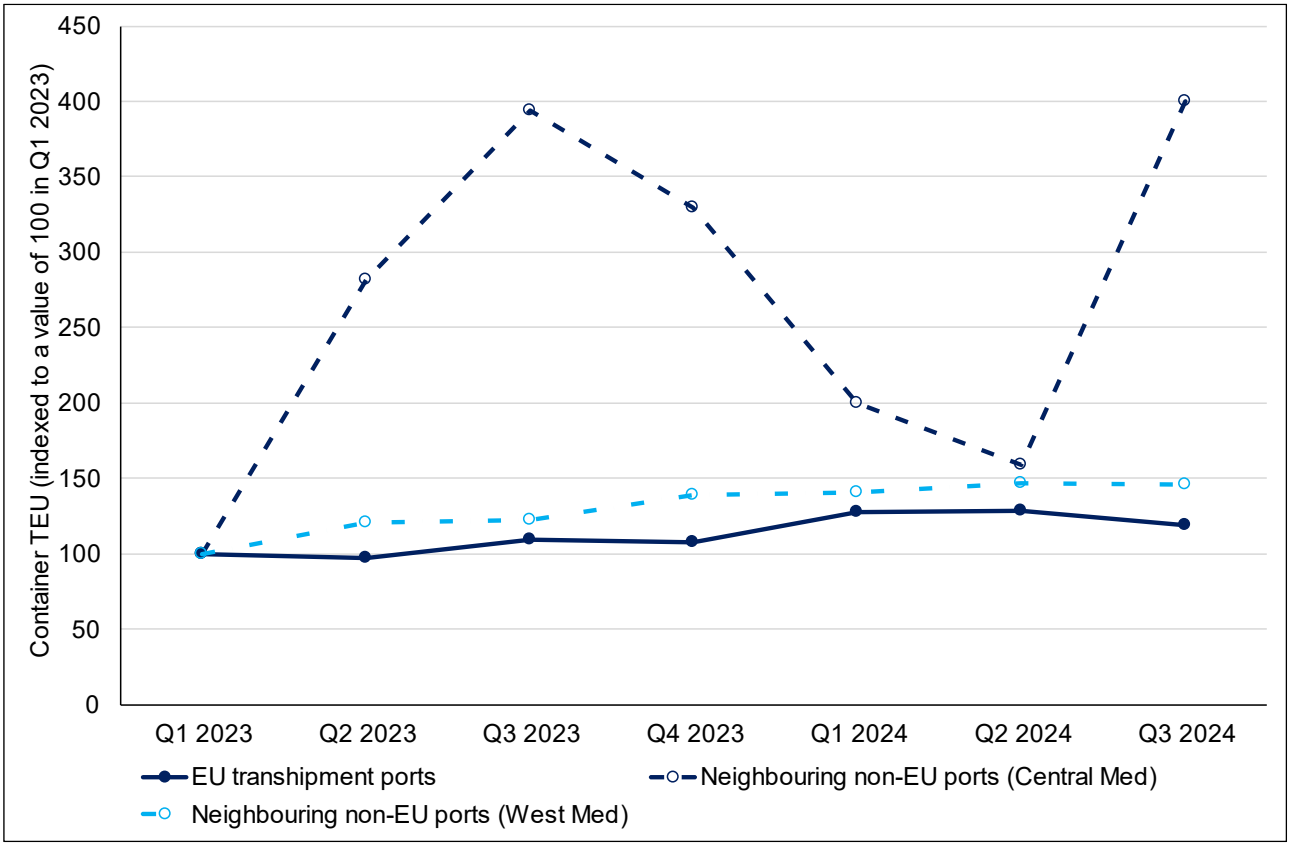
The EU transhipment ports in this region show a gradual increase in total container movements from the beginning of 2023 to Q2 2024, before reducing again in Q3 2024. The Central Mediterranean control group shows a less rapid growth over time, reaching an increase of 18% over Q1 2023 by Q2 2024. As noted previously, the non-EU transhipment ports group consists of only a single port, and this shows a very high growth through to Q3 2023, with an equally rapid reduction to mid-2024. The non-EU transhipment ports in the West Mediterranean provide a more robust comparison with the EU transhipment ports; this shows a very similar growth in container throughput to the EU transhipment ports through to Q2 2024, but it continues to grow through to Q3 2024, in contrast to the EU ports.

Overall, both the EU transhipment ports in the Central Mediterranean and the non-EU West Mediterranean transhipment ports experienced a similar increase in throughput between Q1 to Q3 2023 and Q1 to Q3 2024, although the EU ports show evidence of a reduction in throughput in Q3 2024 which is not evident in the non-EU ports in the West

Mediterranean. The neighbouring non-EU port in the Central Mediterranean (Qasr Ahmed) shows very large fluctuations in throughput between the same periods.

The trends for container *transhipment* activity specifically for ports in the Central Mediterranean are shown in Figure 3-18.

Figure 3-18: Estimations of container imports for transhipment at EU and non-EU ports relevant to the Central Mediterranean from Q1 2023 to Q3 2024, indexed to a value of 100 in Q1 2023



Source: Ricardo analyses of econdb data

Similarly to Figure 3-17, these results include those for non-EU transhipment ports in both the Central and West Mediterranean regions. However, it does not show EU control ports in the Central Mediterranean, because of their limited volumes of transhipment activities (and hence not so relevant for the purposes of this analysis).

Again, the results for the neighbouring non-EU ports in the Central Mediterranean (just the port of Qasr Ahmed) show sizeable fluctuations an unrepresentative very large growth to between Q3 2023 and, with a very large reduction to Q2 2024, followed again by a very rapid increase to Q3 2024. The group of non-EU transhipment ports in the West Mediterranean again provides a more representative comparison with the EU transhipment ports in the Central Mediterranean. In both cases, the data from econdb show a growth in transhipment activities between Q1 2023 and Q3 2024, although the EU ports show a levelling off (leading to a slight reduction) after Q1 2024.

Comparing total transhipment activity in H1 2024 against H1 2023, the EU transhipment ports in the Central Mediterranean show a very similar increase as for neighbouring non-EU ports in the West Mediterranean.

> Overall, from a regional perspective, the total container throughput and transhipment trends do not show any significant differences between the EU transhipment ports in the Central Mediterranean, the EU control group ports and the non-EU transhipment ports – hence there is no indication of relocation of transhipment activities happening from these analyses.

3.2.4. TRC4 - Is any such evolution associated with specific types of voyages (i.e. non-EU/port/non-EU; non-EU/ port/EU; EU/port/EU)?

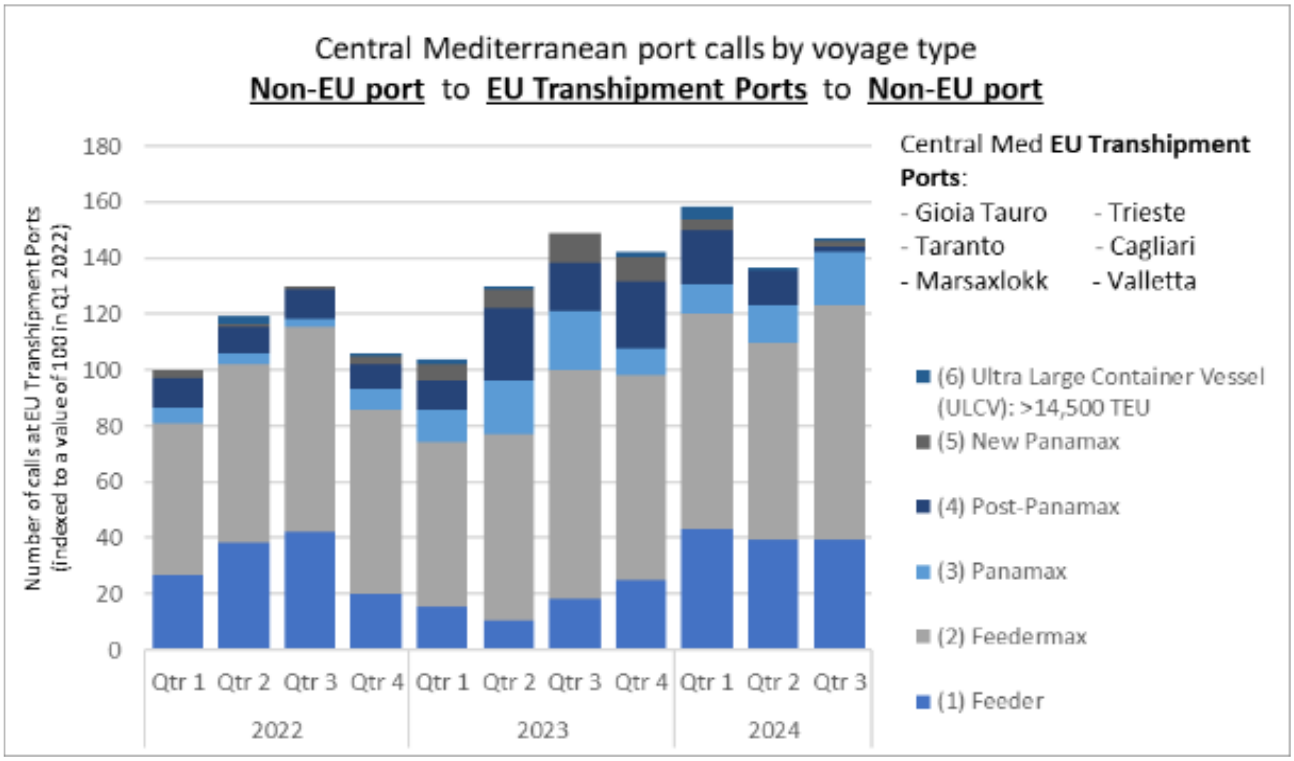
This research question aims to gather evidence of whether there are any differences in evolution of container activities at the Central Mediterranean transhipment hubs related to specific types of voyages between EU and non-EU ports.

To address the question, the EMSA tool has been used to extract the number of voyages (depending on their sequence. Similarly to question TRE4, the tool has been used to assess three types of voyages:

- Non-EU port to EU transhipment port to non-EU-port
- Non-EU port to EU transhipment port to EU-port (including the other way around: EU port to EU transhipment port to non-EU port)
- EU port to EU transhipment port to EU-port.

The results for non-EU – EU – non-EU voyages (Figure 3-19) show that in the first quarter of 2024, when compared to the first quarter of 2023, there has been an increase in the number of container vessels starting their voyage in a non-EU port, arriving to an EU transhipment port in the Central Mediterranean, and then leaving again to another non-EU port. In Q2 of 2024, there was then a reduction in port calls, followed by a partial recovery in Q3 2024. In general, the majority of port calls related to this voyage type are made by vessels in the Feeder or Feedermax size categories. Up to Q1 2024, there were also port calls by the largest vessel types, New Panamax and ULCV, but these have largely disappeared in Q2 and Q3 2024. The total port calls in Q3 2024 were only slightly less than in the equivalent quarter in 2023.

Figure 3-19: Voyages between Non-EU-port, to EU transhipment port, to non-EU-port (case NEN)

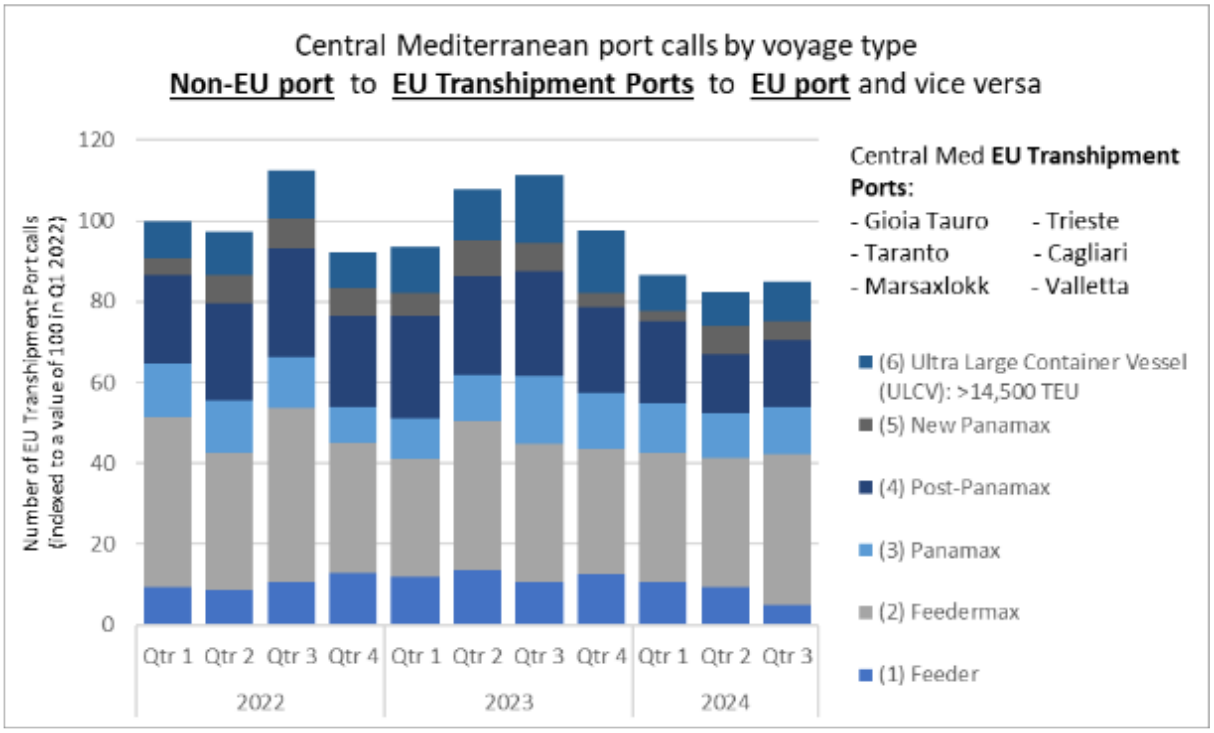


Source: EMSA

Results for the voyages from a non-EU port to an EU transhipment port in the Central Mediterranean and then to another EU port (or vice versa) are shown in Figure 3-20. In this case, the smaller vessels take a much smaller share of the overall voyages (than for the NEN voyages), and there is a much larger share of the voyages taken by the largest vessels. Comparing this to the equivalent figure for the East Mediterranean (Figure 3-7), it is evident that such voyages via a transhipment hub in the Central Mediterranean have a larger share of large vessels than those in the East Mediterranean.

In contrast to the results for the NEN case, which shows an increase in total port calls to Q1 2024, Figure 3-20 shows a peak in the number of port calls in Q3 2023, followed by a reduction to Q2 2024. The total in Q3 2024 is very similar to that in Q2. The smaller vessel categories show little variation through this period, with most of the reduction in port calls being associated with the ULCV and Post-Panamax categories.

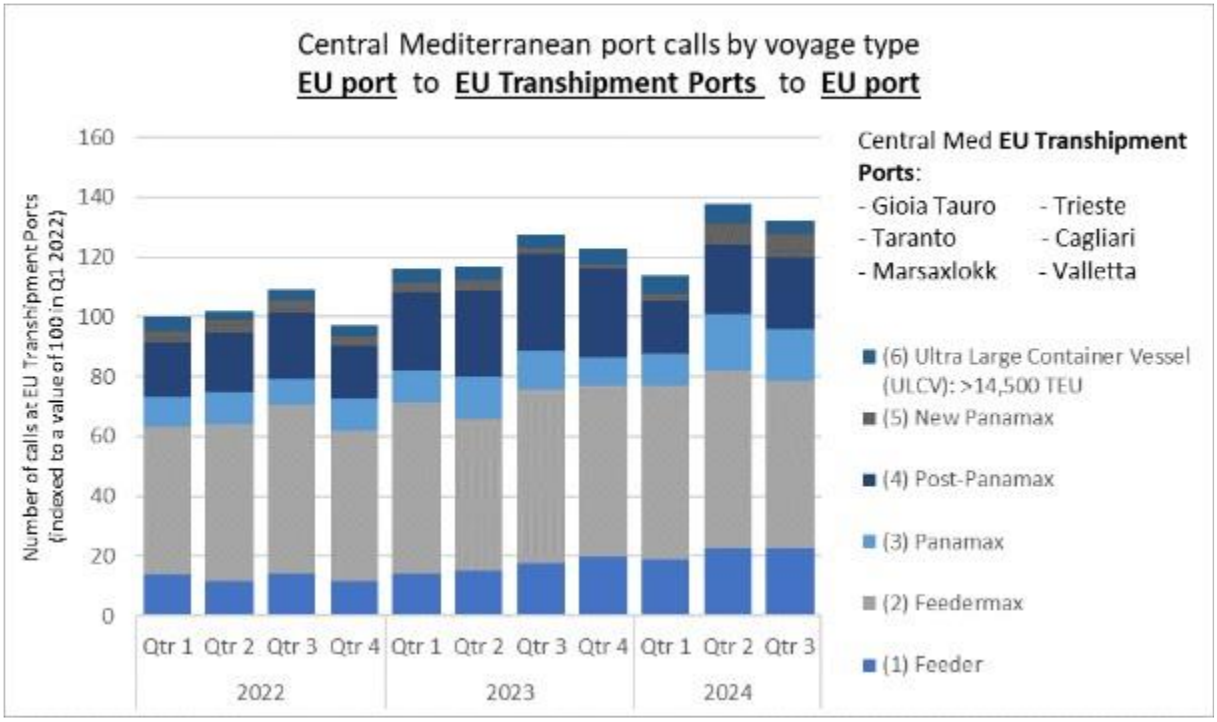
Figure 3-20: Voyages between Non-EU-port to EU transhipment port to EU-port (including the other way around: EU port to EU transhipment port to non-EU-port) (case NEE, EEN)



Source: EMSA

The results for the intra-EU transhipment voyages are shown in Figure 3-21. These results show a greater proportion of the total port calls being related to the smaller vessel sizes and, similarly to the results for the East Mediterranean (Figure 3-8), they show an overall increase in activity in H1 2024 relative to H1 2023, with a particularly noticeable increase in Q2 2024, which is largely maintained in Q3.

Figure 3-21: Voyages between EU-port to EU transhipment port to EU-port (case EEE)

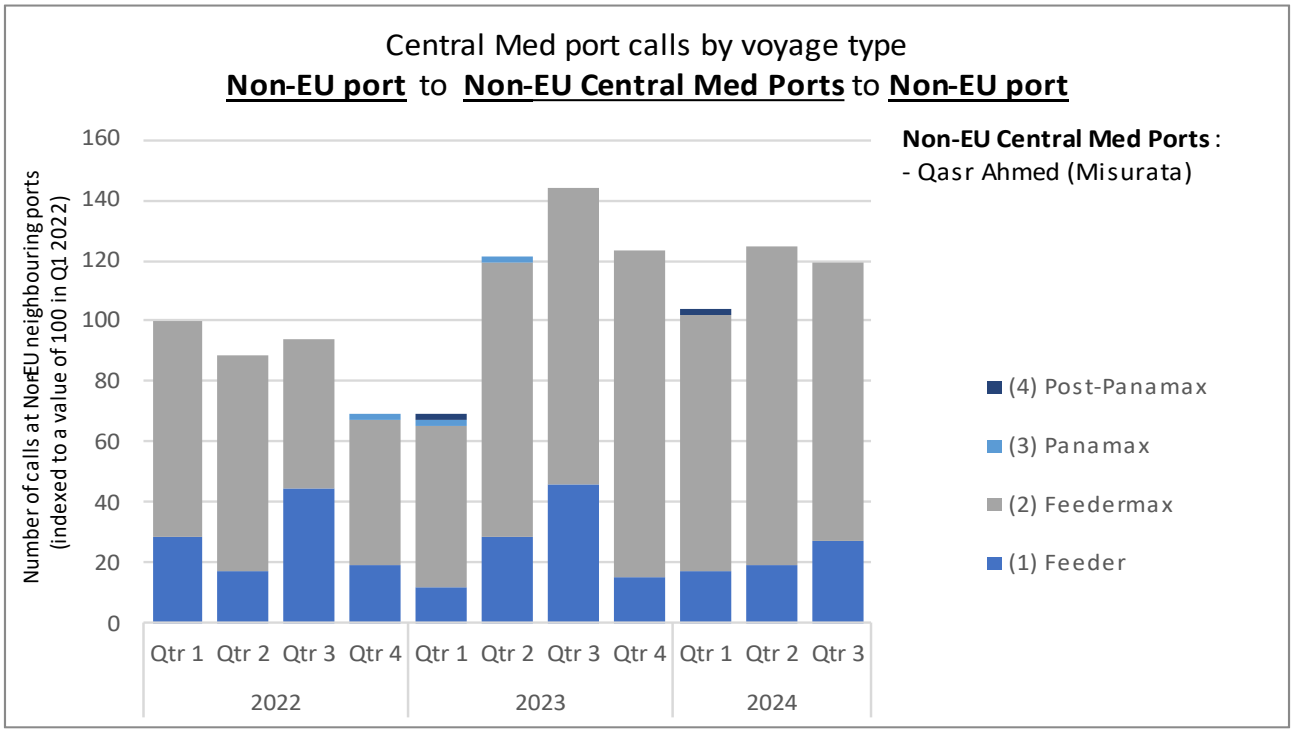


Source: EMSA

Similarly to the analysis of ports in the East Mediterranean, the following charts show the evolution of port calls at the Central Mediterranean non-EU transhipment port (Qasr Ahmed in Libya).

Figure 3-22 shows voyages from non-EU ports to the non-EU transhipment port in the Central Mediterranean to another non-EU port.

Figure 3-22: Voyages from a non-EU port to a non-EU transhipment port to a non-EU port (NNN)

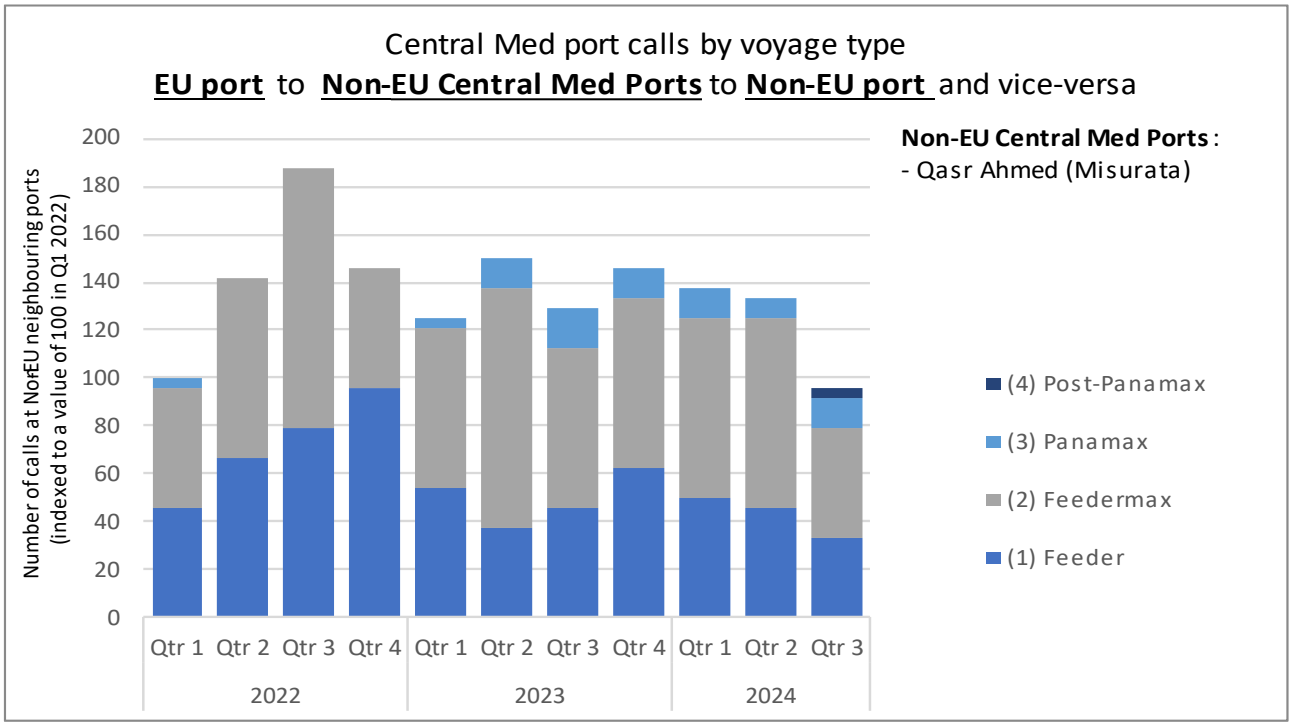


Source: EMSA

In this case, the traffic is composed almost entirely of the Feeder and Feedermax vessel size, reflecting the location of the port (large vessels on inter-continental routes calling in the Mediterranean would be more likely to stop close to where they enter the Mediterranean (at either the Eastern or Western end) rather than travelling to the central location before stopping). The total port calls show an increase in Q3 2023 and a reduction in Q1 2024, but have otherwise been quite stable since a very large increase from Q1 to Q2 2023.

Figure 3-23 shows voyages from an EU port to a non-EU transhipment port and then to another non-EU port, also including those from a non-EU port to a non-EU transhipment port to an EU port.

Figure 3-23: Voyages from an EU port to a non-EU transhipment port to a non-EU port (and vice-versa) (ENN)

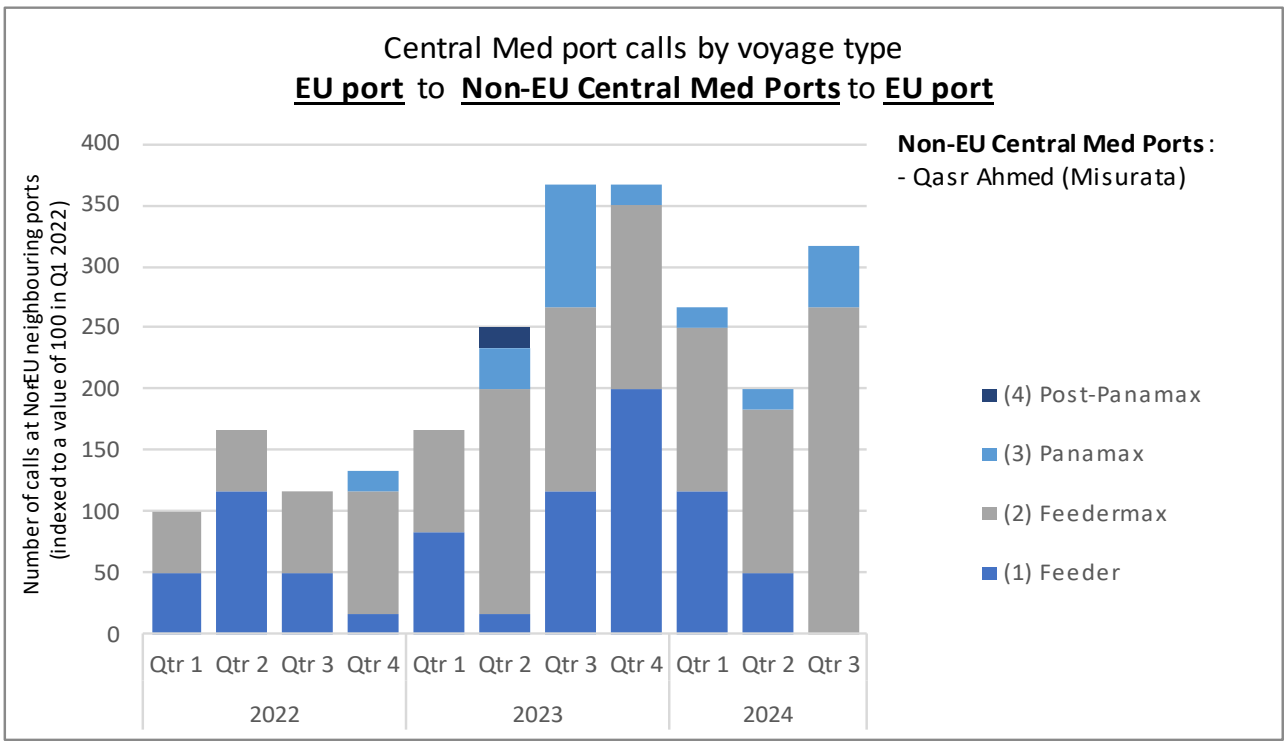


Source: EMSA

Again, these port calls are dominated by the smaller vessel sizes, with negligible numbers of calls by the larger vessel sizes. Following a stable evolution to Q2 2024, port calls on ENN and NNE voyages showed a significant reduction in Q3 2024.

The results of the analyses of voyages from an EU port to a non-EU transhipment port and then to an EU port are shown in Figure 3-24.

Figure 3-24: Voyages from an EU port to a non-EU transhipment port to an EU port (ENE)



Source: EMSA

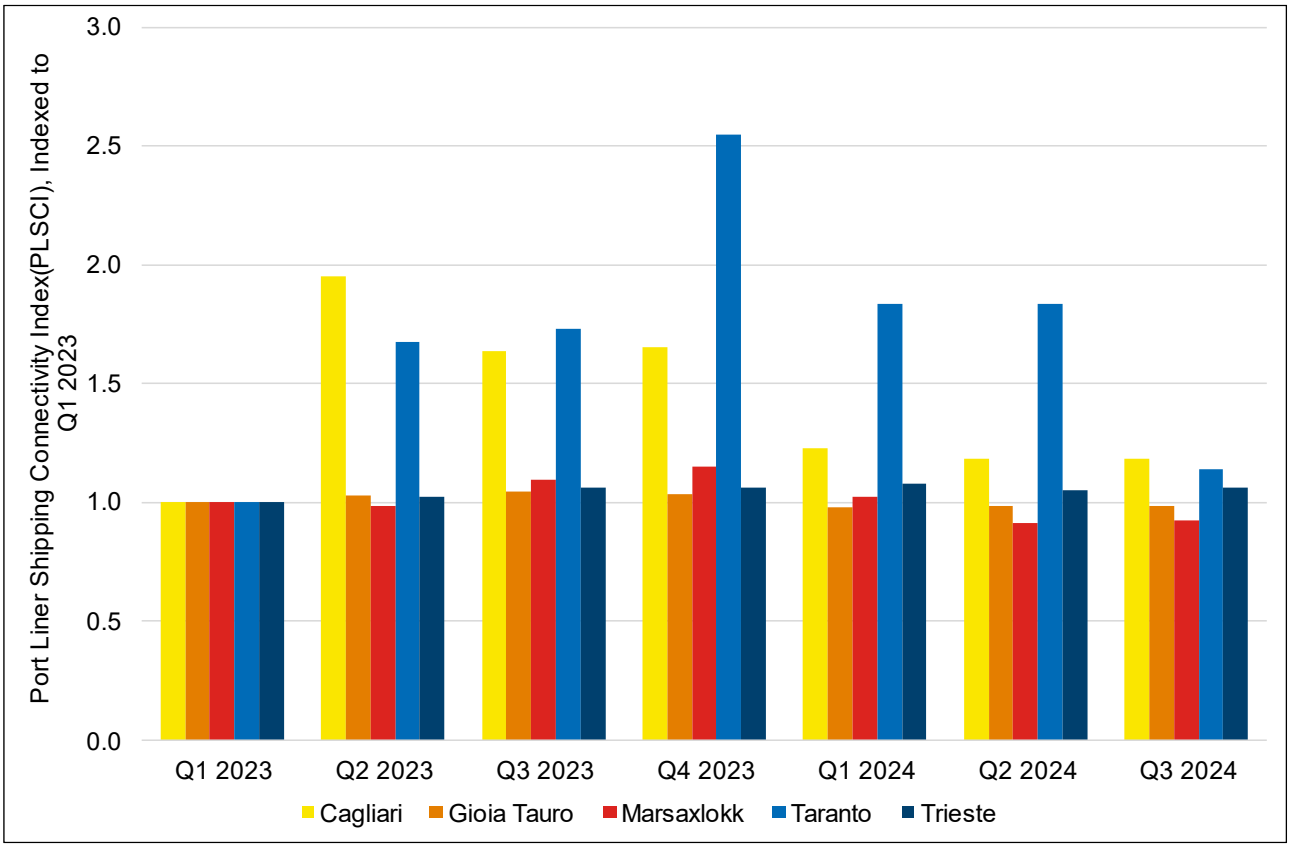
Port calls at the Central Mediterranean transhipment port between calls at EU ports grew dramatically through 2023. During the first two quarters of 2024, the numbers of port calls showed a substantial reduction (although still twice what they were in Q1 2022, for example) before a strong recovery in Q3 2024. As would be expected for its location and the nature of the voyages, there is again very little activity by large vessel categories at the port, with calls in Q3 2024 being dominated by the Feedermax category.

Overall, the results of the analyses presented here show that port calls at EU transhipment hubs in the Central Mediterranean have generally been quite stable in 2024, although there is some evidence of a reduction in calls by the largest vessel categories. Port calls at the non-EU transhipment port in the region are dominated by the smaller, feeder, vessel sizes and have shown reduction in 2024, with variations in evolution between different voyage types. There are no indications of a relocation of transhipment activities away from EU transhipment ports in the region, nor of any increase at the non-EU port.

3.2.5. TRC5 - Is there a change in port liner shipping connectivity index (PLSCI) for the EU transhipment ports (and at the non-EU ports)?

The aim of analysing this question is to identify whether any changes in shipping activity, potentially as a result of the implementation of the extension of the EU ETS for shipping, have led to changes in connectivity for major EU and non-EU transhipment ports in the Central Mediterranean. Similarly to the analysis presented above for the East Mediterranean ports, the question of whether there have been changes to the connectivity of ports in the Central Mediterranean region has been investigated by analysing the PLSCI data from UNCTAD. The PLSCI values for the EU transhipment ports in the Central Mediterranean basin, indexed to Q1 2023, are shown in Figure 3-25.

Figure 3-25: Port liner shipping connectivity index evolution for EU transhipment ports in the Central Mediterranean, indexed to Q1 2023, for Q1 2023 to Q3 2024



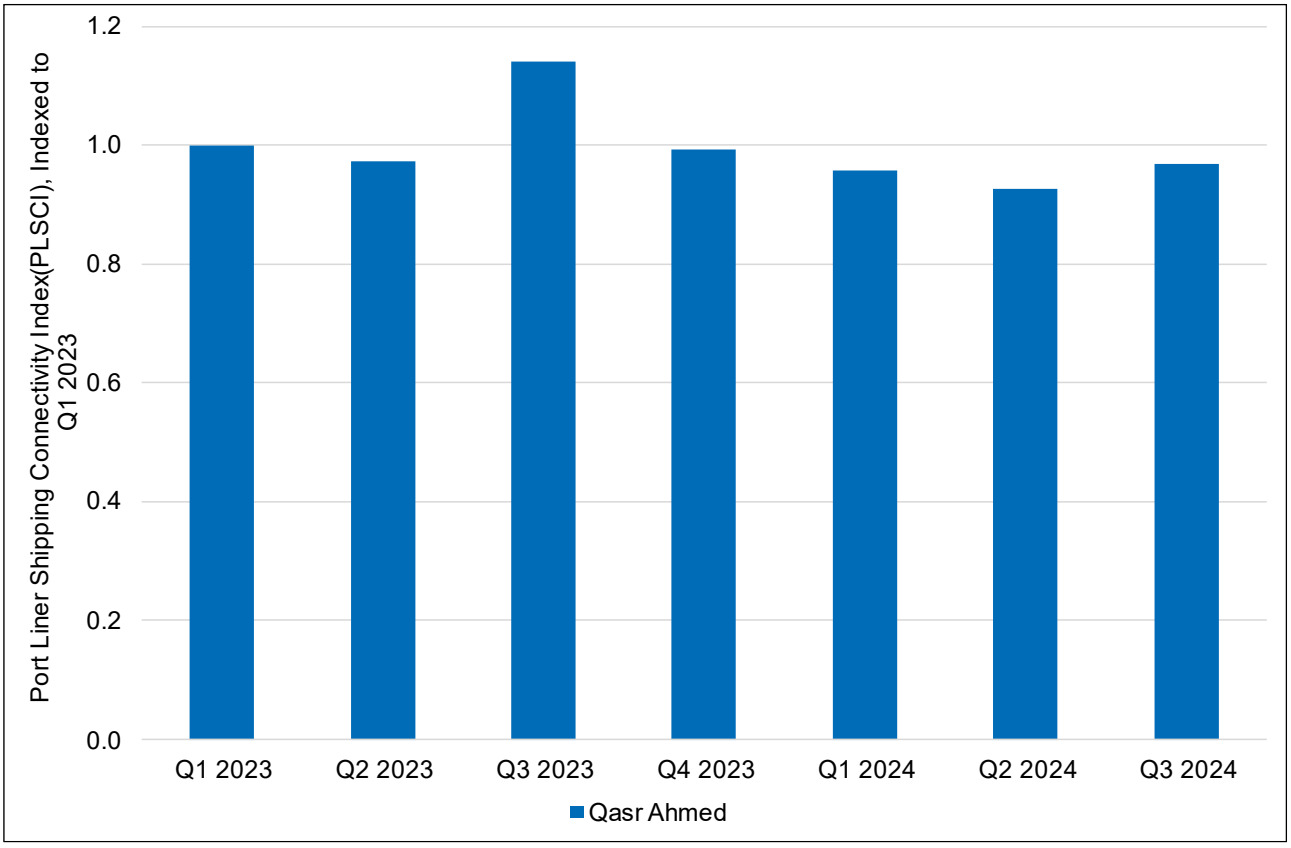
Source: Ricardo analyses of UNCTAD PLSCI data

The port of Cagliari showed a significant increase in connectivity in Q2 2023, but this has gradually reduced since then to about 18% above the Q1 2023 value; the value in Q3 2023 is 28% lower than in the same quarter in 2023. Taranto also experienced a similar significant increase in connectivity between Q1 and Q2 2023. The connectivity continued to increase to Q4 2023, after which it reduced somewhat before a very large reduction in Q3 2024. As a result, the connectivity for this port in Q3 2024 is 34% lower than in Q3

2023 (and 55% lower than in Q4 2023). The port of Trieste also improved its connectivity over the period to Q3 2023, since when it has remained very stable. After a small reduction at the start of 2024, the connectivity for the port of Gioia Tauro has remained constant since. The port of Marsaxlokk has experienced a gradual decrease in connectivity through 2024, with the index in Q3 2024 being 16% lower than it was in Q3 2023 (and 20% lower than in Q4 2023).

Figure 3-26 shows the variation in PLSCI for the non-EU port included in the analysis in the Central Mediterranean (Qasr Ahmed, also referred to as Misurata, in Libya).

Figure 3-26: Port liner shipping connectivity index evolution for non-EU transhipment port in the Central Mediterranean, indexed to Q1 2023, for Q1 2023 to Q3 2024



Source: Ricardo analyses of UNCTAD PLSCI data

The results show a small increase in connectivity at the port in Q3 2023; however, this then decreased before a slight recovery in Q3 2024. As a result, the connectivity in Q3 2024 is 15% lower than in Q3 2023.

Overall, the ports of Cagliari, Marsaxlokk and Taranto show some reductions in connectivity between Q3 2023 and Q3 2024 (and greater reductions relative to their peaks in Q2 and Q4 2023). The majority of the other ports in the Central Mediterranean, both EU and non-EU, show much less variation in 2024. While the reduction in connectivity at these ports could be indicative of evasive transhipment relocation, there

has not been a corresponding increase at the non-EU transhipment port in the region and the loss of connectivity could also be associated with reduced traffic arriving from the East (i.e. through the Suez Canal).

3.3. Relocation of transhipment activities – West Mediterranean

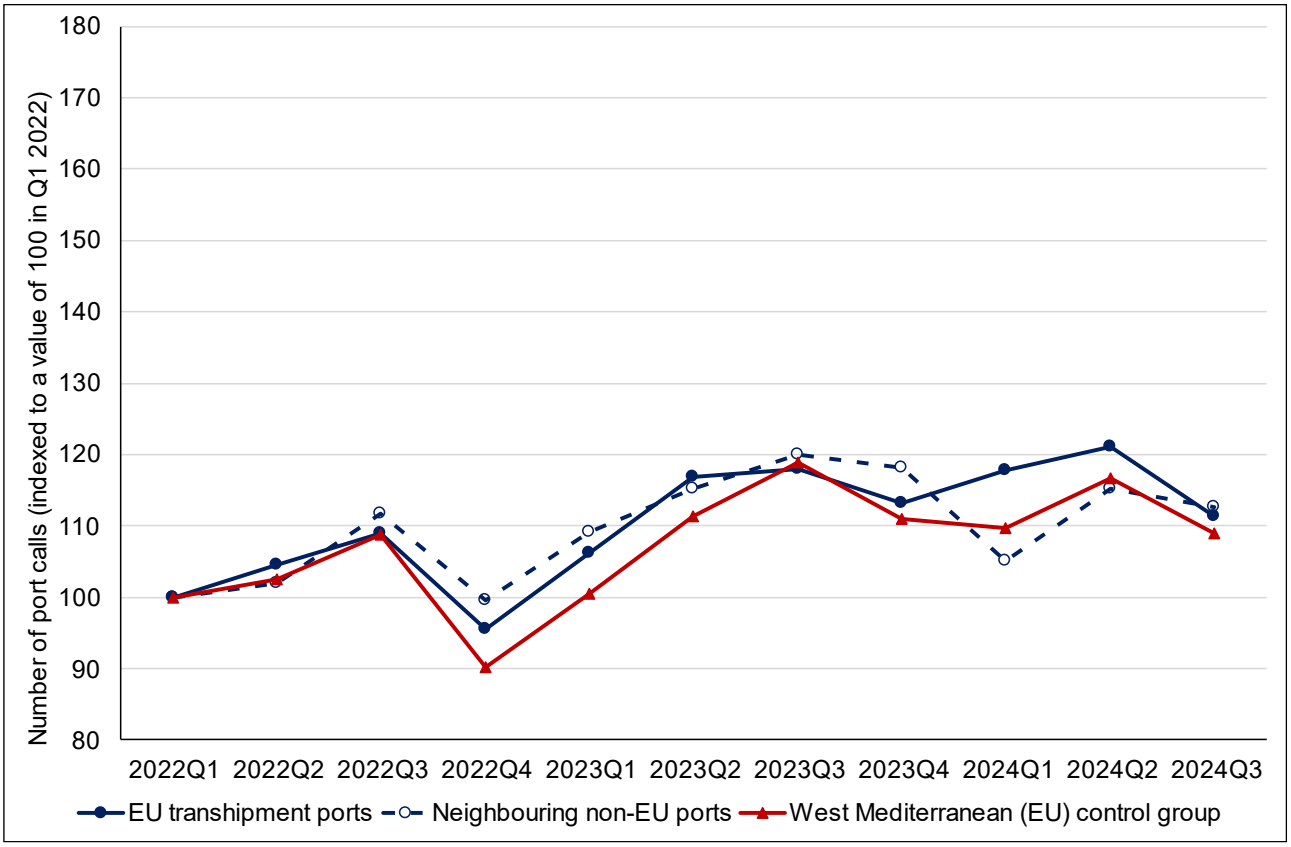
3.3.1. TRW1 – How have container ships' port calls at EU transhipment hubs in the West Mediterranean evolved, particularly compared to the EU control groups and non-EU neighbouring ports?

The purpose of this question is to understand whether there is any evidence of changes in port calls by container ships at EU transhipment hubs in the West Mediterranean, in particular any changes that are different to those experienced by other ports in the region (EU and non-EU) that could be indicative of transhipment relocation.

To investigate this question, data for port calls at EU and identified non-EU ports[59] from the EMSA MARINFO database were analysed to identify the numbers of port calls per quarter since the first quarter of 2022. To enhance the presentation of trends over time, and to ease comparisons between different locations (EU and non-EU ports of relevance to transhipment activities in the West Mediterranean in this case), the numbers of port calls were indexed to a value of 100 in Q1 2022. The results are shown in Figure 3-27.

[59] EU transhipment ports: Algeciras (Spain), Barcelona (Spain), Malaga(Spain), Sines (Portugal), Valencia (Spain). Neighbouring non-EU ports: Bejaia (Algeria), Casablanca (Morocco), Djen-Djen (Algeria), Nador (Morocco), Tanger Med (Morocco). West Mediterranean (EU) control group: Leixoes (Portugal), Lisboa (Portugal), Marseille (France), Santa Cruz de Tenerife (Spain). The selection of ports included in the different analyses are further described in Section 2.3 and listed in Appendix 2.

Figure 3-27: Numbers of port calls by container ships at EU and non-EU ports of relevance to the West Mediterranean, indexed to a value of 100 in Q1 2022

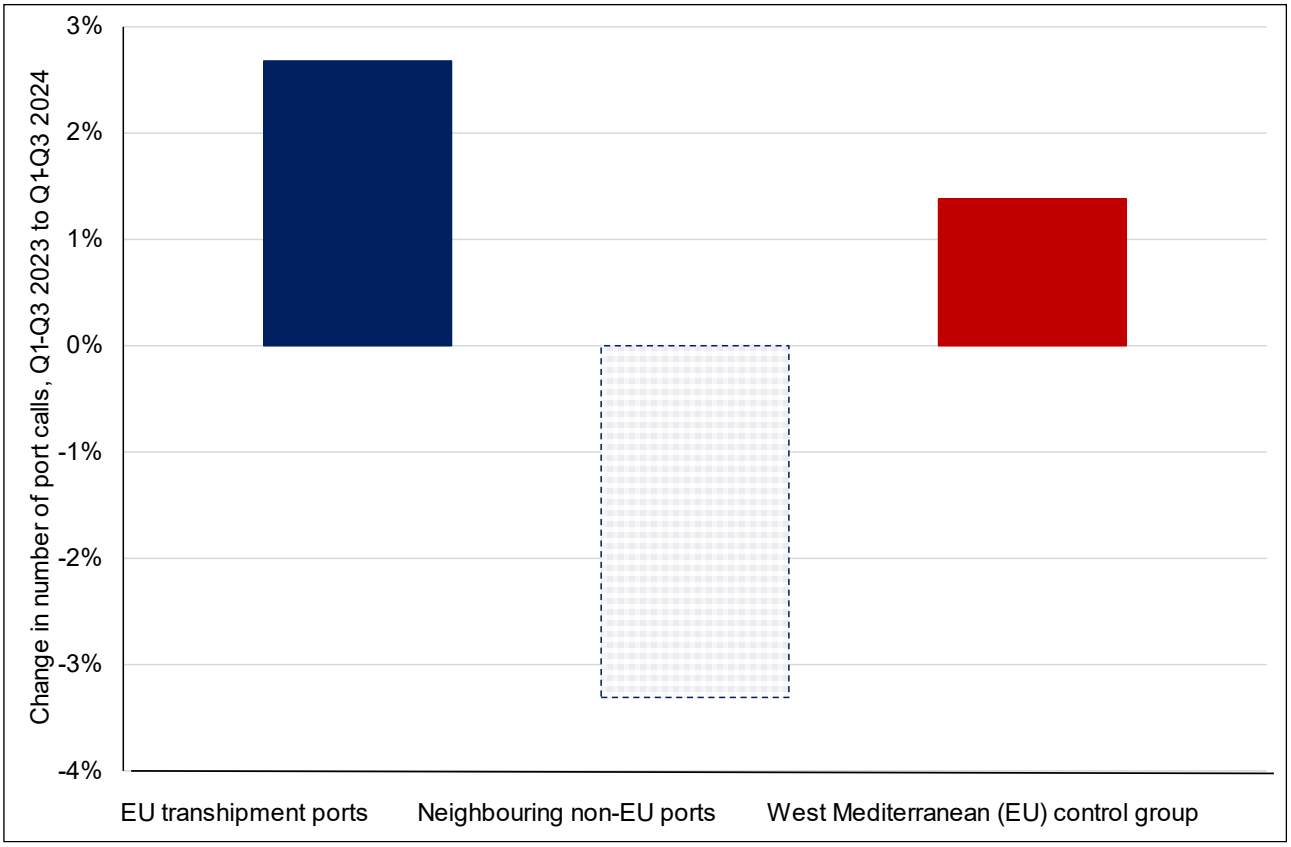


Source: Ricardo analysis of EMSA MARINFO data

Overall, there is a broadly similar trend in the number of port calls associated with EU transhipment ports in the West Mediterranean and the ones associated with non-EU transhipment ports in the same region. The most notable difference is observed in Q1 and Q2 of 2024 where the EU transhipment ports perform better than their competitors in terms of number of port calls. By Q3 2024, the levels of port calls at EU transhipment ports and neighbouring non-EU ports (when indexed to Q1 2022) are very similar.

The percentage changes in port calls between Q1 to Q3 2023 and Q1 to Q3 2024 are shown for the three port categories in Figure 3-28.

Figure 3-28: Percentage change in number of port calls for container ships between Q1 to Q3 2023 and Q1 to Q3 2024



Source: Ricardo analysis of EMSA MARINFO data

This shows a small increase (2.7%) in port calls at EU transhipment ports in the West Mediterranean between Q1 to Q3 2023 and the same period in 2024, with the neighbouring non-EU ports showing a reduction of a slightly greater magnitude (3.3%).

Based on the analysis presented here, and more detailed analysis of the MARINFO data (see Appendix 3), it is not possible to conclude that there are fewer container ships calling at EU transhipment hubs in the West Mediterranean in 2024 than in 2023.

> Overall, these results indicate a slight upward trend in port calls at EU transhipment ports in the West Mediterranean in 2024. Therefore, no evidence of transhipment relocation as an evasive behaviour can be drawn from this analysis.

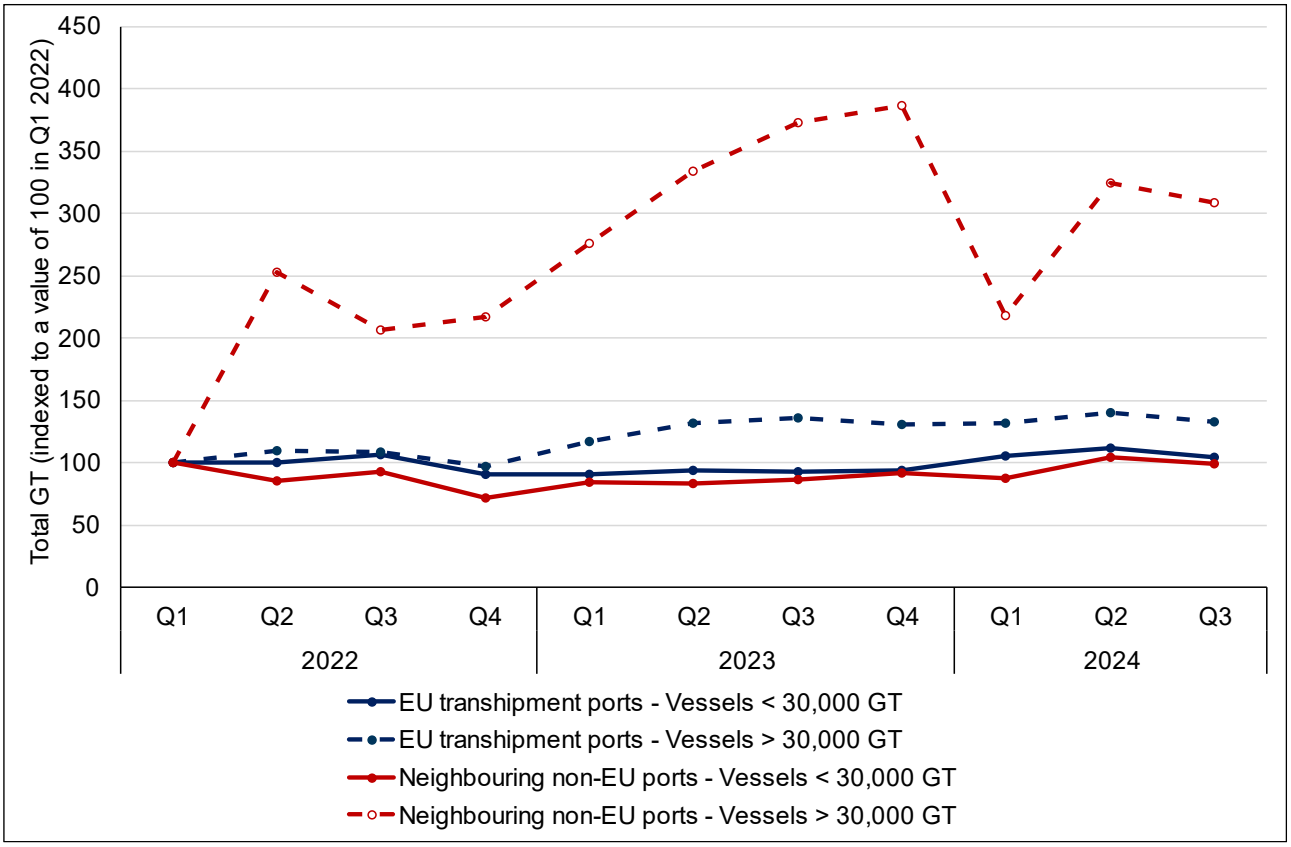
3.3.2. TRW2 - How has traffic of specific container vessel categories (deep sea container ships used for relay transhipment, smaller container vessels used for feeder transhipment) evolved, especially compared to non-EU neighbouring ports (West Mediterranean)?

The aim of this question is to understand whether there are any changes in relay transhipment and feeder transhipment activities in the West Mediterranean that could point to changes in the location of transhipment activities (i.e. relocation as a potential evasive behaviour).

To investigate this question, data from MARINFO have been used to assess the port calls by large container vessels (over 30,000 GT, being representative of container ships used for relay transhipment) and small container vessels (less than 30,000 GT, being representative of container ships used for feeder transhipment) in the West Mediterranean. To provide insight into the transport capacity represented by these port calls for small and large container vessels, the results are presented as time variations of the total GT of the vessels performing the port calls, indexed to a value of 100 in Q1 2022, in Figure 3-29.

As was seen for the similar questions for the East and Central Mediterranean, the trends for small container ships are very similar for EU transhipment ports and neighbouring non-EU ports, with little variation seen over time. For larger vessels, the trends since 2022 are quite different, with EU ports in the region showing a gradual rise and non-EU ports (as already seen in the discussion of research question TRC2) showing a very strong rise through 2022 and much of 2023, before a reduction in 2024. As was noted in the discussion of TRC2, the reason for the reduction in Q1 2024 is not fully clear, but it could be associated with the delays in arrivals due to the increased duration of voyages starting in late 2023 due to the re-routing around the Cape of Good Hope.

Figure 3-29 Total GT transported through ports in West Mediterranean by container vessels from Q1 2022 to Q3 2024, below and above 30,000 GT, indexed to a value of 100 in Q1 2022



Source: Ricardo analysis of EMSA MARINFO data

The year on year changes seen in transport capacity (GT) between Q1 to Q3 2023 and Q1 to Q3 2024 are shown in Table 3-3.

Table 3-3: Year on year changes (Q1 to Q3 2023 to Q1 to Q3 2024) of total GT for container ship port calls in the West Mediterranean

EU < 30,000 GT	EU > 30,000 GT	non-EU < 30,000 GT	non-EU > 30,000 GT
14.0%	4.8%	9.2%	-18.7%

In this case, the EU and non-EU ports again show a similar increase in transport capacity for small container ships from Q1 to Q3 2023 to Q1 to Q3 2024, of 14.0% and 9.2%, respectively. The EU ports also saw an increase in transport capacity of large container ships, although of a smaller percentage than for smaller container ships. The non-EU ports in the West Mediterranean, however, experienced a significant reduction in transport capacity in the same period (following their significant increase previously).

Overall, these results show variations in the trends for small and large container ships in the West Mediterranean, with some significant differences between EU transhipment ports and neighbouring non-EU ports. However, the differences seen do not suggest that the changes are the result of transhipment relocation as an evasive behaviour.

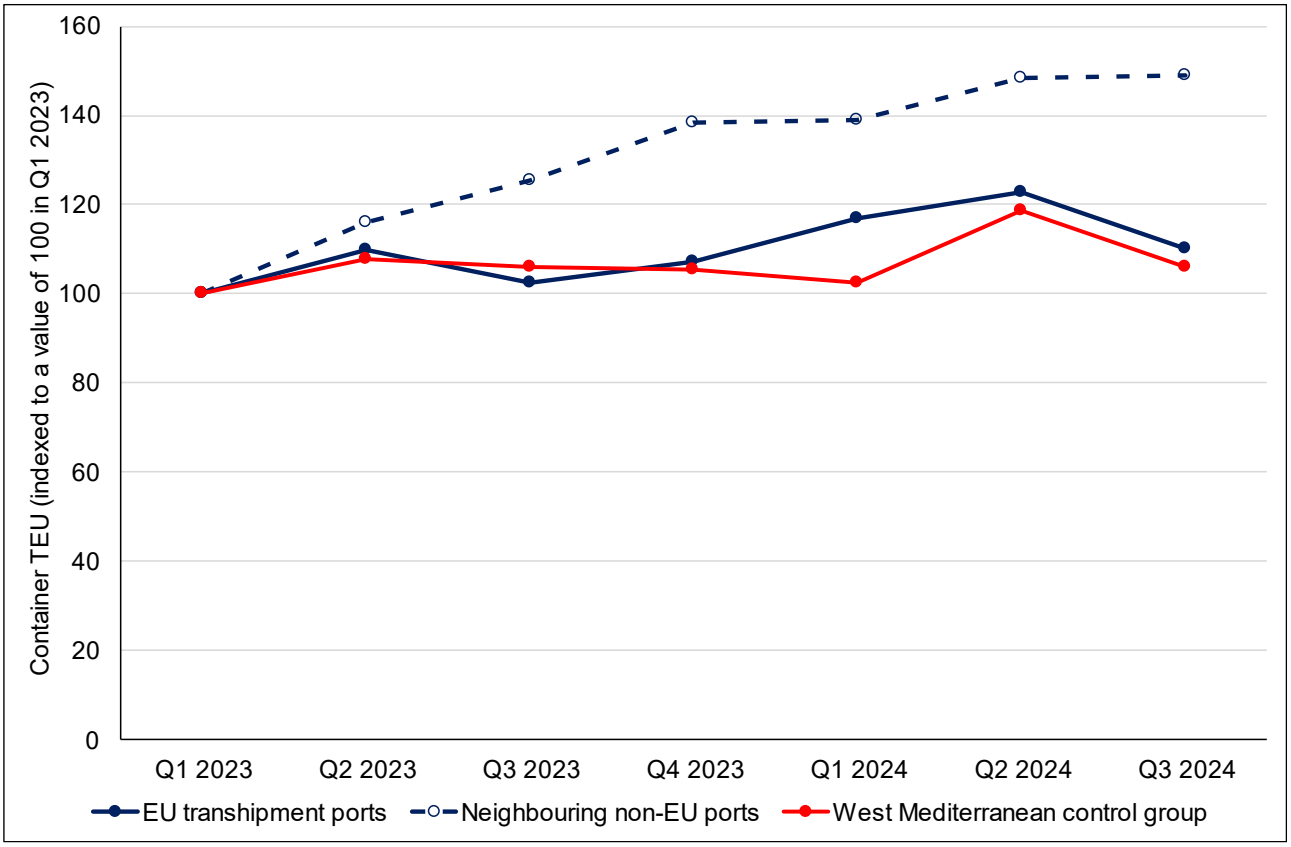
3.3.3. TRW3 - How have container activities, including transhipment, evolved at EU transhipment hubs in the West Mediterranean, especially compared to EU control group and to non-EU neighbouring ports (West Mediterranean)?

The aim of this question is to examine whether data on the transport of containers, particularly transhipment, indicates any shift from EU transhipment ports in the West Mediterranean to non-EU ports that could indicate the occurrence of transhipment relocation as an evasive behaviour. To investigate the question, data on container movements from econdb for EU transhipment ports have been compared with those for neighbouring non-EU ports in the West Mediterranean. To provide an indication of whether any trends seen may be associated with changes in transhipment activity specifically, or more general changes in traffic in the region, comparisons are also made with the West Mediterranean control group ports.

The set of non-EU transhipment ports in the West Mediterranean includes Tanger Med, which dominates total activity in the region and drove most of the growth in activity seen for the group in the following charts.

Total container throughput at ports in the West Mediterranean are shown in Figure 3-30.

Figure 3-30: Estimations of total container throughput at EU and non-EU ports relevant to the West Mediterranean from Q1 2023 to Q3 2024, indexed to a value of 100 in Q1 2023



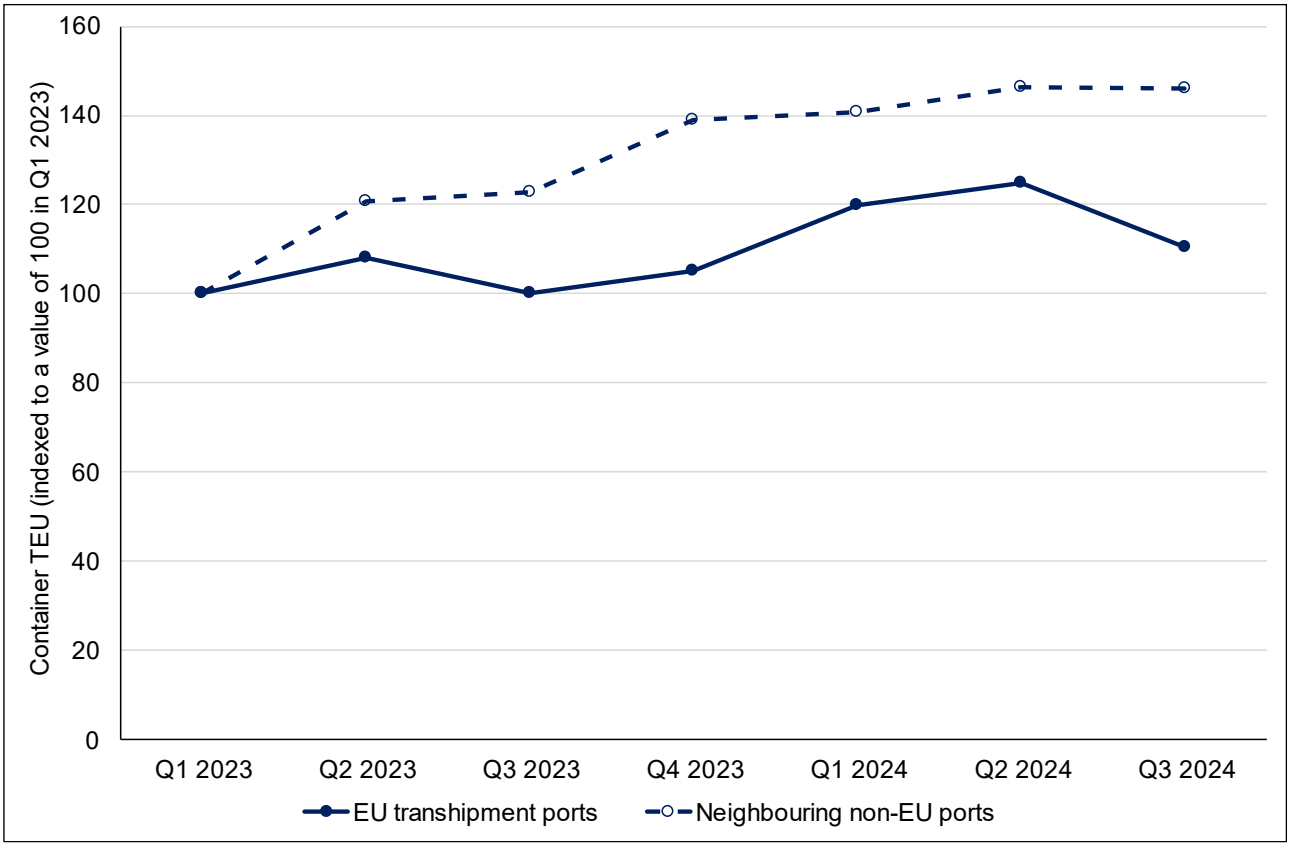
Source: Ricardo analyses of econdb data

As seen previously for the East and Central Mediterranean regions, the EU transhipment ports show a gradual rise in total throughput between Q1 2023 and Q2 2024, with a reduction then seen in Q3 2024. The trends are largely matched by ports in the West Mediterranean control group, which experienced a reduction in activity in Q1 2024, and then recovered almost to the same growth as for EU transhipment ports by Q2 2024 (also followed by a similar reduction to the EU transhipment ports to Q3 2024). Ports in the non-EU ports group show a substantially higher growth in throughput over the period.

Comparing Q1 to Q3 2024 against Q1 to Q3 2023, the econdb data for EU transhipment ports in the West Mediterranean show an increase in container throughput of 11.7%, with the neighbouring non-EU ports showing an increase of 28.5% over the same time period.

Figure 3-31 shows total *transhipment* activity at EU transhipment ports and neighbouring non-EU ports in the West Mediterranean.

Figure 3-31: Estimations of total container transhipments at EU and non-EU ports relevant to the West Mediterranean from Q1 2023 to Q3 2024, indexed to a value of 100 in Q1 2023



Source: Ricardo analyses of econdb data

The econdb data for container transhipments show very similar trends to those of the total throughput, with gradual increases for both EU and non-EU transhipment ports to Q2 2024. In Q3 2024, the EU transhipment ports then show a reduction in transhipments, which is not evident in the neighbouring non-EU ports.

Comparing Q1 to Q3 2024 against Q1 to Q3 2023, the EU transhipment ports in the West Mediterranean show an increase in transhipment activity of 14.8%, with the neighbouring non-EU ports showing an increase of 26.0% over the same time period.

In conclusion, the analysis shows no general reduction in container transhipment activities at EU transhipment hubs in the West Mediterranean. On the contrary, the data shows a generally positive trend in transhipment across the ports, both at EU and non-EU ports.

Overall, there is no clear evidence of a different trend in container activities at EU transhipment ports compared to EU control group and non-EU transhipment ports.

3.3.4. TRW4 - Is any such evolution associated with specific types of voyages (i.e. non-EU/port/non-EU; non-EU/ port/EU; EU/port/EU)?

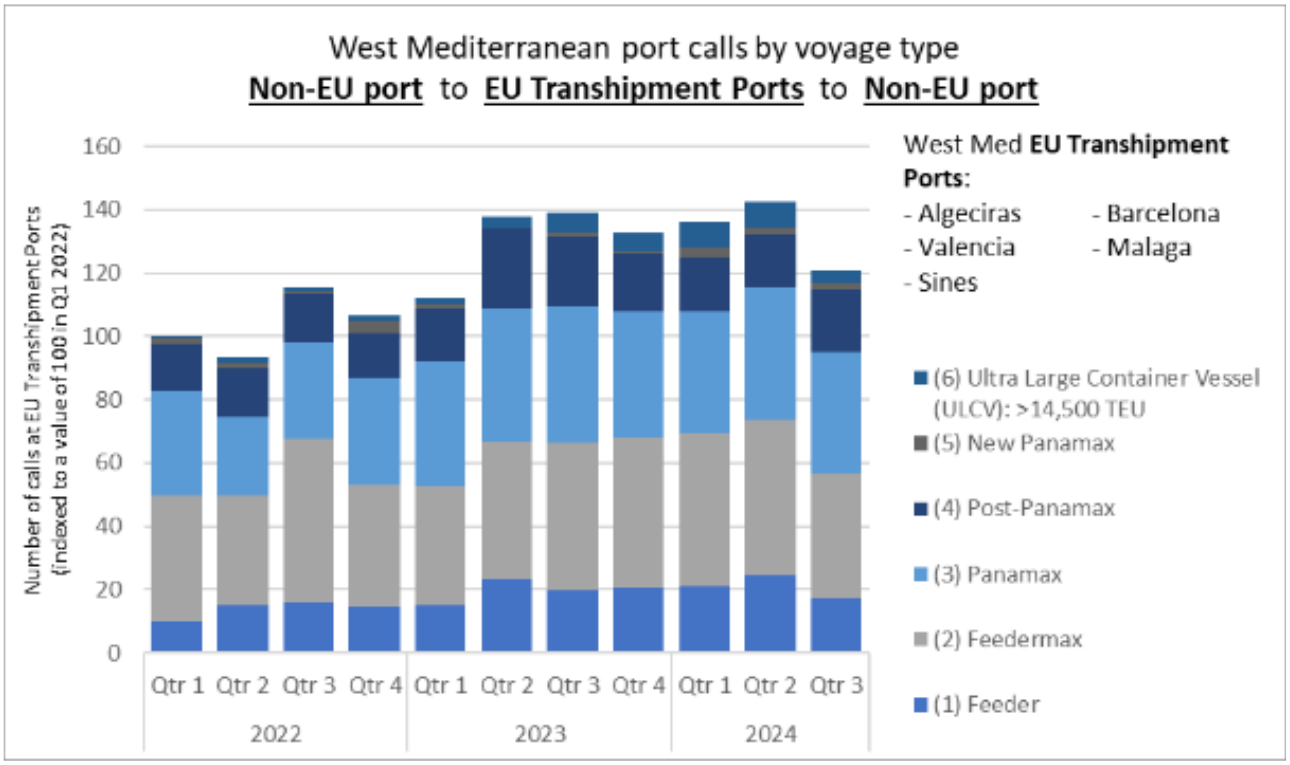
This research question aims to examine whether there are any differences in container activities at the West Mediterranean transhipment hubs associated with specific types of voyages between EU and non-EU ports. To address the question, the EMSA tool has been used to extract the number of voyages depending on their sequence type. Similarly to questions TRE4 and TRC4, the tool has been used to assess three types of voyages:

- Non-EU port to EU transhipment port to non-EU-port
- Non-EU port to EU transhipment port to EU-port (including the other way around: EU port to EU transhipment port to non-EU port)
- EU port to EU transhipment port to EU-port.

The results of this analysis for non-EU – EU transhipment hub – non-EU voyages are shown in Figure 3-32. These show a significant increase in port calls from Q1 2023 to Q2 2023, followed by a continuing, but slower, increase in each quarter through to Q2 2024 and then a reduction to Q3 2024. Overall, this leads to an increase in the number port calls at EU transhipment hubs in the West Mediterranean in Q1 to Q3 2024 of about 4% relative to that in Q1 to Q3 2023.

In comparison with the similar results for the Central Mediterranean ports, there is no dominant vessel size category in the West Mediterranean, although the largest vessel sizes have a smaller percentage of the total than the smaller ones.

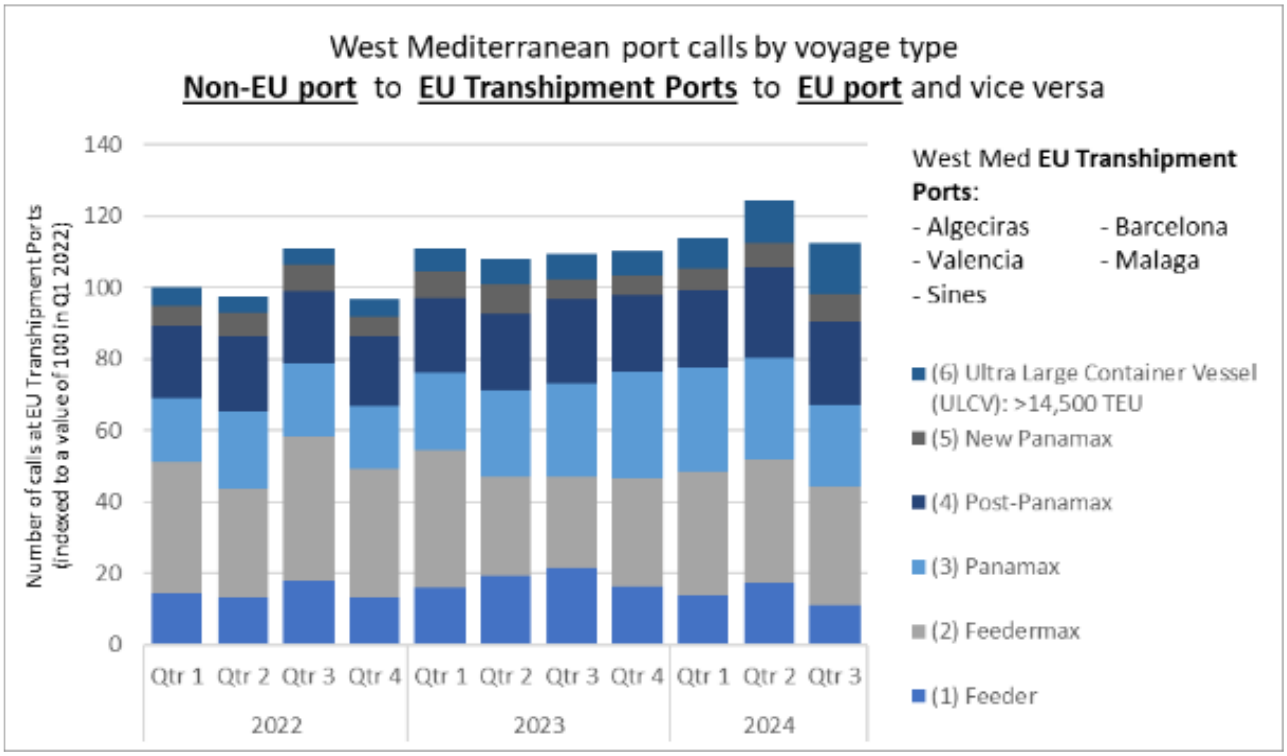
Figure 3-32: Voyages from non-EU-port, to EU transhipment port, to non-EU-port (case NEN)



Source: EMSA

The equivalent results for the EEN and NEE voyages are shown in Figure 3-33. These also show a gradual rise through to Q2 2024, followed by a reduction to Q3 2024, with no significant changes over time in the distribution of port calls across the different vessel size categories (these results also show a slightly more even distribution across the vessel sizes than for the NEN results). Again, overall, the results show a small increase in port calls between Q1 to Q3 2023 and Q1 to Q3 2024.

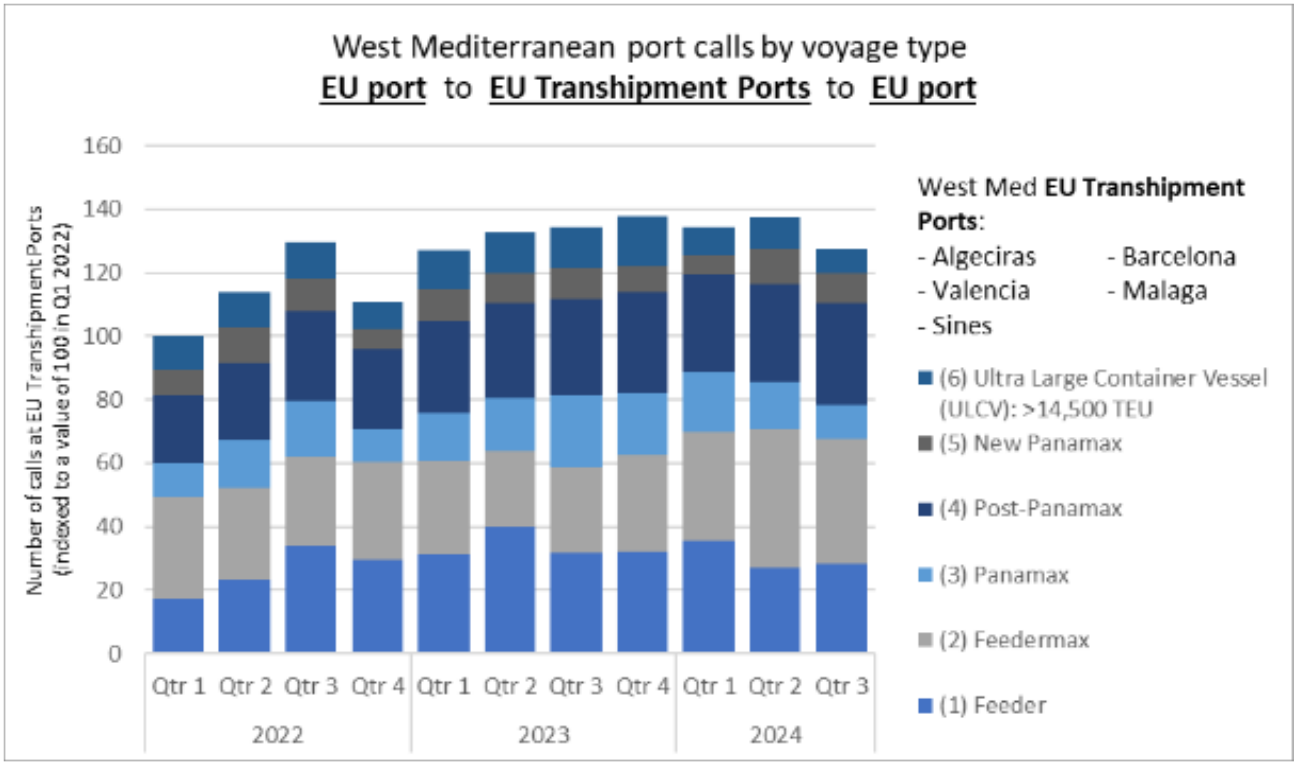
Figure 3-33: Voyages between Non-EU-port to EU transhipment port to EU-port (including the other way around: EU port to EU transhipment port to non-EU-port) (case EEN and NEE)



Source: EMSA

The results for the intra-EU transhipment voyages are shown in Figure 3-34. These results point to a gradual increase in port calls after Q1 2023, with a levelling off in 2024 before a slight reduction to Q3 2024. As a result, the increase in port calls between H1 2024 and H1 2023 is lower, at about 5%. These results also show a more even distribution across the vessel size categories than for the Central Mediterranean results (Figure 3-21). There is a gradual increase in the percentage of port calls by the Feedermax vessel category in 2024, and a small reduction in the ULCV and Panamax categories, but overall, there is no significant change in the vessel size distribution.

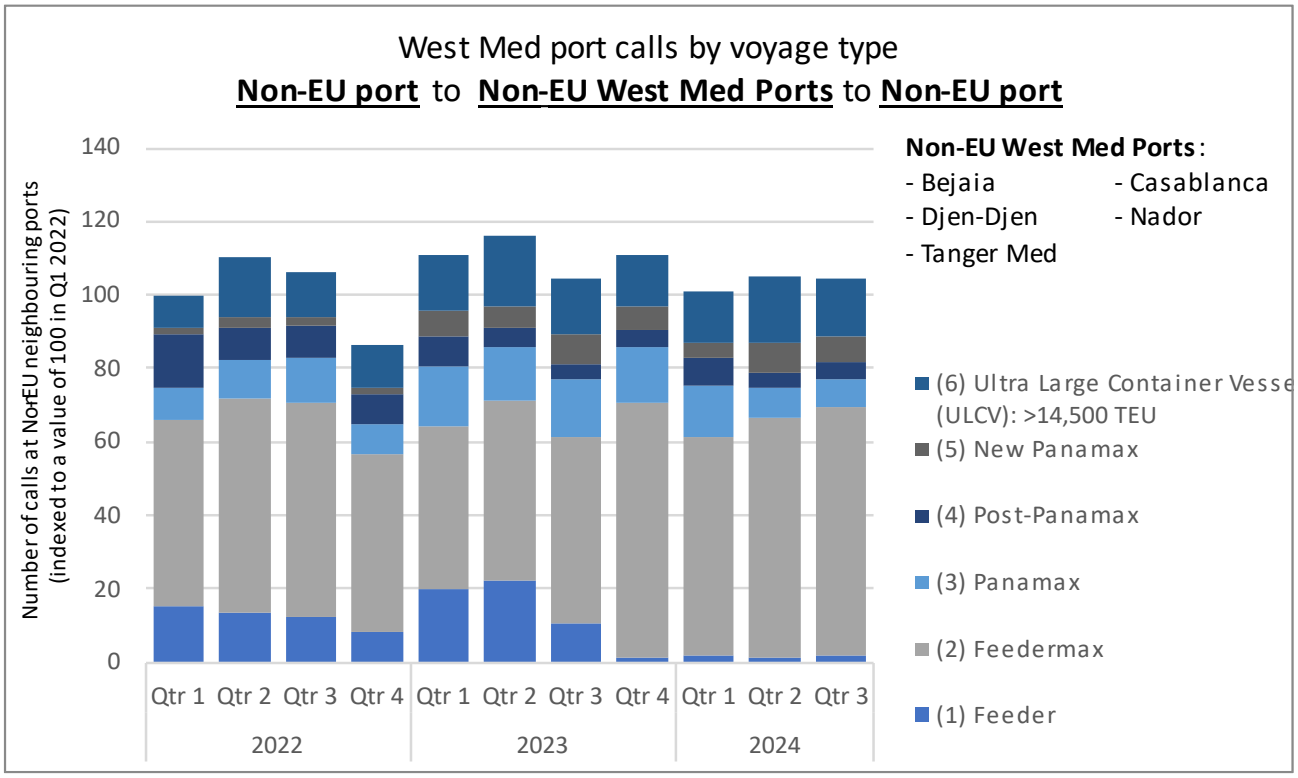
Figure 3-34: Voyages between EU-port to EU transhipment port to EU-port (case EEE)



Source: EMSA

Figure 3-35 shows voyages from non-EU ports to non-EU transhipment ports in the East Mediterranean to another non-EU port.

Figure 3-35: Voyages from a non-EU port to a non-EU transhipment port to a non-EU port (NNN)

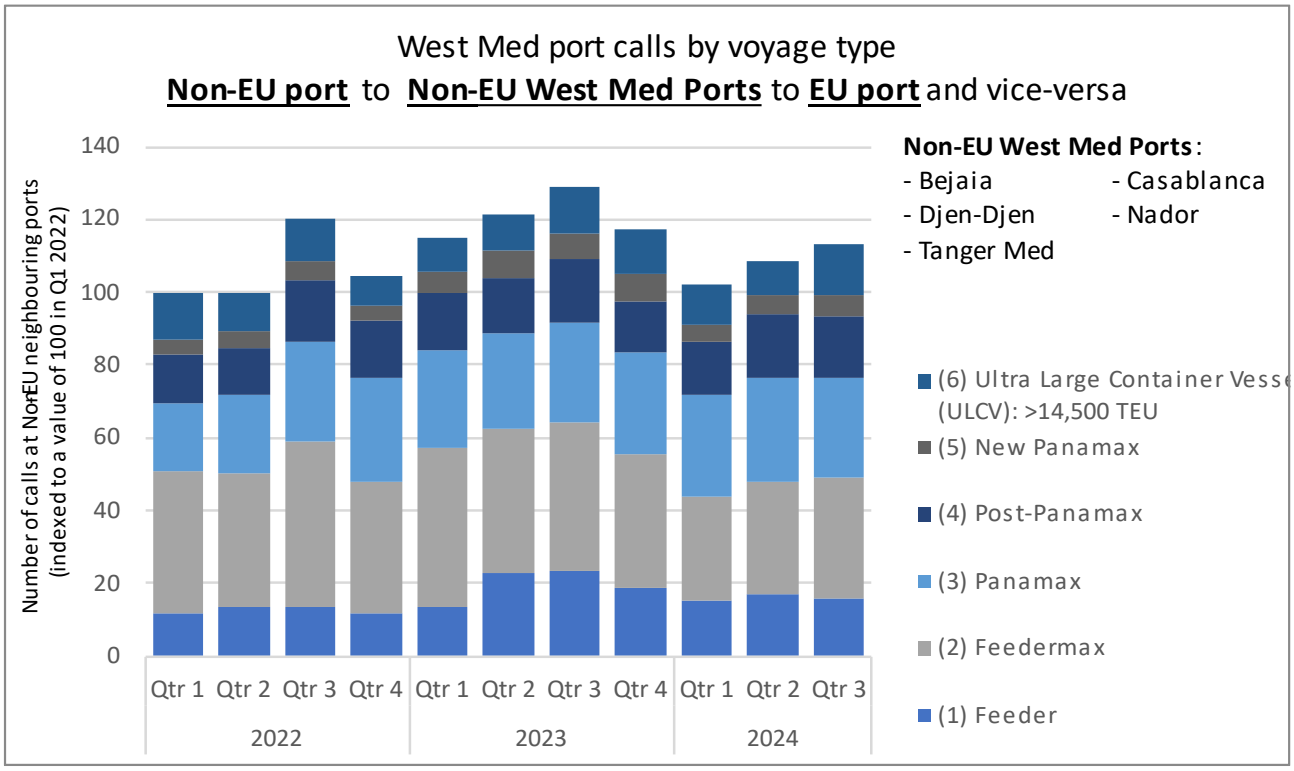


Source: EMSA

These results show a generally stable evolution of port calls on NNN voyages at the non-EU transhipment ports in the West Mediterranean through 2023 and 2024, although there has been a significant reduction in the number of calls by the Feeder vessel category. While the number of port calls by the largest vessel categories have been largely stable, there is no evidence of a significant increase in 2024, as might have been expected from the re-routing of voyages as a result of the situation in the Red Sea. Similarly, there is no evident increase in feeder operations (by Feeder and Feedermax sizes) from these ports, as would be expected if more large container ships were stopping at ports in the West Mediterranean region following re-routing around the Cape of Good Hope.

Figure 3-36 shows voyages from an EU port to a non-EU transhipment port and then to another non-EU port, also including those from a non-EU port to a non-EU transhipment port to an EU port.

Figure 3-36: Voyages from an EU port to a non-EU transhipment port to a non-EU port (and vice-versa) (ENN)

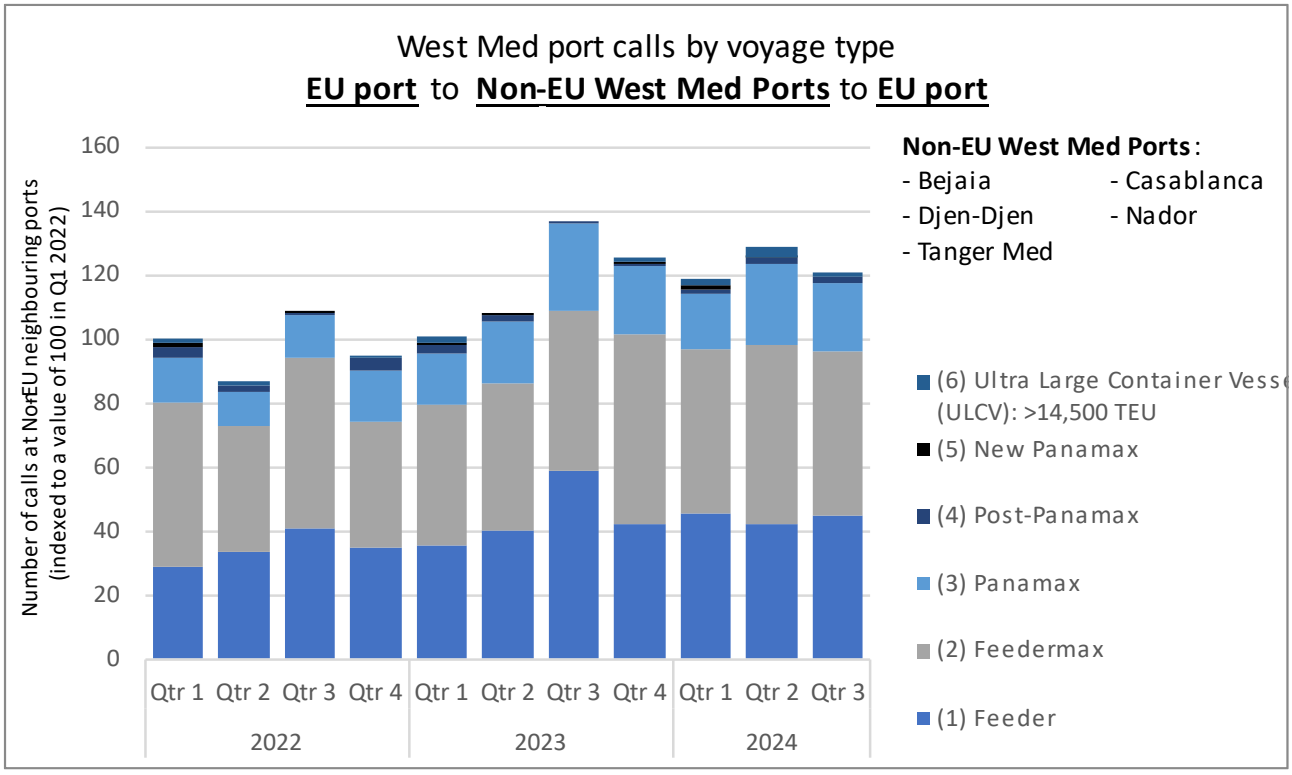


Source: EMSA

Non-EU transhipment ports in the West Mediterranean saw a gradual reduction in port calls on ENN (and NNE) voyages between Q3 2023 and Q1 2024, followed by a gradual increase to Q3 2024. The distribution of these port calls between the vessel sizes is more uniform than for the other voyage types and has remained similar across the full period analysed. The increase in port calls on these voyages since early 2024 is similar to that seen in the first three quarters of 2023 (although at a lower level). Therefore, although the increase could reflect the impacts of the situation in the Red Sea, it is not clear that is the case.

The results of the analyses of voyages from an EU port to a non-EU transhipment port and then to an EU port are shown in Figure 3-37.

Figure 3-37: Voyages from an EU port to a non-EU transhipment port to an EU port (ENE)



Source: EMSA

The number of port calls on this voyage type have been largely stable since Q3 2023. There has been a small increase in the numbers of calls by the largest vessel sizes (compared to Q3 2023), but overall, port calls are still dominated by the feeder vessel sizes.

Overall, the results of the analyses of port calls at EU transhipment ports in the West Mediterranean do not show any reductions over time that would be indicative of evasive transhipment relocation; on the contrary they show a general increase that continues into 2024, although there is then a reduction in calls associated with all voyage types in Q3 2024.

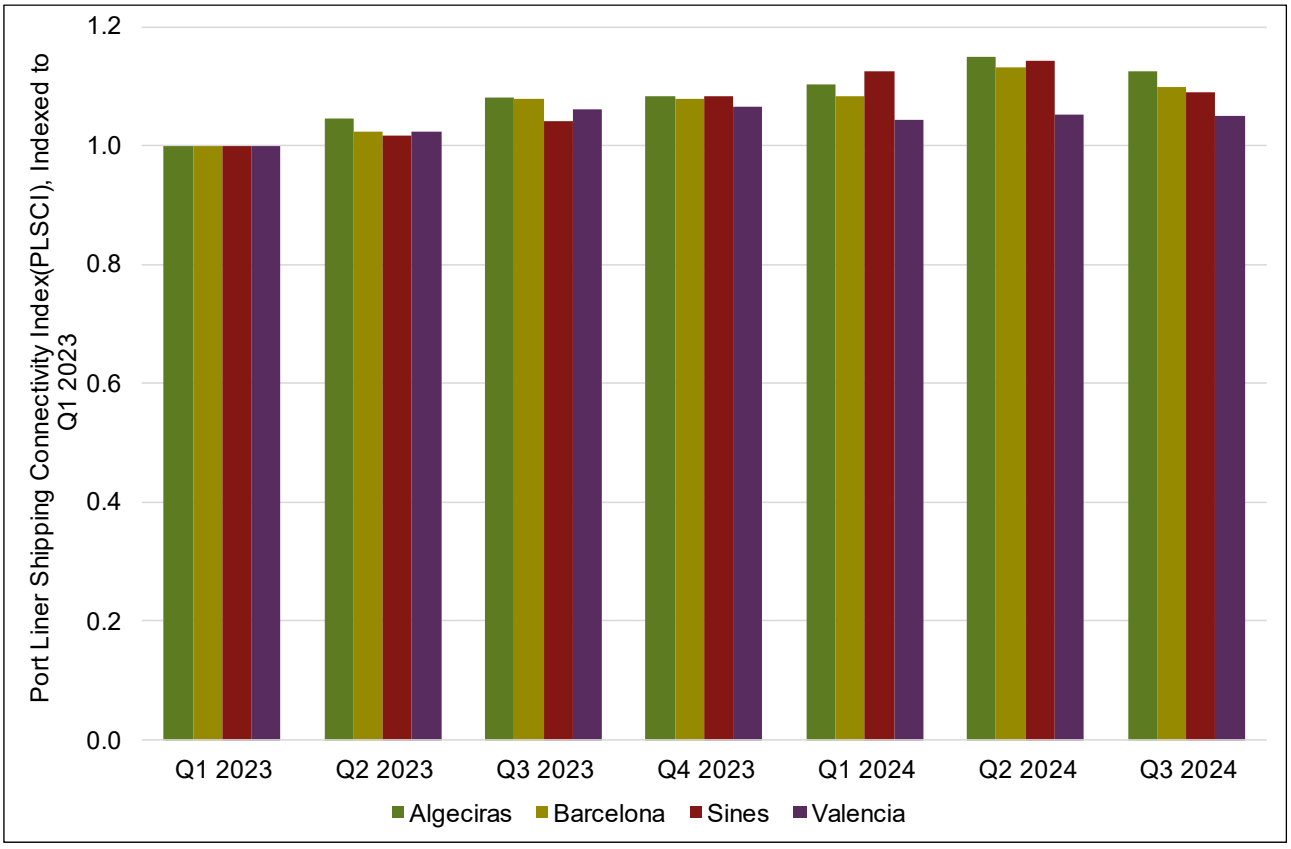
The numbers of port calls at non-EU transhipment hubs in the region have been largely stable through 2023 and 2024, and have not shown any increase in activity that would suggest any evasive relocation of transhipment activities to them.

3.3.5. TRW5 - Is there a change in port liner shipping connectivity index (PLSCI) at the EU transhipment ports (and at the non-EU ports)?

The aim of analysing this question is to identify whether any changes in shipping activity, potentially as a result of the implementation of the extension of the EU ETS for shipping, have led to changes in connectivity for major EU and non-EU transhipment ports in the

West Mediterranean. The analysis of connectivity for EU ports in the West Mediterranean includes PLSCI values from UNCTAD for four ports in Spain and Portugal, as shown in Figure 3-38.

Figure 3-38: Port liner shipping connectivity index evolution for EU transhipment ports in the West Mediterranean, indexed to Q1 2023, for Q1 2023 to Q3 2024

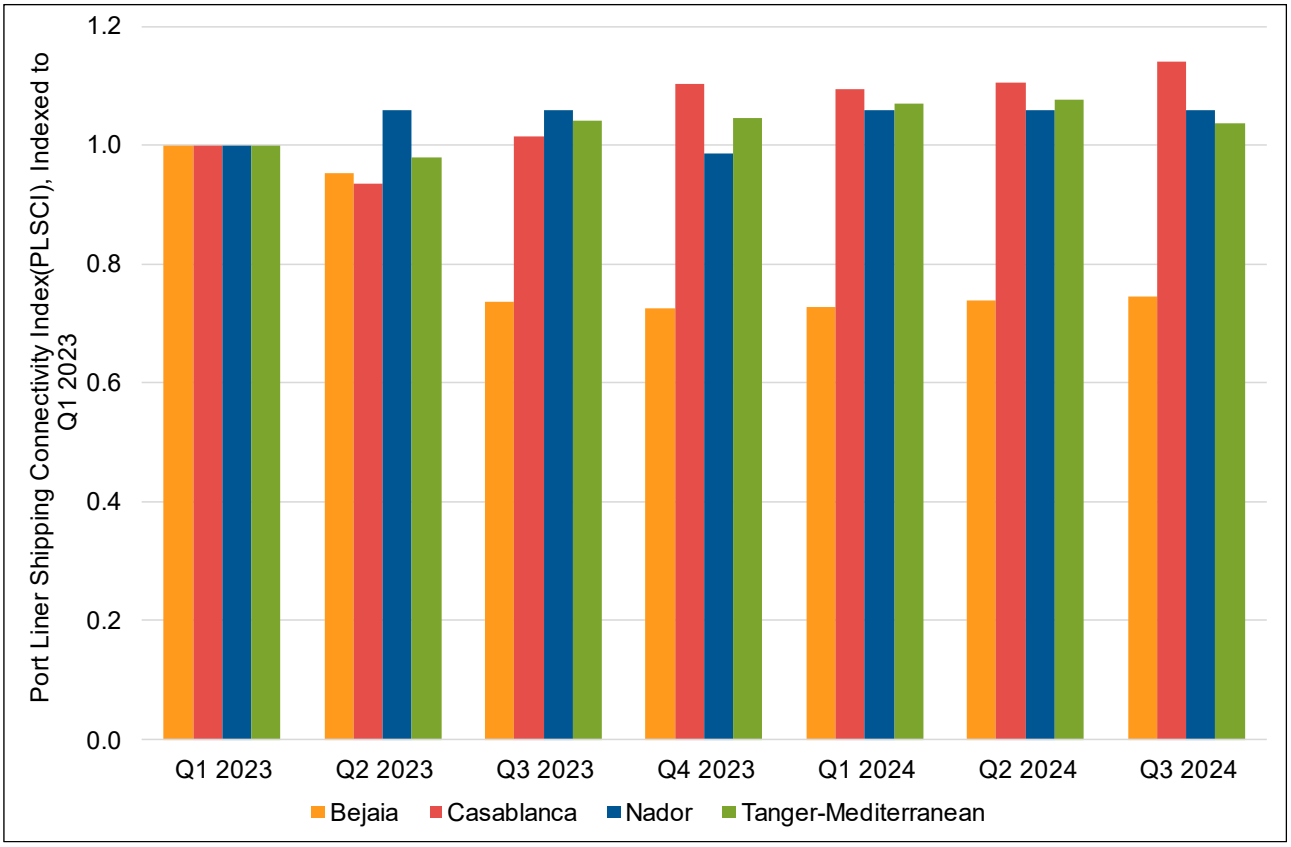


Source: Ricardo analyses of UNCTAD PLSCI data

This figure shows that all four ports have a gradually increasing level of connectivity since Q1 2023, continuing into 2024, although with small reductions evident in Q3 2024. The port of Valencia shows a flattening off of this increase since Q4 2023, although it remains above Q1 2023 levels. As a result, Valencia shows a PLSCI in Q3 2024 the same as in Q3 2023, while the other three ports show a small increase (up to 4%) over the same period. The increase in connectivity of EU ports in the West Mediterranean may reflect the impacts of increasing numbers of vessels travelling from Asia to Europe via the Cape of Good Hope rather than through the Suez Canal and may also be leading to the reduction in connectivity seen at some EU ports in the Central Mediterranean (Section 3.2.5).

Figure 3-39 shows the evolution of PLSCI for non-EU ports of relevance to the West Mediterranean since Q1 2023.

Figure 3-39: Port liner shipping connectivity index evolution for non-EU transhipment ports in the West Mediterranean, indexed to Q1 2023, for Q1 2023 to Q3 2024



Source: Ricardo analyses of UNCTAD PLSCI data

The data point to a notable decrease in connectivity for the port of Béjaïa (Algeria) across the first three quarters of 2023, potentially due to a strike that took place at the port in 2023[60,61], since when it has been very stable. However, for the other three ports there was a slight increase in the connectivity index (up to 10% for Casablanca). Again, these ports may be seeing an increase in connectivity due to the rerouting of voyages around the cape of Good Hope.

There have been reports of the port of Tanger Med potentially losing connectivity as some major shipping companies (e.g., Ocean Alliance, Hapag Lloyd) have removed it from their services in 2024[62]; there is a small reduction seen in the PLSCI values reported by UNCTAD between Q2 and Q3 2024; although the results in Q3 2024 show no difference from that a year previously.

[60] https://www.africaintelligence.com/north-africa/2023/08/25/bmt-strike-causes-disruption-at-port-of-bejaia,110036024-art

[61] https://www.cma-cgm.com/news/4376/pcs-in-bejaia-algeria

[62] Drewry Shipping Insight (https://www.drewry.co.uk/maritime-research-products/maritime-research-products/shipping-insight-annual-subscription)

Overall, there are no significant differences in the evolution of connectivity between EU and non-EU ports in the West Mediterranean that would point to evasive behaviours, with both experiencing slight increases of their connectivity indexes. Those changes that are seen are similar between the EU and non-EU ports and are consistent with the impacts of the changes in operations due to the situation in the Red Sea.

3.4. Relocation of transhipment activities – general questions

3.4.1. TR6 - Do we have any intelligence showing a change of investment patterns in ports (i.e. investments being cancelled in EU ports and accelerated investments in competing non-EU ports, including planned investments)?

A literature review of announced investments at non-EU ports, as well as EU ports, has been undertaken, to compare investments across the two sets of ports and identify whether there is a change in investment activities undertaken. Investments relating to port expansion activities have been investigated, specifically where the cargo capacity of the port has been, or is planned to be, increased.

The review has covered both recent expansions of capacity at ports (in effect in 2024) and recent announcements of investments for future expansion (with the extra capacity expected to be available from 2025 onwards, and before 2035). The sub sections below discuss these investments, split by recent port expansions (in 2024) and future port expansions (from 2025 – 2035).

The following analysis includes EU ports, neighbouring non-EU ports, as well several other non-EU ports, i.e. West African ports, as these had been found to be implementing additional container capacity at their ports. Where possible, data on the incremental capacity increase associated with the port investment has been collected across the ports. It should be noted, however, that the analysis is limited by the availability of investment information for the period from 2024 onwards, specifically on the additional capacity implemented (TEU).

Recent port expansions (additional port capacity in 2024)

This section focuses on the additional capacity already available in 2024 following recent investments. There are various port investment plans highlighting capacity increases in 2024. Main capacity expansion projects identified are highlighted below:

- **El Dekheila** (Egypt): 1.5 mTEU (i.e. 150% increase compared to current capacity, or 180% increase compared to total throughput)[63] - A new container terminal at Egypt's Dekheila port will be handed over to a consortium led by Hutchinson Ports for operation in 2024.
- **Kribi** (Cameroon): 0.7 mTEU (i.e. 186% increase compared to current capacity, or 236% increase compared to total throughput)[64] - Phase II port expansion, via equipment of 13 RTGs, two reach stackers and three empty container handlers
- **Barcelona** (Spain): 0.7 mTEU (i.e. 21% increase compared to current capacity)[65] - Hutchinson Ports are investing in the accommodation of seven more container block, and 14 new automated cranes.
- **Constanta (Romania**): 0.7 mTEU (i.e. 88% increase compared to current capacity) - Port expansion, with addition of facilities to "Project Cargo"[66].
- **Malta Freeport** (Malta): 0.4 mTEU (i.e. 11% increase compared to current capacity, or 14% increase compared to total throughput) - Extension of Terminal 2 North Quay, alongside equipping of two additional[67].
- **Gioia Tauro** (Italy): 0.2 mTEU (i.e. 4% increase compared to current capacity) - Delivery of six cranes to handle large ocean vessels with a capacity of up to 25,000 TEU[68].

Other ports with expansion projects include Piraeus (0.005 mTEU), Ambarli, Felixstowe, Liverpool (0.002 mTEU) and Greenock. However, the exact figures are unknown for some of these ports. Ambarli, Greenock and Felixstowe are investing in new cranes to increase

[63] https://english.news.cn/africa/20240823/d922f8fa75c4401198310f59c895b814/c.html

[64] https://www.aglgroup.com/en/kribi-containers-terminal-kct-is-investing-more-than-us114-million-about-70-billion-cfa-francs-for-the-acquisition-of-new-equipment/

[65] https://container-news.com/hutchison-portss-terminal-in-barcelona-adds-700000-teu-capacity-and-new-cranes/

[66] https://www.reuters.com/markets/commodities/dp-world-romania-doubles-container-shipping-capacity-black-sea-port-2024-06-18/

[67]https://www.maltafreeport.com.mt/about-us/about-us-developments-future-plans/#:~:text=The%20Capacity%20of%20the%20Terminal,of%20reaching%2025%20containers%20across.

[68] https://www.porttechnology.org/news/port-of-gioia-tauro-takes-delivery-of-four-new-quay-cranes/

their handling capacities[69,70], with Piraeus expanding their car terminal[71], and Liverpool expanding their container storage.

When analysing the increase in capacity across EU ports and neighbouring non-EU ports (and West African ports) in the Mediterranean, these amount to 2.2 mTEUs for non-EU ports against 2.0 mTEUs for EU ports.

Future port expansions (additional port capacity from 2025 – 2035)

This section focuses on plans announced for future investments in port capacity.

There are various port investment plans highlighting capacity increases from 2025 onwards. Capacity expansion projects over 1 mTEU are highlighted below, first at EU ports and then at non-EU ports, ranked from the highest expected capacity increase to the lowest:

EU ports

- **Antwerp** (Belgium): 7.2 mTEU (i.e. 58% increase compared to current capacity) - Europa Terminal expansion and Extra Container Capacity Antwerp (ECA) project[72].
- **Valencia** (Spain): 5.0 mTEU (i.e. 71% increase compared to current capacity, or 105% increase compared to total throughput) - New container terminal in the northern extension of the port, in 2030[73].
- **Rotterdam** (Netherlands): 3.8 mTEU (i.e. 28% increase compared to current capacity) - Expansion of container terminal in Prinses Amaliahaven of Maasvlakte II, in 2026[74].
- **Gdynia** (Poland): 2.5 mTEU (i.e. 250% increase compared to current capacity) - Construction of New Outer Port [75].

[69] https://www.peelports.com/news-articles/port-of-greenock-given-vote-of-confidence-with-new-turkiye-container-service

[70] Drewry (2024), "Ports & Terminals Insights"

[71] https://www.portseurope.com/port-of-piraeus-inaugurates-ro-ro-terminal-expansion/

[72] https://www.drewry.co.uk/AcuCustom/Sitename/DAM/021/PTI_Q1_2023.pdf

https://www.portofantwerpbruges.com/en/extra-container-capacity-antwerp-eca

[73] https://www.porttechnology.org/news/port-of-valencia-takes-next-step-on-new-5-million-teu-container-terminal

[74] https://www.ship-technology.com/projects/port-of-rotterdam-expansion/?cf-view

[75] https://gmk.center/en/posts/polish-seaports-sharply-increased-cargo-handling-in-2022-2023/

- **Bremerhaven** (Germany): 2.1 mTEU (i.e. 40% increase compared to current capacity) - Container quay extension[76].
- **Taranto** (Italy): 2.0 mTEU (i.e. 100% increase compared to current capacity) - Includes infrastructure upgrades, equipment modernisation, and technological enhancements.
- **Sines** (Portugal): 1.8 mTEU (i.e. 78% increase compared to current capacity) - Container Terminal (Terminal XXI) expansion in 2028[77].
- **Trieste** (Italy): 1.6 mTEU (i.e. 178% increase compared to current capacity) - New container terminal at Pier VIII [78].
- **Gdansk** (Poland): 1.5 mTEU (i.e. 50% increase compared to current capacity) - Construction of T3 terminal[79]

Non-EU ports

- **Adana** (Türkiye): 9 mTEU – New container terminal, with agreements announced in 2024 (no confirmation of completion date)[80].
- **Sokhna** (Egypt): 3.5 mTEU (i.e. 200% increase compared to current capacity) - New Container Terminal (Ain Sokhna Port) in 2026[81].
- **Damietta** (Egypt): 3.3 mTEU (i.e. 275% increase compared to current capacity) - An international consortium including Hapag-Lloyd, Contship Italia and Eurogate is developing a second container terminal, initially set for 2024 and now expected in 2025.
- **Nador** (Morocco): 3.4 mTEU (i.e. 2,615% increase compared to total throughput) - New Transhipment Nador West Deepwater Port, expected to come into operation in 2027[82].

[76] https://merzario-logistics.com/hundreds-of-millions-for-expansion-of-bremerhaven-port/?lang=en

[77] https://www.apsinesalgarve.pt/en/news/2022/psa-sines-inaugurates-stage-1-of-phase-iii-of-the-sines-container-terminal

[78] https://www.trasportoeuropa.it/english/funding-of-e206-8-million-approved-for-triestes-pier-vii

[79] https://baltichub.com/en/investments/project-t3

[80] https://www.lloydslist.com/LL1149993/Trkiye-plans-new-Mediterranean-container-port

[81] https://www.seatrade-maritime.com/terminals/hutchison-ports-investing-700m-in-sokhna-and-alexandria-terminals

[82] Drewry (2024), "Ports and Terminals Insights"

- **Tanger Med** (Morocco): 3 mTEU (i.e. 33% increase compared to current capacity) - Tanger Med Port Authority undertaking port expansion activities backed by the World Bank, expected in 2025[83].
- **Misrata / Qasr Ahmed** (Libya): 3.0 mTEU (i.e. 150% increase compared to current capacity) - Expansion for constructing 8 berths with a length of 2,000 m and a 12 m draft to enhance the port's annual container handling capacity[84].
- **Djen-Djen** (Algeria): 2.3 mTEU (i.e. 1,047% increase compared to total throughput) - Construction of container terminal at the Djen Djen[85].
- **East Port Said** (Egypt): 2.0 mTEU (i.e. 50% increase compared to current capacity) - Expansion of SCTT's Container Terminal[86].
- **Izmir** (Türkiye): 2.0 mTEU (i.e. 200% increase compared to current capacity) - Alsancak Port expansion via the "Izmir Bay and Alsancak Port Rehabilitation Project".
- **Abu Qir** (Egypt): 2.0 mTEU - New Container Terminal (Hutchinson Ports)
- **Alexandria** (Egypt): 1.4 mTEU (i.e. 93% increase compared to current capacity) - New Container Terminal (B100 project)
- **Tema** (Ghana): 1.2 mTEU (i.e. 48% increase compared to current capacity) - Second phase of Tema Port Expansion Project.
- **Mersin** (Türkiye): 1.0 mTEU (i.e. 38% increase compared to current capacity) - Phase 2 of the EMH Project ("EMH2")
- **London Gateway** (UK): 1.0 mTEU (i.e. 42% increase compared to current capacity) - Opening of a fourth berth at London Gateway.

As displayed above, there are significant investment activities in the Turkish port of Adana (9 mTEU), as well as Antwerp (7.2 mTEU). Other EU port expansion projects have been identified at Livorno, Rijeka, La Spezia, Koper and Burgas, each providing <1 mTEU in additional capacity, alongside Cagliari, Cork, Esbjerg, Bilbao, Limassol, Helsingborg, Rauma, Riga and Thessaloniki (exact TEU figures for the latter are unknown).

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[83] https://www.atalayar.com/en/articulo/economy-and-business/tangier-med-prepares-for-expansion-with-an-investment-of-more-than-700-million-euros/20240112061000195552.html#:~:text=Tangier%20Med%20prepares%20for%20expansion,more%20than%20700%20million%20euros&text=The%20World%20Bank%20will%20finance,of%20private%20vehicles%20and%20lorries.

[84] https://libyaalahrar.net/minister-of-economy-reviews-in-malta-upgrading-libyan-ports-services/

[85] https://www.dzair-tube.dz/en/completion-date-set-for-djen-djen-port-container-terminal/

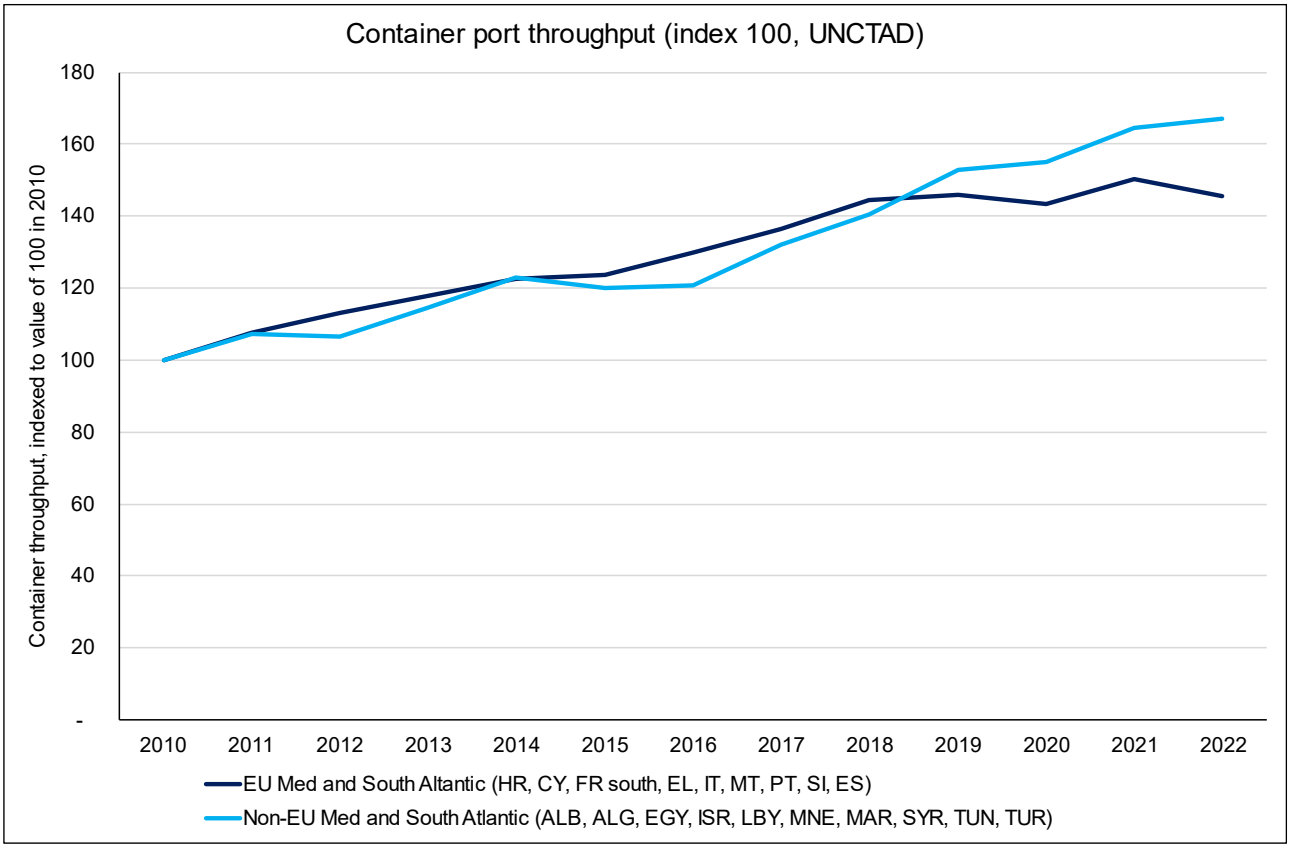
[86] https://www.egypttoday.com/Article/1/134096/Egypt-undertakes-massive-port-expansion-to-boost-trade-logistics

Other non-EU port expansion projects have also been identified at El Dekheila, Beirut, Nouadhibou, Free Town and Bejaia, each providing <1 mTEU in additional capacity, alongside Sheerness, Casablanca, Tekirdag, Haifa, Nemrut Limani Bay (Aliaga), Ashdod, Southampton, Teesport, West Port Said, Annaba and Arzew (planned TEU figures for the latter group are unknown).

When summing port container capacity increases identified for 2025-2035, these represent 25.1 million additional TEU for EU ports, compared with 34.4 million TEU for non-EU neighbouring ports.

When analysing the increase in capacity across EU ports and neighbouring non-EU ports (and West African ports) in the Mediterranean, these amount to 33.4 mTEUs for non-EU ports against 12.6 mTEUs for EU ports. There are evidently larger investments taking place at non-EU ports, compared with EU ports, driven by investments in the East Mediterranean, specifically Egyptian and Turkish ports (i.e. Sokhna, Damietta, East Port Said, Adana). While European ports continue following an organic growth in the context of a mature market, with existing container terminals gradually increasing their capacity to improve their competitiveness and market share, neighbouring non-EU ports, notably around the Mediterranean, continue their swift developments, with some important projects located away from older city centres. It is to be noted that container volumes in non-EU Mediterranean countries increased by 67% over the period 2010 – 2022, following a linear trend.

Figure 3-40: Container port throughput for EU and non-EU ports in the Mediterranean and adjacent Atlantic coast, 2010 to 2022



Source: DG CLIMA analysis of data from UNCTAD

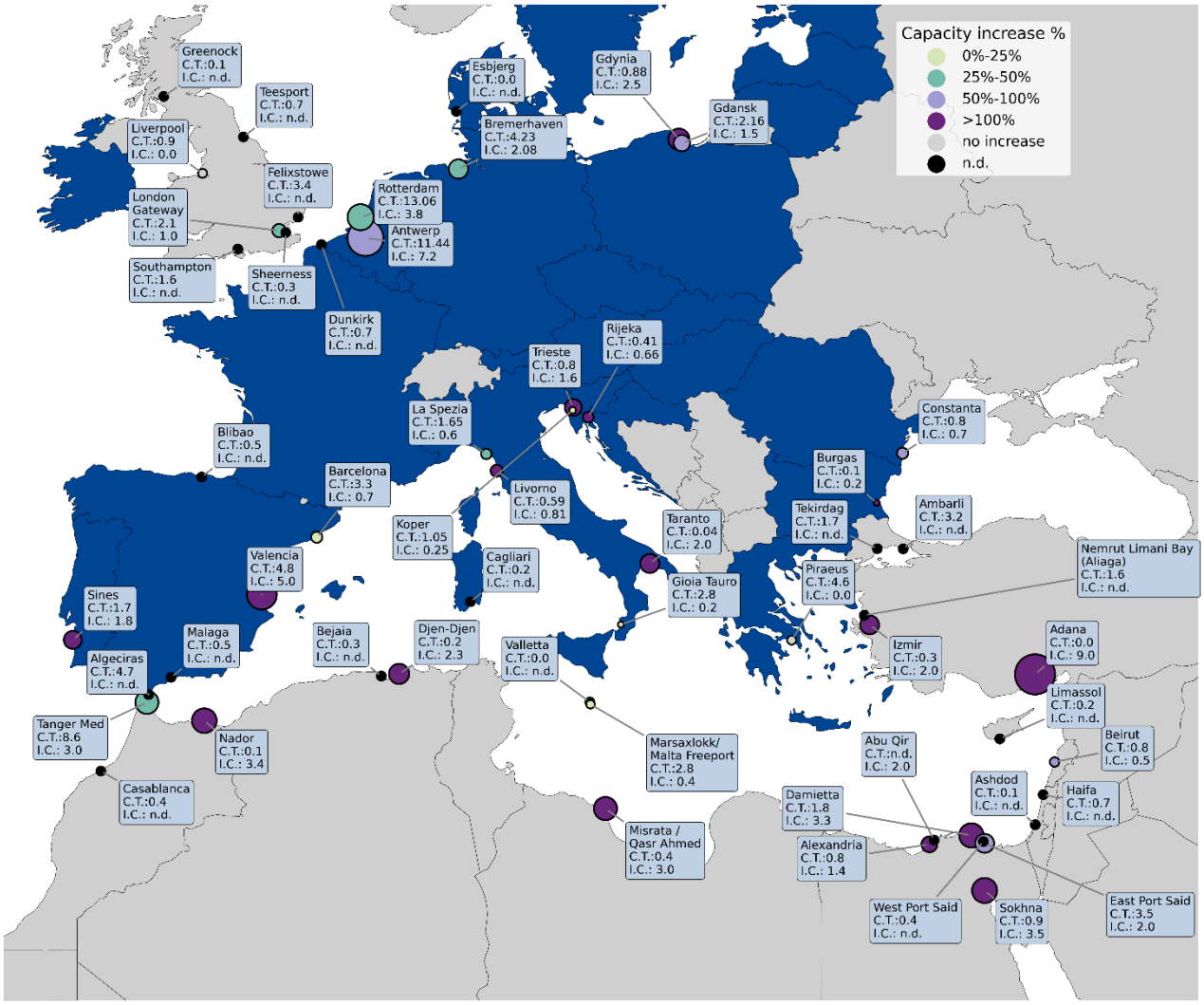
Comparing UK port investments with North-West Europe, the capacity increases amount to 1 mTEU compared to 17.3 mTEU, respectively. Here, the investments in UK ports seem limited compared to that in Northwest Europe.

Summary of all investments

An overview of the total port investments and their associated capacity increases across the Mediterranean region are provided in Figure 3-41 below, which include both recent and future expansions. This map considers EU transhipment ports and non-EU neighbouring ports (as well as several other ports with relevant investments[87]). For the analysis, capacity increases relative to the current throughput at ports have been categorised in different ranges, separated by those that show some increase but less than 25%, those for which the capacity increase is between 25% to 50%, those where the increase is between 50% to 100% and those where the capacity increase is above 100%. There is also a category for ports where it was not possible to find relevant information.

[87] Relates to additional ports with significant investment activity (i.e. Antwerp) as well as West African ports (i.e. Tema)

Figure 3-41: Map of current throughput (C.T.) (mTEUs) and, where available, increased capacity (I.C.) following investments at EU and non-EU ports, for recent and future investments (2024, up to 2035)



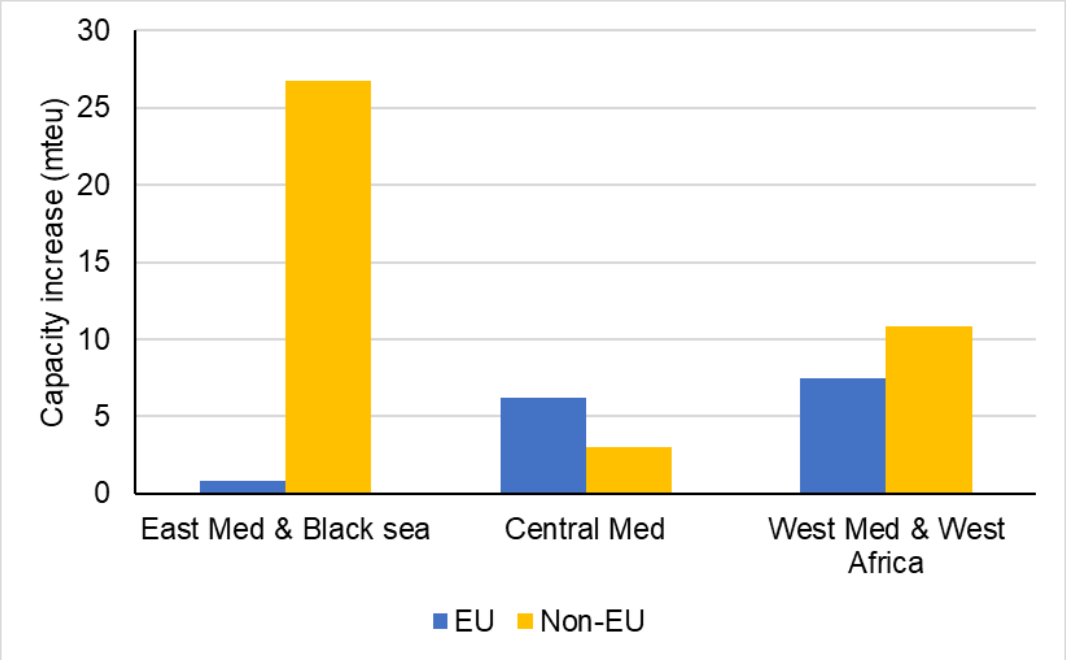
Source: Data collected from literature review of announced investments.

Note: CT: current throughput, IC: increased capacity.[88] *Size of bubbles indicates absolute value of increased capacity*

To complement the information displayed in the map, Figure 3-42 shows the increase in capacity aggregated by region (East Mediterranean & Black Sea, Central Mediterranean, West Mediterranean & Africa). The chart shows separated bars for EU and non-EU ports. As with the map, the analysis is limited by the availability of investment information, specifically on the additional capacity implemented (TEU). This shows a higher increase in the capacity introduced in non-EU ports, compared with EU ports; this is mainly driven by investments in the East Mediterranean (e.g., Adana, Türkiye).

88 Note that this does not include all EU ports, and non-EU neighbouring ports, and hence is indicative; data has been included based on availability.

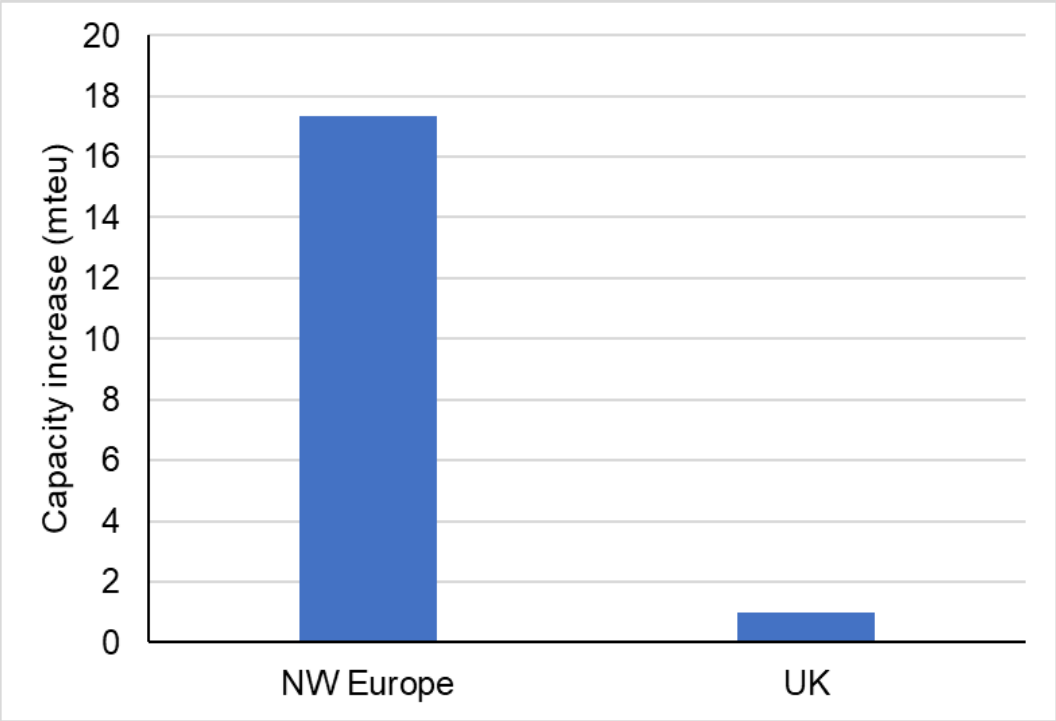
Figure 3-42 Total capacity increases by region, for non-EU and EU ports, for recent and future investments in the Mediterranean (for 2024, up to 2035)



Source: Data collected from literature review of announced investments.

Figure 3-43 compares the port capacity increases in the UK with Northwest Europe. Based on the data presented (limited to ports for which information was available), ports in Northwest Europe clearly demonstrate a significant increase in new capacity relative to their existing capacity, in comparison to UK ports.

Figure 3-43 Capacity increases for UK ports and North-West Europe (for 2024 up to 2035)



Source: Data collected from literature review of announced investments.

When analysing the recent capacity increases, implemented in 2024, there is little difference in the capacity introduced to non-EU ports compared to EU ports. However, when considering investments from 2025 – 2035, there is a higher increase in the capacity introduced in non-EU ports, compared with EU ports; this is mainly driven by investments in the East Mediterranean (i.e. Adana, Türkiye). However, there is no clear evidence to conclude that a change of investment patterns in ports is taking place (i.e. investments being cancelled or reduced at EU ports and accelerated in competing non-EU ports).

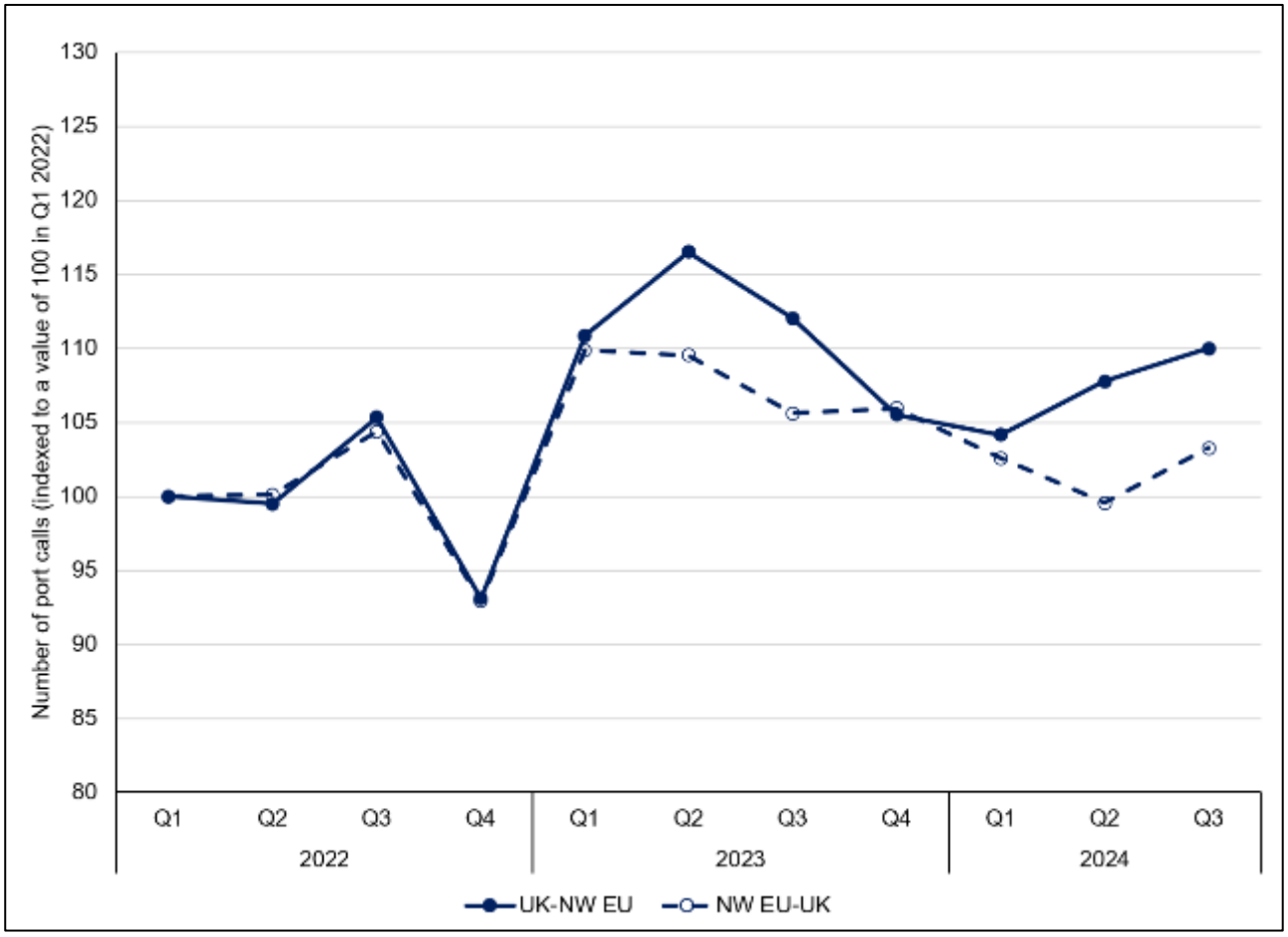
3.5. Evasive port calls at nearby non-EU ports and changes in order of port calls

3.5.1. EPC1 - Is there an increase in calls at relevant UK ports by vessels before calling at EU ports or after departing from EU ports (particularly Northwest Europe)?

This research question aims to gather evidence on potential evasive calls or changes in order of port calls from containerships using UK ports. For this purpose, data from the EMSA MARINFO database were analysed to identify relevant trends in the number of

containership port calls at Northwest EU ports from/to the UK. This analysis focuses on a selection of EU ports located in Northwest Europe, as they are closer to the UK and hence with a higher risk of evasive port calls at UK ports. To enhance the presentation of trends over time, and to ease comparisons between different locations, the numbers of port calls by containerships were indexed to a value of 100 in Q1 2022. The results are shown in Figure 3-44.

Figure 3-44: Indexed number of containership port calls at Northwest (NW) EU from/to the UK from 2022 to 2024



Source: Ricardo analyses of econdb data

Note: The solid line represents port calls at neighbouring EU ports in Northwest Europe (e.g., following a previous call in the UK (covering Felixstowe, Liverpool, London Gateway, Southampton, and Teesport), the dashed line considers port calls at UK ports following a previous call in neighbouring non-EU ports in Northwest Europe (Antwerp, Bremerhaven, Hamburg, Helsingborg, Le Havre, Maasvlakte, Moerdijk, Rotterdam, Zeebrugge)

The trends for traffic from neighbouring Northwest Europe ports to/from UK ports match relatively closely until Q1 2023, after which port calls from the UK to Northwest EU have generally been greater than those for the inverse direction. In both cases, the number of port calls in Q1 to Q3 2024 is below the level observed in Q1 to Q3 2023, though marginally greater than 2022. From this data, there is no observable general trend of more containership traffic between UK and Northwest EU ports in 2024, on a year on year basis.

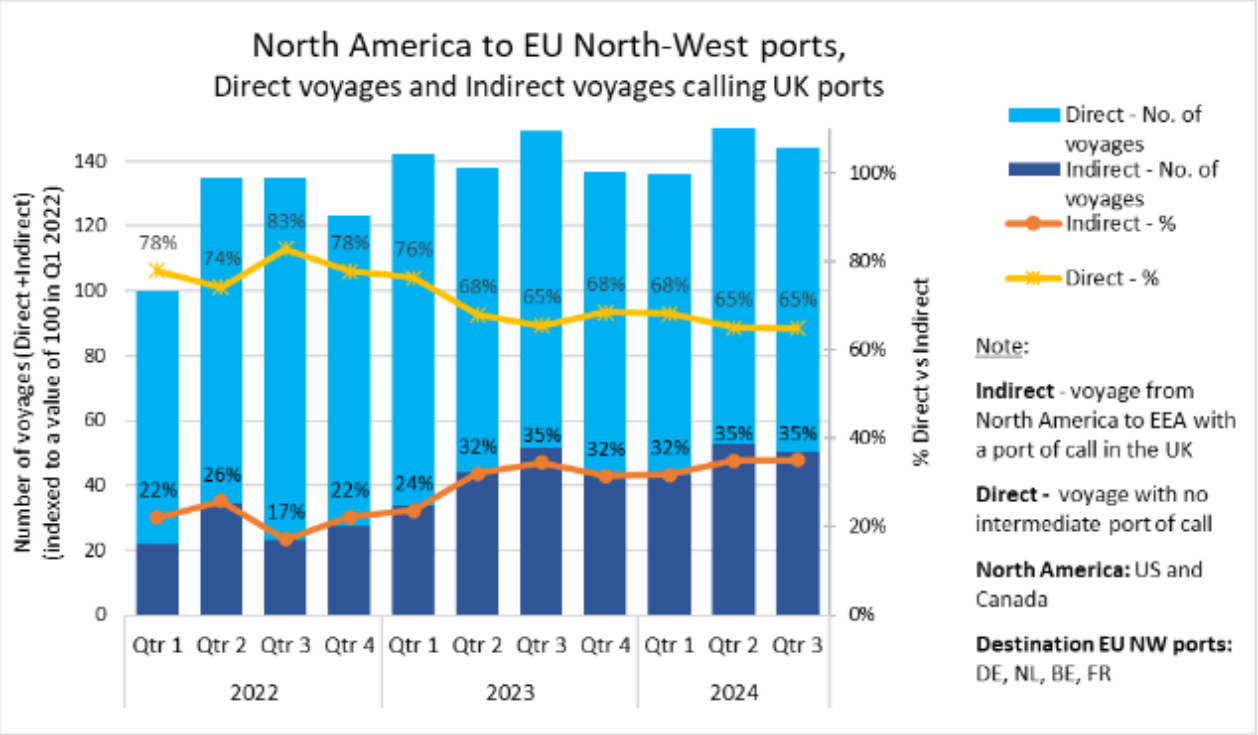
Overall, the total number of voyages by containerships from Northwest EU ports to the UK, and vice versa, has not increased in 2024 compared to 2023.

3.5.2. EPC2 - Are there changes in direct traffic from North American ports to Northwest EU ports?

This research question focuses on a specific case study on containership voyages from North America to Northwest EU ports with possible intermediate stops in the UK. The aim of this case study is twofold. First, it aims to focus on a subset of voyages with frequent intermediate stops in the UK, given the minimal detour on these flows. Second, it aims to disentangle the effects of the Red Sea crisis as these flows are expected to be less affected than traffic flows e.g., from Asia to Europe.

Figure 3-45 presents the number of voyages from North America to EU Member States in Northwest Europe (Belgium, France, Germany, Netherlands) between Q1 2022 and Q3 2024, distinguishing between ‘indirect’ and ‘direct’ voyages. In this case, ‘indirect’ voyages are those with an intermediate port of call in the UK before arriving to an EU port. From the chart, a growth in the indirect voyages year on year for each quarter can be observed in recent years. Such voyages with intermediate port calls in the UK represented 30% of US-EU voyages in 2023 and 34% in 2024. There is also a slightly increasing proportion of indirect voyages relative to direct voyages from Q4 2023 onwards, although the trend seems rather stable since then.

Figure 3-45: Evolution of direct and indirect (with intermediate stops in the UK) traffic from North America to Northwest EU ports



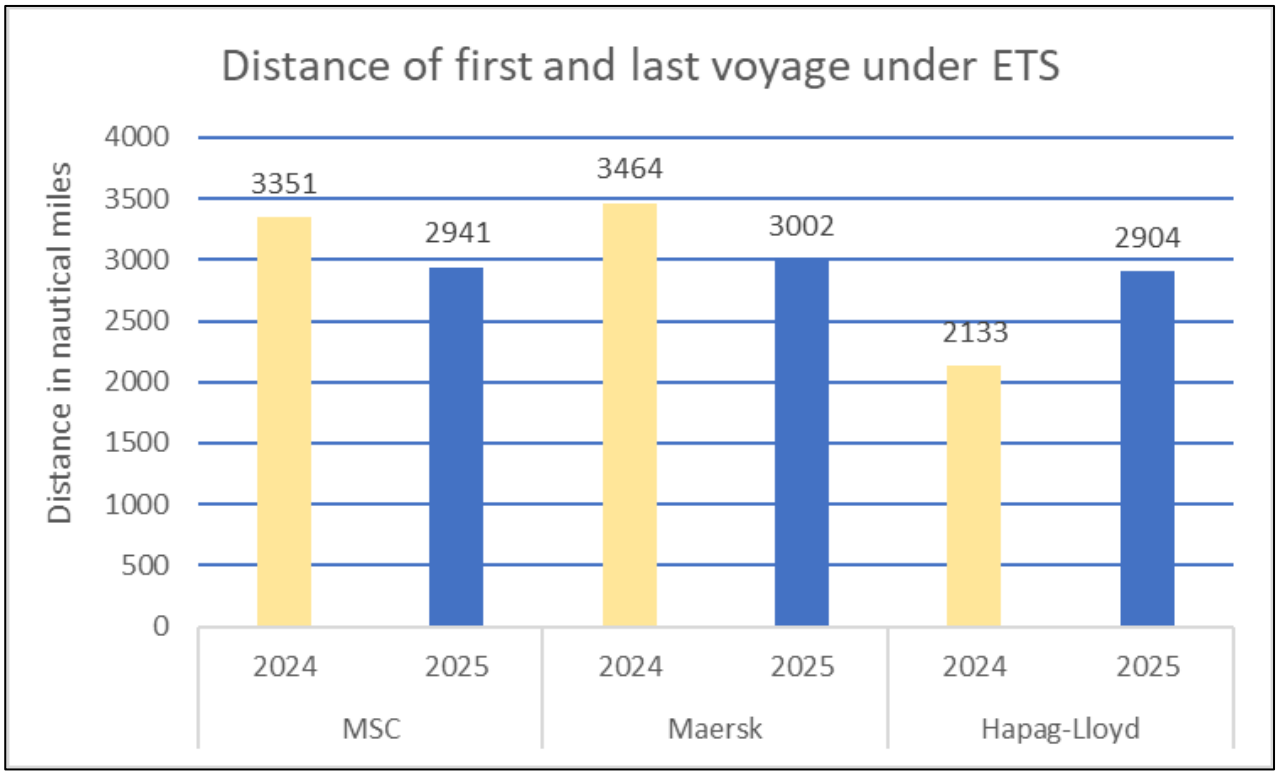
Source: EMSA

An additional (forward-looking) analysis was conducted to better assess possible evasive behaviours in relation to routes from North America to Northwest EU ports and the potential use of additional stops at UK ports. For this, the present case study examines the changes in the routes between North America and Northwest Europe for 2024 and 2025, as communicated by the major shipping operators, and compares overall distances covered by ETS scope across the two years to identify whether there is a trend to reduce ETS exposure on such routes.

To facilitate comparison between the two years, the *average* distance per route that is subject to ETS scope was considered for each operator, to disregard the effects that may be caused by more profound restructuring and changes in routes between the two years. This analysis focuses on MSC, Maersk, and Hapag-Lloyd, due to the availability of data regarding their 2025 itineraries at the time of writing this study. It also focuses on the first and last legs to/from the EU (i.e. intra-EU distances subject to ETS scope are disregarded for the purpose of this analysis).

Figure 3-46 illustrates the average distance travelled on the first and last voyages within the ETS scope, before and after crossing the Atlantic. The case study shows diverging results. For MSC and Maersk, the average distance subject to ETS scope on such routes is expected to decrease by approximately 400 nautical miles each in 2025 compared to 2024, suggesting an increasing use of UK port calls. In contrast, for Hapag-Lloyd, the distance is expected to increase by almost 800 nautical miles in 2025 compared to 2024.

Figure 3-46: case study - average distance travelled first and last voyages with the scope of the EU ETS – transatlantic traffic

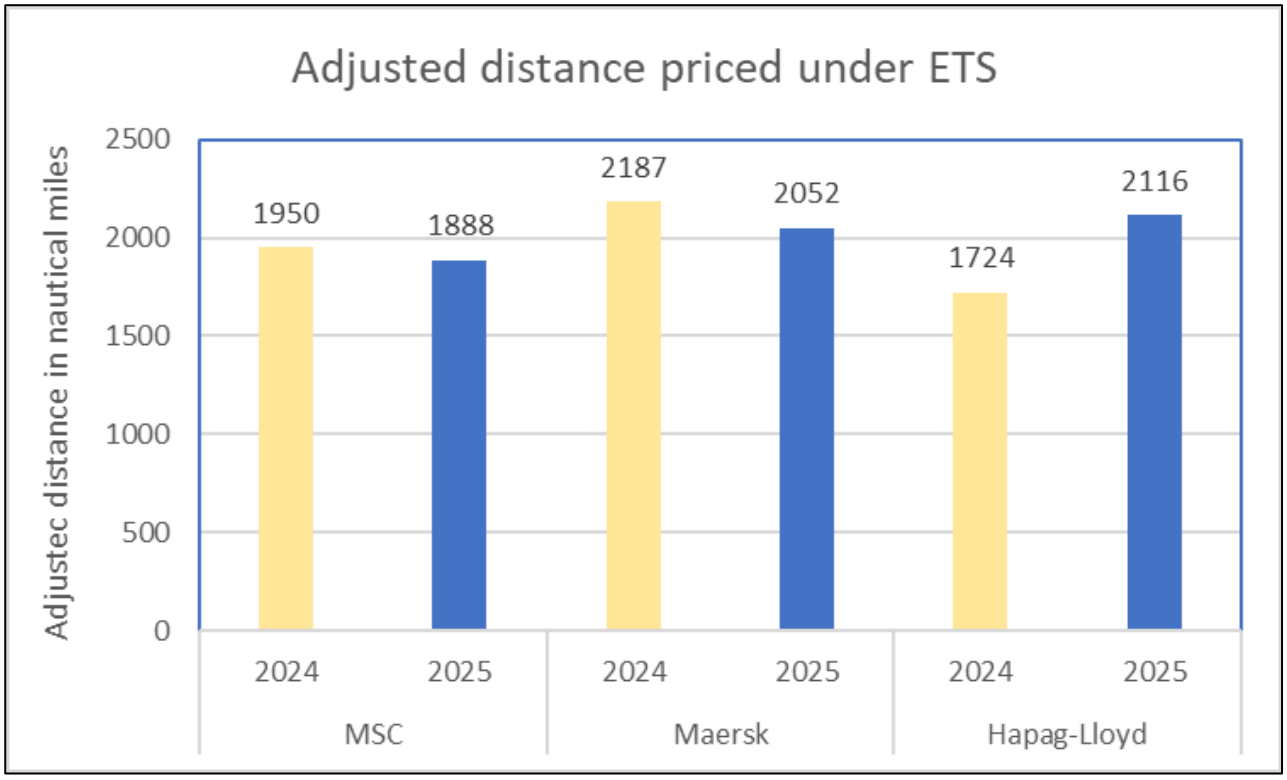


Source: Routes published on websites of shipping companies, as available online at the time of writing this study

Figure 3-47 presents the average distance per route and per operator that would be subject to ETS surrendering obligations. This means that, for this purpose, distances corresponding to intra-EU voyages are accounted for with a 100% coefficient, while extra-EU legs are also considered but only accounted for at 50% (due to the ETS geographical scope).

The trends observed mirror those of Figure 3-47. MSC would experience a decrease of about 60 nautical miles in terms of distance exposed to ETS costs, Maersk by 125 nautical miles, whereas Hapag-Lloyd would see an increase of nearly 400 nautical miles.

Figure 3-47: Case study - Average distance subject to EU ETS obligations



Source: Routes published on websites of shipping companies, as available online at the time of writing this study

Overall, these analyses suggest that, while it is difficult to draw any firm conclusion on possible evasive behaviour in relation to the UK, due to mixed results and notably depending on the companies or the timelines considered, the use of additional stops at UK ports should continue to be closely monitored.

3.5.3. EPC3 - Are there changes in direct traffic from outside the EU to Mediterranean Member States, and changes to indirect traffic from outside the EU to these ports with an intermediate port call at a Mediterranean non-EU neighbouring country?

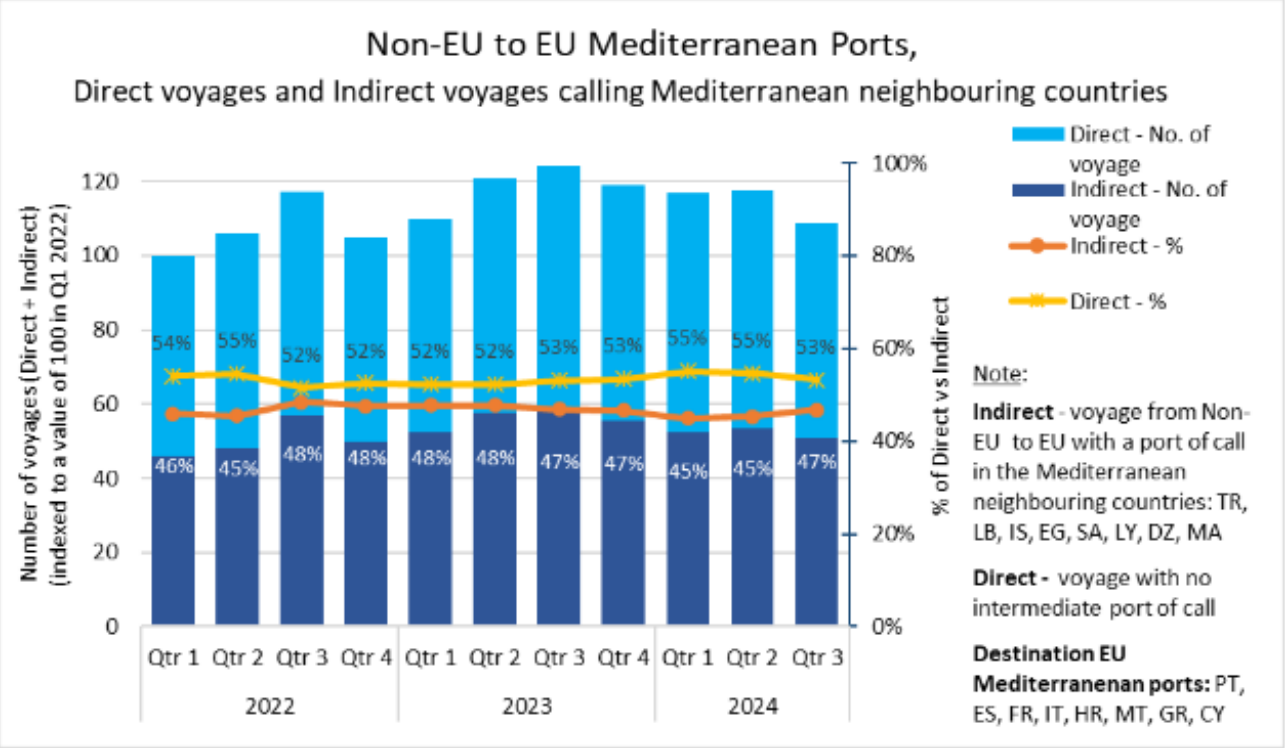
This research question aims to gather evidence on potential evasive calls or changes in order of port calls from containerships in routes to/from Mediterranean EU ports, considering potential intermediate calls at Mediterranean non-EU ports. For this purpose, the EMSA tool is used to extract the number of indirect voyages (defined here as voyages from non-EU ports to EU ports with an intermediate stop at a Mediterranean non-EU port) and number of direct voyages (defined as a voyages from non-EU ports to EU ports without an intermediate stop at a Mediterranean non-EU port) from Q1 2022 to Q3 2024. The scope of Mediterranean EU ports includes all ports in Portugal, Spain, France, Italy,

Malta, Cyprus, Croatia, Greece, while non-EU Mediterranean ports in-scope are those located in Morocco, Algeria, Tunisia, Libya, Egypt, Israel, Lebanon, Türkiye, Saudi Arabia.

The analysis aims to test whether there is an increase in indirect voyages over the monitoring period compared to the equivalent period in 2023 which, coupled with a decrease in direct voyages, could be an indication of evasive port calls or changes in order of port calls.

The results of the analysis presented in Figure 3-48 do not provide any evidence of a significant uptake of evasive port calls or changes in order port calls using Mediterranean non-EU ports as intermediate stops. Both direct and indirect voyages remain relatively stable over 2023 and the first half of 2024, with marginal changes in 2024 compared to 2023 (around 1 percentage point difference).

Figure 3-48: Evolution of direct and indirect (with intermediate stops in Mediterranean non-EU ports) traffic from non-EU to Mediterranean EU ports



Source: EMSA

In conclusion, examined data suggests there is no significant adoption of evasive port calls or changes in order of port calls within the Mediterranean basin up to Q3 2024.

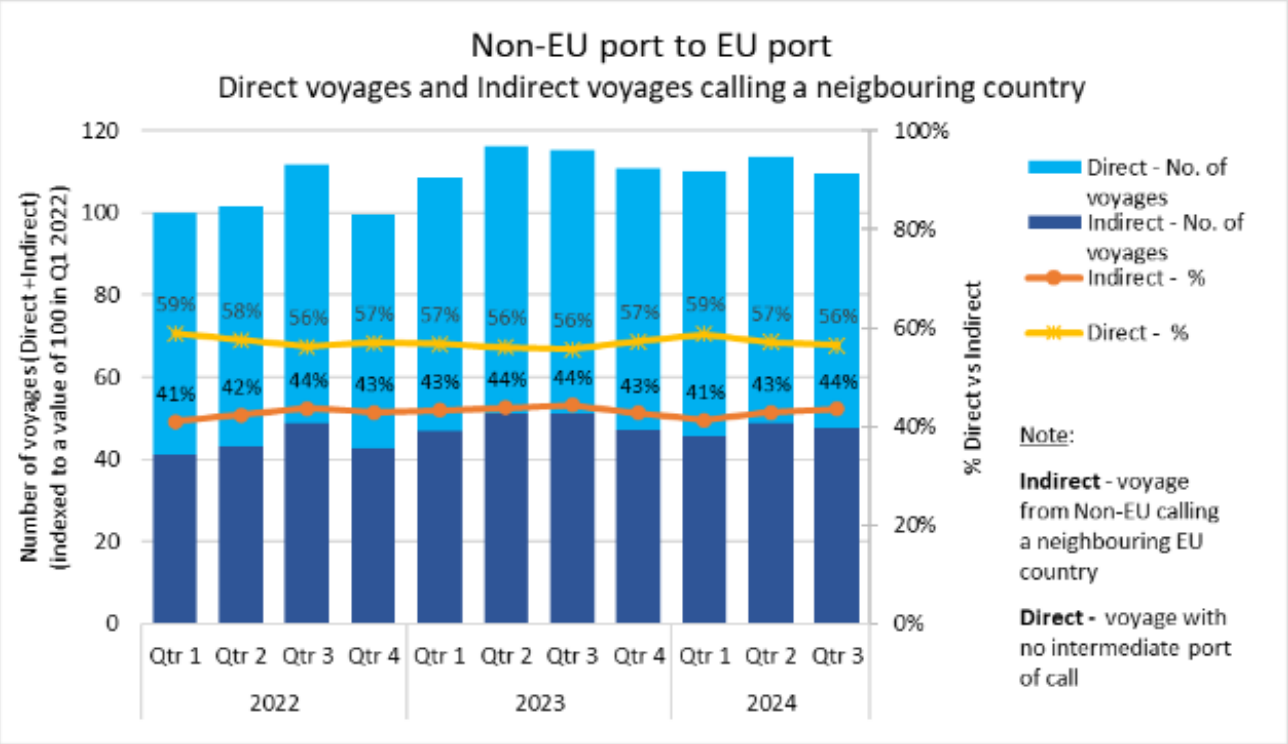
3.5.4. EPC4 - Are there changes in (overall) direct traffic from non-EU ports to EU ports, and to (overall) indirect traffic from non-EU ports to EU ports but with an intermediate port call at a neighbouring non-EU country (within 300 nautical miles from an EU country)?

This research question aims to assess the extent to which there is evidence of evasive port calls or change in order of port calls from containerships at an EU-wide level. Evidence for this research question essentially builds on results from the EMSA tool, which provides number of voyages and total vessel capacity (in TEUs) for (all) world traffic to (all) EU ports between Q1 2023 and Q3 2024, distinguishing between ‘indirect’ and ‘direct’ voyages. In this case, indirect voyages are those with any intermediate port of call in a neighbouring country within a 300 nautical miles range from an EU port.

Similarly to the previous one, this research question aims to test whether there is an increase in indirect voyages (and total vessel capacity), coupled with a decrease in direct voyage, over the monitoring period compared to the equivalent period in 2023 as a potential indication of evasive port calls or changes in order of port calls.

Results presented in Figure 3-49 do not provide any such evidence for evasive port calls or changes in order of port calls. Despite the fluctuations in the number of direct voyages from non-EU to EU ports over 2023 and first half of 2024, both the levels of indirect voyages and share in terms of total vessel capacity in 2024 are not significantly different from those of 2023.

Figure 3-49: Evolution of direct and indirect (with intermediate stops at neighbouring non-EU ports) traffic from non-EU to EU ports



Source: EMSA

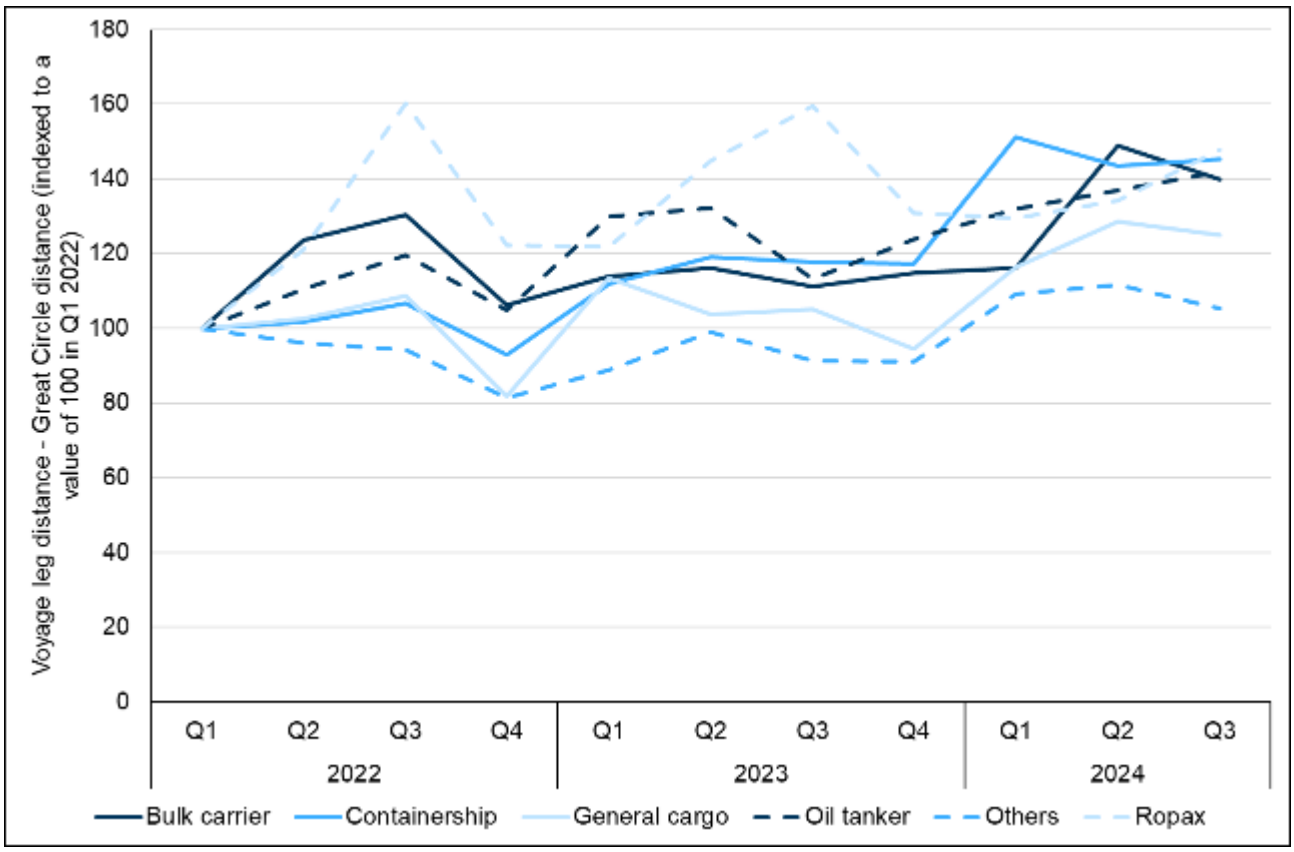
In conclusion, evidence collected for this research question suggests there is no generalised and significant adoption of evasive port calls or changes in order of port calls at an EU-wide level up to Q3 2024.

3.5.5. EPC5 - Is there a decrease in the average distance travelled by vessels on the last leg of a voyage to an EU port, or the first leg of a voyage departing from an EU port?

This research question aims to assess whether there is evidence of evasive port calls based on total great circle distance travelled in EU to non-EU and non-EU to EU voyages. Evidence for this research question essentially builds on results from the analysis of EMSA data, which was used to calculate great circle distance for each voyage included in the data, providing at the end, total distance for six vessel categories, split by voyages arriving at an EU port from a non-EU port, and vice versa, between Q1 2022 and Q3 2024.

Figure 3-50 shows the total great circle distance travelled by vessels on the last leg of a voyage arriving at an EU port from a non-EU port between Q1 2022 to 2024, for a list of top 20[89] EU ports. This is indexed to a value of 100 during Q1 2022.

Figure 3-50: Total great circle distance travelled by all vessel types on the last leg of a voyage arriving at an EU port from a non-EU port



Source: Own elaboration based on EMSA data

The results show that the average great circle distance travelled on non-EU to EU legs has increased marginally over the three years across all vessel types. Among the ship categories analysed, the ones showing the most significant differences when comparing 2024 with 2023 are bulk carriers (growing 30 percentage points in Q2 and 29 in Q3), containerships (growing 39 percentage points in Q1, 24 in Q2, and 27 in Q3) - this increase has also been highlighted by UNCTAD[90] in 2024 - and general cargo ships (24 percentage points Q2 and 20 in Q3), with a considerable increase in total great circle distance. The oil tanker category also shows an increase in 2024 compared to the same quarters in 2023 (particularly in Q3, growing 19 percentage points). The RoPax category shows a decrease in Q2 (1 percentage points) and Q3 (5 percentage points) 2024, compared to 2023. In general, there is a noticeable trend of increasing distances in the

[89] The list of 20 ports was selected based on the year 2023, identifying the 20 EU ports with the highest number of port calls

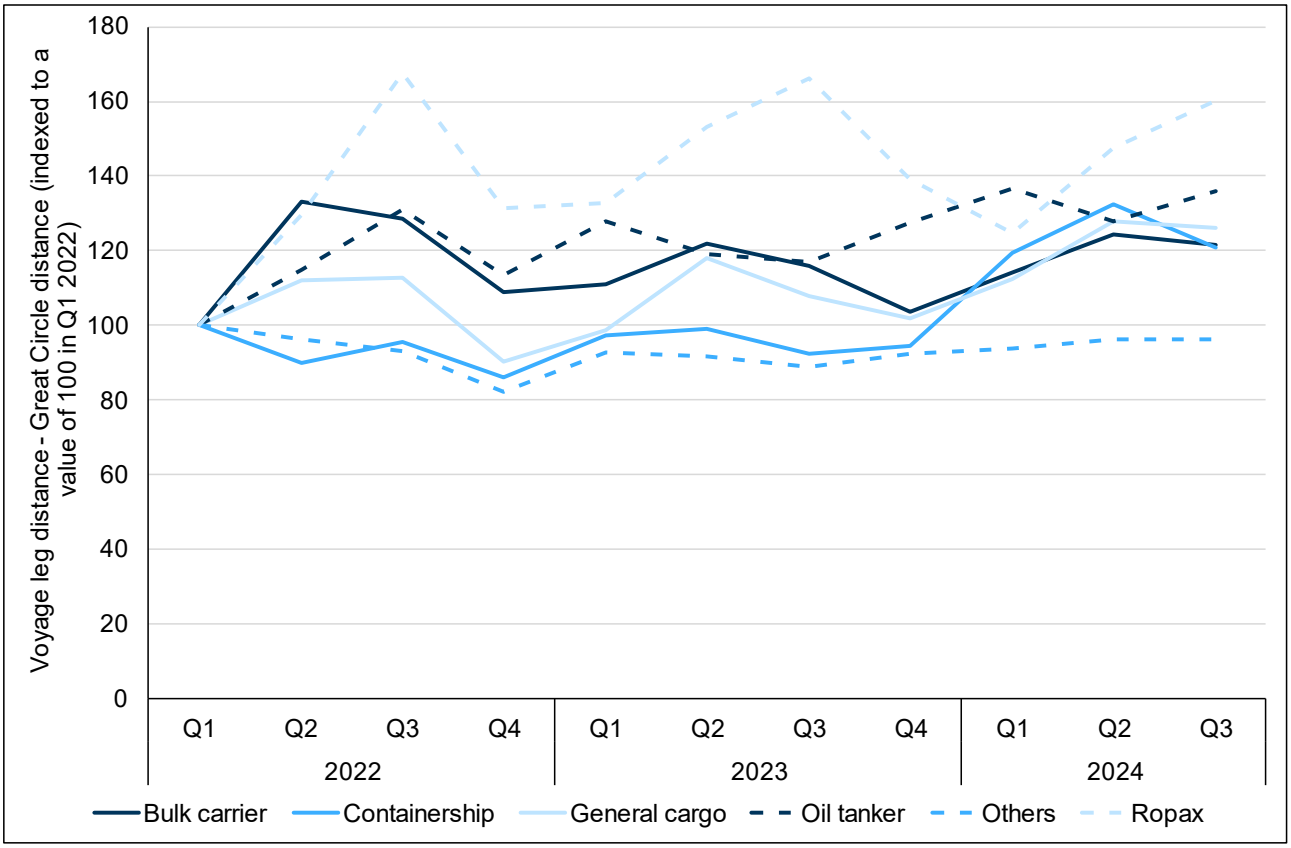
[90] Red Sea Crisis and implications for trade facilitation in Africa | UNCTAD

quarters of 2024 analysed, which could be linked to route changes and other mitigation strategies due to the situation in the Red Sea.

The increase in distance travelled observed in Q1, Q2 and Q3 2024 will likely lead to more GHG emissions being reported under the ETS scope, while the implementation of circumvention measures to avoid the ETS compliance costs would have logically led to the opposite effect. Therefore, these results do not represent supporting evidence of general evasive behaviour that should be leading to shorter voyages from non-EU ports to EU ports, although the situation in the Red Sea is a clear driver of the increase observed.

Complementing the previous analysis, Figure 3-51 below shows the results for the total great circle distance travelled on the first leg of a voyage departing an EU port (from the list of 20 ports) to a non-EU port between Q1 2022 and Q3 2024.

Figure 3-51 Total great circle distance travelled by all vessel types on the first leg of a voyage departing an EU port to a non-EU port



Source: Own elaboration based on EMSA data

The results show that the total great circle distance travelled in EU to non-EU legs has increased over time, mainly focusing in Q1 to Q3 of 2024. The categories showing the most significant changes are containership (22 percentage points in Q1, 33 in Q2 and 29 in Q3) and general cargo (14 percentage points in Q1, 10 in Q2 and 18 in Q3). The rest of the categories do not show significant increases. RoPax exhibits decreases in 2024 (8 percentage points in Q1, and 6 in Q2 and Q3).

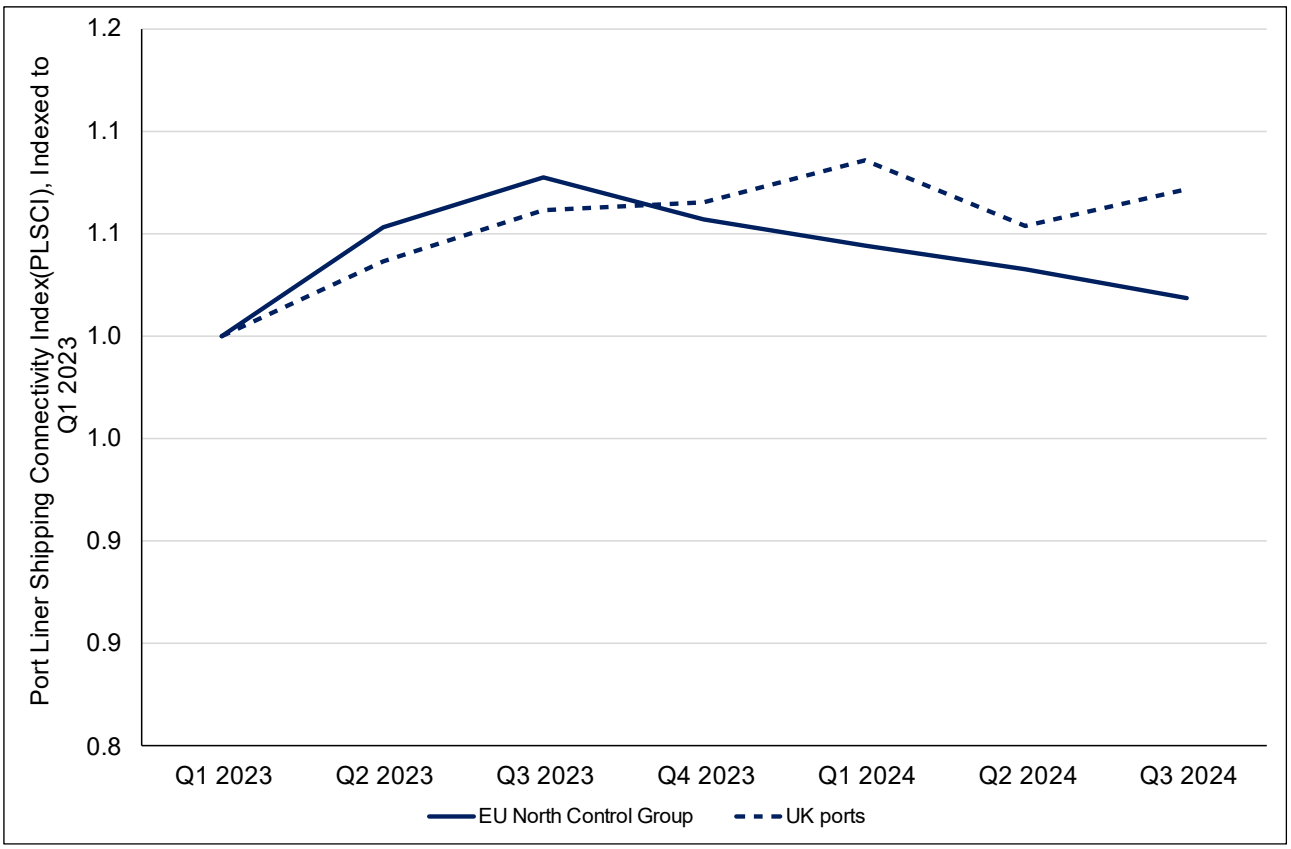
> Overall, while some categories show increases in distances during certain quarters, other categories exhibit declines, and there is no clear trend that could suggest evasive behaviours are taking place at large.

3.5.6. EPC6 - Is there a change in port liner shipping connectivity index (PLSCI) for Northwest EU ports, notably compared to neighbouring non-EU ports in the UK?

The aim of this question is to investigate whether there is evidence of an increased level of connectivity at non-EU ports in 2024, which might indicate evasive port calls occurring at these non-EU ports. The question is particularly relevant to the case of UK ports, as vessel operators may choose to call at a UK port on the way to, or from, Northwest EU, where previously they may have travelled directly to EU ports in Northwest Europe. The question has been investigated using the port liner shipping connectivity index (PLSCI) data, which were also used to investigate research questions TRE5, TRC5 and TRW5 presented earlier.

The PLSCI results for individual ports in the UK and the EU North control group (indexed to a value of 100 in Q1 2023) have been collated to show the overall evolution for both groups in Figure 3-52.

Figure 3-52: PLSCI evolution since Q1 2023 for EU North control group and UK ports

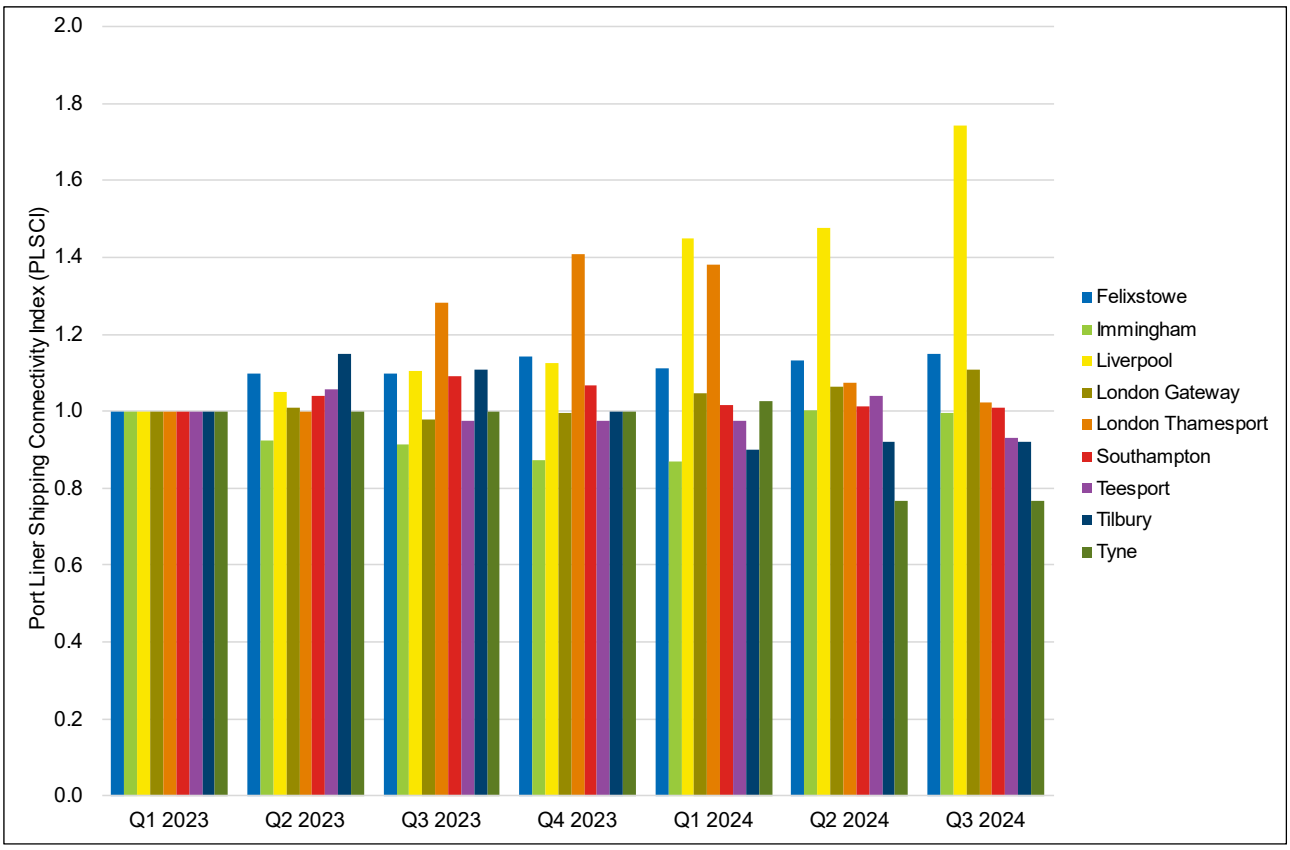


Source: Ricardo analyses of PLSCI data from UNCTAD

The results show a similar trend, with slightly greater growth for EU ports, to Q3 2023, after which the connectivity for the EU North control group ports declined, to be only 2% higher in Q3 2024 than in Q1 2023. In contrast, the connectivity for UK ports continued to increase to Q1 2024, after which it levelled off (reducing and then increasing again) to reach a value 7% higher in Q3 2024 than in Q1 2023.

The evolution of PLSCI for UK ports is explored in more detail in Figure 3-53, which shows the results for the individual ports that were included in the combined results in Figure 3-52.

Figure 3-53: PLSCI evolution since Q1 2023 for UK ports

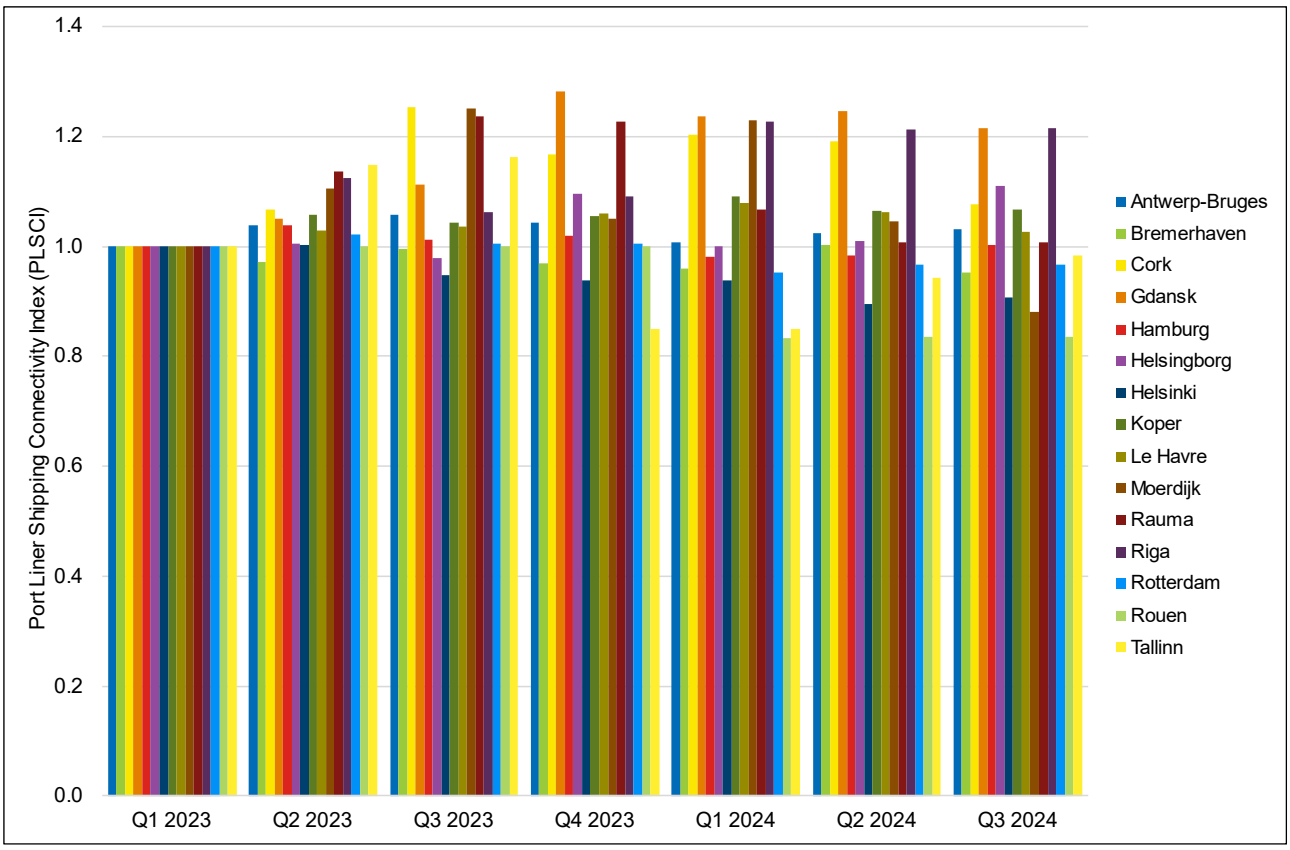


Source: Ricardo analyses of PLSCI data from UNCTAD

Over the period of the analysis, Figure 3-53 shows that different ports in the UK have performed differently, with Liverpool showing particularly strong growth in connectivity, which has contributed most to the better results of UK ports (than for EU North Control Group ports) seen in Figure 3-52. Other ports have fared less well, with some, such as London Thamesport, Tilbury and Tyne, actually experiencing reduced connectivity in Q3 2024 than in the equivalent period in 2023.

Similar analyses for the ports included in the EU North Control Group are shown in Figure 3-54.

Figure 3-54: PLSCI evolution since Q1 2023 for ports in the EU North Control Group



Source: Ricardo analyses of PLSCI data from UNCTAD

This shows that the ports in the EU North Control Group also perform differently, although with a smaller range than for the UK (0.83 to 1.12, compared to 0.77 to 1.74). While Gdansk and Riga both show increases in connectivity of over 20% relative to Q1 2023, several ports (Bremerhaven, Helsinki, Moerdijk, Rotterdam, Rouen and Tallinn) have lost connectivity in the same period. The ports of Cork, Moerdijk, Rauma, Rouen and Tallinn all experienced reductions of greater than 10% in connectivity between Q3 2023 and the equivalent period in 2024.

> Overall, when considering the evolution of connectivity in 2024, UK ports have performed better than EU ports in Northwest Europe, although this improvement is almost solely due to the performance of the port of Liverpool.

3.5.7. EPC7 - Are any changes in national legislation likely in the short to medium term that would affect the economics of possible evasive behaviours (for example, will the UK extend the UK ETS to maritime transport in a similar way to air transport)?

To support our assessment, a review of the literature focused on identifying and analysing relevant legislative changes announced in selected neighbouring non-EU countries, namely the UK, Türkiye, Egypt and Morocco.

Both the UK and Türkiye have announced plans of implementing carbon pricing mechanisms for the shipping sector that are presented below. Egypt recently launched a voluntary carbon market, but there is no mention of maritime coverage[91]. No announcements of planned legislation changes were identified in the case of Morocco as part of the literature search.

Concerning the UK, the intention to expand the UK ETS to cover domestic maritime voyages of vessels above 5,000GT from 2026[92,93] has been announced. A recent consultation was launched in November 2024 on the UK's expansion to maritime, with the objective to look at different implementation options as well as to consult on potential future expansion of the UK ETS to additional maritime emissions[94]. The consultation mentions the possibility to cover half of UK-EU emissions on top of UK domestic emissions, and potentially half of emissions from international voyages which start or end in the UK from overseas, should multilateral action through the IMO be delayed, or prove insufficient in reducing GHG emissions from international shipping. Depending on its geographical scope, the implementation of the UK ETS could contribute to mitigating the risk of evasive port calls at UK ports (e.g., evasive port calls at UK ports).

In the case of Türkiye, the implementation of an ETS scheme is under preparation. The Turkish Climate Change Mitigation Strategy and Action Plan (2024-2030) includes actions to establish the ETS scope, setting emissions cap, and establishing a pilot period[95]. Efforts are reportedly underway to finalise a draft Climate Law establishing the legal framework

[91] https://www.lexology.com/library/detail.aspx?g=fe56309e-1d06-4877-89c7-988203eb065f

[92] https://committees.parliament.uk/publications/45178/documents/223685/default/

[93] https://www.gov.uk/government/publications/uk-emissions-trading-scheme-long-term-pathway/the-long-term-pathway-for-the-uk-emissions-trading-scheme

[94] https://assets.publishing.service.gov.uk/media/6747627277462f7809147537/uk-ets-scope-expansion-maritime-consultation.pdf

[95] https://iklim.gov.tr/db/english/icerikler/files/CLIMATE%20CHANGE%20MITIGATION%20STRATEGY%20AND%20ACTION%20PLAN%20_EN.pdf

for a national ETS, expected to be presented to Parliament in 2024[96]. According to the International Carbon Action partnership[97,98] the pilot phase of the ETS was initially planned to launch before the end of 2024 and expected to run for a two-year transition period; a recent publication by the Turkish Executive Director indicated that this is now planned for 2025[99]. At COP29 (November 2024), Eyüp Kaan Morali, Head of Türkiye's Carbon Pricing Department, also confirmed Türkiye's approach to establishing its ETS and the upcoming pilot phase[100]. This pilot ETS is reported to leverage data collected under Türkiye's mandatory Monitoring, Reporting and Verification (MRV) system which has been in place since 2015. Full implementation of the ETS is planned, following this trial, currently planned for October 2026. However, given the delay in starting the pilot phase, full implementation may also be delayed. On 9 July 2024, the Turkish Parliament amended the "port law" to oblige commercial ships calling at Turkish ports to pay for their GHG emissions (GHG levy). According to the law, the prices to be charged should be based on the verified greenhouse gas emissions and the current carbon price of the EU ETS. Revenues should be used to support green shipping activities in Türkiye. The Turkish presidency is expected to issue regulations detailing the types of ships affected, emission fee rates, and procedures for monitoring, reporting, and verifying emissions. It is not clear whether the ETS will also apply to extra-TK voyages, which would then have the potential to fully address the evasion risk in relation to Türkiye.

Additionally, Türkiye has a regulation acting as an incentive for ship owners, which aims to increase the capacity of maritime transportation between Turkish ports and other countries (implemented in 2022)[101]. Reportedly, Turkish ship owners will be paid by the Ministry of Transport and Infrastructure for every 10 nautical miles travelled by a trailer, semi-trailer and tanker carried by Turkish flagged vessels. The incentive does not apply to container vessels, with only ship owners who operate vessels on new lines being entitled to benefit from the incentive since the aim of the regulation is to increase the number of lines used for combined transportation between Turkish ports and the ports of other countries.

Concerning the other two countries, as mentioned above, besides a voluntary carbon market, there is no mention of maritime coverage by an ETS or other similar scheme in

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[96] https://icapcarbonaction.com/en/news/turkiye-envisions-central-role-ets-2024-2030-climate-strategy

[97] https://icapcarbonaction.com/en/ets/turkish-emission-trading-system

[98] https://kesikli.com/news-insight/2024-07-29-contemplated-emissions-trading-system-in-turkey-carbon-trading/

[99] https://www.elibrary.imf.org/view/journals/002/2024/312/article-A001-en.xml

[100] https://en.apa.az/cop29/development-of-the-global-emissions-trading-system-discussed-at-cop29-photo-453652

[101] https://www.ersoybilgehan.com/en/publication-detail/new-incentive-for-turkish-ship-owners-turkey-to-promote-the-establishment-of-new-lines/

Egypt. Similarly, no announcements or other evidence of planned legislation changes were identified in the case of Morocco in our literature search.

Beyond the above we should also add that there are several incentives, e.g., tax incentives, which allow for cheaper travel through ports in the countries under consideration. The UK, Morocco and Egypt have established “free zones” which offer tax incentives, subsidies and customs duties occurred during trade[102,103,104]. These zones aim to attract investment by companies seeking to export products from these countries. Many of these incentives, however, have been in place for several years, and there have been no specific developments in 2024 which would encourage evasive behaviours.

These free zones currently in place in the UK, are referred to as UK Freeports. Recent changes have been made to the time period over which the tax reliefs can be claimed at these locations. This period has been extended from five years to ten, thereby securing a decade of tax reliefs at Freeport sites, and hence further port growth[105]. Several UK stakeholders are also pushing for an increase in the offering of Freeports[106], to create further incentives for investment, however the UK Parliament is not currently considering this [107].

Additionally, the UK has also revoked its Port Services Regulation (PSR) from 1 January 2024; this was a regulation aimed at supporting the EU’s PSR, which is a regulation providing a framework for the provision of port services, rules on financial transparency and on port infrastructure charges within the EU. The regulation had previously aimed to promote competition and outsourcing in the UK, by making it easier for port services to be provided by companies outside the UK, as well as enforcing the transparency of port charges and public funds[108]. As many UK ports are privately owned, the regulation was reportedly viewed by UK industry stakeholders as disadvantageous; this was in regard to encouraging additional competition from EU ports as well as the potential for costly compliance requirements to hinder investments[109]. Following the UK’s exit from the EU,

[102] https://www.great.gov.uk/international/content/investment/how-we-can-help/freeports-in-the-uk/

[103] https://www.state.gov/reports/2024-investment-climate-statements/morocco/

[104] https://www.gafi.gov.eg/English/StartaBusiness/InvestmentZones/Pages/FreeZones.aspx

[105] https://www.gov.uk/government/news/roadmap-published-to-accelerate-growth-in-port-towns-and-cities

[106] https://www.britishports.org.uk/freeports/

[107] https://publications.parliament.uk/pa/cm5804/cmselect/cmbeis/272/report.html#heading-7

[108] https://policyexchange.org.uk/wp-content/uploads/2022/10/A-Global-Maritime-Power.pdf

[109] https://assets.publishing.service.gov.uk/media/620a791d8fa8f54915f4369e/benefits-of-brexit.pdf

the Government had considered that this was no longer suitable for the UK ports sector. This repealing of the legislation reduces the rules which the UK is subject to[110].

Regarding UK port investment activities[111,112,113,114], this does seem to show an increase in investments, although UK roadmaps note that up to £4 billion is required[115].

> Overall, despite the legislations and port incentive measures identified in non-EU countries, few significant changes have occurred in the first half of 2024 that could be considered as changes intended to (or with the potential to) attract more vessels to non-EU neighbouring countries instead of EU ports.
>
> On the contrary, the implementation of the recently announced carbon pricing schemes for maritime transport in Türkiye and in the UK may contribute to mitigating evasion risks in coming years by increasing the level playing field with EU ports.

3.5.8. EPC8 - Have vessel operators announced changes to routes that add extra port calls at nearby non-EU ports OR replace EU port calls at transhipment ports by port calls at nearby non-EU transhipment ports? (distinguishing whenever possible new/extra port calls, changes in order of port calls, vs replacement of port calls)

In this research question we are examining evidence of route changes that would point to possible evasion risks, including:

- Evasive port calls: Changes to routes where new port calls have been added at non-EU ports
- Changing order of port calls: Changes made to routes in the order of port calls

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110 https://www.gov.uk/government/consultations/repealing-the-eu-port-services-legislation/repealing-the-eu-port-services-legislation

111 https://www.bbc.com/news/articles/c39lyx43x93o

112 https://www.newcivilengineer.com/latest/labour-promises-1-8bn-investment-in-uk-port-infrastructure-19-04-2024/

113 https://www.abports.co.uk/news-and-media/latest-news/2024/abp-acquires-land-to-fuel-future-growth/

114 https://committees.parliament.uk/publications/34426/documents/189604/default/

115 https://www.renewableuk.com/media/ezvmvea3/industry-roadmap-2040-building-uk-port-infrastructure-to-unlock-the-floating-wind-opportunity_march-2023.pdf

- Relocation of transhipment operations: Changes to routes where EU port calls have been replaced by non-EU port calls

A detailed literature review has been conducted screening for announcements of changes to routes in the EU and neighbouring ports.

It should be noted that the majority of announcements identified relate to discussion of the former two evasion risks, with limited announcements for the latter; few announcements indicate a direct replacement of an EU port with a non-EU port. Additionally, responses from ports questionnaires have been used to complement the analysis.

The announcements on route changes have been classified by changes currently/previously in place (backward-looking analysis) (presented in Section Backward-looking review (changes in effect in 2024)), and future route announcements (forward-looking analysis, from 2025 onwards) (Section Forward- looking review (changes in effect from 2025 and beyond)). These have also been grouped by region, based on the location of the port(s) responsible for the change in route, namely where the added port call, replaced port, or the new first port of call (relevant for a change in order of port calls) is located. Regions have been categorised following the approach we use for the analysis of evasive behaviour in the previous sections: West Mediterranean, Central Mediterranean, East Mediterranean, and Northern Europe.

In addition to this categorisation, for the forward-looking announcements, a case study focusing on analysis of transatlantic routes has also been included (routes between North America and Northwest Europe), investigating further 2025 routes announcements. This case study was deemed most relevant because of the risk in relation to addition of UK port calls as intermediate stops, and because such traffic flows are expected to be less impacted by the Red Sea crisis.

3.5.8.1. Backward-looking review (changes in effect in 2024)

East Mediterranean & Red Sea

In the East Mediterranean, announcements have focused on route changes made due to the Red Sea crisis, with vessels trying to avoid Houthi attacks. Vessels have been circumventing the Suez Canal via routes around Africa, with some shipping companies creating alternative routes via Egypt (including Port of Alexandria and Port Said)[116,117], hence adding non-EU ports to their routes.

Changes in routes from the Far East to Europe, via Africa, mainly favour the ports of Western and Northern Europe, to the detriment of Piraeus, which is no longer the first

[116] https://www.alfarescargo.com/impact-of-the-red-sea-crisis-on-land-shipping-in-the-middle-east

[117] https://www.healthandsafetyinternational.com/article/1860316/shipping-firms-re-route-protect-against-red-sea-missile-risks

European port to be encountered by ships, now arriving via the Cape of Good Hope[118]. Some services operating larger vessels have reduced their services calling at Piraeus and are now instead opting to use smaller feeders from West Mediterranean ports to transport cargo into the East Mediterranean. It is reported that 282,000 containers (TEU) were transferred through Piraeus in January 2024, compared to 323,000 in the same month of the previous year. An analysis by Drewry[119] indicates that there was a reduction from 31 to 26 weekly deep-sea loops calling at ports in the East Mediterranean / Black Sea, from Q2 2023 to Q2 2024. In Q2 2024, there were no weekly deep-sea loops calling at Black Sea ports, compared to one loop in Q2 2023; with the area exclusively covered by feeders and short sea services[120]. In Q2 2023, eight loops from Asia/South Asia/Middle East to North Europe/North America made port calls at East Mediterranean ports; and as of Q2 2024, all those loops routed via the Cape of Good Hope with no East Mediterranean calls.

An example of this is the Evergreen service, North Europe Service 7 (NEU7), which previously included Piraeus as its first European westbound port of discharge on the way to Antwerp, Hamburg and Rotterdam[121]. However, in light of the Red Sea crisis, this route had omitted Piraeus. The Ocean Alliance's Far East – North Europe loop, which called at Piraeus, was also suspended, due to insufficient vessel availability. However, following this, the services have been updated (AEM1)[122], now reinstating Piraeus as the first European port of call, and transiting through the Suez Canal from May 2024[123]. Another source also reports that many large container transporters (CMA CGM, Cosco Shipping Lines, Evergreen Line and Orient Overseas) decided to stop their itineraries from Asia to Piraeus[124], reportedly driven by the Houthi attacks on vessels.

There are several routes which have added non-EU ports. Hapag Lloyd reports the addition of Alexandria port, whilst removing Barcelona and Marseille ports[125]. CMA CGM also added Alexandria (Egypt) to their route, from September 2024, however this is in between two non-EU ports, and so does not seem to indicate an evasive behaviour[126]. The

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[118] The new "data" in the port from the situation in the Red Sea (accessed August 2024)

[119] Drewry (2024), Ports & Terminals Insight – Quarterly Analysis of the Ports and Terminals Market

[120] Drewry (2024), Ports & Terminals Insight – Quarterly Analysis of the Ports and Terminals Market

[121] https://www.maritimebell.com/cosco-evergreen-upgrade-joint-far-east-mediterranean-service

[122] Qingdao → Shanghai → Ningbo → Kaohsiung → Hong Kong → Yantian → Singapore → Piraeus → La Spezia → Genoa → Fos-sur-Mer → Valencia → Singapore → Qingdao

[123] https://www.hellenicshippingnews.com/cosco-shipping-lines-announces-the-launch-of-ocean-alliance-day-8-product-in-2024/?utm_source=chatgpt.com

[124] https://www.ekathimerini.com/economy/1231044/containing-the-houthi-impact-on-piraeus-port/

[125] https://container-news.com/msc-updates-european-service-network/

[126] https://www.ajot.com/news/cma-cgm-terminal-change-in-alexandria-egypt-on-emed-2-service

Alliance made announcements of revised port rotations, effective from April 2024[127]; this includes the addition of Damietta (Egypt) in between Singapore and Rotterdam, under the FP1 service. Another route (FE4) introduces London Gateway into a route, between the ports of Antwerp and Tangiers. This addition of the nearby non-EU port calls could be signs of evasive behaviour.

However, it should also be noted that there are various other routes under the network which introduce EU ports into their routes. Hapag Lloyd MD1 and MD2 services introduced calls at the ports of Algeciras and Genoa respectively. CMA CGM announced the reshuffling of their services between Türkiye, Greece, Cyprus, Lebanon, Malta and Libya at the end of 2023[128]. Their TULYB service now omits Gebeze (Türkiye) and Damietta (Egypt) ports, and also switches round the ports of Ambarli and Aliaga (Türkiye). The GTL service now omits Port Said East, and Bingazi (Libya), whilst adding ports Limassol (Cyprus) and Tripoli (Libya). It also reorders the port call at Piraeus, such that it is called at on the forward route, as opposed to being previously called at on the return route. There is no effect on EU ports with the first route. With the second route, there is an extension of the route to include EU as well as non-EU ports, extending the existing route, as opposed to including non-EU ports where they previously were not included. Therefore, there is no evidence from these route changes suggesting evasive behaviour.

Limited literature has been reported on route changes for reasons other than for re-routing around the Red Sea crisis. No information from the ports questionnaires to EU Member States has been received to suggest that other significant route changes have taken place in the East Mediterranean.

Overall, there are limited announcements on route changes that have affected East Mediterranean ports, with the exception of Piraeus port for which traffic has been diverted away from, due to the restrictions for larger vessels to reach the port through the Red Sea route. There is no evidence to conclude that this is driven by ETS evasion.

Central Mediterranean

In the case of the Central Mediterranean ports, one source reports that global shipping companies are diverting their vessels away from the Red Sea, bypassing the Mediterranean and failing to call at Malta Freeport[129], with only few services still transiting though the Suez Canal, calling at Malta Freeport. Other services are having to take the alternative route around the Cape of Good Hope, bypassing the Mediterranean altogether, and calling at North African ports instead. Additionally, MSC and CMA CGM have reportedly re-routed their vessels, by cancelling the Malta stopover and taking cargo to Valencia instead for transhipment, with feeder ships distributing cargo to neighbouring

[127] https://www.one-line.com/en/news/alliance-announces-service-network-adjustments-2024

[128] https://www.cma-cgm.com/news/4563/cma-cgm-to-reshuffle-its-services-linking-east-med-countries-malta-amp-libya

[129] https://timesofmalta.com/article/freeport-talks-clients-shipping-lines-avoid-red-sea-bypass-malta.1077153

countries[130]; CMA CGM report these as contingency measures on services which usually cross the Suez Canal, mentioning that this is a result of the Red Sea crisis, to ensure the safety of its vessels through these routes[131].

This is also the case with the NEMO service lines between Australia, India and Europe, with this service omitting Malta as a stopover. All Mediterranean export volumes are to be routed via Valencia, where Malta is omitted. It is also reported that Malta Freeport has lost four mainline services since January 2024 (NEMO Westbound, NEMO Eastbound, EPIC Westbound[132,133] and INDUS express[134,135]). With the former two services, this is unlikely to be driven by evasion motivations, as one EU port is directly replaced with another EU port, rather than relocating transhipment activities outside the EU. With the EPIC Westbound service, there is no replacement of the port, so there is no conclusive evidence to suggest that transhipment relocation is taking place; however, Tanger Med is still served, and so it is possible for increasing transhipment activities to be focused here. With the INDUS express, there are no neighbouring non-EU ports on the route, so it is unlikely that transhipment activities are relocated elsewhere, following the omission of Malta and Valencia. An MSC route, Himalaya Express reportedly also drops the port of Malta, whilst adding the Turkish port of Izmir and Gioia Tauro in Italy[136]. Another EU port is dropped by the Ocean Alliance, with the port of Genoa dropped from the service between Asia and the North Mediterranean, effective from May 2024[137]. The Italian port Gioia Tauro has been

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130 https://elmercantil-com.translate.goog/2024/01/19/msc-y-cma-cgm-eligen-valencia-como-hub-de-exportacion-de-su-linea-entre-europa-y-australia/?_x_tr_sl=es&_x_tr_tl=en&_x_tr_hl=en&_x_tr_pto=wapp

131 https://www.rdtlogistic.com/wp-content/uploads/2023/12/Customer-Advisory-Oceania-Lines-NEMO-Service-New-Rotation-Dec-2023.pdf

136 https://container-news.com/msc-updates-european-service-network/#:~:text=The%20updated%20itinerary%20will%20include,(United%20Arab%20Emirates)%2C%20Abu

136 https://container-news.com/msc-updates-european-service-network/#:~:text=The%20updated%20itinerary%20will%20include,(United%20Arab%20Emirates)%2C%20Abu

136 https://container-news.com/msc-updates-european-service-network/#:~:text=The%20updated%20itinerary%20will%20include,(United%20Arab%20Emirates)%2C%20Abu

136 https://container-news.com/msc-updates-european-service-network/#:~:text=The%20updated%20itinerary%20will%20include,(United%20Arab%20Emirates)%2C%20Abu

136 https://container-news.com/msc-updates-european-service-network/#:~:text=The%20updated%20itinerary%20will%20include,(United%20Arab%20Emirates)%2C%20Abu

137 https://mykn.kuehne-nagel.com/news/article/carrier-service-update-7-23-may-23-May-2024

added to two different MSC service lines operating in the Mediterranean[138]. Overall, the evidence available points to a diversion of larger vessels away from certain EU ports in the Central Mediterranean (in particular Malta Freeport) as a result of the Red Sea crisis. At the same time though, there are also reports of shipping lines adding other non-EU ports to their routes, thus re-routing through these channels. In a few cases, there is no direct replacement of the port (Malta), so there is no conclusive evidence to suggest that transhipment relocation is taking place. However, there is no extensive and clear evidence to conclude that that has happened on a systematic basis across the region, nor that this may be caused by ETS.

West Mediterranean

Turning to the West Mediterranean, the Red Sea crisis appears to have led to a number of new routes being introduced and changes to the ports being used, affecting both EU and non-EU ports in the region.

Maersk announced in February 2024, the creation of a “new Morocco Bridge solution” which connects Morocco with Spain and the rest of Europe. The route reportedly calls at Tanger Med (Morocco), before arriving at Algeciras (Spain) with onward distribution of cargo across the rest of Europe[139]. The route is reportedly driven by growth in trade between Morocco and the EU and reducing congestion. Maersk reported that this is driven by the evolution of Morocco to a strategic hub of North Africa, as a result of supply chain disruptions elsewhere, including COVID-19, the geopolitical environment and recessionary trends. This appears to be a feeder service and may be indicative of an ambition to increase the use of Tanger Med as a transhipment hub for deep sea routes, following which feeder services can be distributed from Tanger Med to the EU.

Tanger Med has reportedly seen an increase in use for transhipment, with Maersk and MSC also announcing a new weekly service including Tanger Med[140], which links the Far East to the Mediterranean. This relates to the AE12 / Phoenix service, which now adds a Tanger Med call since February 2024, adding it between Trieste and Singapore on the return journey[141,142].

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[138] https://www.shippingitaly.it/2024/02/15/il-porto-di-gioia-tauro-accoglie-la-premier-meloni-con-due-nuove-linee-di-msc/

[139] https://www.maersk.com/news/articles/2024/02/14/morocco-europe-bridge

[140] https://www.tangermedport.com/en/new-maritime-service-linking-the-far-east-to-the-mediterranean-operated-by-maersk-and-msc-ae12-phoenix/

[141] https://container-news.com/msc-adjusts-its-east-west-network-to-manage-disruption-caused-by-red-sea-crisis/

[142] MSC (2024), ASIA-MEDITERRANEAN NETWORK https://www.msccargo.cn/-/media/files/msc-cargo/msc-solutions/trades/east-west-network/asia-mediterranean-network-feb-2024.pdf

Maersk also introduces another service, ME8, to connect the Middle East with Europe, utilising Port Tanger Med and Port Said as transhipment hubs[143]. However, whilst new routes are being implemented to call at Tanger Med, it can be concluded that these do not seem to replace existing stops at EU transhipment hubs.

Another example is Hapag Lloyd's extension of a goods transport service line, for the delivery of oranges, from South Africa (Durban port), to call at Tanger Med before arriving in the Mediterranean[144]; this service was announced to operate in 2024. Hapag-Lloyd explains that Morocco has been used as a distribution centre to connect local farmers in South Africa with European markets. It should be noted that the shipping company also provides a direct service line from Durban to the EU port of Rotterdam.

In parallel, there have been several reports of EU ports being removed from services. For example, Hapag Lloyd has removed the ports of Barcelona and Marseille from its West Mediterranean to Red Sea service, whilst adding Egypt's Alexandria port; this route could reflect evasive behaviour, as this is an example of EU ports being directly replaced with non-EU ports. Additionally, MSC removed Barcelona port from its consolidation of two services (Canex1 and Canex2)[145], effective July 2024; this is reportedly driven by operational efficiency objectives and seeking to reduce congestion at Barcelona, by channelling shipments through its Valencia hub. At the same time though, MSC added the port of Barcelona back into another route, the Türkiye/West Med service to the US, which now includes the ports of Barcelona and Fos-sur-Mer (France)[146], effective July 2024. The MSC route removing Barcelona is unlikely to be evasive behaviour, as the removal of the West Mediterranean port from one service is balanced by the addition of the same port back into another route. This is reportedly aimed at increasing trade connectivity between Europe and the US.

Furthermore, despite the route changes incorporating non-EU ports reported above, there are also multiple reports of increased transhipment activity occurring at EU ports in the West Mediterranean, with operators adding Spanish and Portuguese ports to their routes. MSC announced the addition of Sines Port (Portugal) to the Dragon Service route, effective from February 2024, reportedly to strengthen Portugal's connectivity to the Far East[147]. Hapag Lloyd reported the inclusion of Valencia port in its connections with the port of Jeddah (Saudi Arabia). The route previously rotated between Tanger Med and Damietta

[143] https://www.maersk.com/news/articles/2024/02/05/maersk-to-add-new-service-me8-between-the-middle-east-with-europe

[144] https://www.hapag-lloyd.com/en/services-information/news/2024/04/citrus-connect-rotterdam-direct.html

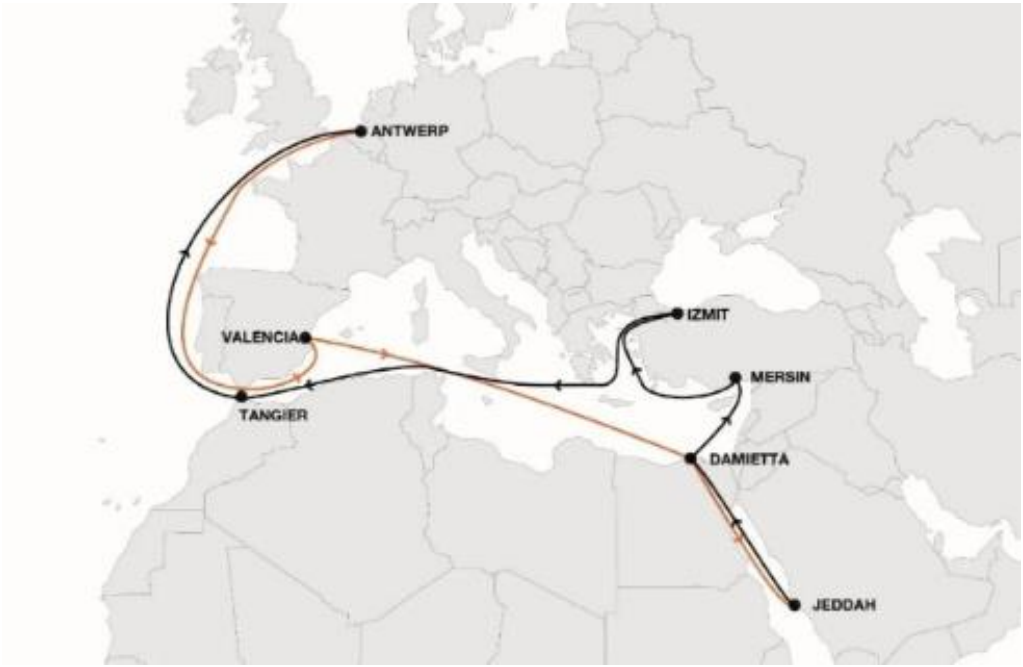
[145] https://theloadstar.com/msc-unveils-new-mediterranean-north-america-transatlantic-network/

[146] https://www.porttechnology.org/news/msc-reshuffles-mediterranean-us-service/

[147] https://televisaodosul.pt/porto-de-sines-com-novas-rotas/

(Egypt)[148], with Valencia introduced to the Jeddah express (JDX) shuttle rotation in April 2024, to improve the connectivity from West Mediterranean ports to Red Sea[149]. This route has also been extended to North Europe, to include Antwerp-Bruges, which knocked out Tanger Med from the port rotation. It should be noted that a separate ad-hoc service shuttle service was introduced calling at Tanger Med, Damietta, and Jeddah. The JDX route runs through the Mediterranean and crosses the Suez Canal, to enter and leave the Red Sea; it crosses the Red Sea on the way to the East, but not on the return rotation. From November 2024, this route includes Turkish ports Mersin and Izmit, and Tangiers[150].

Figure 3-55: Hapag Lloyd route linking the West Mediterranean and the Red Sea, now excluding Tanger Med from the rotation and adding the port of Valencia 149



Source: Hapag Lloyd (2024) (reproduced with permission)

Overall, there are several examples of **non-EU ports being added to new and existing routes operating in the West Mediterranean. However, there are also many announcements of route changes adding EU ports. Therefore, there is inconclusive evidence to date that evasive port calls are taking place.**

Northern Europe

[148] https://elmercantil.com/2024/03/28/hapag-lloyd-incluye-valencia-en-su-linea-feeder-con-el-mar-rojo-y-elimina-a-tanger-med/

[149] https://www.hapag-lloyd.com/en/services-information/news/2024/01/here-s-an-update-on-the-red-sea-situation.html

[150] https://www.hapag-lloyd.com/en/services-information/news/2024/11/jdx-rotation-jeddah-express.html

Outside the Mediterranean, several shipping companies have recently added UK ports in their routes. MSC reported that the port of Liverpool is now connected with China and Vietnam via the "Britannia" service line, from July 2024 onwards[151]. This is linked to ambitions to boost coverage from China and Vietnam to the UK and Northwest Continent, allowing for a "premium service network" throughout the UK. However, it is also possible that this could be a signal of evasive behaviour. Another announcement made by MSC, in February 2024, introduced a new rotation between Türkiye and the UK, aimed at extending cargo transportation to the UK and European markets[152]. UK ports Portbury and Greenock are now included in this rotation, before shipping to France, thereby adding non-EU ports prior to EU ports. However, this appears to be primarily designed as a route expansion to enhance MSC's connectivity between UK and Asia.

Another MSC route, the Swan-Sentosa, now includes London Gateway as the first European port of call, from Asia, replacing Felixstowe (UK) as the first port of call following East Asia, after which the route continues onto other European ports. As such, this modification does not alter to a significant extent the distance covered by ETS liabilities. Besides, this route now also includes the port of Hamburg, to improve connectivity in Germany[153].

In its revision of the Asia – North Europe Network, MSC has removed EU ports from several services replacing with non-EU ports, potentially signifying transhipment relocation. However, the removed EU ports have been added back into other services, such that the ports are still being called at and not removed entirely. MSC justified the changes in rotation as improvements in its services and offering of new port pairs as it adapts to the "ongoing challenges of port congestion in Europe". For example, the Griffin service removed Le Havre and added Yantian (China) into the route. The Lion service added the port of Le Havre but removed Rotterdam; the latter port is now being called at during the Griffin service. The Condor service also omits the port of Le Havre, with no replacements being made; however, the Britannia route now adds the port of Le Havre, replacing London Gateway.

Hapag Lloyd also added the port of London Gateway in an Asia – North Europe trade, calling at the UK in between Antwerp (Belgium) and Tanger Med, effective from April 2024[154]. However, the liner also changes the routes of many other lines connecting Asia to North Europe and the Mediterranean by adding EU ports, and so this addition can be considered insignificant. In this case, with the addition of London Gateway port, it is not

[151] https://www.msc.com/en/newsroom/news/2024/june/launches-britannia-new-standalone-loop-connecting-asia-to-north-europe

[152] https://www.msc.com/en/newsroom/news/local-news/united-kingdom/2024/february/new-msc-turkiye-uk-west-coast-service-rotation

[153] https://www.msc.com/en/newsroom/customer-advisories/2024/may/rotation-change-trade-asia-to-north-europe

[154] https://theanetwork.com/static/thea-press-release-20231213.pdf

possible to conclude that a systematic replacement of EU ports and transhipment relocation has taken place.

Maersk and MSC have recently announced changes to Asia-Europe routes (August 2024) where several ports have been dropped to improve transit times and reduce delays. Hapag-Lloyd also announced a reshuffle of ports in a shipping line connecting the Middle East, India and Northern Europe; however, the ports being switched around are located in India and this does not affect the first or last ports of call at a non-EU port before arriving at an EU port.

Additionally, Maersk has announced its enhancement of the ME2 service line between India and North Europe, which now includes ports of Rotterdam, Felixstowe and Bremerhaven, scheduled in between the ports of Algeciras and Port Tangiers, effective from April 2024[155]. This introduces EU ports between non-EU ports, which results in improved connectivity to North Europe, but with limited ETS charges. These examples, however, seem unlikely to be driven by ETS evasion, and rather an attempt to provide shipping services to additional ports.

ACL's new schedule, from May 2024, calls at Liverpool as the first port in and out of Europe, which will not stop at any other intermediate European ports, reportedly driven by attempts to reduce transit times[156].

Finally, as of January 2024, CMA CGM has diverted its NEMO Northbound service to omit all Mediterranean ports. Following a port call at Le Havre, the Mediterranean ports previously served are now omitted, with the next port call at London Gateway[157]. All Mediterranean cargo was reported to be transhipped in Tanger Med (or Hamburg, if not available). This, however, was reported as one of their contingency plans in response to the Red Sea crisis.

Overall, considering the route changes that have already taken place, there has been few route changes in the North region, with additional ports calling in the UK. It is not inconceivable that some of these route changes are motivated by ETS compliance cost considerations. However, there is insufficient evidence so far to conclude this across the region and in a number of cases.

[155] https://www.maersk.com/news/articles/2024/04/19/maersk-enhances-me2-service-between-india-and-north-europe

[156] https://www.peelports.com/news-articles/fastest-container-service-between-ireland-and-north-america-launched

[157] https://www.rdtlogistic.com/wp-content/uploads/2023/12/Customer-Advisory-Oceania-Lines-NEMO-Service-New-Rotation-Dec-2023.pdf

3.5.8.2. Forward- looking review (changes in effect from 2025 and beyond)

East Mediterranean

In the East Mediterranean, announcements have focused on route changes made due to the Red Sea crisis, with vessels trying to avoid Houthi attacks.

There have been several contingency plans announced by carriers relating to the ongoing Red Sea crisis. Maersk and Hapag-Lloyd have such a plan[9], under the Gemini alliance, to commence from beginning of 2025, with two routing options provided to shippers to improve schedule reliability. If carriers return to traditional Red Sea routing through the Suez Canal, the Gemini alliance will establish a number of services, of around 300 vessels with a combined capacity of 3.4 million TEU. In the event that carriers continue to re-route around the Cape of Good Hope, Gemini will increase the number of vessels under these routes to 340 vessels, with an increase in capacity to 3.7 million TEU. As of October 2024, Maersk and Hapag-Lloyd announced that vessels will continue to bypass the Red Sea and use the Cape of Good Hope for the new alliance from February 2025 onwards, due to the situation in the Red Sea remaining volatile. Both companies have indicated that they intend to revert to the Red Sea once this becomes safe[158].

Central Mediterranean

The ONE alliance has announced five new routes from Asia to the Mediterranean, from January 2025; services MD1, MS2, MD3, MD4 and IOM[159]. Repeated port calls include Damietta, Barcelona, Valencia, Genoa and Piraeus.

West Mediterranean

Changes to routes affecting West Mediterranean ports primarily relate to changes that have already been implemented in 2024 and have been discussed in the prior Backward-looking review (Section Backward-looking review (changes in effect in 2024)). Whilst carriers have made various route announcements for 2025, few of these affect West Mediterranean ports. MSC have announced the launch of a comprehensive East/West shipping network, to commence from February 2025, however changes do not involve West Mediterranean ports[160,161].

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[158] Gemini Cooperation opts for Cape of Good Hope route as Red Sea crisis continues

[159] https://www.one-line.com/en/news/one-announces-east-west-products-effective-february-2025

[160] https://logistics-manager.com/msc-unveils-new-east-west-shipping-network-for-2025/

[161] https://www.msc.com/en/newsroom/news/2024/september/msc-unveils-future-standalone-east-west-network

Maersk have also announced their consolidation of SLZ (Mediterranean Sea A) and SLH (Mediterranean Sea B) services into a new service[162]. The new consolidated route (SLN) now omits several ports, specifically Vado Ligure (Italy), Genoa (Italy), Beirut (Libya), Latakia (Syria), Iskenderun (Türkiye) and Izmir (Türkiye).

CMA CGM report adjustments to its Asia-Northern Europe routes, FAL 1 and FAL 3, by replacing Algeciras with Tanger Med in both services, in effect from January 2025[163,164].

Northern Region

Several announcements made include the addition of non-EU ports into existing Northern Europe routes, but also cases where new EU port calls have been added. On the one hand, in line with new shipping alliances in 2025, revisions of service networks are in place, with changes foreseen to take place on the Asia-North Europe trade route[165]. Gemini partners, Maersk and Hapag-Lloyd have added London Gateway to serve as their UK port on the Asia-North Europe route, however this replaces the existing UK port of Felixstowe. Additionally, Hapag Lloyd announced the reshuffle of its China-Germany service, which added a port call at Southampton into its route, in between Africa (Tema, Ghana) and the EU (Rotterdam) but drops the EU port of Antwerp; effective from January 2025[166]. CMA CGM also announced adjustments to its Asia-Northern Europe routes, FAL 1 and FAL 3[167,168], with the addition of Southampton into the former route, in between Dunkirk and Gdansk. On the other hand, the ONE alliance announced seven new routes from Asia – Northern Europe, services FE1 to FE6 and IOX[169] with European port calls including Le Havre, Rotterdam, Hamburg and Antwerp.

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[162] https://www.maersk.com/news/articles/2024/12/24/new-service-implementation-east-mediterranean-west-mediterranean-sln-mediterranean-sea-c

[163] https://www.cma-cgm.com/local/belgium/news/930/asia-north-europe-lines-cma-cgm-announces-revised-fal-1-amp-fal-3-rotations

[164] https://www.assahifa.com/english/morocco/exclusive-cma-cgm-restructures-shipping-routes-elevating-tanger-med-as-western-mediterraneans-key-hub/

[165] https://theloadstar.com/hapag-lloyd-reveals-rotation-changes-to-asia-europe-cgx-service/

[166] https://www.hapag-lloyd.com/en/services-information/news/2024/11/cgx-china-germany-express-rotation.html

[167] https://www.cma-cgm.com/local/belgium/news/930/asia-north-europe-lines-cma-cgm-announces-revised-fal-1-amp-fal-3-rotations

[168] https://www.assahifa.com/english/morocco/exclusive-cma-cgm-restructures-shipping-routes-elevating-tanger-med-as-western-mediterraneans-key-hub/

[169] https://www.one-line.com/en/news/one-announces-east-west-products-effective-february-2025

At the same time, there are also cases of new routes dropping EU port calls. Bremerhaven was removed from the MSC ME2 service[170] although the port will continue to be served using the existing Samba route, with transhipment in Tanger Med.

Transatlantic Routes

To complement the above, transatlantic routes have been reviewed in greater details via a case study focusing on routes between North America and Northwest Europe, with the objective to compare route trajectories in 2024 with those announced for 2025. These routes contribute to a substantial proportion of global shipping volume, however, are expected to be less affected by the Red Sea crisis, which eases the assessment of changes to routes. Additionally, the strategic location of the UK increases the risk of evasive port calls at UK ports, which further justifies why such routes into the Northwest region, specifically, have been further investigated.

Ten pairs of routes, for which 2024 itineraries are directly comparable to 2025, have been reviewed, and presented in Table 3-4 below. MSC possesses three pairs of routes from 2024 and 2025 that are directly comparable, with none of them exhibiting significant changes related to evading the ETS costs.

Maersk has two pairs of routes that are directly comparable between 2024 and 2025. One pair is almost identical and does not demonstrate any behaviour relevant to evasion (TA1). The other pair of routes underwent some changes from 2024 to 2025, targeting the same regions but with different ports, leading to slight changes in distances travelled, particularly after the last EEA port (TA2). However, the effect remains limited.

Hapag-Lloyd possesses five pairs of comparable routes between 2024 and 2025. Among these, two routes are identical (AT1; AT2), two routes have removed a UK port of call in one direction, which is contrary to evasion (AL2; AL3), and the last route altered the order of ports so that a UK port of call directly before entering the EEA drastically reduces the journey distance under ETS scope (AL4).

Overall, there is one example of potential evasive behaviour (route AL4), however this is balanced by several examples which indicate non-evasive behaviour.

[170] https://www.maersk.com/news/articles/2024/09/25/middle-east-to-europe-services-me2-service-change-announcement

Table 3-4: Case study of routes between North America and Northwest Europe, comparison of 10 routes from 2024 - 2025

Shipping Company	Service	East / West bound	Relevant change(s) between current (2024) and new route(s) (announced for 2025)	Change in (average) distance subject to EU ETS scope before the first EU port call (inbound) in nautical miles	Change in (average) distance subject to EU ETS scope after the last EU port call (outbound) in nautical miles
MSC	Canada Express	Westbound	An additional EU port-call	-	-
		Eastbound	N/A	-	-
	Montreal Express	Westbound	N/A	-	-
		Eastbound	N/A	-	-
	Ecuador-NWC - USA / NWC-USA-Ecuador	Westbound	N/A	-	-
		Eastbound	N/A	-	-
Maersk	TA1	Westbound	N/A	-	-
		Eastbound	N/A	-	-
	TA2	Westbound	Different ports within the same region	-	+1083
		Eastbound	Only small changes	-31	-

Shipping Company	Service	East / West bound	Relevant change(s) between current (2024) and new route(s) (announced for 2025)	Change in (average) distance subject to EU ETS scope before the first EU port call (inbound) in nautical miles	Change in (average) distance subject to EU ETS scope after the last EU port call (outbound) in nautical miles
Hapag-Lloyd	AT1	Westbound	N/A	-	-
		Eastbound	N/A	-	-
	AT2	Westbound	N/A	-	-
		Eastbound	N/A	-	-
	AL2	Westbound	Only small changes	-	+127
		Eastbound	Port-call in UK was removed	+3438	-
	AL3	Westbound	UK port-call was shifted, instead of last leg, it is in between two EU port-calls	-	+3860
		Eastbound	N/A	-	-
	AL4	Westbound	N/A	-	-
		Eastbound	UK port-call was shifted to position before EU	-4609	-

Source: Analysis based on routes made publicly available by shipping companies at the time of writing this study

In addition to these routes changes made to existing services where direct route comparisons across the two years are possible, there are also routes which are heavily restructured in 2025 compared to 2024, with different ports added and removed, rendering any comparison route by route more difficult. Therefore, for those remaining routes, the change in the average route distance subject to ETS scope in the first/last leg before/after the EU port call was considered, to identify whether average ETS exposure on such legs will reduce in 2025 compared to 2024. The results are shown in Table 3-5 below.

Table 3-5: Other routes between North America and Northwest Europe with change in average distance subject to ETS scope before/after the first/last EU port call

Shipping Company	Service	East / West bound	Change(s) between current (2024) and new route(s) (announced for 2025 or already implemented	Change in (average) distance subject to EU ETS scope before the first EU port call (inbound) in nautical miles	Change in (average) distance subject to EU ETS scope after the last EU port call (outbound) in nautical miles
MSC	2024: NEUATL1, NEUATL2, NEUATL3, NWC to Mexico Express; 2025: NEUSEC1, NEUSEC2, Mexico Gulf Express	Westbound	4 2024 routes, compared to 3 2025 routes, more EU port-calls	-	+386
		Eastbound	4 2024 routes compared to 3 2025 routes, more EU port-calls, one route in 2025 with new UK port-call	-1316	-
Maersk	2024: TA3, CAE; 2025: TA3, TA4	Westbound	2 routes from 2024 were restructured, one 2025 route goes directly to Mexico after the EU, increasing the last leg	-	+1099
		Eastbound	2 routes from 2024 were restructured, both 2025 routes include additional UK port-calls	-3377	-

Shipping Company	Service	East / West bound	Change(s) between current (2024) and new route(s) (announced for 2025 or already implemented	Change in (average) distance subject to EU ETS scope before the first EU port call (inbound) in nautical miles	Change in (average) distance subject to EU ETS scope after the last EU port call (outbound) in nautical miles
Hapag-Lloyd	2024: AL5, ATA; 2025: AL1, CES, SWX	Westbound	2 routes from 2024 compared to 3 routes in 2025, in 2025 one UK port-call less, also one route goes directly to Mexico	-	+1710
		Eastbound	2 routes from 2024 were restructured to 3 routes in 2025; although one route more, in 2025 there is one UK port-call less	+2192	-

Source: Analysis by DG CLIMA

Amongst these restructured routes, there are three examples of routes which could signal evasive behaviour. While none of the four MSC routes of 2024 has a port call in UK in the eastbound direction, NEUSEC1, one of three new 2025 routes, has a UK port call in the eastbound direction directly before entering the EU. The Maersk routes TA3 and CAE from 2024 are restructured to routes TA3 and TA4 in 2025; these now include additional port calls in the UK, which reduces the distance covered by the ETS scope. However, there are also various examples of routes which indicate the addition of EU port calls, thereby increasing the distance subject to the EU ETS scope, hence contrary to ETS evasive behaviours.

Overall, the available route announcements by main liner companies for 2025, point to a number of route modifications in comparison to 2024. However, only a few of these routes include additional UK port calls. Other routes include additional of EU port calls or removal of UK port calls.

Based on this case study, it is not possible to point to any trend of evasive behaviour planned for 2025.

3.6. Shifting demand to other transport modes with higher environmental impacts

The implementation of the EU ETS may increase costs for RoRo vessel operators, potentially incentivising a shift to modes of transport with lower direct compliance costs but higher environmental impacts, such as road transport, particularly for shorter/more flexible routes and where infrastructure supports efficient trucking[171].

To analyse the potential occurrence of this, we analysed available evidence for two specific cases:

- Changes in RoRo and RoPax traffic from EU ports in the Mediterranean, focusing on ports in Italy and Spain, two cases considered at higher risk of replacement of maritime transport by road transport.
- Changes in volume of transport of goods to the port of Burgas (Bulgaria) from ports in Georgia, Romania and Türkiye in January to June 2024, relative to the same months in 2023. Again, this case is expected to be at higher risk of replacement of maritime transport by road transport.

To do so, we used available data from the EMSA MARINFO database on the number of port calls between the specific countries, combined with data from Eurostat on international road freight transport. The objective was to identify possible trends that could indicate a shift from one mode to the other, although it should be noted that data on road freight transport are only available up to the first quarter of 2024. This means that there are limited observation points available for the period under consideration to allow for any firm conclusions.

3.6.1. OTM1 - Have there been changes in the transport of goods by RoRo and RoPax traffic from EU ports in the Mediterranean (e.g., Italy and Spain)?

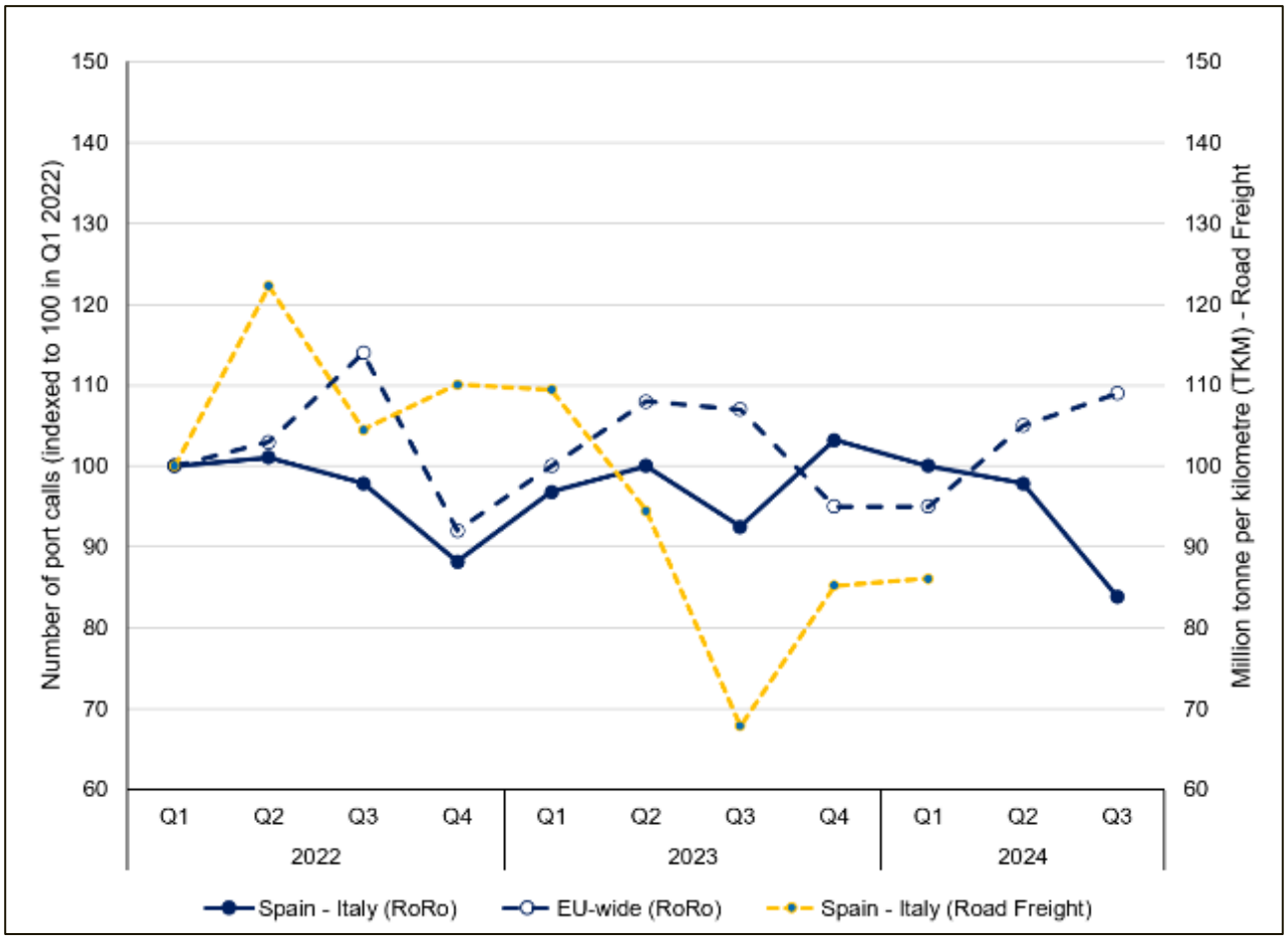
Data from the EMSA MARINFO database were analysed to identify whether there have been changes in the transport of goods by RoRo traffic from EU ports in the Mediterranean, focusing specifically on journeys between Spain and Italy. To determine whether there has been a shift to other transport modes, international road freight data from Eurostat showcasing the total goods transported by road in million tonne-kilometre (TKM) between Spain and Italy is used as a comparison to the maritime data. While there are additional external factors involved, if a shift to other transport modes such as road

[171] Road transport will however also be fully included within the scope of so-called 'ETS2' as from 2027. More information is available on Commission's website: https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/ets2-buildings-road-transport-and-additional-sectors_en

transport is taking place in 2024 because of evasive behaviours, it could be expected that the data for RoRo traffic would decrease, while the road freight data would increase.

Figure 3-56 shows the evolution in the number of port calls by RoRo traffic from ports in Spain to Italy from Q1 2022 to Q3 2024. The number of port calls is indexed to a value of 100 in Q1 2022. The data shows RoRo traffic from Spain to Italy, while the EU-wide data showcases RoRo port calls for all intra-EU traffic. This is also compared to international road freight data from Spain (country of loading) to Italy (country of unloading), also indexed to a value of 100 in Q1 2022 with the most recent data available in Q1 2024. The analysis of these international freight transport volumes is not specific to the ports of the two countries and includes all freight transport among the two countries. Nonetheless, we would expect that any sizeable shift from maritime to road freight should be captured in the relevant data.

Figure 3-56: Evolution of RoRo and road freight transport activity from ports in Spain to Italy compared to intra-EU RoRo voyages (Q1 2022 – Q3 2024)



Source: Ricardo analyses of EMSA MARINFO, ESTAT (road_go_iq_utt)

As shown in Figure 3-56, RoRo traffic on the Spain-Italy route exhibits signs of seasonal variation, with the highest number of port calls taking place in Q1 and Q2 each year (except 2023); traffic at this time is around 10% higher than Q3 and Q4. There is also a small general decline in RoRo activity on a year-to-year basis between the two countries,

which can be seen when comparing the latest data in Q3 2024 to the same quarter in previous years. Q3 2024 traffic is roughly 9% lower compared with Q3 2023 and 14% lower than Q3 2022.

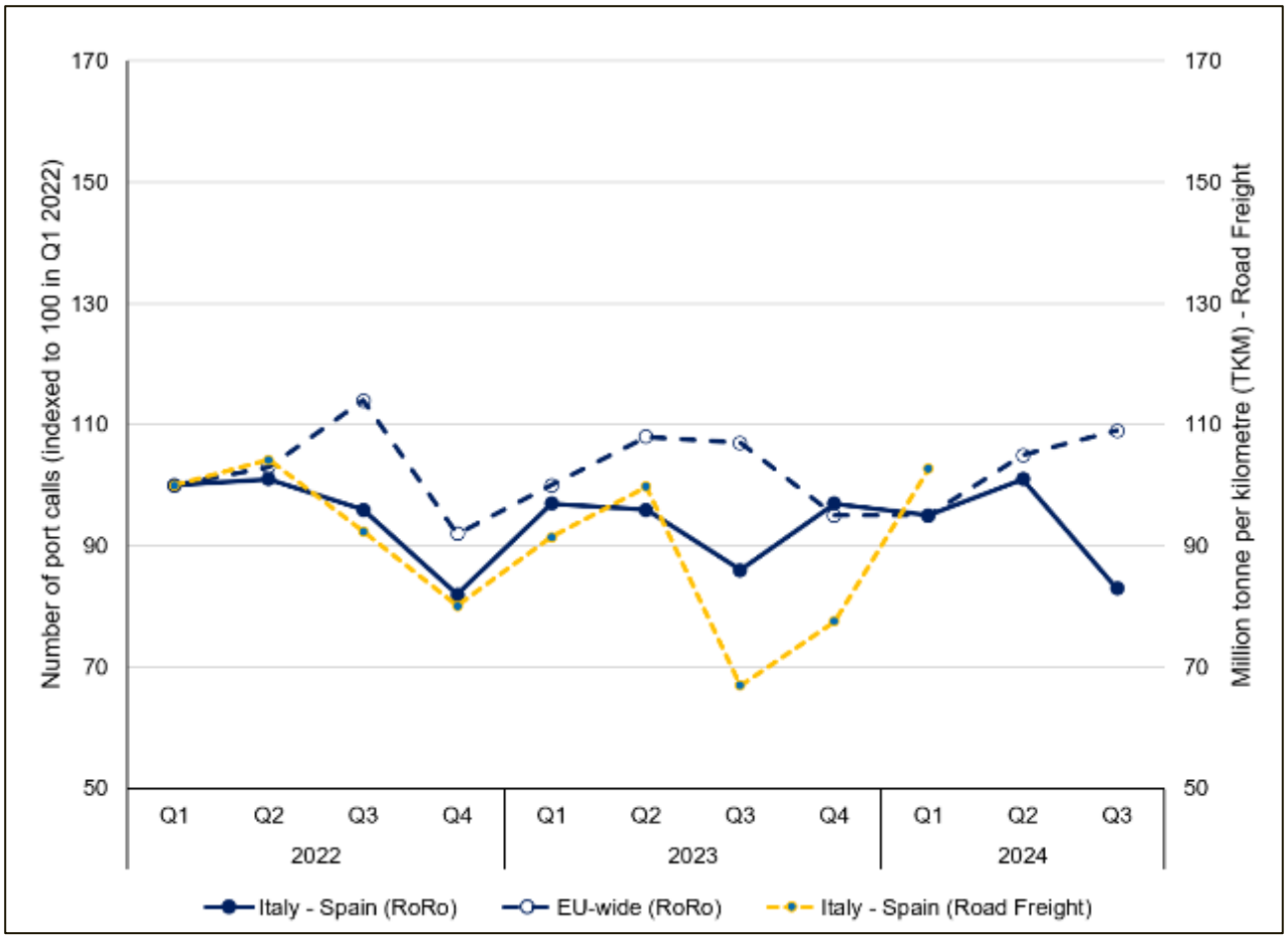
In comparison, EU-wide RoRo traffic has been at higher relative levels, with more port calls taking place but still with mainly seasonal fluctuations remaining within ~10% of the Q1 2022 base. EU traffic in Q3 2024 is equal to the same quarter in 2023 and only marginally lower than in 2022. Thus, when compared against the EU-wide traffic, Spain-Italy port call activity has followed a similar trend in the initial period but the data for Q2 and Q3 in 2024 points to a significant level of divergence in Spain-Italy port call activity – especially in Q3 in 2024. If continued, it could possibly indicate a more systematic decline in the level of maritime traffic between the two countries. However, it is difficult to determine the significance and implications of this decrease without further data.

At the same time, the available data for international road freight[172] - that only cover the period up to the first quarter of Q1 2024 - do not point to any shift to road freight activity in comparison to the respective quarters in 2023 or 2022. Reported levels in Q1 2024 were significantly lower than the respective quarters in the two previous years. As the latest data from Eurostat covers up to Q1 2024 it is not possible to reach any meaningful conclusions as to the presence of a trend or not.

Figure 3-57 below looks at the inverse of the routing of Figure 3-56 above showing the evolution in the number of port calls by RoRo traffic from Italy to Spain from Q1 2022 to Q3 2024. This is again compared against EU-wide RoRo traffic over the same period with the number of port calls in indexed to a value of 100 in Q1 2022.

[172] International road freight transport quarterly data: sum of unloaded goods in reporting country (Spain) by country of loading (Italy) (road_go_iq_utt) and loaded goods in reporting country (Italy) by country of unloading (Spain) (road_go_iq_ltt)

Figure 3-57: Evolution of RoRo and road freight transport activity from ports in Italy to Spain compared to intra-EU RoRo voyages (Q1 2022 – Q3 2024)



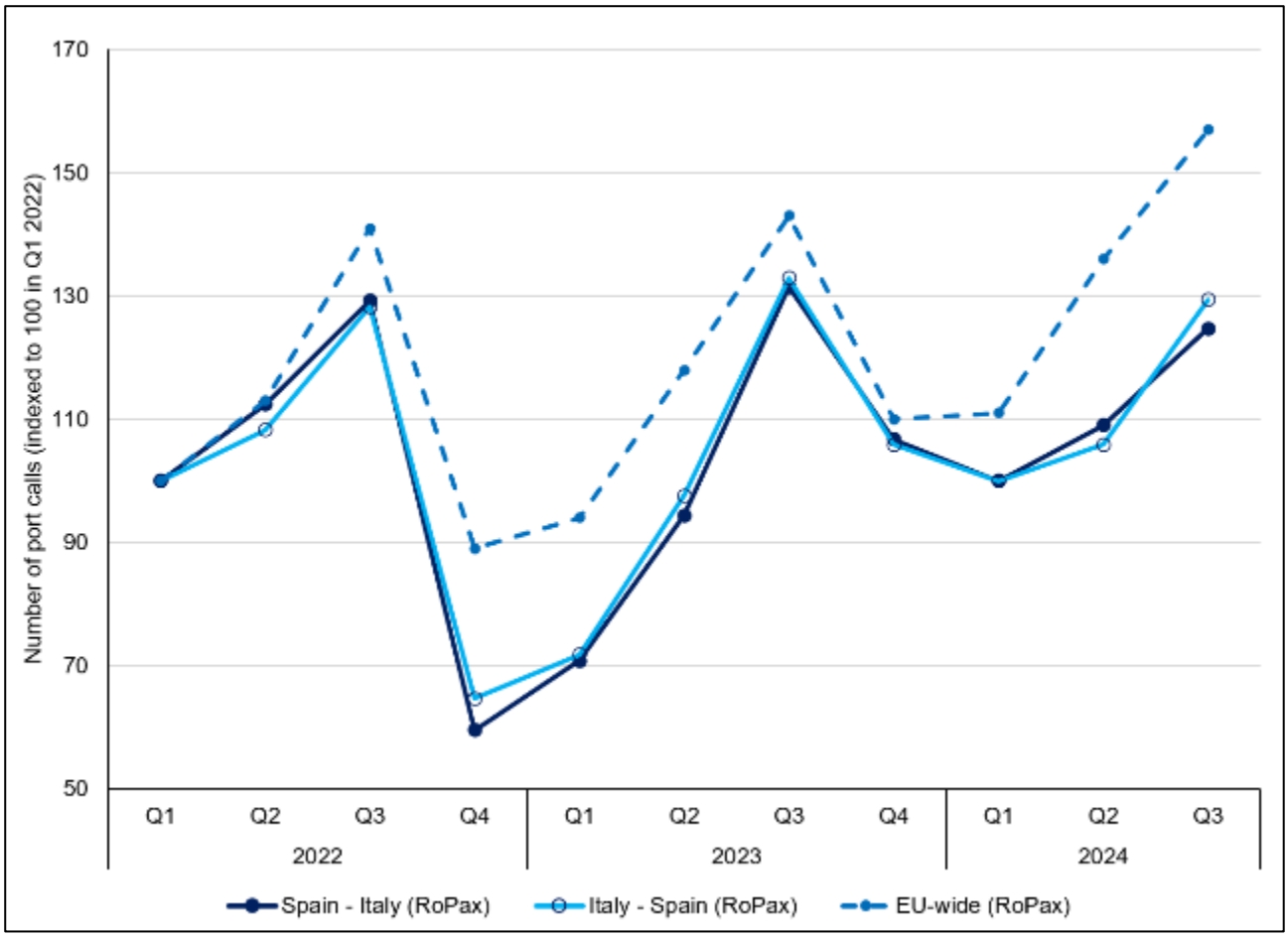
Source: Ricardo analyses of EMSA MARINFO, Eurostat (road_go_iq_ltt__custom_13856611)

The RoRo traffic from Italy to Spain is very similar to the inverse routing shown in Figure 3-56. Traffic from Italy to Spain also shows evidence of seasonality, with the general trend of a decline in traffic throughout the observed period, with a marked drop in traffic levels starting in late 2023 with the lowest point on the graph (-24% from Q1 2022) observed in Q3 2024. When comparing the latest data in Q3 2024 to the same quarter in previous years, a year on year decline is seen, with Q3 2024 traffic roughly 3% lower compared to 2023 and 14% lower than 2022.

The comparison with the international road freight traffic data does not allow for meaningful conclusion although we can see an increase in Q1 2024 above the respective Q1 levels in 2023 and 2022. Again, as the data only cover one quarter it is not possible to make any inferences.

Finally, RoPax traffic data is presented here as an additional comparison to RoRo to determine whether any possible impacts may extend to passenger vessels. Figure 3-58 displays the change in traffic trends for RoPax routes between Spain and Italy (both directions) between Q1 2022 and Q3 2024. This is compared to routes from the two countries towards the EU. The number of port calls in indexed to a value of 100 in Q1 2022.

Figure 3-58: Evolution of RoPax transport activity from ports in Spain to Italy compared to all intra-EU RoPax voyages (Q1 2022 – Q3 2024)



Source: Ricardo analyses of EMSA MARINFO

For both the Spain-Italy case study and the wider EU voyages, the overall trends for RoPax follow a consistent seasonal pattern, characterised by sharp peaks in Q3 of each year. For both the Spain-Italy case study and the wider EU voyages, the overall trends for RoPax follow a consistent seasonal pattern, characterised by sharp peaks in Q3 of each year. This reflects increased passenger and vehicle movements during the summer months, the bigger seasonal peaks and troughs for traffic between Spain and Italy suggests a more dynamic variation in demand compared to EU-wide traffic. Unlike RoRo traffic, where a large decrease in traffic can be observed in Q3 2024, the RoPax traffic does not show a decline but instead is consistent with traffic seen in Q3 of 2023 and 2022.

Overall, when considering both RoRo and RoPax traffic between Spain and Italy and the limited road freight data, it is not possible to conclude that there is a generalised and significant change in the level of maritime traffic.

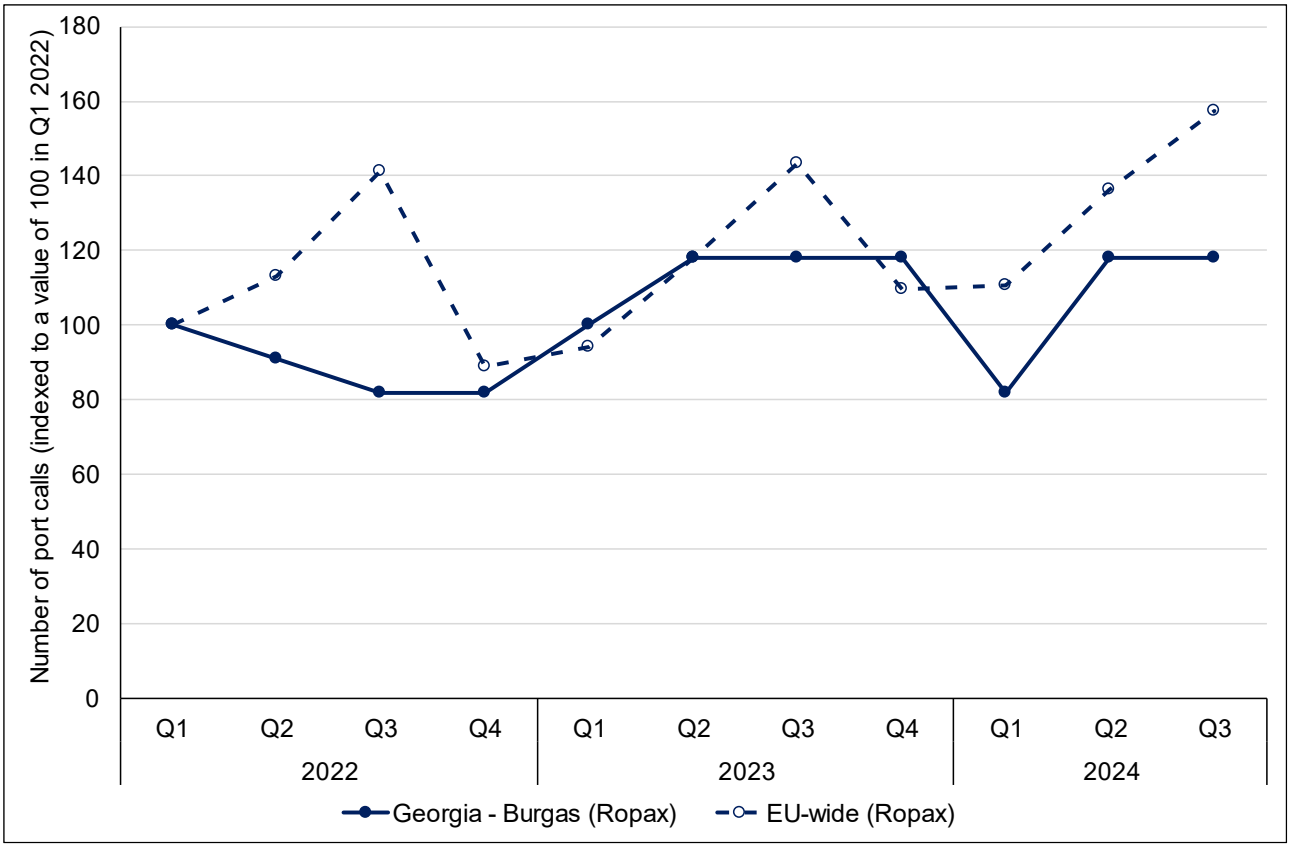
At the same time, it is not possible to conclude on the presence, or not, of a shift towards road freight in the transport of goods between the countries of Spain and Italy. Additional data on the level of maritime and freight traffic is considered necessary to reach a firmer conclusion in the future

3.6.2. OTM2 - For ports in Bulgaria, has there been a reduction in the transport of goods to the ports of Burgas and Varna from ports in Georgia and Türkiye in 2024, relative to the same months in 2023?

In this second case, we examine whether there has been a shift from shipping to road transport for carrying goods across the Black Sea to the ports in Bulgaria, and particularly the port of Burgas. Traffic from Türkiye and Georgia was considered using data from EMSA MARINFO. Due to a lack of data, Romania is not included in the final charts.

Figure 3-59 presents the evolution of RoPax traffic at the port of Burgas in Bulgaria from Q1 2022 to Q3 2024. Due to a lack of data from Türkiye, only data for Georgia is provided. RoRo traffic was not included in the chart as there is insufficient data from the region to produce any trendline. As can be seen, in Q3 2024, the Georgia-Burgas trend does not show any significant decline in traffic when compared to the same quarter in 2023 and 2022. There is evidence of seasonality taking place, but the peaks and troughs are less pronounced than EU-wide RoPax traffic, which may be due to specific market dynamics and operational characteristics of RoPax services in the Black Sea region compared to the rest of the EU.

Figure 3-59: Evolution of RoPax transport to the port of Burgas from ports in Georgia compared to EU-wide traffic by number of port calls

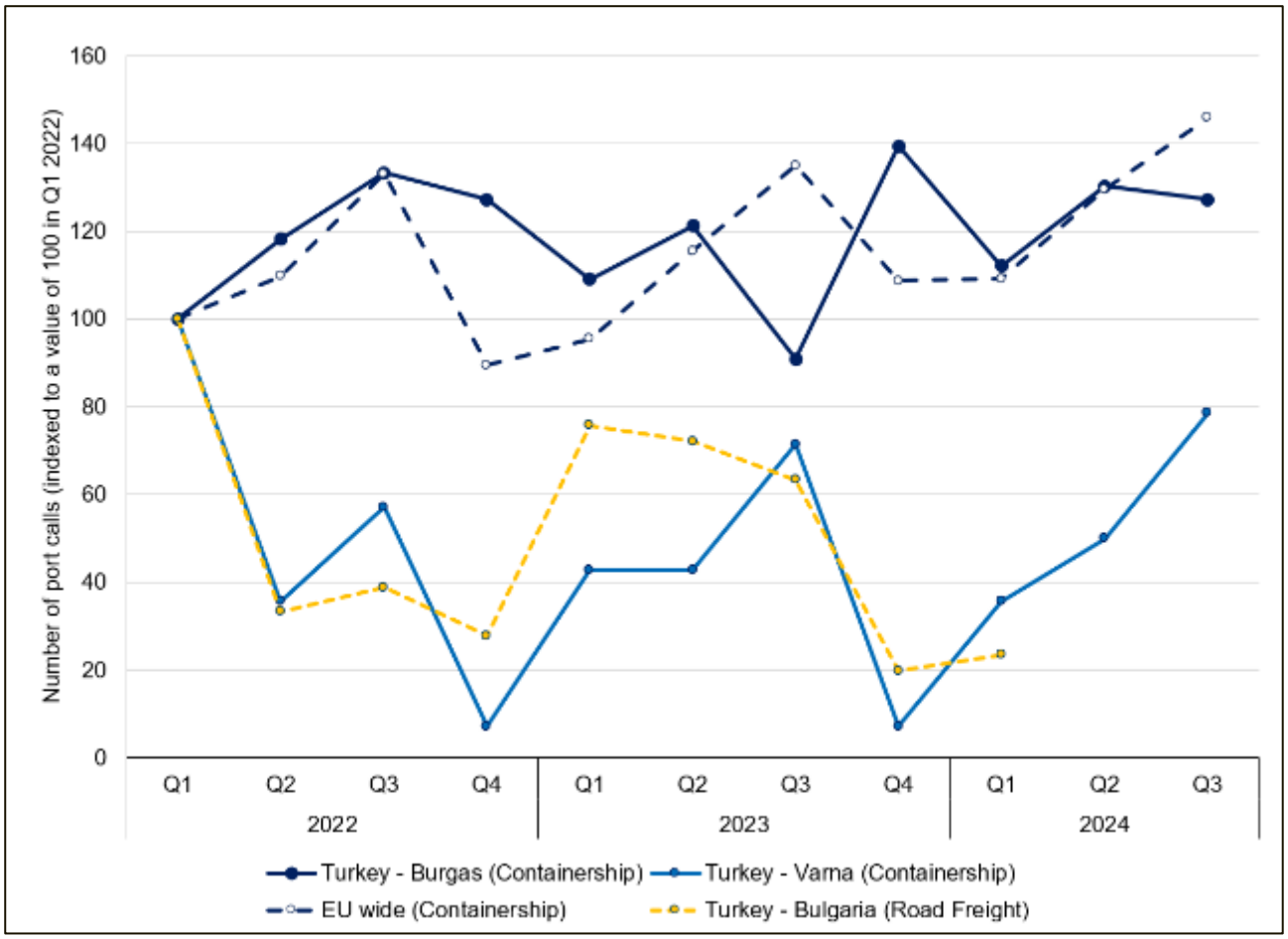


Source: Ricardo analyses of EMSA MARINFO

In addition, containership traffic to the port of Burgas and Varna from Türkiye was analysed (Figure 3-60 below) and was compared with the EU wide containership transport figures from 2022 to 2024. The two ports have followed different trends with the volume of traffic in Burgas fluctuating above the Q1 2022 levels (except in Q3 2023) but total levels on a year-to-year basis for the three quarters of each year largely similar and not dissimilar to the general EU-wide traffic. Varna has experienced fluctuations between 10% and 80% of the Q1 2022 levels and despite the significant growth in each quarter between the period of Q4 2023 and Q3 2024 it is still at levels below Q1 2022. The EU-wide traffic shows strong seasonal trends, with large increases (of the order of 40%) between Q1 and Q3 each year, followed by a large reduction in Q4 (the reduction in Q4 2023 was smaller than in 2022, leading to 2024 results showing a significant increase in traffic over 2023 levels). Burgas shows similar seasonal trends, although without the increase to Q3 each year.

Limited data on international road freight data from Eurostat between Bulgaria (as country of unloading) and Türkiye (country of loading) point to a small increase in road transport in the first quarter of 2024 in comparison to the previous quarter but at much lower levels than in Q1 2023. No data on freight transport between Bulgaria and Georgia are available in Eurostat. Meaningful conclusions are not possible given the limited period covered.

Figure 3-60: Evolution in containership and road freight transport to the port of Burgas/Varna from Türkiye compared to EU-wide containership by number of port calls



Source: Ricardo analyses of EMSA MARINFO, Eurostat (road_go_iq_utt__custom_13905947)

To address the lack of data for road freight, we also sought evidence in the literature on whether there have been any reports or announcements of changes in traffic in ports in Bulgaria indicating modal shift to road transport is taking place. However, we have not identified any announcements on increased road transport of goods entering the EU, including reports for Bulgaria. Bulgaria's Kapitan Andreevo border crossing with Türkiye is reportedly the busiest land border in Europe with almost all truck traffic from Türkiye and the Middle East passing through it. There are reports of border crossing problems[173] but this is a problem already reported in 2023 and thus not an indication of increased road freight activity.

In conclusion, we observe no significant reduction in maritime traffic to the port of Burgas – a main port in Bulgaria in the Black Sea – from other ports in the Black Sea in Türkiye and Georgia. The traffic in Varna – the second Bulgarian port in the Black Sea - has

[173] https://www.euractiv.com/section/politics/news/bulgaria-mulls-nationalising-tir-parking-lots-to-tackle-border-transport-chaos/

actually increased the last quarters following a significant decrease in the period before 2024.

Data on road freight transport examined between Bulgaria and Türkiye show a small increase in Q1 2024 in comparison with the previous quarter but from a very low base in the previous period. As they also only cover one quarter in 2024, it is not possible to reach any conclusion.

3.7. Assigning best performing vessels to EU routes

The single question on this risk is 'Has there been an increased use of more efficient vessels on routes to EU ports in 2024 compared to the same months in 2023?' The purpose of this question is to address the risk that vessel operators may choose to use their 'best performing vessels' (i.e. those with the lowest emissions per tonne-mile) on routes to and from EU ports to reduce their emissions on those routes and, hence, their surrendering liabilities under the EU ETS. While a reduction in emissions from maritime transport is fully consistent with the aims of the EU ETS, it is important to note that this is not achieved if vessel operators simply move their vessels with higher emissions to other routes (those that do not include calls at EU ports). A sudden improvement in the efficiency of vessels visiting EU ports in 2024 could indicate that the improvement has been achieved by moving vessels between routes rather than through global fleet modernisation (which would be expected to be a more gradual process).

Vessel operators are required to report a technical energy efficiency index for each vessel that calls at an EU port under the THETIS-MRV system. They may report their energy efficiency existing ship index (EEXI) or energy efficiency design index (EEDI) where feasible, or an estimated index value (EIV)[174] if not. To investigate any changes in efficiency indices for vessels visiting EU ports in 2024, the vessels included in the EMSA MARINFO ports calls database have been matched (where possible) to reported efficiency indices (EEDI, EEXI or EIV) in the THETIS-MRV reports.

As the results considered here are based on a combination of two data sources, there is the potential that not all vessels that have visited EU ports are included in the analysis, as some may not have efficiency indices included in the THETIS-MRV data. Importantly, if operators have introduced new, more efficient vessels onto routes to the EU in 2024

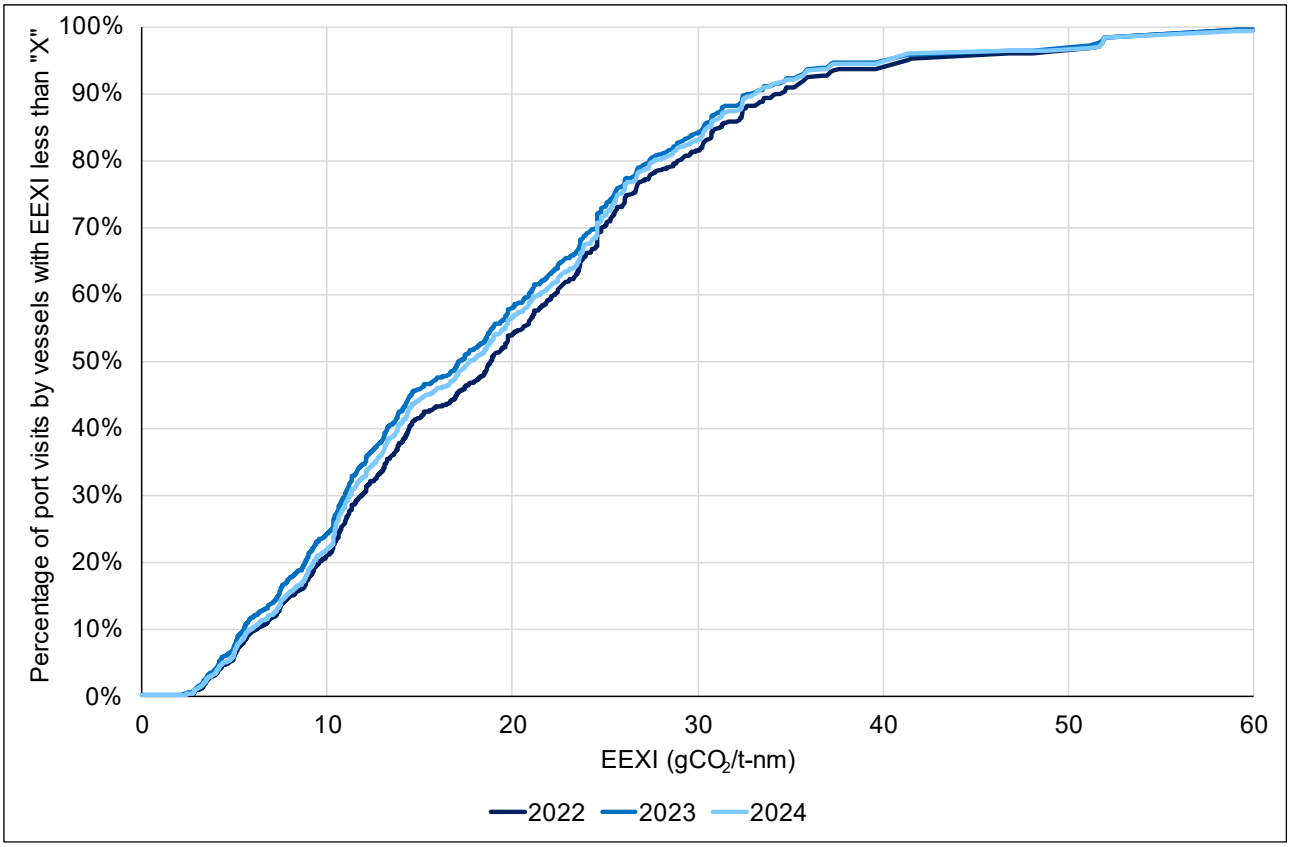
[174] EEDI is a calculation of the CO_2 emissions per unit work (tonne-mile) based on the technical design parameters of the vessel. All new vessels are required to have an EEDI value that complies with the IMO targets for efficiency improvements since 2012. The EEXI value is a similar calculation for existing (in-service) vessels, with some adjustments to the approach to allow for the lack of detailed design information. Since 2023, all existing vessels have been required to have an EEXI value complying with the IMO target. EIV is a simplified calculation that has mainly been used to derive efficiencies for older vessels without needing to report sea trial results.

(whether intended as an evasive behaviour or because the EU is a key region for their operations), information on them will not appear in existing THETIS-MRV data and they will not be included in the analysis. Conversely, if operators have removed older, less efficient, vessels from EU operations, they will be included in the data for 2023 and the impact of their removal in 2024 will be included in the analysis.

To confirm that the results capture a sufficient percentage of all vessels visiting EU ports in each year, they were analysed further, and out of the 19,065 vessels included in the MARINFO data for EU ports, 17,093 (approximately 90%) have an efficiency index recorded in THETIS-MRV. These vessels with efficiency indices available are used on approximately 95% of port calls in 2022 and 2023 and 92% in 2024. More information on numbers of vessels included in the analysis can be found in Appendix 3. Overall, the high percentages of vessels and port calls having efficiency indices in THETIS-MRV gives confidence in the representativeness of the results of the analyses.

As the basis for the three indices is different, the presentation of the reported values for 2022 to 2024 focuses on those for EEXI in Figure 3-61. Vessels have only been required to report EEXI since 2023; therefore, results for previous years were obtained using the fleets for the previous years and the EEXI values reported in 2023 (for the vessels that did so). The indices are presented in the form of cumulative frequency distributions for the three years. A significant improvement in efficiency index would result in more vessels reporting low index values, moving the curve to the left.

Figure 3-61: Cumulative frequency distribution for technical efficiency of vessels visiting EU ports (vessels reporting EEXI)



Source: THETIS-MRV, EMSA MARINFO and Ricardo elaboration

As seen in Figure 3-61, for vessels reporting EEXI (which included the majority of vessels that first visited EU ports in 2023), the results for 2024 are very similar to those for 2023, and slightly better than for 2022. For example, in 2024, 50% of port calls (by vessels reporting EEXI) had EEXI values of 17.7 or lower; in 2023, the corresponding percentage of vessels (reporting the same levels of EEXI) was 51.6% and in 2022 it was 46.8%. From these results, it can be seen that there is a small improvement over time (e.g., comparison of 2024 with 2022), but it is not sufficient to suggest a significant change in the use of vessels on routes to and from the EU, such as a sudden increase in more efficient vessels which could be indicative of an evasive behaviour – going beyond evolutions that would be expected from improvements over time (notably as a result of MRV).

Overall, the results of the analyses of energy efficiency indices do not show any sudden improvement in efficiencies of the vessel fleet used on EU routes that would indicate evasive behaviours. The addition of the THETIS-MRV data for 2024 (when available) will allow this analysis to be brought up to date, with all efficiency values reported in 2024 being matched to vessel movements from the MARINFO data.

To investigate further the risk of assigning ‘best performing vessel’ to EU voyages, analysing the age profile of the fleet visiting EU ports may also be relevant.

The analyses by EMSA of the age profile of container vessels provide the results shown in Table 3-6, below.

Table 3-6: Age profiles of container vessel fleet visiting EU ports in 2023 and 2024

Vessel age (years)	2023	2024
Less than or equal to 5 years	12%	14%
6 to 19 years	69%	66%
20 years or more	19%	20%

Source: EMSA analyses of SafeSeaNet data

These results show a slight increased percentage of the fleet being taken by vessels of 5 years of age or less in 2024 compared to 2023. They also show a slight increase in the percentage taken by the oldest vessels, with the reduction in percentage being taken by vessels from 6 to 19 years of age.

The results from EMSA indicate an increase in the use of younger vessels on EU routes, which could be indicative of a selective use of the most efficient vessels on such routes. However, it is perhaps more likely that the result reflects global cycles in fleet replacements. For instance, it is estimated that the percentage of the worldwide fleet of containerships less than 5 years of age was 17% in 2024, compared to 14.5% in 2023.[175]

> Overall, the analyses of the age profiles and energy efficiency indices of vessels visiting EU ports from 2022 to 2024 are not conclusive regarding possible evasion occurring.

3.8. Use of ships below size threshold

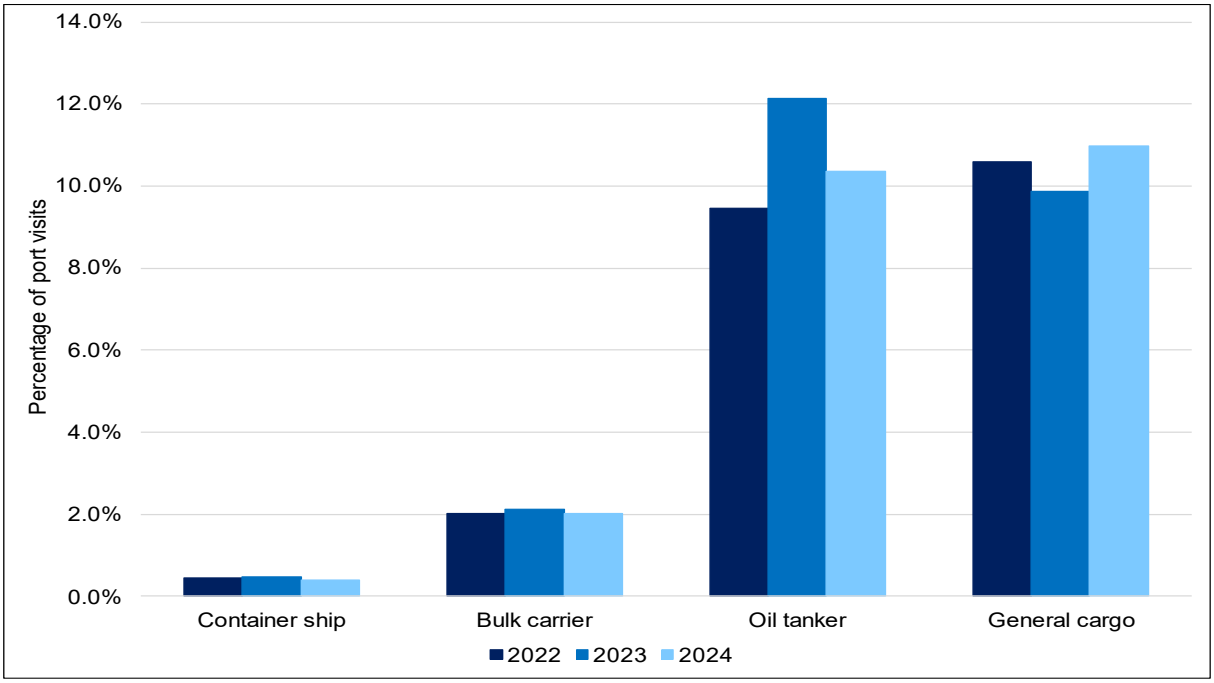
The question on this risk is the following: ‘Has there been an increased use of vessels below 5,000 GT (in particular those just below 5,000 GT) on routes to EU ports?’ This question is intended to understand whether there is evidence of vessel operators increasing the use of vessels below the EU ETS size threshold (i.e. below 5,000 GT) on incoming extra-EU routes and, in particular, those between 4,000 GT and 5,000 GT (the size of vessel most likely to be used in place of those above 5,000 GT, if the operator is aiming to reduce overall costs). Analysis of data from the MARINFO database indicated that vessels below 5,000 GT form only a small portion of total traffic at the key EU ports (up to about 12%, depending on the vessel type); therefore, if any changes in the use of

[175] United Nations Conference on Trade and Development, *2024 Review of Maritime Transport* (UNCTAD/RMT/2024) and *2023 Review of Maritime Transport* (UNCTAD/RMT/2023).

small vessels are observed, they will relate to only a very small percentage of total emissions (and EU ETS allowances to be purchased) unless the changes are very large.

Figure 3-62 shows the percentage of port visits on incoming extra-EU routes of vessels between 4,000 GT and 5,000 GT (as a percentage of all incoming extra-EU port visits) for the period from January to April in 2022 to 2024. The results include the four key vessel types of container ships, bulk carriers, oil tankers and general cargo ships (the vessel categories for which literature indicates greatest competition between the respective size segments).

Figure 3-62: Percentage of port calls on incoming extra-EU voyages by vessels between 4,000 GT and 4,999 GT in January to April, 2022 to 2024, for four vessel categories

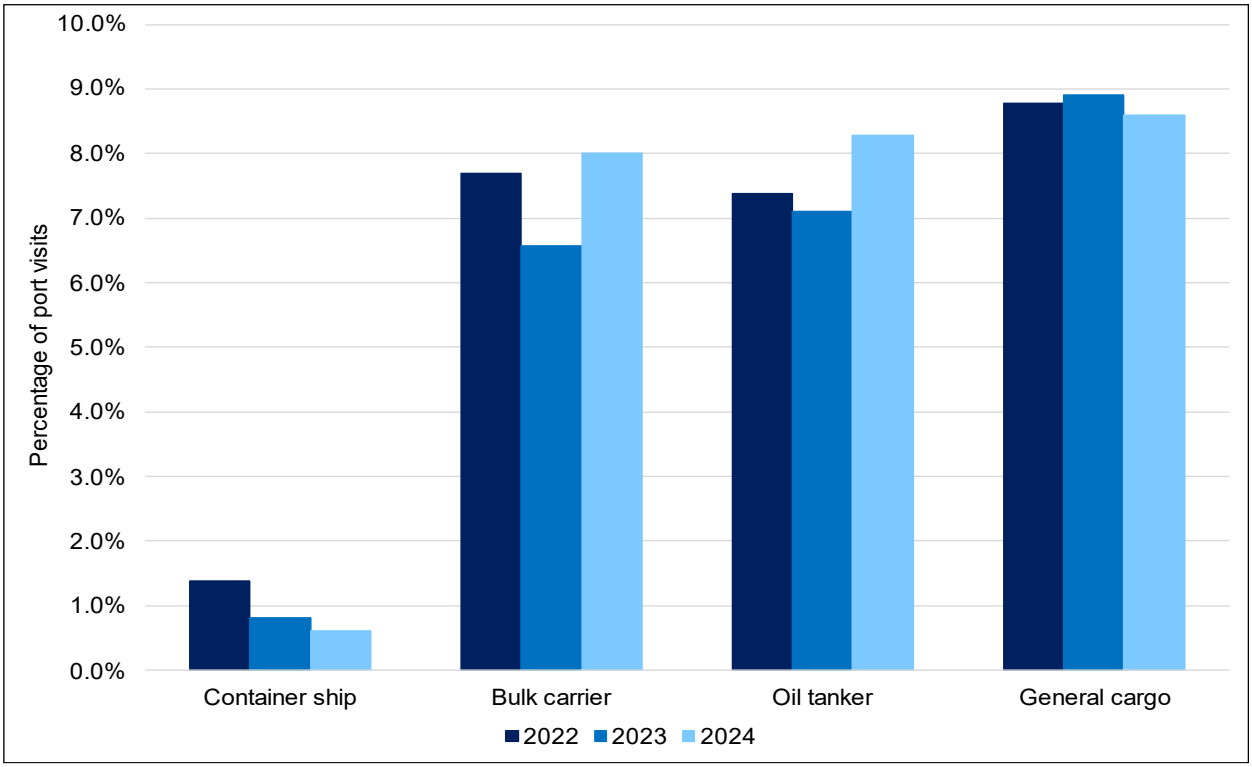


Source: EMSA MARINFO and Ricardo elaboration

The results show that the percentage of port visits by container ships between 4,000 GT and 5,000 GT is very low in all three years (about 0.5%), with no evidence of any increase in January - April 2024. Bulk carriers have a slightly greater percentage of vessels in the size range (about 2.0%), but, again, no evidence of any increase in 2024. The third vessel category, oil tankers, has a significantly greater use of vessels in the 4,000 GT to 5,000 GT size range, around 9% to 12%. In this case, the use of such vessels in 2024 is greater than in 2022, but less than in 2023. General cargo vessels also show a relatively high use (around 10% to 11%) on these routes; again, there have been only minor variations in the percentages over the three years, with a small reduction in 2023 and a similar rise in 2024.

Similar results are presented for the use of vessels in this size range on intra-EU routes in Figure 3-63.

Figure 3-63: Percentage of port calls on intra-EU voyages by vessels between 4,000 GT and 5,000 GT in January to April, 2022 to 2024, for four vessel categories



For container ships, the percentage of port calls by vessels in the 4,000 GT to 5,000 GT size range is slightly higher than for extra-EU voyages, around 1.4% in 2022, but this percentage has reduced in 2023 and 2024. For bulk carriers, the percentage of port visits is significantly higher than on extra-EU voyages (about 7.7% in 2022). This percentage reduced in 2023 and then increased again in 2024 to 8.0%. While this does indicate an increased use of vessels in this size range in January – April 2024, it is only a small increase compared to 2022 and is, therefore, not significant.

For oil tankers, the percentage of port visits by vessels in the size range is slightly less than on extra-EU voyages at about 7.4% in 2022. In 2024, this percentage increases to 8.3%. Again, while this is an increase over the same period in previous years, it is not large enough to indicate any significant increase in the use of such vessels.

For general cargo ships, the percentage of port visits by vessels in the 4,000 GT to 5,000 GT range is slightly lower than on incoming extra-EU routes (just under 9% compared to 10% to 11%); again, there are only minor variations in the percentage across the three years shown.

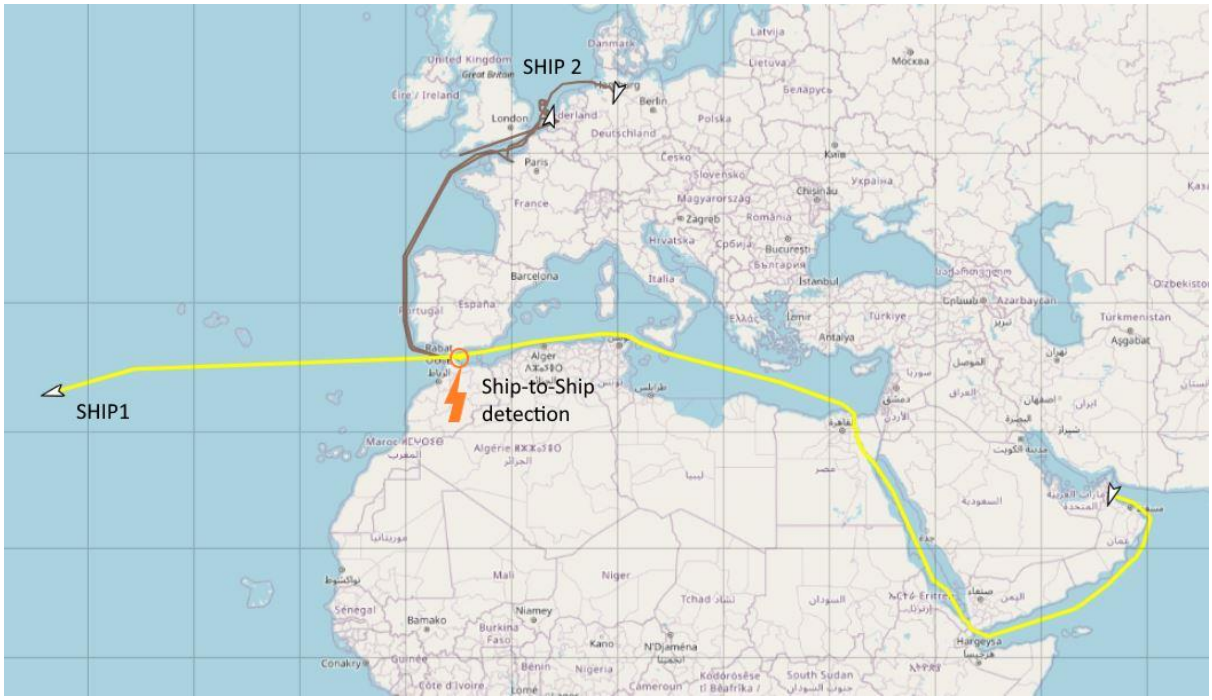
> Overall, there is no evidence of a greater use of vessels in the 4,000 GT to 5,000 GT size range, which could be indicative of an evasive behaviour.

3.9. Ship-to-ship transfers

To answer the research question on this risk ('Has there been an increase in the number of ship-to-ship transfers in EU waters since the start of the ETS maritime implementation?'), the analysis considers the occurrence of the following ship-to-ship transfers: cases where one of the two pairing ships for STS operations, above 5,000 GT, comes from a non-EU port ('Ship 1') and returns again to a non-EU port, whereas the second pairing ship ('Ship 2') departs and calls again after the STS operation in an EU port. For the purpose of this analysis, only STS transfers happening outside port limits and within 300 nautical miles of EU Member States territory are being considered.

Figure 3-64 illustrates one typical case of a ship-to-ship transfer case scenario subject to the present analysis.

Figure 3-64: Typical case of ship-to-ship transfer



Source: EMSA analysis

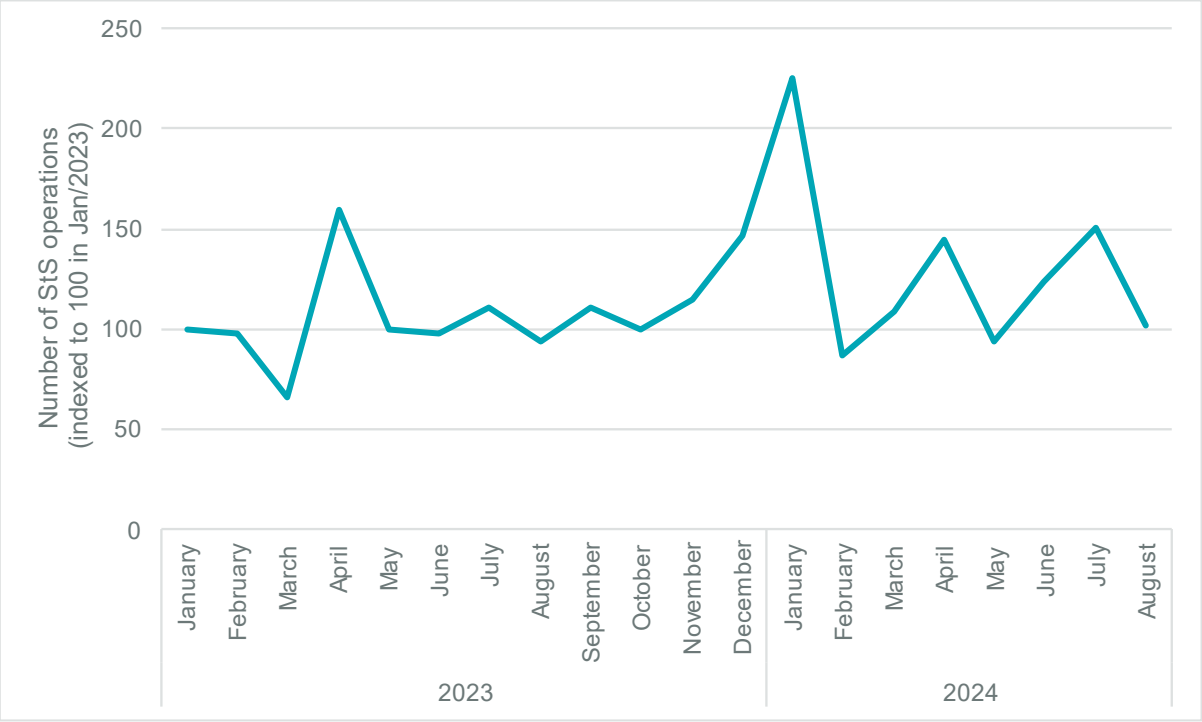
The reason for focusing on these cases is because the above-described scenario corresponds to STS operations most relevant to possibly indicate an evasive behaviour; in such examples, Ship 1 would not call at any EU port, hence avoiding any EU ETS surrendering liabilities. Ship 2 may or not be subject to EU ETS, depending on its size:

- Ship 2 would not be subject to EU ETS scope if it is below 5,000 GT;
- Ship 2 would be subject to EU ETS scope if that vessel is above 5,000 GT; but even if that were the case, the distance covered would be expected to be smaller

than if Ship 1 had called the EU port directly. Hence this could still be related to a type of evasive behaviour.

Figure 3-65 represents the evolution in the number of STS transfers corresponding to the above-described scenario, estimated from analyses of satellite data. The results include both cases where Ship 2 is below and above 5,000 GT. The number of STS transfers is indexed to 100 in January 2023.

Figure 3-65: Estimated number of ship-to-ship transfers within 300 nautical miles from EU Member States territory, from January 2023 to August 2024 (indexed to 100 in January 2023)



Source: EMSA analysis of satellite data

In Figure 3-65 and Figure 3-66 , the trend is rather stable between 2023 and 2024, although there may be some important monthly variations. **There is no overall increase since January 2024 compared to 2023 that could indicate a greater use of STS transfers as a potential evasive behaviour since the introduction of the EU ETS to maritime transport.**

It is to be noted that, although these graphs do not include 2022 data, the number of STS transfers has greatly increased since Q1 2022 as a consequence of the Russian invasion of Ukraine and impacts on energy supplies. To provide an order of magnitude, STS transfers are almost five times higher in Q1 2023 compared to Q1 2022.

It is also worth noting that the regions with the highest activities in terms of such STS transfers are the East and Central Mediterranean regions. Malta and Lakonikos bay (in Greece) are the two areas with highest levels of activity, as illustrated by Figure 3-66 below.

Figure 3-66: Map with the density and geographical distribution of STS transfers events (focus on the Mediterranean region)

Source: EMSA analysis

Finally, in order to better grasp the scale of STS transfers and possible associated risks, the number of ship-to-ship transfers was compared against the level of activity of the entire fleet of tanker vessels subject to ETS scope. Based on the number of voyages of tankers vessels from/to an EU port in 2023, it can be concluded that the number of STS transfers in 2023 represents only 0.7% of the total number of tanker vessels port calls in an EU port.

> Overall, there is no evidence of an increase in the number of ship-to-ship transfers of cargo taking place in EU waters since the extension of the EU ETS to maritime transport.

4. Monitoring of other impacts of the EU ETS extension

This section covers the analysis of possible impacts of the EU ETS extension to maritime transport considering, transport cost increases, market distortions and impacts on shipping services that constitute essential services of territorial continuity.

Table 4-1: Possible impacts from the EU ETS for maritime transport

Possible impact	Description
Impacts on transport costs	The purchase of allowances by shipping companies to ensure compliance with EU ETS are expected to increase overall shipping costs. Shipping companies are expected to at least partially pass through ETS costs to their customers in the form of ETS surcharges.
Impacts on essential services for territorial continuity	Increased shipping costs could lead to changes in the supply and price of ferry (passenger and RoPax) services connecting EU islands and remote territories to the mainland.

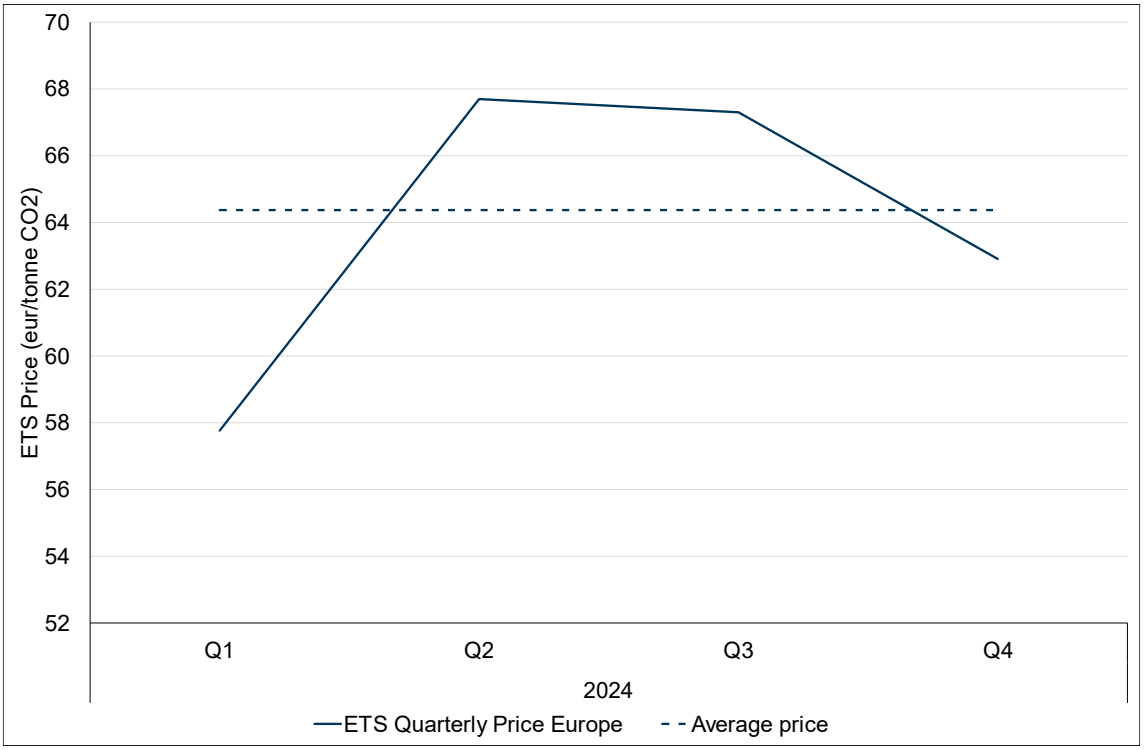
4.1. Impacts on transport costs

This section aims to assess the impact on shipping costs following the implementation of the ETS in 2024. This includes the impact of ETS allowance costs on shipping companies (compared to fuel costs and total shipping costs) and ETS surcharges on shippers (compared to freight rates).

4.1.1. ETS allowances costs for shipping companies

Shipping companies need to purchase ETS allowances for their GHG emissions from 2024. In 2024, the first year of the phase-in period, a 40% factor applies to GHG emissions to be surrendered which lowers the costs associated to ETS compliance accordingly. The price of ETS allowances has been relatively stable in 2024. Figure 4-1 shows a quarterly average of ETS allowances' price (EUR/tonne CO_2) for 2024. The price varied between 58 EUR/tonne CO_2 (Q1) and 68 EUR/tonne CO_2 (Q2) throughout this period, with the 2024 average at 64 EUR/tonne CO_2.

Figure 4-1 EU ETS allowance price - Average and quarterly in 2024



Source: International Carbon Action Partnership (ICAP) Allowance price explorer (primary market)

Note: Q4-2024 is not complete.

Total ETS costs for the maritime sector in 2024 have been computed by considering the above average price for ETS allowances in 2024, estimated CO_2 emissions under MRV, the 40% phase-in factor for overall 2024 emissions and the 50% factor for extra-EU emissions.

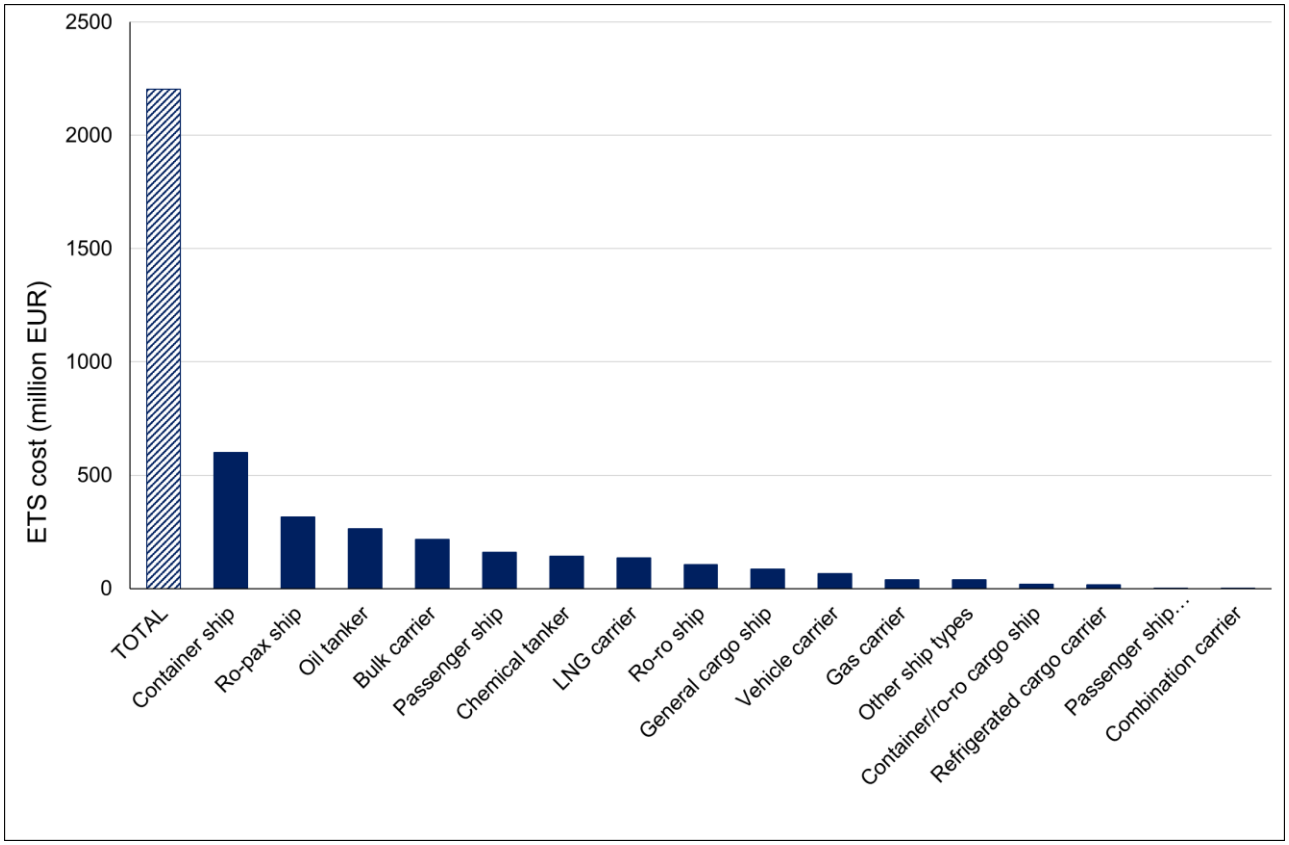
For simplification purposes, it was assumed that activity levels in 2024 would be equivalent to those in 2023, and 2023 MRV CO_2 data[176] was used to estimate total CO_2 emissions under ETS in 2024. This approach is conservative in the sense that it does not consider the effect of GHG mitigation measures that vessel owners and operators may have adopted (such as new, more efficient, vessels or retrofitting emissions reduction technologies to existing vessels) on 2024 CO_2 emissions[177]. In total, shipping companies calling at EU ports are expected to surrender around 34 million allowances in 2025 for their 2024 emissions, which represent an estimated costs of around EUR 2,200 million on ETS allowances.

[176] MRV data 2023, v23 (20/11/2024)

[177] At the same time, such measures would be associated with abatement costs which are expected to be equal or lower than avoided ETS costs.

Figure 4-2 illustrates the estimated ETS cost for the entire fleet and for each ship category. In absolute terms, the ETS costs are estimated to be the largest for containerships followed by RoPax ships, oil tankers and bulk carriers.

Figure 4-2 Total costs of ETS allowances in 2024, by ship category



Source: Ricardo analysis

The cost linked to the ETS implementation is expected to increase in 2025 and 2026, when the phase-in factor will grow to 70% and 100%, respectively. It will also be influenced by the effect of GHG mitigation measures implemented by shipping companies, which would reduce demand for ETS allowances.

ETS costs in 2024 were compared to vessel´s operating costs[178] and total shipping costs[179]. For this, fuel costs were calculated on the basis of 2023 MRV data on fuel consumption by ship category. A weighted average fuel price was used, combining the 2024 average prices of VLSFO (30%) and MGO (70%) from the EMEA bunker price reference[180], resulting in a final value of 606 EUR/tonne of fuel in 2024. Then, the proportion of fuel costs out of operating costs (66% on average) and out of total shipping

[178] Including fuel costs, staff costs, port fees and other operating costs.

[179] Including operating costs plus capital costs of vessels.

[180] https://shipandbunker.com/prices/emea

costs (42% on average) was assumed[181] to estimate the share of ETS costs out of total operating costs and total shipping costs (see Table 4-2).

Table 4-2: Share of ETS costs in 2024 out of vessel´s operating (OPEX) and total shipping costs

Share of ETS cost:	2024
- out of vessels' operating costs	5.9%
- out of total shipping costs	3.7%

Source: Ricardo analysis

To complement the analysis of average ETS cost impacts, three different cases of routes were examined to offer a more detailed view on cost impacts for specific shipping routes. These include a deep-sea container route from Far East to North Europe (both via the Suez Canal and via the Cape of Good Hope), an intra-Mediterranean container route and a trans-Atlantic bulk carrier route. Assumptions on vessel and route characteristics have been made based on existing shipping services (see Table 4-3).

Table 4-3: Description of case studies on cost impacts

Case study	Vessel characteristics (1)	Route characteristics (2)
Far-East to North Europe container route (via Suez Canal or Cape of Good Hope)	• GT: 194,849 • Capacity: 18,300 TEUs • Average load: 14,350 TEUs • CO_2 emissions per distance: 950.5 $kgCO_2/nm$	• Port calls: Shanghai (China) – Tanjung Pelepas (Malaysia) – Rotterdam (the Netherlands) • Intra-EU distance: 0 nm • Extra-EU distance: 8,731 nm (via Suez Canal) or 11,900 nm (via Cape of Good Hope)

[181] Percentages based on costs estimates from the REF2020 scenario modelled in PRIMES-Maritime.

Case study	Vessel characteristics (1)	Route characteristics (2)
Intra-Mediterranean container route	• GT: 50,721 • Capacity: 4,258 TEUs • Average load: 3,178 TEUs • CO_2 emissions per distance: 469.1 $kgCO_2/nm$	• Port calls: Algeciras (Spain) – Piraeus (Greece) – Izmit (Türkiye) • Intra-EU distance: 1,483 nm • Extra-EU distance: 390 nm
Trans-Atlantic bulk carrier route	• GT: 43,666 • Average load: 82,278 tonnes • CO_2 emissions per distance: 263.3 $kgCO_2/nm$	• Port calls: Ponta Ubu (Brazil) – Antwerp (Belgium) • Intra-EU distance: 0 nm • Extra-EU distance: 4,979 nm

Source: Ricardo analysis

*Note: (*1) Vessel characteristics have been extracted from THETIS-MRV data for specific vessels (IMO vessel number) deployed on these routes. (2) Distance has been extracted from sea-distance.org

For each of these routes, Table 4-4 shows the total ETS cost per one-way voyage. These figures have been compared against total shipping costs per voyage. In addition, based on the assumed load factor per vessel, the ETS cost per cargo unit (per TEU or tonne) was estimated. This analysis shows that estimated ETS costs represent from 3% to 6% of shipping costs depending on whether the ETS coverage of the voyage (extra-EU voyages vs intra-EU voyages). For the container routes analysed, the ETS cost per TEU were estimated at around 7-8 EUR/TEU but this increases with the re-routing via the Cape of Good Hope (up to 10 EUR/TEU).

Table 4-4: Results from case studies on cost impacts in 2024

Case study	Estimated ETS cost per one-way voyage (EUR) [40% phase-in applied]	Estimated ETS cost per cargo unit (EUR per TEU or tonne)	Fuel cost per one-way voyage (EUR)	% ETS cost out of total shipping costs
Far East to North Europe container route (via Suez Canal)	106,224	7.4 EUR/TEU	1,612,380	3%

Case study	Estimated ETS cost per one-way voyage (EUR) [40% phase-in applied]	Estimated ETS cost per cargo unit (EUR per TEU or tonne)	Fuel cost per one-way voyage (EUR)	% ETS cost out of total shipping costs
Far East to North Europe container route (via Cape of Good Hope)	144,779	10.1 EUR/TEU	2,197,609	3%
Intra-Mediterranean container route	22,801	7.2 EUR/TEU	170,710	6%
Transatlantic bulk carrier route	16,780	0.20 EUR/tonne	253,068	3%

Source: Ricardo analysis

Overall, the analysis suggests that **in 2024, ETS costs represent a relatively modest increase in shipping costs**, particularly on routes with a significant extra-EU component. This share will increase in 2025 and 2026, when the phase-in factor will grow to 70% and 100%, respectively, but also depending on the GHG emission mitigation policies implemented by shipping companies.

4.1.2. ETS surcharges on shippers

Shipping companies may pass through ETS costs to shippers in the form of “ETS surcharges”. This is however not regulated by the ETS Directive and rather the result of commercial practices and contractual arrangements. Many liner operators have already announced and published these surcharges, which aim to offset the increased costs associated with purchasing ETS allowances. These surcharges vary depending on route, cargo type, and ship size. As an example of ETS surcharges, Table 4-5 shows announced values for some major liner operators (considering both directions).

To put this into further context, ETS surcharges per TEU are compared against container freight rates for each route and direction, which reflect shipping costs plus profit margin of operators. The Red Sea crisis led to an increase in container freight rates in 2024. The China Containerized Freight Index, a key indicator of freight rates for container shipping, grew approximately 120 per cent from October 2023 to June 2024. It was found that the Red Sea crisis and disruptions to the Suez Canal was the most substantial factor, contributing 148-percentage points to the cumulative increase (120 per cent) in the China

Containerized Freight Index[182]. To disentangle the effect of the Red Sea crisis on freight rates, 2023 average values published by UNCTAD are used for comparison purposes.

Table 4-5 shows that announced ETS surcharges are mostly within the range of 1 – 5% of container freight rates in 2023. The analysis per direction demonstrates that the share of ETS surcharges out of freight rates does not vary substantially across different directions on a given route and operator. This variation is clearly below the usual volatility of container freight rates, which means that ETS surcharges in 2024 are expected to lead to limited impacts on total transport prices. It is also significantly lower than the 148 percentage points increase in container freight rates attributable to the Red Sea crisis as mentioned above.

Announced ETS surcharges are generally higher than estimated ETS costs per TEU in our Asia to North Europe case study. While the average ETS surcharge imposed on the route Asia to North Europe by the shipping companies listed in Table 4-5 below amounts to 30 EUR/TEU on average (and 20 EUR/TEU in the opposite direction), the above-calculated ETS cost for such a route is 7-10 EUR/TEU. This demonstrates that ETS surcharges decided by shipping companies on a specific lines do not necessarily reflect the expected EU ETS costs associated to these lines. These are rather the outcome of commercial decisions that may reflect additional criteria (attractivity of the route, demand/supply relationship, different redistribution of EU ETS costs among lines, etc.).

Table 4-5: ETS Surcharge for carriers across different routes

Carrier	Route	Surcharge (per TEU)/(per Reefer) (1)	% increase in comparison to 2023 freight rate (2)	Surcharge (per TEU)/(per Reefer) – Opposite direction (1)	Increase to 2023 freight rate (2)
Maersk[183]	Far Asia to North Europe	€46 / €67	2.2% / 3.1%	€31 / €46	2.4% / 3.5%
	Asia to Mediterranean	€32 / €47	1.5% / 2.2%	€18 / €27	1.4% / 2.1%
	Europe to North America	€59 / €88	1.6% / 2.3%	€35 / €53	2.1% / 3.2%
Hapag-Lloyd[184]	East Asia to North Europe	€42/ €109	2.0% / 5.1%	€29 / €76	2.2% / 5.8%

[182] UNCTAD Review of maritime transport 2024 (Chapter 3) RMT 2024 - Chapter III. Freight rates, maritime transport costs and their impact on consumer prices and economic activity

[183] https://www.maersk.com/news/articles/2024/12/02/emissions-surcharge-ems-ess

[184] https://www.hapag-lloyd.com/en/online-business/quotation/tariffs/trade-surcharges.html#anchor_76e716

Carrier	Route	Surcharge (per TEU)/(per Reefer) (1)	% increase in comparison to 2023 freight rate (2)	Surcharge (per TEU)/(per Reefer) – Opposite direction (1)	Increase to 2023 freight rate (2)
	East Asia to South Europe	€43 / €114	2.0% / 5.3%	€29 / €78	2.2% / 5.9%
	North Europe to North America East coast	€32 / €59	0.8% / 1.6%	€23 / €43	1.4% / 2.6%
CMA CGM[185]	Asia to North Europe	€25 / €40	1.2% / 1.9%	-	0.0% / 0.0%
	Asia to Mediterranean	€20 / €30	0.9% / 1.4%	-	0.0% / 0.0%
	Europe to North America	€43 / €65	1.1% / 1.7%	-	0.0% / 0.0%
Evergreen[186]	Asia to Europe	€27/ €41	1.3% / 1.9%	€14 / €21	1.1% / 1.6%
	Asia to Mediterranean	€23 / €35	1.1% / 1.6%	€9 / €14	0.7% / 1.1%
	Europe to North America	€33 / €50	0.9% / 1.3%	€19 / €29	1.2% / 1.8%
OOCL[187]	Far East Asia to North Europe	€27 / €41	1.3% / 1.9%	€17 / €26	1.3% / 2.0%
	Far East Asia to Mediterranean	€19 / €29	0.9% / 1.4%	€10 / €15	0.8% / 1.1%
	Europe to US	€46 / €69	1.2% / 1.8%	€15 / €23	0.9% / 1.4%
HMM[188]	Asia to North Europe	€32/ €48	1.5% / 2.2%	€24 / €36	1.8% / 2.7%
	Asia to Mediterranean	€47 / €71	2.2% / 3.3%	€29 / €44	2.2% / 3.4%

[185] https://www.cma-cgm.com/news/4463/preparing-for-the-eu-emissions-trading-system-application-to-shipping

[186] https://www.seatrade-maritime.com/containers/evergreen-first-out-with-concrete-eu-ets-charges

[187] https://www.oocl.com/eng/aboutoocl/corporatemessages/2023/Pages/30Nov2023.aspx

[188]https://www.hmm21.com/e-service/cmsBoard/CmsBoard.do?sc1=C004&cPage=3002797&nationCdB=US&rhqB=DALHQ&sc1D=&sc2D=&sc3D=&srcTextB=surcharge&pageS=1&pageL=10#

Carrier	Route	Surcharge (per TEU)/(per Reefer) (1)	% increase in comparison to 2023 freight rate (2)	Surcharge (per TEU)/(per Reefer) – Opposite direction (1)	Increase to 2023 freight rate (2)
	Europe to North America	€41	1.1% / 0.0%	-	0.0% / 0.0%
MSC[189]	Far East Asia to North Europe	€22 / €33	1.0% / 1.5%	€13 / €20	1.0% / 1.5%
	Asia to Mediterranean	€18 / €27	0.8% / 1.3%	€14 / €21	1.1% / 1.6%
	Europe to North America	€37 / €56	1.0% / 1.5%	€18 / €27	1.1% / 1.6%
COSCO[190]	Asia to North West Europe	€28 / €42	1.3% / 2.0%	€19 / €29	1.4% / 2.2%
	Asia to Mediterranean	€19 / €29	0.9% / 1.4%	€11 / €17	0.8% / 1.3%
	Europe to North America East Coast	€42 / €63	1.1% / 1.7%	€27 / €41	1.6% / 2.5%
Yang Ming[191]	Asia to North Europe	€24 / €35	1.1% / 1.6%	€11 / €15	0.8% / 1.1%
	Asia to Mediterranean	€18 / €26	0.8% / 1.2%	€8 / €12	0.6% / 0.9%
	Europe to North America	€27 / €40	0.7% / 1.1%	€12 / €18	0.7% / 1.1%

Source: Ricardo analysis based on various publicly available sources

Note (1): Two values are shown per route in the format "€ x / € y". The first value is for dry and the second value for reefer.

[189] https://www.msc.com/en/newsroom/customer-advisories/2023/october/implementing-eu-ets-from-1-january-2024

[190] https://coscoshipping.com.br/wp-content/uploads/2023/12/Notification-ETS-Surcharge-Carbon-Emissions-Trading-Systema-Surcharge-Effective-from-Jan-01-2024.pdf

[191] https://www.yangming.com/news/press_release/PressContent.aspx?BulletinType=Member&uid=14503&localSiteD=

Note (2) “Contracted” freight rates (which include the costs of the rate of shipping plus additional charges such as terminal handling fees) taken from UNCTAD Review of Maritime Transport 2024[192] for Asia to Europe and Europe to North America routes (and opposite direction).

In principle, short sea shipping services (often RoRo and RoPax services) might have a lower capacity to pass through ETS costs due to their lower elasticity of demand compared to deep sea services, particularly when facing strong competition from land-based modes. However, there is also evidence of specific ETS surcharges being applied on short sea shipping routes. An analysis of ferry routes in the EU shows that the impact of ETS costs on ticket prices largely varies across routes selected, with a price increase ranging from 3% to 11% (see Table 4-6).

Table 4-6: ETS surcharges and resulting ticket price increase in 2024 on selected EU ferry routes (prices for return voyages for 1 adult and 1 car)

Port of Departure	Port of Arrival	ETS Surcharge (EUR)	Ticket price (EUR) (pax and car return)	% Ticket price increase
Patras (Greece)	Ancona (Italy)	42	675	6%
Calais (France)	Dover (UK)	8	240	3%
Karlskrona (Sweden)	Gdynia (Poland)	13.6	374	4%
Toulon (France)	Ajaccio (France)	20	184	11%
Marseille (France)	Bastia (France)	18	448	4%
Livorno (Italy)	Palermo (Italy)	24	245	10%

Source: DGCLIMA analysis

Overall, ETS costs are generally passed on to shippers by shipping companies, with **relatively limited impact on total transport prices in 2024**, estimated to be between 1% and 5% for deep sea container services and between 3% and 11% for short sea shipping services.

[192] UNCTAD Review of maritime transport 2024 (Chapter 3) RMT 2024 - Chapter III. Freight rates, maritime transport costs and their impact on consumer prices and economic activity

4.2. Impacts on essential shipping services for territorial continuity

4.2.1. Introduction

Essential shipping services that ensure territorial continuity are critical for connecting geographically isolated regions, such as islands or remote coastal communities, with the mainland or other major hubs. These services, predominantly operated via ferries (RoRo and RoPax) often include the transport of passengers, goods, and essential supplies, and they play a vital role in maintaining the social and economic integration of these regions with the broader national or regional economy.

The extension of the EU ETS to the maritime sector introduces a new operational cost for operators providing these essential shipping services and this poses a risk that service providers might reduce the frequency of their operations, withdraw from or merge less profitable routes, or increase prices for passengers and cargo. This could undermine the accessibility and affordability of essential services, particularly for vulnerable populations.

This is why the ETS Directive foresees derogations for small islands and for transnational routes under Public Service Contract or Public Service Obligation (PSO-PSC). These relate to shipping services which are subsidised by national or regional governments to ensure territorial continuity especially in remote or less economically developed areas (less frequented routes). With the case of PSOs (or PSCs) established by two EU Member States, one having no land border with another EU Member State and the other being the closest, shipping companies undertaking these routes will be exempt from the obligation to surrender ETS EU allowances.

This section examines the extent to which the risk of negative impacts on essential shipping services for territorial continuity is being materialised by looking at whether there are observed changes to selected routes of essential services and the potential additional costs associated with the ETS to operators on these routes.

4.2.2. Are there any observed changes in frequencies of these services?

We have used MARINFO data to identify the top ten ferry services to islands in the EU, based on the number of port calls by RoRo and RoPax vessels over 2022 – 2024 and identify the most frequented islands. They are listed in Table 4-7.

The present analysis focuses on these top ten ferry services as most voyages from/to small island ports are exempted from EU ETS as per Article 12(3-d) of the EU ETS

Directive[193]. Hence, the ETS costs are not expected to have any significant negative impact on these (less frequented) services from/to small islands. On the contrary, some shipping lines might add port calls at these exempted small islands' ports in order to benefit from the derogation on their way from/to other non-exempted islands belonging to the same Member State, thereby increasing the transport services and connectivity of small islands.

In Table 4-7, only 3 out of the 10 top ten ferry services identified would be subject to the small islands derogation pursuant to Article 12(3-d) of the ETS Directive.

Table 4-7: Top ten routes between EU mainland ports and EU islands, based on number of port calls from 2022 to 2024

#	Route	Country (start port)	Country (end port)	Island (end port)	Route falling within the small islands derogation?
1.	Piombino - Portoferraio	Italy	Italy	Elba	Yes
2.	Ystad - Ronne	Sweden	Denmark	Bornholm	No (*)
3.	Livorno - Olbia	Italy	Italy	Sardinia	No
4.	Valencia - Palma	Spain	Spain	Mallorca	No
5.	Barcelona - Palma	Spain	Spain	Mallorca	No
6.	Stockholm - Mariehamn	Sweden	Finland	Åland Islands	No (*)
7.	Grisslehamn - Berghamn Eckero	Sweden	Finland	Åland Islands	No (*)
8.	Nynashamn - Visby	Sweden	Sweden	Gotland	Yes
9.	Naples - Palermo	Italy	Italy	Sicily	No
10.	Valencia - Ibiza	Spain	Spain	Ibiza	Yes

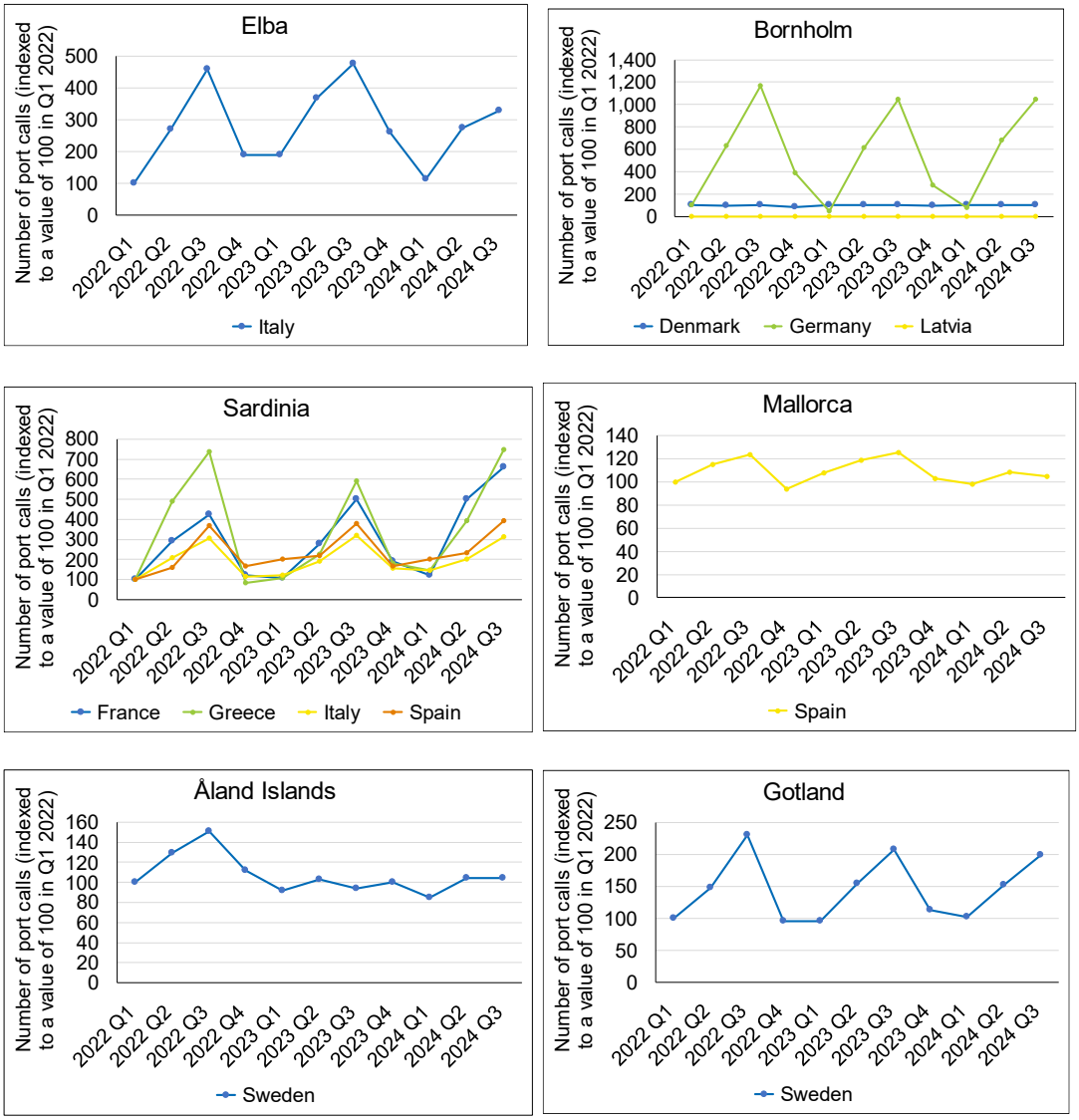
Source: Own elaboration based on MARINFO

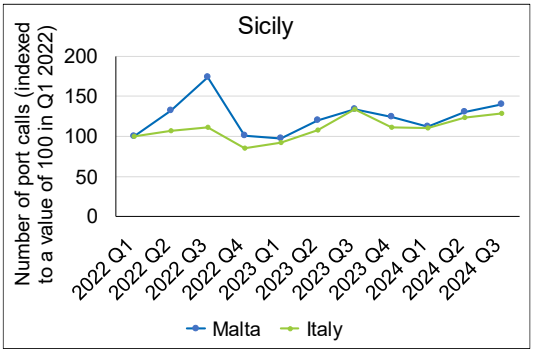
[193] Commission Implementing Decision (EU) 2023/2895 Implementing decision - EU - 2023/2895 - EN - EUR-Lex

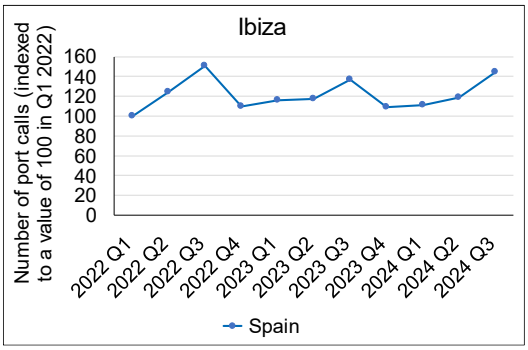
(*) Although the island port is listed in Commission Implementing Decision (EU) 2023/2895, the concerned route is not subject to the derogation pursuant to Article 12(3-d) of the ETS Directive because it is connecting two different Member States.

For the eight islands identified in the above routes, we have then analysed trend in the number of port calls to these islands from 2022 to Q3 of 2024 using MARINFO data (see Figure 4-3).

Figure 4-3: Trend in port calls at EU islands over time, with indication of country of previous port (see legend)







Source: Ricardo analyses of EMSA MARINFO data

Across the eight islands analysed above, there is no obvious decrease in port calls from 2023 to 2024. Island Elba, Bornholm, Sardinia and Gotland all experience strong periodic/ seasonal trends. Comparing the port calls on a quarterly basis, Elba experiences a slight dip from Q1 and Q2 of 2023 to Q1 and Q2 for 2024, however Bornholm and Gotland have seen a stable trend across the quarters between 2023 and 2024, and Sardinia has seen a slight increase between the first two quarters of 2023 to 2024.

Furthermore, it is worth noting that the three islands (Sardinia, Mallorca, Sicily) that do not benefit from the small islands derogation pursuant to Article 12(3-d) of the ETS Directive do not show any specific variation in traffic compared to the five islands that are listed in Commission Implementing Decision (EU) 2023/2895. This tends to confirm the absence of any significant ETS impacts on frequencies of traffic from/to islands.

Charts showing the trend in port calls for the remaining EU islands[194] are presented in Appendix 3. Across 44 islands, a very similar trend can be seen to the islands discussed above; a slight decrease is seen in port calls following Q3 to Q4 of 2023, however this is seen to recover in Q2 of 2024.

Information received from the questionnaire sent to MS port authorities has also been reviewed for any reported changes to island ferry routes. Limited responses relevant to island ferry routes has been provided from island ports or Member State authorities. One Italian mainland port mentioned that ferries and cruises have recovered from COVID-19 with a general increase of demand. It is not evident from the limited information provided that there have been any implications for island ports as a result of the ETS.

4.2.3. What could be the additional ETS cost to these services?

To assess the potential additional ETS costs to operators, routes identified in the previous section and not connected to any island listed in Commission Implementing Decision (EU) 2023/2895 have been used for the analysis. For these routes, MRV data has been used to

[194] Includes all islands in the Mediterranean, excluding those with low activity (i.e. < 200 port calls per year) or intermittent port calls. *Source: EMSA MARINFO data*

obtain information on fuel consumption, used in conjunction with fuel costs[195] to estimate the total annual cost for each voyage (forward and return routes)[196]. The associated ETS costs have been calculated, based on the associated CO_2 emissions per voyage, ETS cost per tonne of CO_2[197], and required ETS allowances (%).

Table 4-8: Estimated ETS costs for key island routes in the EU 2024

#	Route	ETS cost (mEUR) (for 2024, at 40% emissions)
3	Livorno - Olbia	10.6
4	Valencia - Palma	6.9
5	Barcelona - Palma	3.1
9	Naples - Palermo	5.6

Source: Own elaboration based on EMSA and MRV data

In 2024, the ETS cost is estimated to be an additional 5.6% over the estimated total shipping costs for all above routes (using the same assumptions as in Section 4.1). The ETS cost would be expected to increase in 2025 and 2026, due to the phase-in approach, but also influenced by future measures taken by shipping companies to reduce their GHG emissions.

Increases in costs and possibly prices may yield economic impacts for islands which already experience a higher cost of life compared to mainland Europe. As flagged by a port authority from the questionnaire, it is possible that ETS costs can be charged to cargo offloaded by shipping companies, which could increase the living costs of the local population.

> Overall, the ETS can be expected to have some impacts on the voyage costs payable for shipping routes to islands, with greater impacts in the following years due to the phase-in approach. To this point, there is currently no evidence that ETS has led to a reduction in shipping services to islands, based on the trend in port calls analysed;

[195] Fuel use has been assumed to be 70% VLSFO and 30% MGO. Costs based yearly average fuel price in Rotterdam, taken from: https://shipandbunker.com/prices/emea/nwe/nl-rtm-rotterdam. Fuel prices have been assumed to remain constant, for the analysis, in order to ease comparison between the years.

[196] As data for 2024 is only available for the first three quarters of the year, an approximation has been made for Q4 of 2024. This has been done by estimating the inflationary factor between the same quarters of 2023 and 2024 (taking an average of the factors), and applying this factor to Q4 of 2023 in order to estimate Q4 of 2024.

[197] EU ETS allowance costs of €64.62 per tonne CO_2 have been assumed for 2024. The cost has been assumed to be the same for 2025 onwards, to enable comparison of ETS costs across the years.

> therefore, the ETS cost in the current year does not seem to have affected the frequency of shipping services to islands or deterred companies from undertaking these routes, based on the data available.

5. Impacts on shipping services to, from and within outermost regions

The impact assessment on the extension of the EU ETS to maritime transport[198] identified that EU outermost regions (and other islands) are particularly exposed to economic impacts from changes in the shipping sector and would be affected more by the implementation of the EU ETS on the maritime sector. This is due to several factors, including significantly longer voyage legs to outermost regions than intra-EU journeys and lower GDP per capita at outermost regions compared to their national (and wider EU) averages.

As a result, the updated ETS Directive includes some derogations for voyages travelling to/from outermost regions until 31 December 2030. Shipping companies are not obliged to surrender allowances for emissions produced on voyages between a port located in an outermost region of an EU Member State and a port located in the same EU Member State (e.g., Lanzarote-Valencia), including voyages between ports within an outermost region (e.g., Lanzarote-Fuerteventura) and voyages between ports in the outermost regions of the same EU Member State (e.g., Guadeloupe-Martinique). In addition, shipping companies are not obliged to surrender allowances in respect of emissions released within the ports in relation to such voyages.

The implementation of the EU ETS on voyages to and from outermost regions (if not from the same Member State) would be expected to increase operating costs, while influenced by the measures implemented by shipping companies to reduce their GHG emissions (which may, themselves, incur additional costs). This may have had an impact on demand for transport in relation to outermost regions and may also have resulted in some evasive behaviours, similar to those described in Section 3.

The approach to assessing the possible impacts of the EU ETS on transport to, from and between outermost regions follows a similar approach to that for evasive behaviours, with a set of research questions, which are addressed using quantitative and qualitative analyses. The research questions adopted are shown in Table 5-1 and are addressed in the following sections.

[198] https://op.europa.eu/en/publication-detail/-/publication/ba865136-353b-11ec-bd8e-01aa75ed71a1

Table 5-1: Research questions covering impacts on shipping services to, from and within outermost regions

Question ID	Question	Indicators	Data used
ORI1	Has there been a reduction in maritime traffic at ports in outermost regions?	Numbers of port calls by quarter at ports in outermost regions, disaggregated by main relevant ship types	EMSA MARNFO data
ORI2	Do trends in maritime traffic at outermost region ports show different patterns depending on origin/destination?	Numbers of port calls by quarter at ports in outermost regions, separated by country of origin	EMSA MARNFO data
ORI3	Have there been decreases in transhipment activities at ports in outermost regions?	Quantities of container transhipments by quarter for ports in outermost regions	Econdb data

5.1. ORI1 – Has there been a reduction in maritime traffic at ports in outermost regions?

The aim of this question is to investigate whether there have been any reductions in traffic at ports in outermost regions since the extension of the EU ETS in 2024. Any such reductions in traffic to ports could indicate impacts of the EU ETS on maritime traffic to such regions, potentially due to the increase in transport costs leading to a reduction in demand.

The analyses of data from the EMSA MARINFO database to address this question, considered the following EU outermost regions and ports:

Outermost region	Ports
Azores	Ponta Delgada, Vila do Porto, Praia da Vitoria, Angra do Heroismo, Praia da Graciosa, Horta, Sao Roque do Pico, Velas
Madeira	Funchal, Porto Santo, Canical
Canary Islands	San Sebastian (Canary Islands), Santa Cruz de la Palma, Santa Cruz de Tenerife, Arrecife de Lanzarote, Puerto del Rosario, Morro Jable, Las Palmas, Agaete Puerto de las Nievas, Los Cristianos
Guadeloupe	Basse-Terre, Folle Anse, Pointe-a-Pitre
French Guiana	Degrad des Cannes, Pariacabo, St Laurent du Maroni
Martinique	Fort-de-France, Marin (Martinique)
Mayotte	Longoni (Mayotte)
Saint Martin	Galisbay

Outermost region	Ports
Réunion	Port Réunion

For each of these outermost regions, the numbers of port calls by different vessel types (for vessels above 5,000 GT, and hence covered by the EU ETS) have been analysed to identify whether there are any trends indicating impacts of the EU ETS on vessel operations.

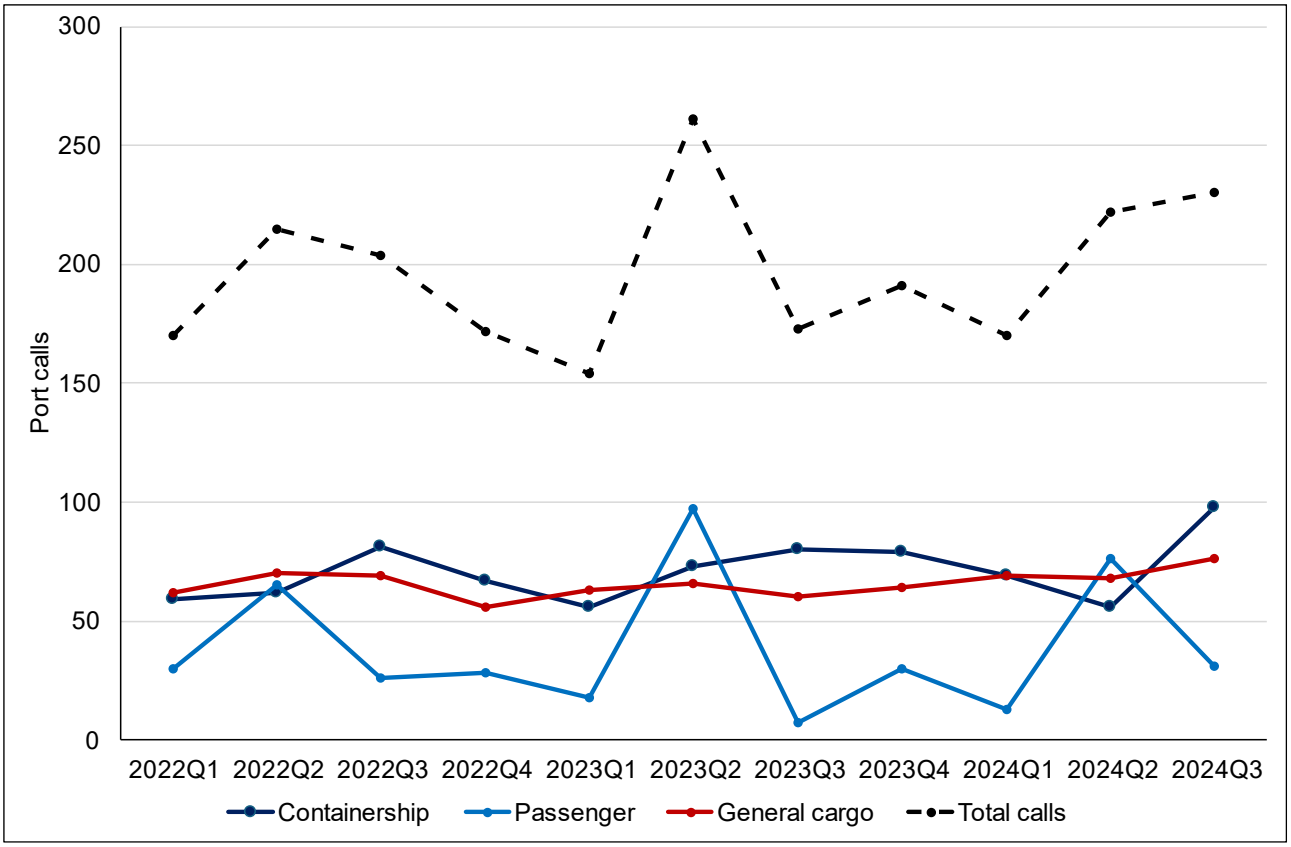
5.1.1. Azores

In Figure 5-1, the analysis looks at the total number of port calls at ports in the Azores in each quarter from the beginning of 2022 to Q3 2024, with the numbers by different vessel types also shown. In addition to the vessel types included in Figure 5-1, analyses were also made of port calls by RoPax, RoRo cargo, refrigerated cargo and oil tanker vessels; however, the numbers of port calls identified for these vessel types were zero or negligible.

The total port calls showed a peak in Q2 of 2023, after which they dropped back to similar levels to those from previous quarters. There has then been another rise in port calls to Q2 2024. Looking at the different vessel categories, it is clear that the large variations in the overall numbers of port calls is related to the passenger ship sector, with the sharp increases in Q2 2023 and Q2 2024 being mirrored by this sector. This shows strong seasonal variations, with peaks seen in Q2 of both 2022 and 2023 (and possibly Q2 2024), which may be related to demand for the cruise sector. Year on year, the passenger ship sector shows a reduction of 1.6% in port calls between Q1 to Q3 2023 and Q1 to Q3 2024; this is mostly due to the lowering of the peak in calls between Q2 2023 and Q2 2024. The other vessel categories (container and general cargo ships) both show much lower variations over time. The container ship sector does show a gradual reduction in port calls from Q3 2023 to Q2 2024, but only to similar levels to those that were seen in Q1 2023; this is then followed by an increase to Q3 2024. The container ship sector shows an overall increase in port calls from H1 2023 to H1 2024 of 6.7%, while the general cargo sector shows an increase of 12.7% over the same period.

Overall, there is no indication of any significant reduction in port calls at ports in the Azores in 2024 and no indication of any different behaviour amongst the different vessel categories, other than the differences in seasonal variations seen.

Figure 5-1: Numbers of ports calls by quarter at ports in the Azores (from Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.1.2. Madeira

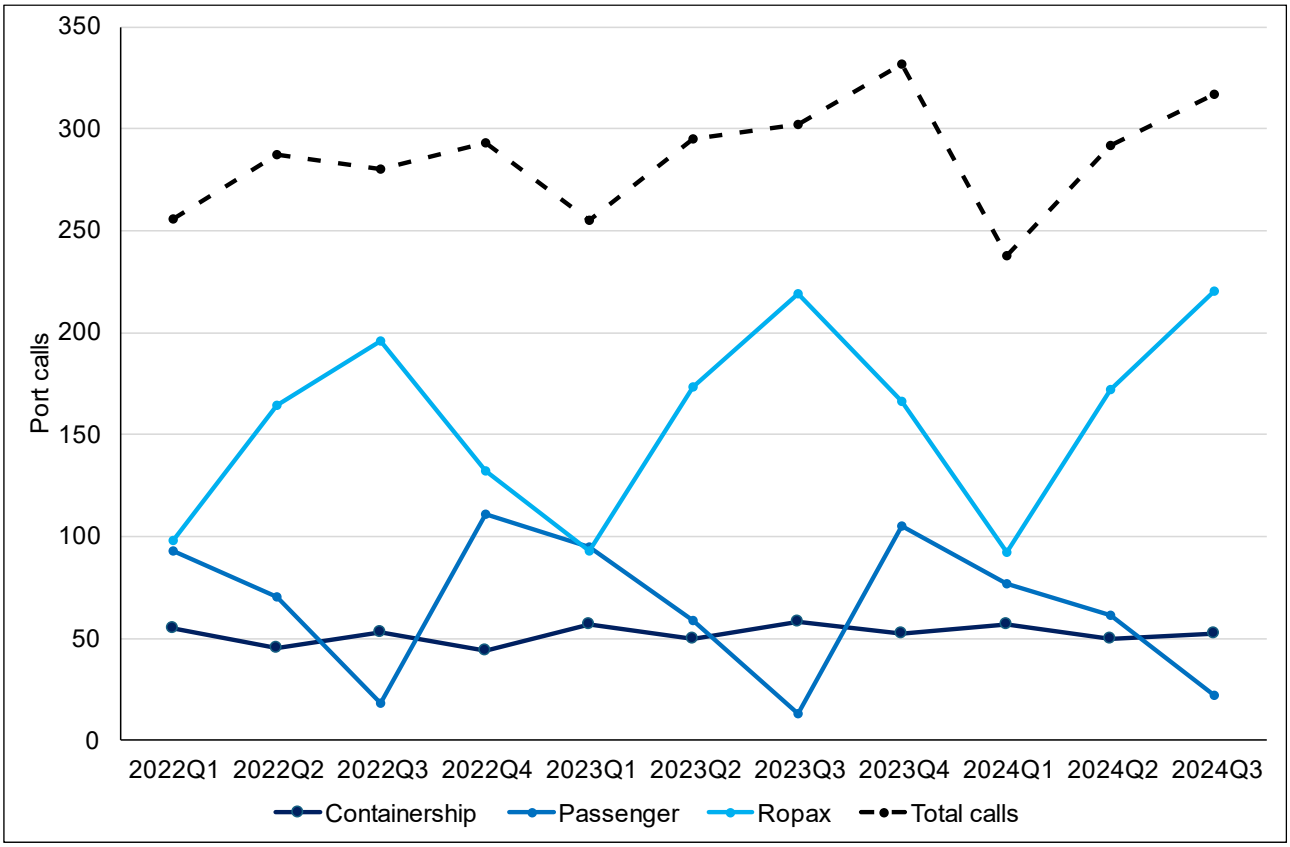
The numbers of port calls at ports in Madeira are shown in Figure 5-2.

In this case, the variations in activity are again strongly seasonal for passenger and RoPax vessels. Calls by container vessels are generally at lower levels than the other two categories and show relatively little variation over time.

Year on year, the container ship sector shows a slight reduction of 3.6% in port calls between Q1 to Q3 2023 and Q1 to Q3 2024, with the passenger and RoPax ship sectors having reductions of 4.2% and 0.2% in port calls over the same period.

Overall, while there are significant differences in the behaviour of some vessel categories (passenger and RoPax vessels) in 2024, these are consistent with those seen in the same quarters of previous years and do not show any specific impacts of the EU ETS in 2024.

Figure 5-2: Numbers of ports calls by quarter at ports in Madeira (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.1.3. Canary Islands

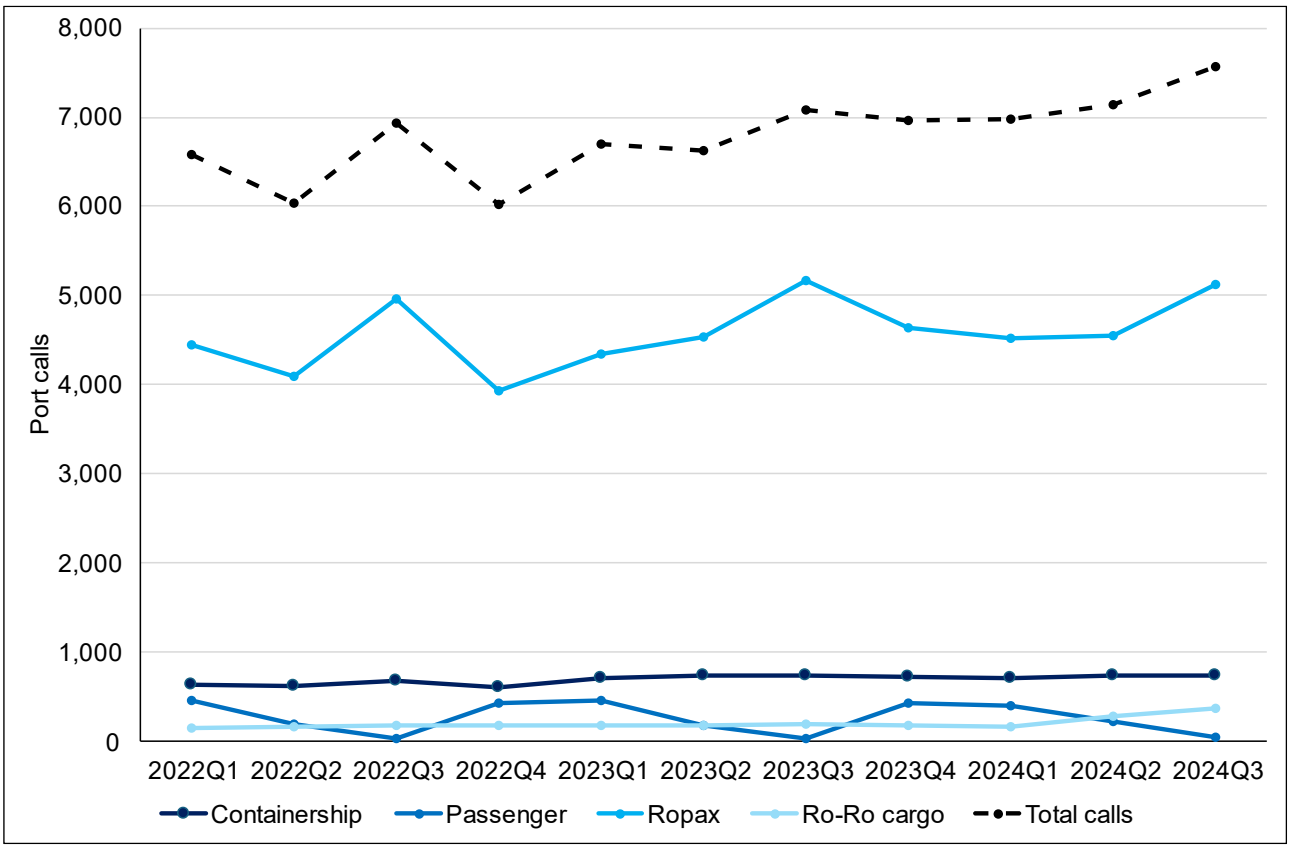
The numbers of port calls at ports in the Canary Islands are shown in Figure 5-3.

The largest contribution to port calls at ports in the Canary Islands is from RoPax vessels. The numbers of port calls by these ships have been largely stable over time and do not show any significant variations in 2024. The container ship sector has a substantially lower level of port calls and, again, they show little variation in 2024. Numbers of port calls by passenger and RoRo cargo vessels are lower still, with passenger vessels showing some seasonal dependence (peaks in Q4 and Q1 of each year), while those for RoRo cargo vessels are very stable, with a small increase evident in Q2 2024.

Year on year, the container ship category had a slight increase of 0.1% in port calls between Q1 to Q3 2023 and Q1 to Q3 2024, with the passenger ship and RoPax sectors having a reduction of 2.9% and an increase of 1.2% over the same period. The RoRo cargo sector experienced an increase of 43% in port calls during this period, but this is against a low level throughout 2023 and a relatively small rise in 2024.

Overall, numbers of port calls at ports in the Canary Islands do not show any noticeable reductions in 2024 in comparison to 2023 and there are no significant differences in the behaviour between vessel categories.

Figure 5-3: Numbers of ports calls by quarter at ports in the Canary Islands (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.1.4. Guadeloupe

The numbers of port calls at ports in Guadeloupe are shown in Figure 5-4.

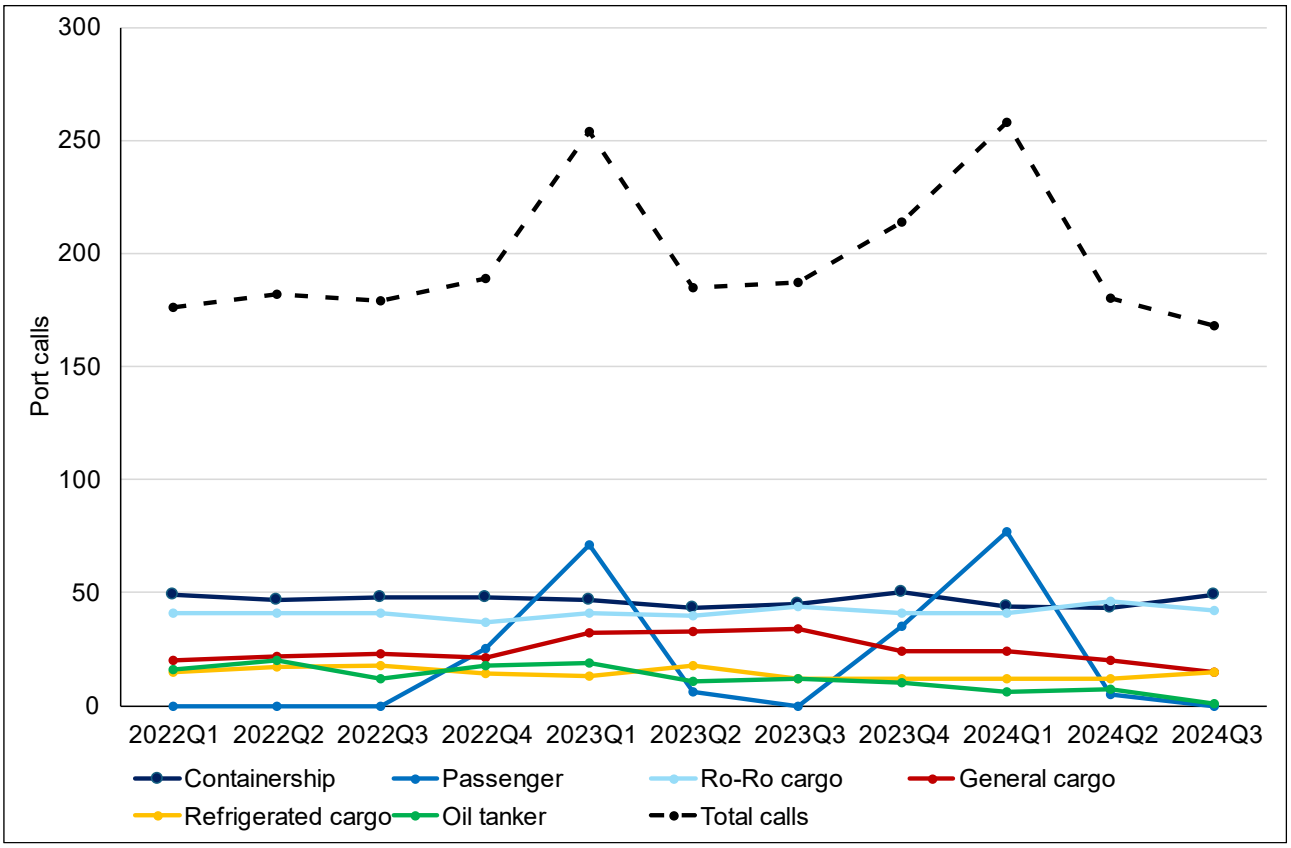
Similarly to other outermost regions, the passenger vessel sector shows significant seasonal variations, with peaks evident in Q1 of 2023 and 2024 (although there was no equivalent peak in Q1 of 2022, potentially due to the lingering impacts of the COVID-19 pandemic on some sections of the tourism industry). All other vessel categories show much lower variations in numbers of port calls, with no indication of changes in 2024, although some vessel categories (e.g., general cargo and oil tanker) have seen quite significant reductions in port calls as 2024 has progressed.

Year on year, the container ship category had an increase in port calls of 0.8% from Q1 to Q3 2023 and Q1 to Q3 2024, with the general cargo, refrigerated cargo and oil tanker sectors experiencing reductions of 40.4%, 9.3% and 66.7% reductions, respectively. As

noted above, the passenger ship sector has a strong seasonal variation at Guadeloupe; in Q1 2024 the peak was slightly higher than in 2023, with a result of 6.5% increase in port calls for Q1 to Q3 2024, relative to the same period in 2023. The RoRo category also experienced a small increase (3.2%) between Q1 to Q3 2023 and Q1 to Q3 2024.

Overall, the numbers of port calls at ports in Guadeloupe do not show any noticeable changes in 2024.

Figure 5-4: Numbers of ports calls by quarter at ports in Guadeloupe (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.1.5. French Guiana

The numbers of port calls for ports in French Guiana are shown in Figure 5-5.

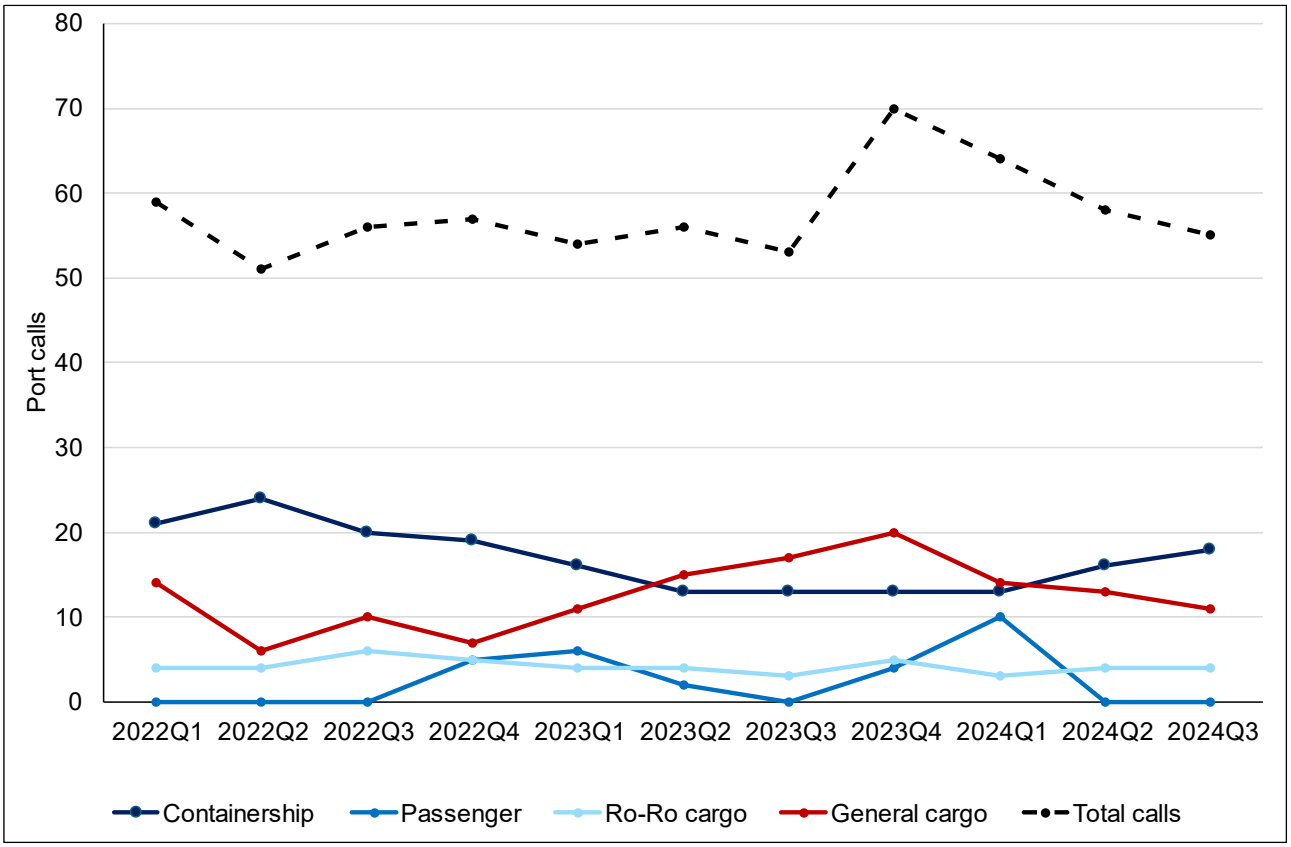
Overall, the numbers of port calls at ports in French Guiana are much lower than for the previous outermost regions. The results show a gradual reduction in port calls over time for the container ship sector, accompanied by a gradual increase by the general cargo sector. In both cases, there is a reversal of the trend in 2024, perhaps indicative of changes in market (i.e. changes in demand for different products leading to changes in the form of transport). The passenger ship sector shows a reduction to zero port calls in Q2

2024, similarly to some previous quarters, while the RoRo cargo sector is more stable than any of the other sectors.

Year on year, the container ship sector had an increase in port calls in Q1 to Q3 2024 of 16.7% relative to the same period in 2023, while the general cargo sector experienced a reduction of 7.0%. The passenger ship sector had a 25.0% increase in port calls, while overall, the RoRo cargo sector saw no change in port calls across the two periods.

The overall results show some different behaviours of different vessel categories in 2024; however, the numbers of port calls are generally very low and likely to be sensitive to wider economic factors (and, therefore, may not be indicative of impacts of the EU ETS).

Figure 5-5: Numbers of ports calls by quarter at ports in French Guiana (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.1.6. Martinique

The numbers of port calls at ports in Martinique are shown in Figure 5-6.

The passenger ship category shows strong seasonality, with the peak numbers of port calls occurring in Q1; some other categories do exhibit some form of seasonality, but at a much lower level.

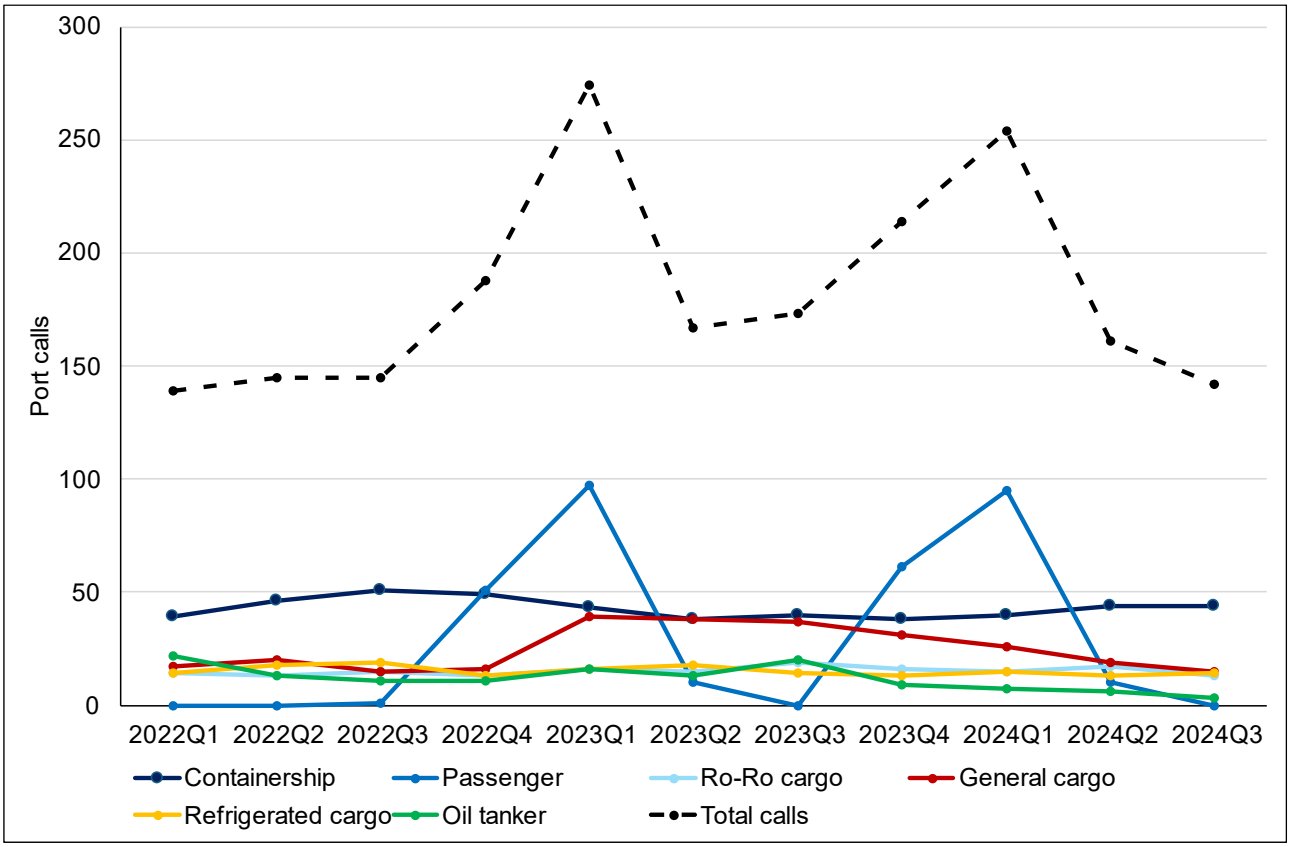
Year on year, the container ship category saw a growth in port calls of 5.8%, while all other categories experienced a reduction. The reduction for the passenger ship category was small at 1.9%, while those for RoRo and refrigerated cargos categories were rather larger at 10.0% and 12.5%, respectively. The general cargo and oil tanker categories both experienced a significant drop in port calls, at 47.4% and 67.4%.

The results for Martinique show similar characteristics to those for Guadeloupe, with strong seasonal variations in passenger traffic. More detailed investigations show that in Q1 2024, approximately 3% of the port calls by passenger vessels were by vessels that had departed from Guadeloupe, with the remainder being departures from other islands in the Caribbean (Barbados, St Lucia, Virgin Islands, etc.). In Q2 2024, the total number of port calls by passenger ships had dropped sharply, with all being associated with departures from the other islands in the Caribbean. However, this is in line with normal seasonal effects for this segment.

Conversely, for Guadeloupe, in Q1 2024, approximately 36% of port calls by passenger vessels are departures from Martinique, with the remainder being from the other islands in the Caribbean, suggesting a direction to a circular route calling at multiple islands. In Q2 2024, again the number of port calls by passenger vessels had dropped sharply at Guadeloupe, with about 30% being from Martinique.

Importantly, the distributions of routes (i.e. departure countries for port calls at these two islands) were very similar for Q1 2023, with all traffic being either between the two islands or from other islands in the Caribbean. There were no port calls by passenger vessels that had departed mainland EU Member States in either year, all traffic was from ports within the Caribbean. While the difference in percentages of port calls at Martinique by vessels departing Guadeloupe, and those at Guadeloupe by vessels departing Martinique, shows that there is a dominant direction of travel around the region, there is no evidence that this has changed in 2024 compared to the previous year.

Figure 5-6: Numbers of ports calls by quarter at ports in Martinique (Q1 2022 to Q3 2024)



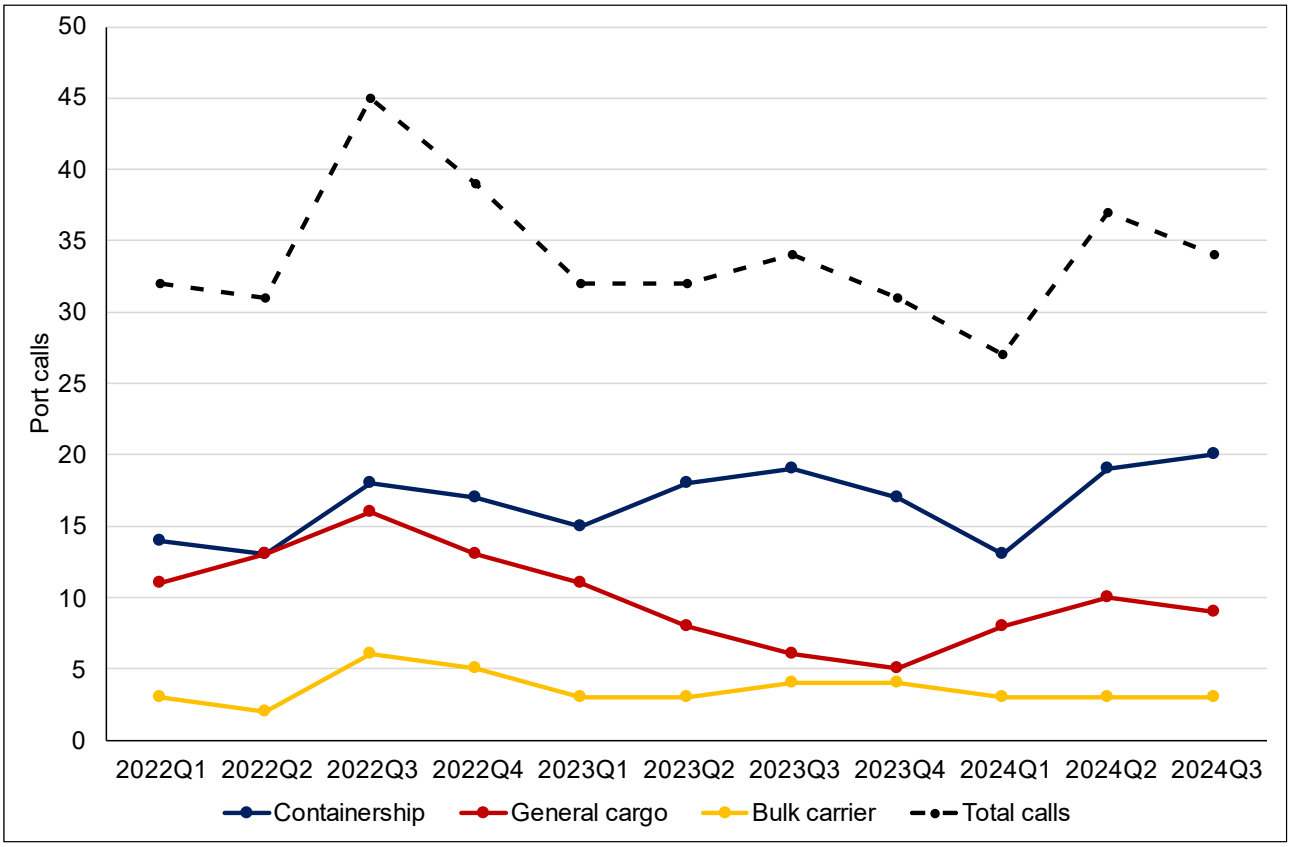
Source: Ricardo analyses of EMSA MARINFO data

5.1.7. Mayotte

The numbers of port calls at ports in Mayotte are shown in Figure 5-7. The container ship category has a generally constant level of calls, although with some reductions evident in Q1 of 2023 and 2024. The general cargo category had a peak number of calls in Q3 of 2022, after which there was a gradual reduction to Q4 of 2023. In 2024, the category showed some signs of recovery in Q1 and Q2, with Q3 then very similar to Q2. The other category with port calls at Mayotte is the bulk carrier category, which has a lower level of calls (three to five calls per quarter), which have been quite stable since 2023.

Year on year, the container ship category showed no change between Q1 to Q3 2023 and the same period in 2024, while the general cargo category showed an 8.0% increase between the same three quarter periods, noting that this started from a reducing level in 2023. Over the same periods, the bulk carrier category shows a 10.0% reduction in port calls, although, as noted above, this is against a low number of calls per quarter for this category.

Figure 5-7: Numbers of ports calls by quarter at ports in Mayotte (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

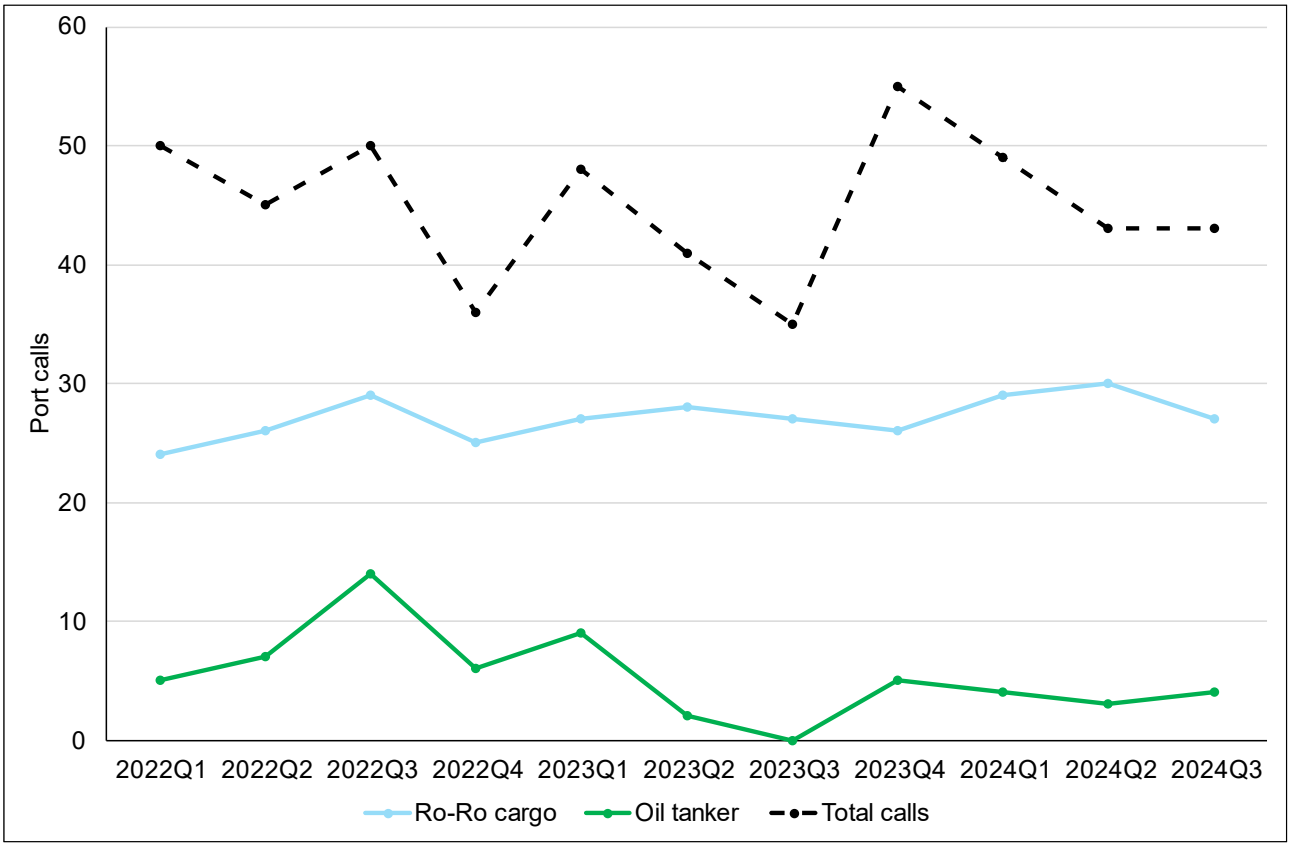
5.1.8. Saint Martin

The numbers of port calls at ports in Saint Martin are shown in Figure 5-8.

For Saint Martin, the only vessel categories with any evident traffic are the RoRo cargo and oil tankers. The numbers of port calls for RoRo cargo vessels are generally very stable, with some slight evidence of seasonality. The numbers of port calls for oil tankers are much lower, with no noticeable seasonality.

While both the vessel categories show variations across the time period shown, neither exhibits any significant reductions in 2024.

Figure 5-8: Numbers of ports calls by quarter at ports in Saint Martin (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.1.9. Réunion

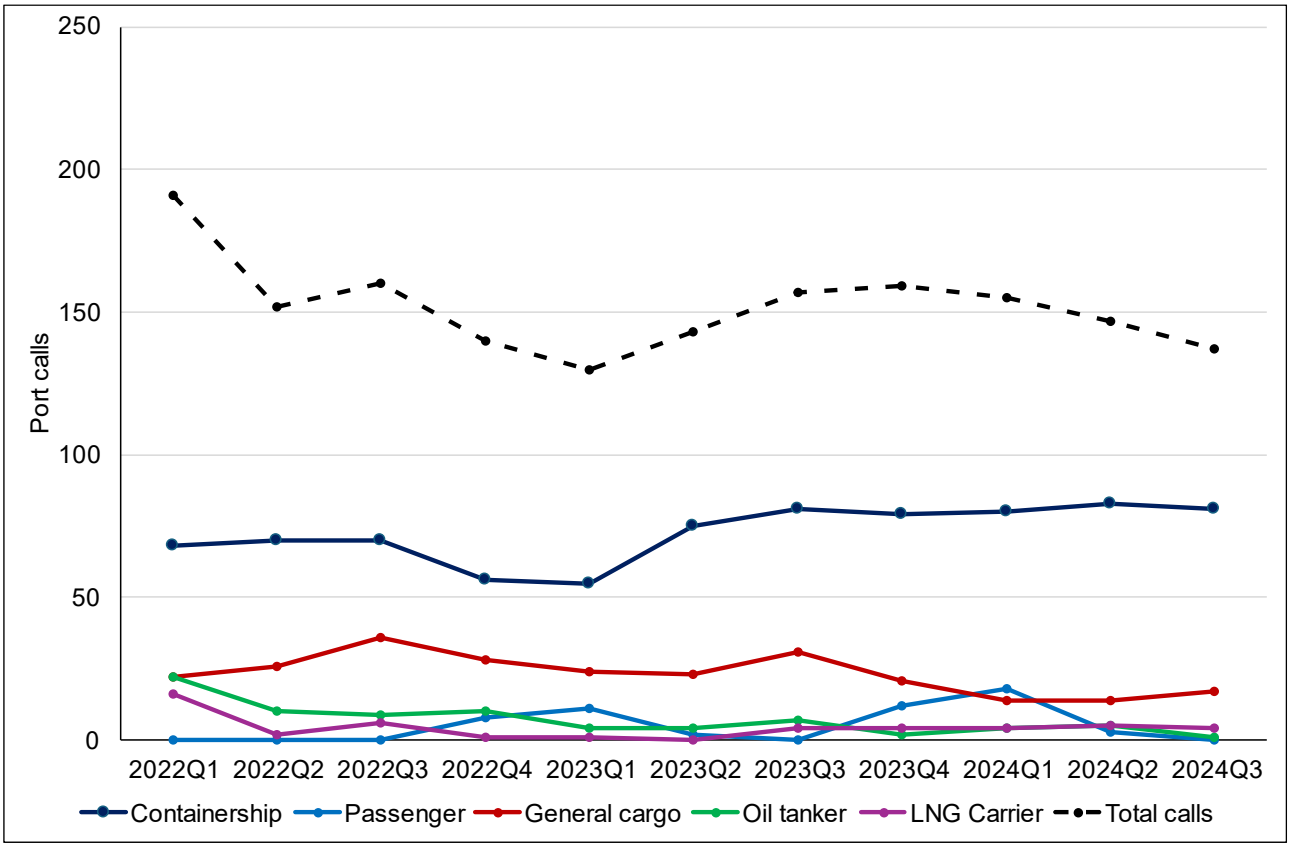
The numbers of port calls by vessels in Réunion are shown in Figure 5-9.

The results for Réunion show a generally stable level of port calls by most vessel types (following some reductions evident in early 2022). Calls by container ships, which have the greatest contribution to the total, show a small increase from Q2 2023 over the previous quarters.

Passenger ships show a reduction in port calls between Q1 and Q2 2024, but this is consistent to that seen in 2023.

Year on year, port calls by container ships increased by 15.6% in Q1 to Q3 2024 compared to the same period in 2023, while those by passenger ships increased by over 61% (from a low level). General cargo ships and oil tankers both experienced reductions in port calls over this period, by 42.3% and 33.3% respectively.

Figure 5-9: Numbers of ports calls by quarter at ports in Réunion (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.1.10. General observations

It should be noted that in responses to the ports' questionnaire, several of the outermost regions have reported their concerns about being included in the Maritime ETS. For example, one Member State reports that a current service includes a transatlantic route from Valencia (Spain) to a port located in the outermost region of another Member State, which will now have a 100% ETS charge. The ports have mentioned that this can result in a competitive disadvantage for ports in the outermost regions. Additionally, ports have noted that the import of energy-related products (wood pellets or coal, for example) can be very important for the islands and the increase in costs will be passed through to the islanders. Despite theoretical concerns over potential impacts, they do not however mention any reports of changes to existing shipping services; this is also evidenced by the trends discussed above.

> Overall, the analysis of port calls at the different outermost regions analysed in 2024 shows trends that are consistent with those seen in previous years or appear to be associated with changes in traffic within the region (in particular within the Caribbean). They do not indicate any unusual reductions in traffic in any of the outermost regions in 2024.

5.2. ORI2 - Do trends in maritime traffic at outermost region ports show different patterns depending on origin/destination?

The aim of this question is to analyse whether there have been any significant changes in port calls in outermost regions, looking at the origin and destination of voyages. This provides insights into whether any changes in operations may be associated with evasive behaviours such as calling at other outermost regions first, to reduce the costs under the EU ETS. It can also provide indications of whether the magnitude of traffic from non-EU countries is being reduced because of the increased costs of transport following the extension of the EU ETS. Many outermost regions are dependent on the import of goods (including food and energy) by maritime transport for their well-being; therefore, the main focus of the analysis has been on voyages to the islands from other countries (including both EU and non-EU), more so than departures from the outermost regions, to identify the relevant trends in traffic.

The analysis for this question draws on the same data from the EMSA MARINFO database as for ORI1, but now focusing on the country or region of departure for the voyages seen. The results are separated by voyages within the outermost region, those from the European continental territory of the same Member State, those from other outermost regions (of the same Member State), those from other EU Member States (including their outermost regions) and those from other countries.

5.2.1. Azores

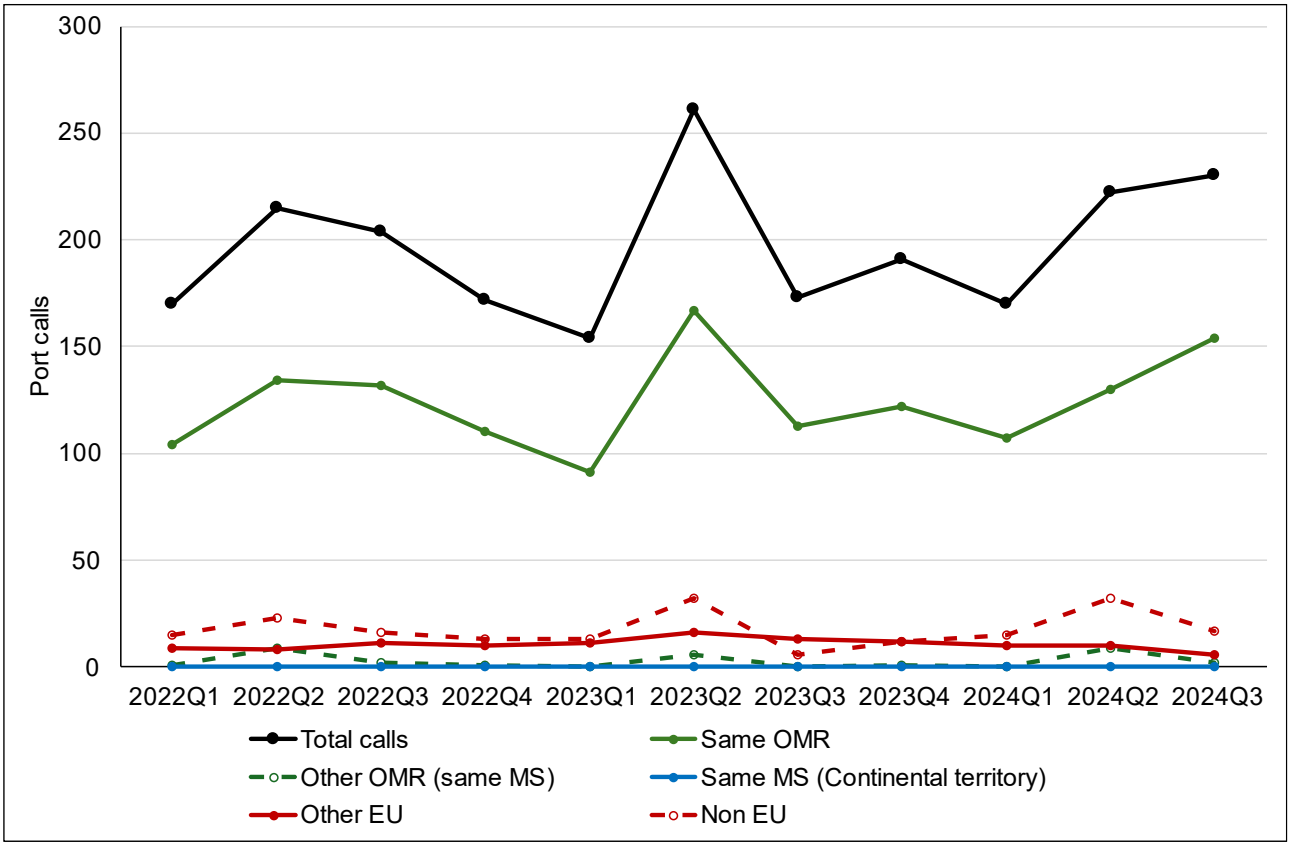
Figure 5-10 shows the total number of port calls at ports in the Azores in each quarter from the beginning of 2022 to mid-2024, split by the country of origin for the voyage to the port.

The port calls in the Azores are dominated by voyages from other islands within the (same) outermost region, with a low level of calls on voyages from the continental territory of the same Member State (Portugal). Voyages from other non-EU countries show a similar trend, albeit at a much lower level, while those from other EU Member States (including their outermost regions) are largely stable. Voyages from other outermost regions of the same Member State (Portugal) are generally at a very low level, with small seasonal increases evident in Q2 of each year.

Year on year, port calls for voyages within the Azores increased by 5.4% between Q1 to Q3 2023 and Q1 to Q3 2024, notwithstanding the large spike seen in Q2 2023. Over the same timeframe, voyages from the same Member State increased by 8.3%. Port calls on voyages from other outermost regions (with the same Member State) experienced a large percentage increase (against an overall low level) of 83%, while those from other EU Member States decreased by 35%. Voyages from non-EU countries increased by 25.5%.

Overall, the port calls associated with voyages within the Azores, from other Portuguese outermost regions and from the same Member State all increased in 2024, while those from other EU Member States decreased (but not those from non-EU countries). This could indicate existence of behaviours favouring routes within the same Member State to benefit from the outermost region derogation; however, the overall trends and the very low levels of traffic related to other EU Member States do not allow any firm conclusion to be drawn on this. This should be further monitored in months and years to come.

Figure 5-10: Numbers of ports calls by quarter at ports in the Azores (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.2.2. Madeira

The numbers of port calls at ports in Madeira, separated by the country of origin for the voyage to the port, are shown in Figure 5-11.

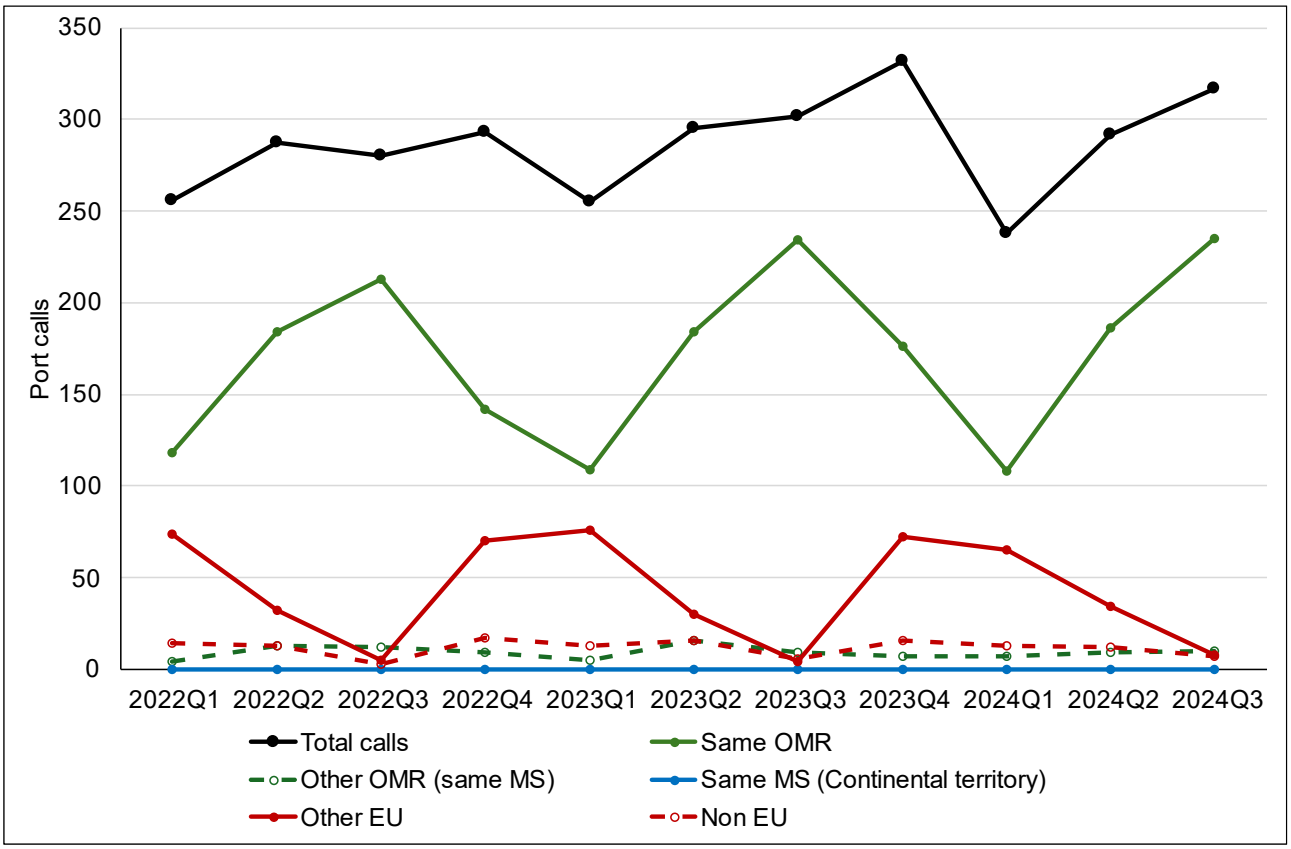
As was seen when considering the numbers of port calls by vessel types (Figure 5-2), there were strong seasonal variations (with opposite phases) for RoPax and passenger vessels. Figure 5-11 shows that the peaks seen in Q3 of each year for RoPax vessels are associated with voyages within the outermost region, while the peaks seen in Q1 of each year for passenger vessels are associated with voyages from other EU Member States (mostly ports in the Canary Islands).

Voyages from the same Member State (Portugal) and other EU Member States (including their outermost regions) also follow a seasonal variation, although with peaks in Q4 of each year and at a lower level, while those from non-EU countries are generally quite constant and at a low level.

Year on year, the port calls associated with voyages within the outermost region were almost identical (0.4% increase) between Q1 to Q3 2023 and Q1 to Q3 2024. Voyages from the same Member State showed a small increase (2.0%), while those from other Member States (including their outermost regions) reduced by 2.7%. Voyages from non-EU countries experienced a moderate reduction over the period (8.6%).

Overall, the traffic at ports in Madeira follow very similar trends for different countries of origin, although with the timing of the peaks in the seasonal variations being dependent on the region of origin.

Figure 5-11: Numbers of port calls by quarter at ports in Madeira (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.2.3. Canary Islands

Port calls in the Canary Islands, separated by country of origin of the voyage to the port, are shown in Figure 5-12.

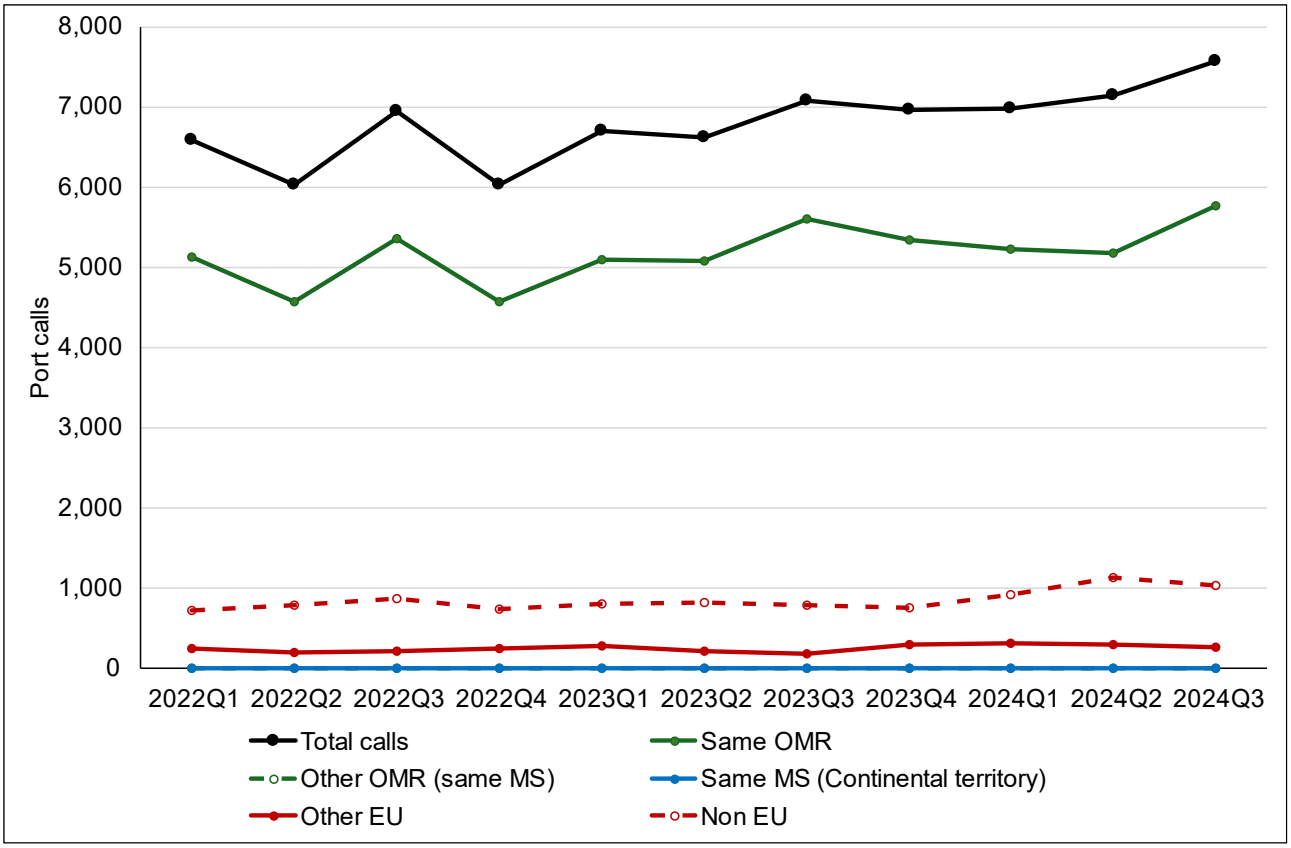
Numbers of port calls in the Canary Islands are generally much higher than in other outermost regions. Port calls are largely dominated by those within the outermost region, with much lower levels seen from the same Member State (Spain). The voyages within the Canary Islands show a small seasonal variation, with peaks seen in Q4 of each year, although the variations are not very consistent year on year. Port calls by vessels coming from non-EU ports show a slight rise since Q4 2023, consistent with the changes in routes due to the situation in the Red Sea and vessels taking the opportunity for a call in the Canary Islands.

The number of port calls from both the same Member State (Spain) and other EU Member States have remained very constant through 2023 and 2024, with no indication of a change in routing away from other Member States to be direct from Spain.

Year on year, port calls on voyages within the Canary Islands show a small increase (2.5%) between Q1 to Q3 2023 and Q1 to Q3 2024, while those from the same Member State have increased by a very similar amount (2.7%). As expected from the Red Sea re-routings, port calls on voyages from non-EU countries have increased significantly (by 27.3%). Port calls on voyages from other EU Member States increased by a significant percentage (28.9%); however, this is relative to a low overall level.

Overall, trends of port calls in the Canary Islands do show some evidence of differences depending on the origin of the voyage; however, the main difference seen, that of an increase in voyages from non-EU countries, is consistent with other trends seen due to the Red Sea situation.

Figure 5-12: Numbers of ports calls by quarter at ports in the Canary Islands (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.2.4. Guadeloupe

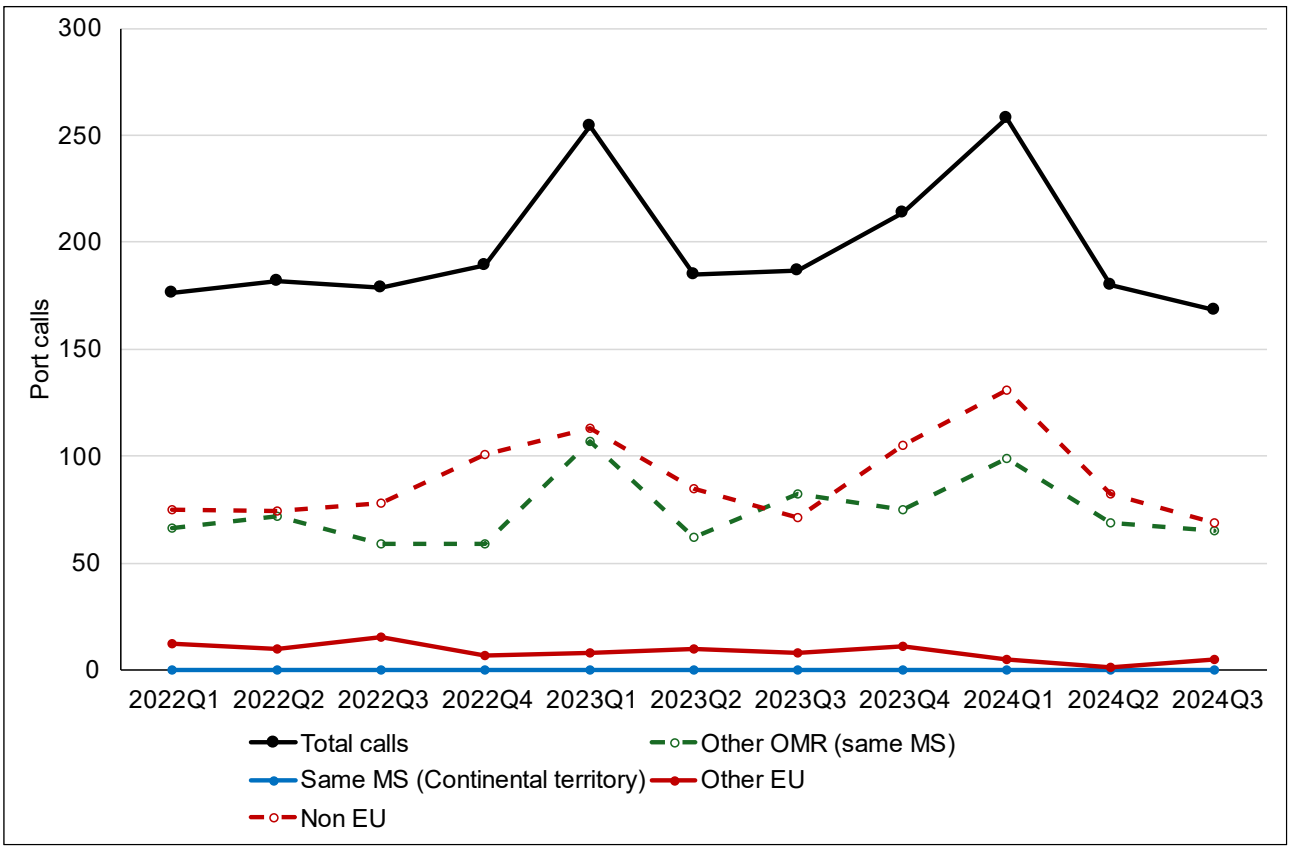
Port calls in Guadeloupe, separated by country of origin of the voyage to the port, are shown in Figure 5-13.

The trends of ports calls at ports in Guadeloupe are largely dominated by those from other French outermost regions (predominately Martinique, but also French Guiana and Saint Martin) and from non-EU countries (mostly other islands in the Caribbean, but also longer routes such as Canada, China, Gibraltar, the UK and the US). Both these types of routes are largely seasonal, with peaks in Q1 of each year. As was seen in Figure 5-4, the peaks are mostly related to the seasonal passenger traffic.

Year on year, port calls associated with voyages from other French outermost regions decreased by 7.2% between Q1 to Q3 2023 and Q1 to Q3 2024, with traffic from non-EU countries increasing by 4.8%. Port calls on voyages from the same Member State showed no overall change across this period.

While there are differences in the trends depending on the origin of the route, the key differences are associated with changes in transport of goods within the Caribbean, rather than longer distances (such as from the EU).

Figure 5-13: Numbers of ports calls by quarter at ports in Guadeloupe (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.2.5. French Guiana

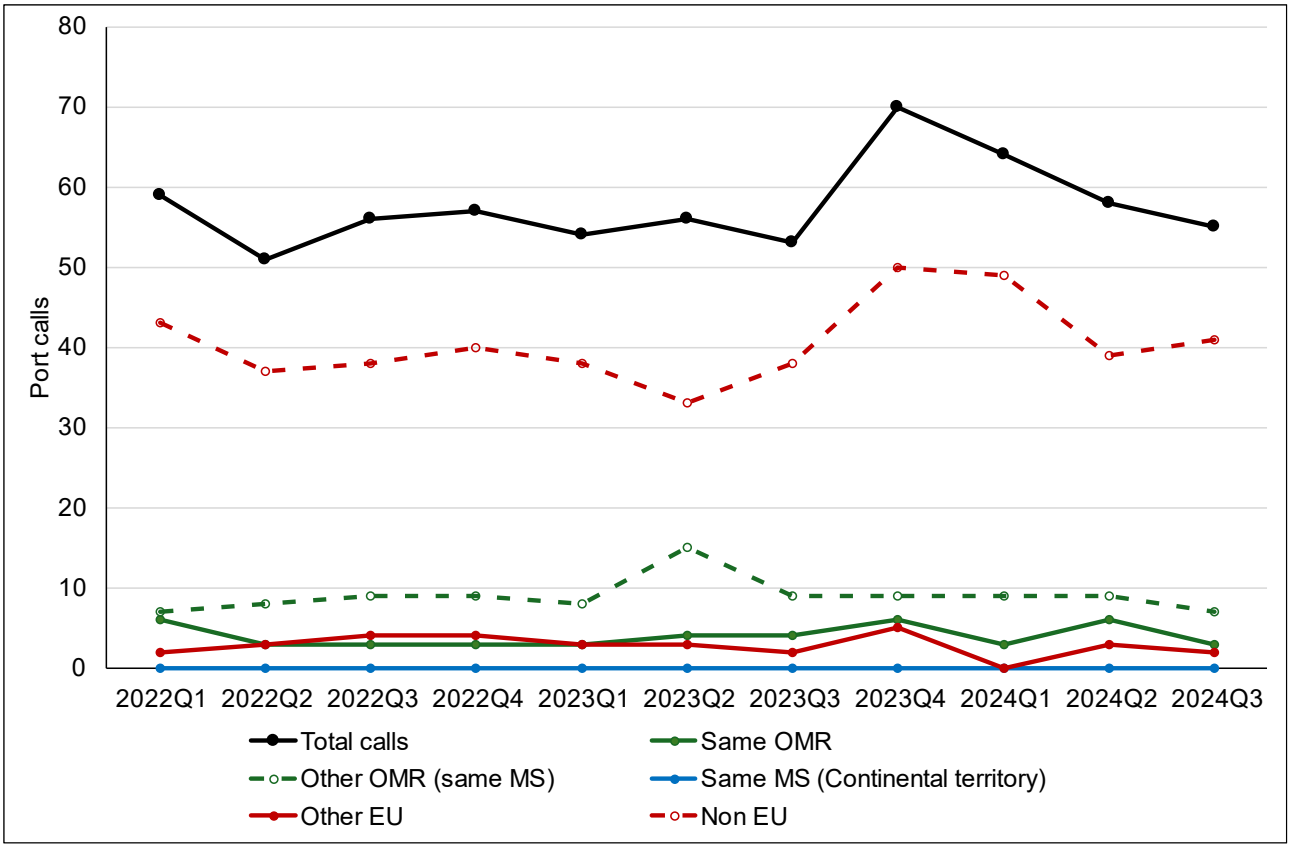
Port calls in French Guiana, separated by country of origin of the voyage to the port, are shown in Figure 5-14.

The main routes for port calls in French Guiana are from non-EU countries (mainly other islands in the Caribbean, but also some longer distance such as Brazil, China and South Africa) and from other French outermost regions (Guadeloupe and Martinique).

Year on year, the number of port calls in French Guiana on voyages from non-EU countries increased by 18.4% between Q1 to Q3 2023 and Q1 to Q3 2024, while those from other French outermost regions reduced by 21.9%.

Similar to Guadeloupe, there are some differences between the trends, depending on the origin for the route, but these are mainly associated with the changes in maritime trade in the Caribbean.

Figure 5-14: Numbers of ports calls by quarter at ports in French Guiana (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.2.6. Martinique

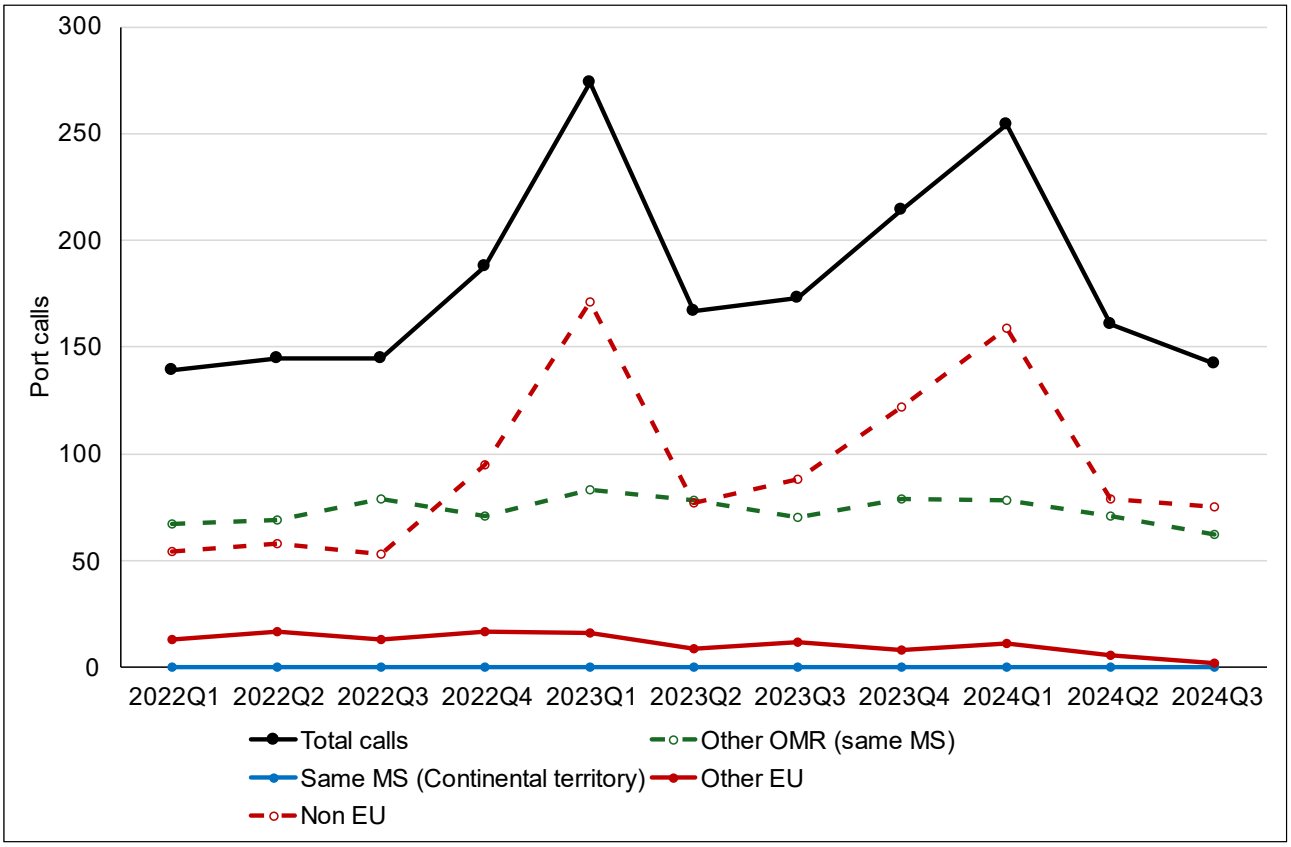
Port calls in Martinique, separated by country of origin of the voyage to the port, are shown in Figure 5-15.

As for Guadeloupe and French Guiana, and as seen previously in Figure 5-6, the trends in port calls at ports in Martinique are primarily associated with seasonal passenger vessel operations in the Caribbean (from non-EU islands in the region).

Year on year, port calls on voyages from non-EU countries (islands) decreased slightly (by 6.9%) between Q1 to Q3 2023 and Q1 to Q3 2024, while those from other French outermost regions decreased by 8.7%. Traffic from the same Member State increased significantly on a percentage basis (40%), but this is relative to a very low overall level.

The overall trends, and the variations between routes based on the origin country, are consistent with those seen for other countries in the Caribbean.

Figure 5-15: Numbers of ports calls by quarter at ports in Martinique (Q1 2022 to Q3 2024)



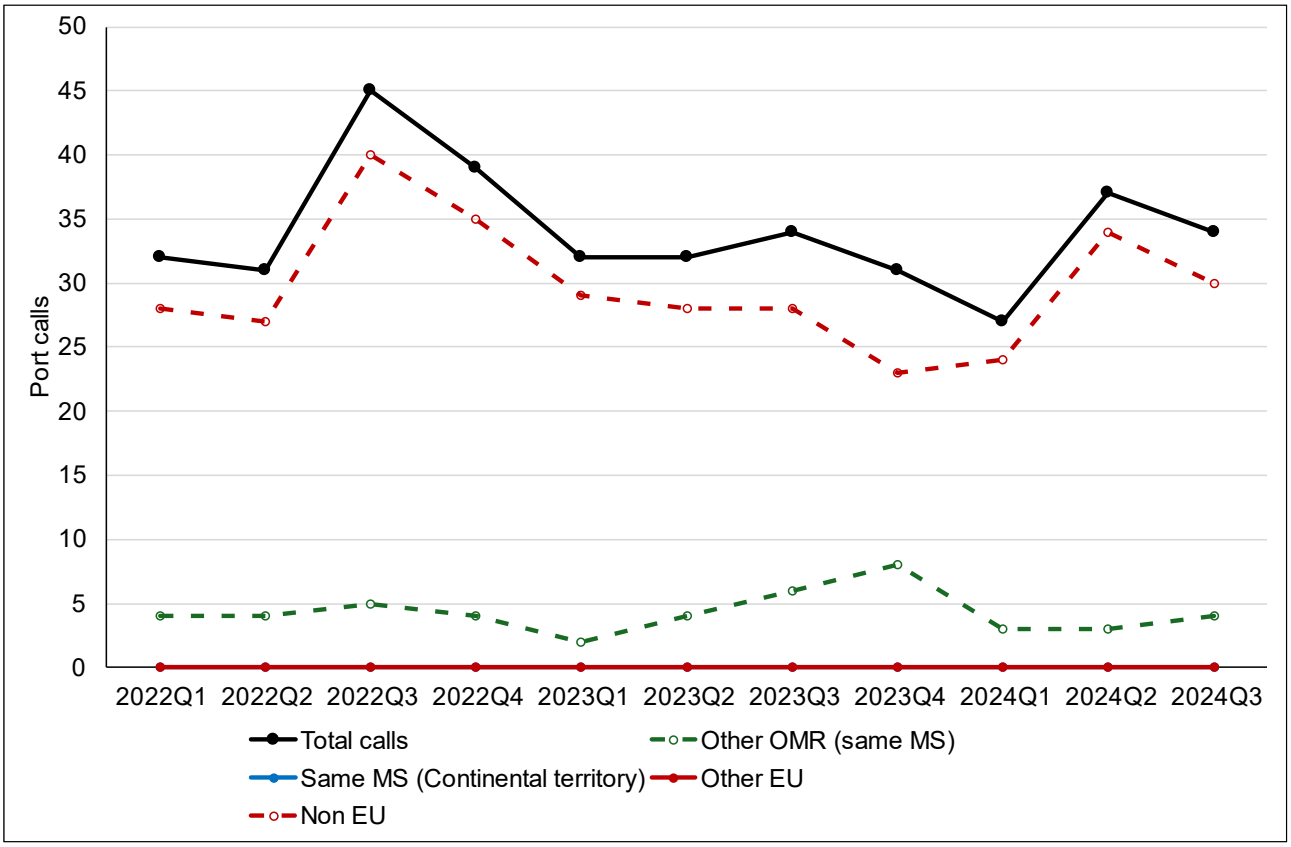
Source: Ricardo analyses of EMSA MARINFO data

5.2.7. Mayotte

Port calls in Mayotte, separated by country of origin of the voyage to the port, are shown in Figure 5-16.

The port calls at the island are dominated by those from non-EU countries. As well as the nearby Comoros islands, the origins of the voyages to Mayotte include other islands in the Indian Ocean (Madagascar, Mauritius, Réunion, Seychelles) and countries in Africa and the Middle East (Kenya and the United Arab Emirates). There was also a significant number of port calls on voyages starting from Somalia in 2022, but these had disappeared in 2023 and 2024.

Figure 5-16: Numbers of ports calls by quarter at ports in Mayotte (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

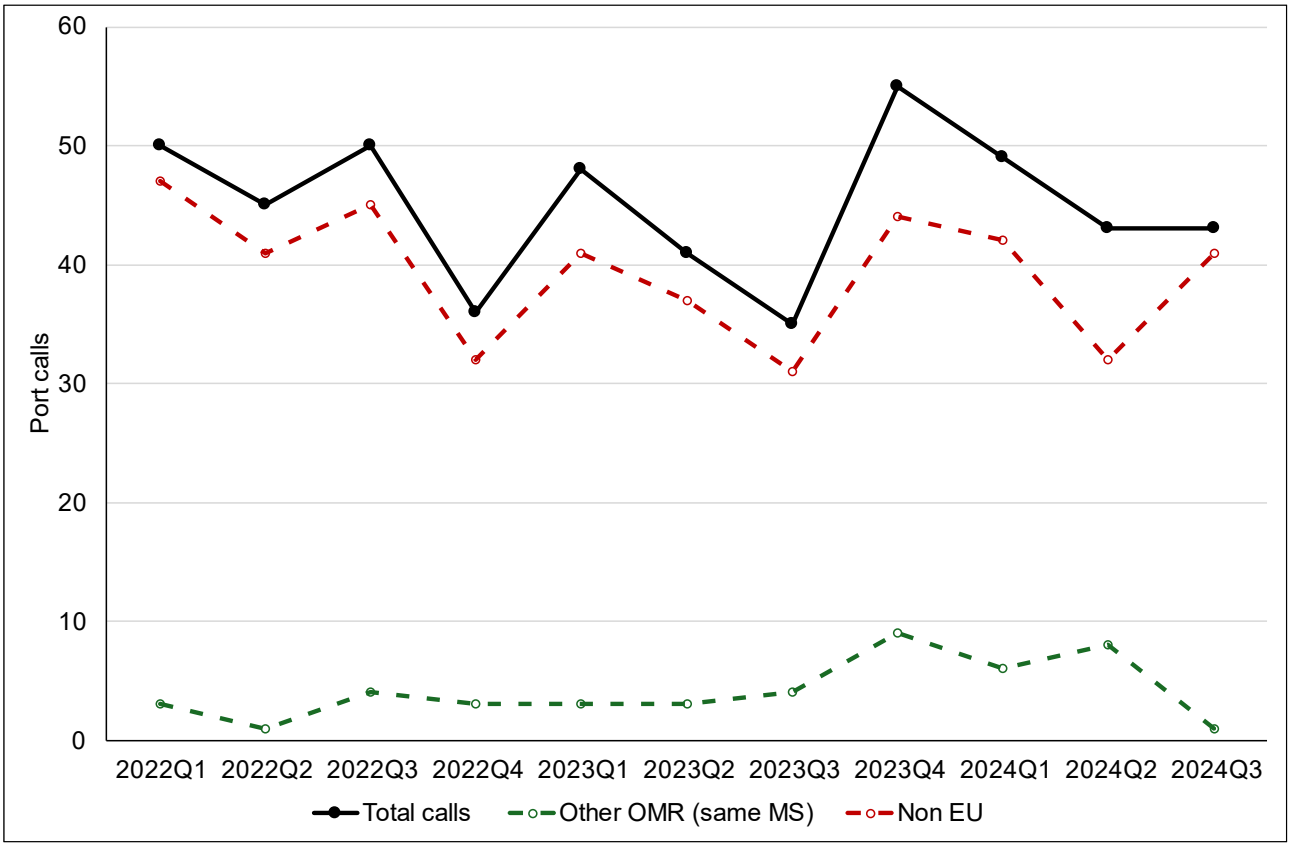
5.2.8. Saint Martin

Port calls in Saint Martin, separated by country of origin of the voyage to the port, are shown in Figure 5-17.

There are significantly fewer port calls at Saint Martin than, for example, Guadeloupe or Martinique; however, the trends are similar, with traffic being dominated by routes from non-EU islands in the Caribbean and other outermost regions (also in the Caribbean).

Between Q1 to Q3 2023 and Q1 to Q3 2024, port calls by vessels on routes from non-EU countries increased by 5.5%, while those from other French outermost regions increased by 50% (mostly due to the relatively strong traffic in Q1 and Q2 2024, as there was then a strong reduction in Q3).

Figure 5-17: Numbers of ports calls by quarter at ports in Saint Martin (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

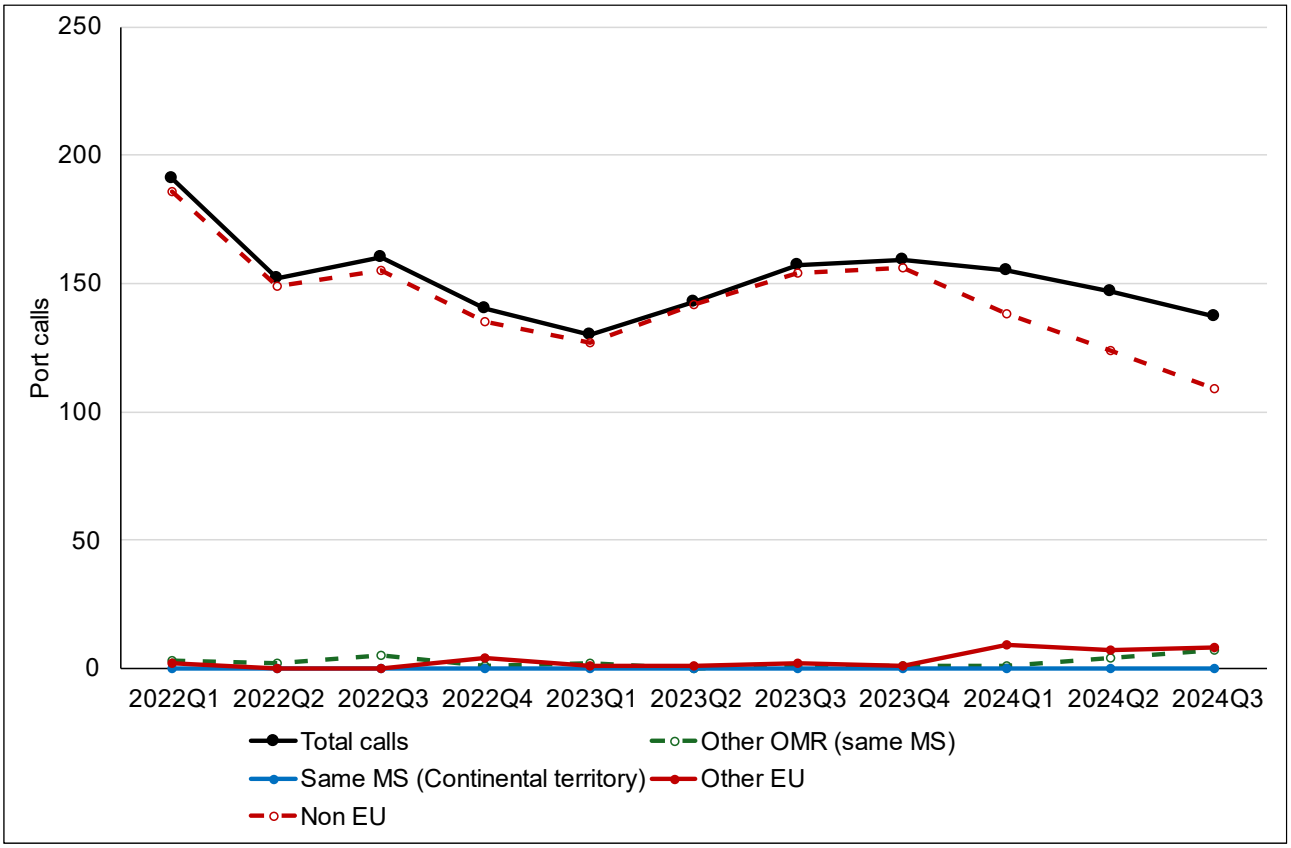
5.2.9. Réunion

Port calls in Réunion, separated by country of origin of the voyage to the port, are shown in Figure 5-18.

Prior to 2024, port calls in Réunion were dominated by those from non-EU countries, with very low levels from ports in the EU or other outermost regions. Calls from non-EU countries have reduced somewhat in 2024. The port calls associated with routes from the same Member State (France) show an increase from Q4 2023 to Q3 2024, which is largely mirrored by those from other EU Member States (and their outermost regions).

Year on year, port calls at Réunion on voyages from non-EU countries reduced by 10.1% between Q1 to Q3 2023 and Q1 to Q3 2024. At the same time, there have been corresponding increases by voyages from the same Member State and other EU Member States, leading to an overall increase in port calls of approximately 2.1% over the same period.

Figure 5-18: Numbers of port calls by quarter at ports in Réunion (Q1 2022 to Q3 2024)



Source: Ricardo analyses of EMSA MARINFO data

5.2.10. General observations

Overall, there is little indication of any differences in trends of port calls in outermost regions depending on the origin of the voyage. There is some indication in the Canary Islands of differences in trends, with a greater increase in 2024 of port calls on voyages from non-EU countries, but these appear to be related to the impacts of the situation in the Red Sea, rather than related to the extension of the EU ETS. There is also no indication of any overall reduction in traffic from other EU Member States, or increases in traffic from the same Member State, which benefit from a temporary derogation under the ETS Directive.

> Overall, the analysis of port calls at the different outermost regions analysed in 2024 show trends that are consistent with those seen in previous years, or appear to be associated with changes in traffic due to the situation in the Red Sea or changes within the region (in particular within the Caribbean). They do not indicate any unusual reductions in traffic in any of the outermost regions in 2024.

5.3. ORI3 - Have there been decreases In transhipment activities at ports in outermost regions?

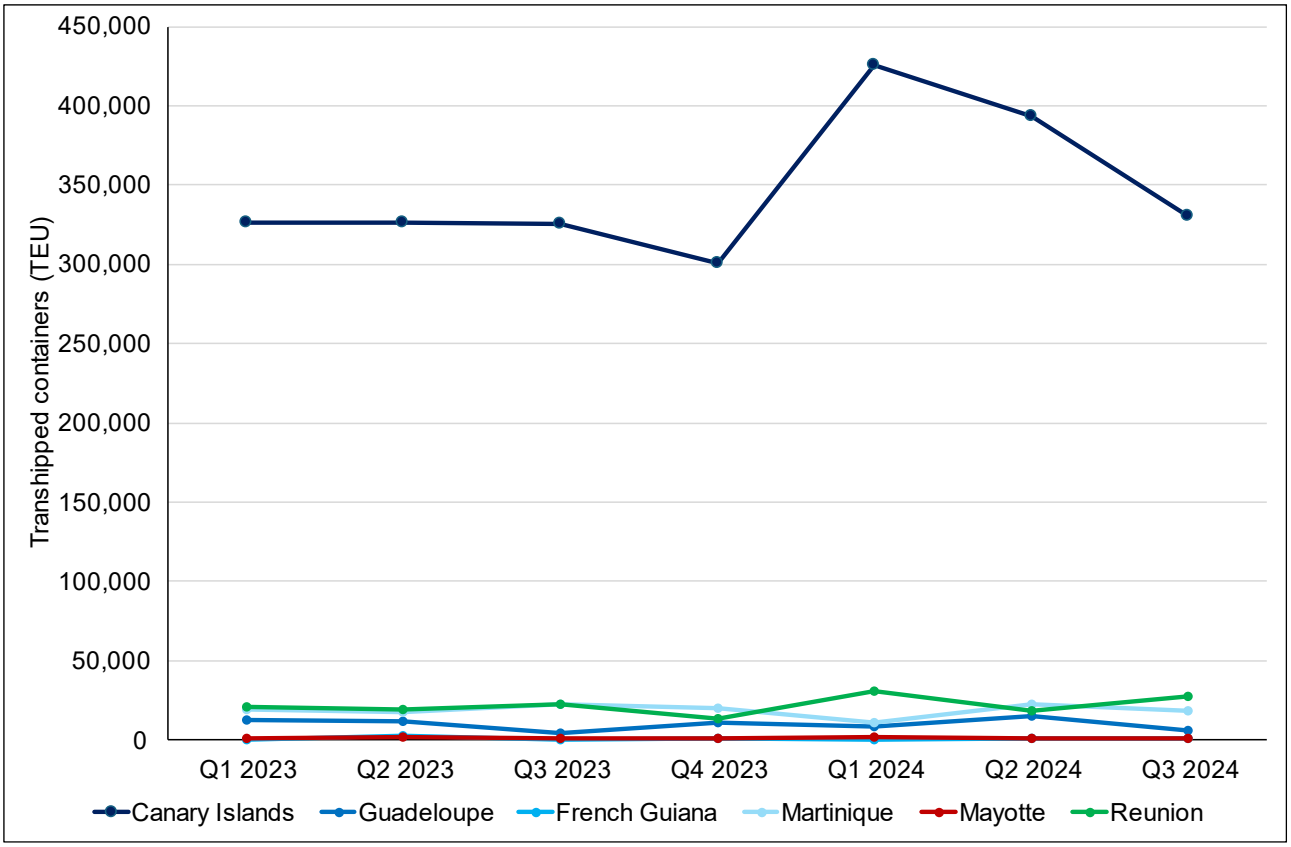
The aim of this question is to investigate whether there is any evidence of levels of container transhipment activities in outermost regions (especially the Canary Islands) having reduced in 2024 compared to previous years. Such reductions in transhipment activities could indicate impacts of the EU ETS on traffic to and from outermost regions, with impacts on the economics of the port operations, and may be indications of evasive behaviour.

The container movements data from the econdb database include transhipment activities at ports in the Canary Islands, Guadeloupe, French Guiana, Martinique, Mayotte and Réunion. The remaining outermost regions included in the analyses shown in Sections 5.1 and 5.2 are less relevant to the risk of relocation transhipment activities (no data was available on container movements).

Figure 5-19 shows the evolution of container transhipments (in TEU) at the ports in those regions.

As can be seen, the level of activity at ports in the Canary Islands (predominately Puerto de Las Palmas and Santa Cruz de Tenerife) is much higher than in the other outermost regions. In the Canary Islands, transhipment activity increased significantly from Q4 2023 to Q1 2024, consistent with the rerouting of large container traffic around the Cape of Good Hope due to the impacts of the situation in the Red Sea. Since then, there has been a gradual reduction in activity back to similar levels to those in 2023. Overall, the Canary Islands experienced a 17.6% increase in transhipments in the period Q1 to Q3 2024, compared to Q1 to Q3 2023. Over the same period, Réunion saw a 22.4% increase in transhipment activity, with Guadeloupe seeing a 5.3% increase. On the other hand, Martinique had a 14.5% reduction in transhipment activity over the same period. As seen in Figure 5-19, these last three outermost regions have much lower levels of transhipment activity than the Canary Islands, so the percentage changes in activity do not represent the same changes in TEU handled.

Figure 5-19: Container transhipments at ports in outermost regions from Q1 2023 to Q3 2024



Source: Ricardo analyses of econdb data

Overall, container transhipment activity at ports in EU outermost regions is dominated by that at ports in the Canary Islands, which showed a significant increase in early 2024, most probably related to the impacts of the situation in the Red Sea. At all the other regions with transhipment activity, the levels of transhipments are low. Some variations over time are seen in the transhipments in these other outermost regions; however, while they are large in percentage terms, they are small compared to those seen in the Canary Islands. Therefore, as a result, it is not possible to identify any direct impacts of the EU ETS on container transhipment activities in EU outermost regions in 2024.

6. Conclusions

The scope of the EU ETS was increased to include maritime transport of voyages to and from EU ports by revisions to the EU ETS Directive (2003/87/EC), which were adopted in 2023, with the requirements for purchase and surrender of EU ETS allowances becoming applicable from January 2024. This report provides an initial analysis of the extension of the EU ETS to maritime transport.

The current study was commissioned by the European Commission (DG CLIMA) to monitor the effects of the implementation of the EU ETS for maritime transport from the start of 2024. A key focus of the study has been on the identification of potential evasive behaviours, by which vessel operators may seek to reduce their obligations under the EU ETS by changing aspects of their operations (particularly the ports that they call at), and the monitoring of whether these risks are occurring in practice. This has been accompanied by monitoring of other impacts of the implementation of the EU ETS (levels of traffic and emissions under the scope of the EU ETS and the associated impacts on costs).

The analysis identified a set of possible evasive behaviours that should be monitored:

- Relocation of transhipment activities;
- Evasive port calls at nearby non-EU ports;
- Changes in order of port calls;
- Shifting demand to other transport modes with higher environmental impacts;
- Assigning best performing vessels to EU routes;
- Use of ships below size threshold;
- Increased use of ship-to-ship transfers of cargo.

A shortlist of ports felt to be at greatest risk of being impacted by these risks was prepared, covering both EU and non-EU ports. The monitoring of the potential occurrence of these risks has mainly been based on information provided by ports through a survey of Member States, port calls data (for EU and non-EU ports), provided by EMSA from their MARINFO database, and container movements data provided by econdb. As appropriate, these data were supplemented by literature searches for information on changes in activity (including announcements of new, or changed, routes by vessel operators).

In performing the analyses of vessel traffic, it was identified that the current situation in the Red Sea is having significant impacts on vessel operations, with many operators electing to divert around the Cape of Good Hope rather than travelling through the Suez Canal. This may be masking any changes in operations that operators may have made in response to the implementation of the EU ETS.

When looking at market trends over the first three quarters of 2024, the data shows that important changes in maritime traffic and routes occurred in 2024. However, these changes seem mainly related to the ongoing impacts of the Red Sea crisis, which resulted in many shipping companies deviating their routes around South Africa, via the Cape of Good Hope. To disentangle the effects of the Red Sea from the ones from the ETS extension to the extent possible, the analysis compares trends at EU and non-EU ports, considering their economic activity, location and exposure to the Red Sea crisis.

As a result, the analysis shows no evidence of generalised container transhipment relocation, whereby neighbouring non-EU ports would profit from a decrease in port activity happening at EU ports. There are some indications of increased levels of transhipment activity at ports in Türkiye, with a reduction at EU ports in the East Mediterranean; however, it is likely that this is associated with the impacts of the Red Sea situation and the ongoing Israel-Hamas crisis. There is also no clear evidence to suggest that shipping companies are adding stops at neighbouring non-EU ports or modifying the order of their port calls solely to circumvent ETS obligations. In addition, a review of case studies and market data reveals no evidence of modal shift towards road transport, nor an increase in the use of smaller ships or ship-to-ship transfers, which could have suggested that companies are adopting or implementing evasive behaviours.

When examining forward-looking indicators, including route announcements for 2025 and planned investments in ports, the analysis reveals no discernible trends that could indicate a change in market behaviour resulting from the ETS extension to maritime transport. Meanwhile, the study highlights the shipping industry's highly dynamic landscape, with container shipping companies rapidly adapting their routes and operations in response to the Red Sea crisis. Although a few examples suggest that companies may be considering circumvention behaviours when designing their future routes, the analysis does not provide conclusive evidence of this trend. Planned investments in ports, both in the EU and neighbouring countries, are not experiencing a noticeable turnaround, with many ports planning ambitious investments to increase their competitiveness and market share, particularly for container transhipment activities.

In terms of broader impacts, the ETS extension to maritime transport and the obligation for shipping companies to surrender EU allowances is expected to increase total shipping costs by 3.7% in 2024, with a higher increase anticipated in 2025 and 2026, linked to the phase-in approach and depending on the implementation of GHG mitigation measures in the sector. These costs are generally passed on to shippers by shipping companies, with relatively limited impact on total transport prices, estimated to be between 1% and 5% for deep sea container services and between 3% and 11% for RoPax short sea shipping services in 2024. The analysis does not show evidence of reduced shipping services to EU islands or outermost regions, with port traffic and transhipment activities remaining relatively stable.

While this first report does not find evidence of major changes directly attributable to the introduction of the EU ETS, these conclusions should be viewed with caution due to the limitations of this analysis. Notably, the significant spill-over impacts of the Red Sea crisis

on maritime traffic, the limited experience in the implementation of the system for maritime emissions, and data limitations all factor into the limitations of the analysis. It is therefore important to continue monitoring the impact of the EU ETS extension to maritime transport on a regular basis, as required by the ETS Directive. This initial report should be seen as the first step of an ongoing process, providing the foundation for future analysis and for possible enhancements of the monitoring approach, in particular when it comes to considering future perspectives. This continuous process should allow for the rapid identification of new trends, patterns, and emerging issues that will inform decision-making and policy development.

7. Appendices

7.1. Appendix 1 Risk of evasion research questions

The following table provides the full list of research questions used to review the risk of evasive behaviours.

Table 7-1: Research questions on transhipment relocation evasive behaviour risk

Code	Question	Indicator(s)	Data sources
General transhipment questions			
TR6	Do we have any intelligence showing a change of investment patterns in ports (i.e. investments being cancelled in EU ports and accelerated investments in competing non-EU ports, including planned investments)?	Information on investments in EU ports and in non-EU ports related to increases in container capacity for transhipment operations or related to improvements in port infrastructure to improve container throughput.	Literature review
East Mediterranean relevance			
TRE1	How have container ships' port calls at EU transhipment hubs in the East Mediterranean evolved, particularly compared to the EU control groups and non-EU neighbouring ports (East Mediterranean)?	For ports Piraeus, Limassol, total port calls per month in January to September 2024, compared to the same months in 2023. Compare the evolution of port calls over time between EU transhipment hubs, non-EU transhipment ports and ports in the EU control groups (South and North) Calculate mean and standard deviation for port calls across 2022 to 2023, then present results for months in 2024 as multiples of standard deviation from the 2022-2023 mean, to indicate whether the changes seen are within 'normal' fluctuations or more significant.	EMSA MARINFO data EMSA PowerBI tool

Code	Question	Indicator(s)	Data sources
TRE2	How has traffic of specific container vessel categories (deep sea container ships used for relay transhipment, smaller container vessels used for feeder transhipment) evolved, especially compared to EU control group and to non-EU neighbouring ports (East Mediterranean)?	For each port, total port calls and total GT per month in January to September 2024 compared to the same months in 2023 for container ships over 30,000 GT and the same comparison for vessels below 30,000 GT[199].	EMSA MARINFO data
TRE3	How have container activities, including transhipment, evolved at EU transhipment hubs in the East Mediterranean, especially compared to EU control group and to non-EU neighbouring ports (East Mediterranean)?	For ports Piraeus, Limassol, total container imports (TEU) for transhipment per month in January to September 2024, compared to the same months in 2023. Calculate mean and standard deviation for port calls across 2022 to 2023, then present results for months in 2024 as multiples of standard deviation from the 2022-2023 mean, to indicate whether the changes seen are within 'normal' fluctuations or more significant. Comparisons of EU container transhipment ports with similar evolutions of container activities at EU control group ports (particularly the South control group) and non-EU transhipment ports in the East Mediterranean.	Econdb plus ports questionnaires and official/national statistics (e.g., Puertos del Estado)

[199] Selection of GT threshold based on observation that large container ships (e.g., Hapag Lloyd Berlin Express class, 23,664 TEU, 229,376 GT, https://www.ship-technology.com/features/the-top-10-largest-container-ships-in-the-world/?cf-view) have approximately 10 GT per TEU and that Feeder container ships are generally those with less than 3,000 TEU (https://briese.ch/new-feeder/). Further analysis might identify a different threshold , but it is unlikely to be very different to 30,000 GT.

Code	Question	Indicator(s)	Data sources
TRE4	Is any such evolution associated with specific types of voyages (i.e. non-EU/port/non-EU; non-EU/port/EU; EU/port/EU)?	Changes in port calls (for ports at risk) separated into three route categories: • Non-EU-port to port under consideration to non-EU-port • Non-EU-port to port under consideration to EU-port (including the other way around: EU port to port under consideration to non-EU-port) • EU-port to port under consideration to EU-port Overall distances of voyages in these different categories (e.g., if distance of non-EU / EU / non-EU voyages tend to reduce).	EMSA PowerBI tool
TRE5	Is there a change in port liner shipping connectivity index (PLSCI) for the EU transhipment ports (and at the non-EU ports)?	PLSCI for the EU ports above in Q1 and Q2 of 2024 compared to the same quarters in 2023.	UNCTAD PLSCI data (quarterly)
Central Mediterranean relevance			

Code	Question	Indicator(s)	Data sources
TRC1	How have container ships' port calls at EU transhipment hubs in the Central Mediterranean evolved, particularly compared to the EU control groups and non-EU neighbouring ports (East Mediterranean)?	For ports Cagliari, Gioia Tauro, Marsaxlokk, Taranto, Trieste, Valletta, total port calls per month in January to September 2024, compared to the same months in 2023. Compare the evolution of port calls over time between EU transhipment hubs, non-EU transhipment ports and ports in the EU control groups (South and North).Calculate mean and standard deviation for port calls across 2022 to 2023, then present results for months in 2024 as multiples of standard deviation from the 2022-2023 mean, to indicate whether the changes seen are within 'normal' fluctuations or more significant.	EMSA MARINFO data EMSA PowerBI tool
TRC2	How has traffic of specific container vessel categories (deep sea container ships used for relay transhipment, smaller container vessels used for feeder transhipment) evolved, especially compared to EU control group and to non-EU neighbouring ports (Central Mediterranean)?	For each port, total port calls per month in January to September 2024 compared to the same months in 2023 for container ships over 30,000 GT and the same comparison for vessels below 30,000 GT .	EMSA MARINFO data
TRC3	How have container activities, including transhipment, evolved at EU transhipment hubs in the Central Mediterranean, especially compared to EU control group and to non-EU neighbouring ports?	For ports Cagliari, Gioia Tauro, Marsaxlokk, Taranto, Trieste, Valletta, total container imports (TEU) for transhipment per month in January to September 2024, compared to the same months in 2023. Calculate mean and standard deviation for port calls across 2022 to 2023, then present results for months in 2024 as multiples of standard deviation from the 2022-2023 mean, to indicate whether the changes seen are within 'normal' fluctuations or more significant.	Econdb plus ports questionnaires and official/national statistics (e.g., Puertos del Estado)

Code	Question	Indicator(s)	Data sources
TRC4	Is any such evolution associated with specific types of voyages (i.e. non-EU/port/non-EU; non-EU/port/EU; EU/port/EU)?	Changes in port calls (for ports at risk) separated into three route categories: • Non-EU-port to port under consideration to non-EU-port • Non-EU-port to port under consideration to EU-port (including the other way around: EU port to port under consideration to non-EU-port) • EU-port to port under consideration to EU-port Overall distances of voyages in these different categories (e.g., if distance of non-EU / EU / non-EU voyages tend to reduce).	EMSA PowerBI tool
TRC5	Is there a change in port liner shipping connectivity index (PLSCI) for the EU transhipment ports (and at the non-EU ports)?	PLSCI for the EU ports above in Q1 and Q2 of 2024 compared to the same quarters in 2023.	UNCTAD PLSCI data (quarterly)
Western Mediterranean relevance			

Code	Question	Indicator(s)	Data sources
TRW1	How have container ships' port calls at EU transhipment hubs in the West Mediterranean evolved, particularly compared to the EU control groups and non-EU neighbouring ports?	For ports Algeciras, Barcelona, Malaga, Sines, Valencia, Las Palmas, total port calls per month in January to September 2024, compared to the same months in 2023. Compare the evolution of port calls over time between EU transhipment hubs, non-EU transhipment ports and ports in the EU control groups (South and North) Calculate mean and standard deviation for port calls across 2022 to 2023, then present results for months in 2024 as multiples of standard deviation from the 2022-2023 mean, to indicate whether the changes seen are within 'normal' fluctuations or more significant.	EMSA MARINFO data EMSA PowerBI tool
TRW2	How has traffic of specific container vessel categories (deep sea container ships used for relay transhipment, smaller container vessels used for feeder transhipment) evolved, especially compared to EU control group and to non-EU neighbouring ports (West Mediterranean)?	For each port, total port calls per month in January to September 2024 compared to the same months in 2023 for container ships over 30,000 GT and the same comparison for vessels below 30,000 GT.	EMSA MARINFO data

Code	Question	Indicator(s)	Data sources
TRW3	How have container activities, including transhipment, evolved at EU transhipment hubs in the West Mediterranean, especially compared to EU control group and to non-EU neighbouring ports (West Mediterranean)?	How have container activities, including transhipment, evolved at EU transhipment hubs in the West Mediterranean, especially compared to EU control group and to non-EU neighbouring ports?	For ports Algeciras, Barcelona, Malaga, Sines, Valencia, Las Palmas, total container imports (TEU) for transhipment per month in January to September 2024, compared to the same months in 2023. Calculate mean and standard deviation for port calls across 2022 to 2023, then present results for months in 2024 as multiples of standard deviation from the 2022-2023 mean, to indicate whether the changes seen are within 'normal' fluctuations or more significant.
TRW4	Is any such evolution associated with specific types of voyages (i.e. non-EU/port/non-EU; non-EU/port/EU; EU/port/EU)?	Changes in port calls (for ports at risk) separated into three route categories: • Non-EU-port to port under consideration to non-EU-port • Non-EU-port to port under consideration to EU-port (including the other way around: EU port to port under consideration to non-EU-port) • EU-port to port under consideration to EU-port Overall distances of voyages in these different categories (e.g., if distance of non-EU / EU / non-EU voyages tend to reduce).	EMSA PowerBI tool
TRW5	Is there a change in port liner shipping connectivity index (PLSCI) for the EU transhipment ports (and at the non-EU ports)?	Is there a change in port liner shipping connectivity index (PLSCI) for the EU transhipment ports (and at the non-EU ports)?	UNCTAD PLSCI for the EU ports above in Q1 and Q2 of 2024 compared to the same quarters in 2023.

Table 7-2: Research questions on evasive port calls risk

Code	Question	Indicator(s)	Data sources
EPC1	Is there an increase in calls at relevant UK ports by vessels before calling at EU ports or after departing from EU ports (particularly Northwest Europe)?	Numbers of port calls at an EU port following a call at a UK port, or port calls at a UK port following a call at an EU port, per month in January to September 2024, compared to the same months in 2023.	EMSA MARINFO data. EMSA PowerBI tool.
EPC2	Are there changes in direct traffic from North American ports to Northwest EU ports?	Numbers of port calls at an EU port following a call at a North American port, or port calls at a North American port following a call at an EU port, per month in January to September 2024, compared to the same months in 2023.	EMSA PowerBI tool.
EPC3	Are there changes in direct traffic from outside the EU to Mediterranean Member States (Portugal, Spain, France, Italy, Malta, Cyprus, Croatia, Greece), and changes to indirect traffic from outside the EU to these ports with an intermediate port call at a Mediterranean non-EU neighbouring country (Morocco, Algeria, Tunisia, Libya, Egypt, Israel, Lebanon, Türkiye, Saudi Arabia)?	Numbers of port calls at an EU port in the Mediterranean following a call at a non-EU port outside the Mediterranean. Number of port calls at an EU port in the Mediterranean following a call at a non-EU port in the Mediterranean.	EMSA PowerBI tool.
EPC4	Are there changes in (overall) direct traffic from non-EU ports to EU ports, and to (overall) indirect traffic from non-EU ports to EU ports but with an intermediate port call at a neighbouring non-EU country (within 300 nautical miles from an EU country)?	Numbers of port calls at an EU port following a call at a non-EU port beyond 300 nautical miles from an EU port. Number of port calls at an EU port in the Mediterranean following a call at a non-EU port within 300 nautical miles from an EU port.	EMSA PowerBI tool.

Code	Question	Indicator(s)	Data sources
EPC5	Is there a decrease in the average distance travelled by vessels on the last leg of a voyage to an EU port, or the first leg of a voyage departing from an EU port?	Distribution of distances for voyage legs arriving at an EU port from a non-EU port, or departing from an EU port for a non-EU port, in January to September 2024, compared to the same months in 2023. Separate by vessel type. Identify EU ports most affected. Identify the relevant non-EU ports.	EMSA MARINFO data.
EPC6	Is there a change in port liner shipping connectivity index (PLSCI) for the EU ports, notably compared to neighbouring non-EU ports (in particular in UK)?	PLSCI for the EU ports above in Q1 and Q2 of 2024 compared to the same quarters in 2023, Comparisons with PLSCI for EU control groups and non-EU ports of relevance to this risk.	UNCTAD PLSCI data (quarterly)
EPC7	Are any changes in national legislation likely in the short to medium term that would affect the economics of calling at ports in the country relative to an EU port (for example, will the UK extend the UK ETS to maritime transport in a similar way to air transport)?	List of likely changes to national legislation in nearby non-EU countries that would affect the economics of port calls.	Literature search
EPC8	Have vessel operators announced changes to routes that add extra port calls at nearby non-EU ports? (distinguishing whenever possible new/extra port calls vs changes in order of port calls)	Qualitative review	Literature search including possibly extracts from Drewry reports

Table 7-3: Research questions on shifting demand to other transport modes evasive behaviour risk

Code	Question	Indicator(s)	Data sources
OTM1	Have there been changes in the transport of goods by RoRo traffic from EU ports in the Mediterranean (e.g., Italy and Spain)?	Numbers of port calls by RoRo vessels in ports in Italy and Spain by quarter (Q1 2022 to Q3 2024). Quantity of road freight between Italy and Spain over the same period.	EMSA MARINFO data Eurostat data
OTM2	For ports in Bulgaria, has there been a reduction in the transport of goods to the ports of Burgas and Varna from ports in Georgia and Türkiye in 2024, relative to the same months in 2023?	Port calls by RoRo vessels at ports in Bulgaria by quarter (Q1 2022 to Q3 2024). Road freight traffic entering Bulgaria from other countries (in particular Türkiye) over the same period.	EMSA MARINFO data Eurostat data

Table 7-4: Research question on use of best performing vessels on EU routes evasive behaviour risk

Code	Question	Indicator(s)	Data sources
BPV	Has there been an increased use of more efficient vessels on routes to EU ports in 2024 compared to the same months in 2023?	Distributions of energy efficiency indices EEDI, EEXI or EIV (where available) for voyages to EU ports, separated by vessel type and GT range (i.e. percentage of voyages by vessels above an EEDI, EEXI or EIV value), comparing 2024 to 2023.	EMSA MARINFO data THETIS MRV (for EEDI, EEXI and EIV values for individual vessels)

Table 7-5: Research question on use of vessels below size threshold evasive behaviour risk

Code	Question	Indicator(s)	Data sources
BST	Has there been an increased use of vessels below 5,000 GT (in particular those just below 5,000 GT) on routes to EU ports??	Percentage of voyages from non-EU ports to EU ports by vessels of 4,000 GT to 4,999 GT relative to voyages by vessels above 5,000 GT. Percentage of intra-EU voyages by vessels of 4,000 GT to 4,999 GT relative to voyages by vessels above 5,000 GT. Calculate separately for different vessel types (i.e. calculate percentage of GT for container ships of 4,000 GT to 4,999 GT relative to container ships above 5,000 GT).	EMSA MARINFO data

Table 7-6: Research questions on increased use of ship-to-ship transfers evasive behaviour risk

Code	Question	Indicator(s)	Data sources
STS	Has there been an increase in the number of ship-to-ship transfers in EU waters since the start of the ETS maritime implementation?	Number of ship-to-ship transfers authorised by EU Member States to date in 2024, compared to the same months in 2023.	EMSA analysis of own data

7.2. Appendix 2 List of ports in analysis

Table 7-7 shows the ports that were included in the analyses presented in the report, including the split between geographic areas in the Mediterranean.

Table 7-7: List of ports grouped by basin and whether at risk of evasion or control group

Ports shortlists		
EU transhipment ports		
Western Mediterranean basin		
Algeciras (Spain)	Barcelona (Spain)	Malaga (Spain)
Sines (Portugal)	Valencia (Spain)	
Central Mediterranean basin		
Cagliari (Italy)	Gioia Tauro (Italy)	Marsaxlokk/Malta Freeport (Malta)
Taranto (Italy)	Trieste (Italy)	Valletta (Malta)
East Mediterranean		
Limassol (Cyprus)	Piraeus (Greece)	
Black Sea basin		
Burgas (Bulgaria)		
Other		
Puerto de Las Palmas (Gran Canaria, Spain)		
Neighbouring non-EU ports		
Western Mediterranean basin relevance		
Bejaia (Algeria)	Casablanca (Morocco)	Djen-Djen (Algeria)
Nador (Morocco)	Tanger Med (Morocco)	
Central Mediterranean basin relevance		
Qasr Ahmed (Misurata) (Libya)		
East Mediterranean relevance		
Alexandria (Egypt)	Ambarli (Türkiye)	Ashdod (Israel)
Beirut (Lebanon)	Damietta (Egypt)	East Port Said and West Port Said (Egypt)

Ports shortlists		
El Dekheila (Egypt)	Haifa (Israel)	Izmir (Türkiye)
Mersin (Türkiye)	Nemrut Limani Bay (Türkiye)	Sokhna (Egypt)
Tekirdag (Türkiye)		
Non-EU ports (Evasive port calls risk)		
Alexandria (Egypt)	Bejaia (Algeria)	Casablanca (Morocco)
Damietta (Egypt)	Felixstowe (UK)	Liverpool (UK)
London Gateway (UK)	Southampton (UK)	Teesport (UK)
EU ports control group (North)		
Antwerp (Belgium)	Bremerhaven (Germany)	Cork (Ireland)
Gdansk (Poland)	Gothenburg (Sweden)	Hamburg (Germany)
Helsingborg (Sweden)	Helsinki (Finland)	Koper (Slovenia)
Le Havre (France)	Rouen (France)	Moerdijk (Netherlands)
Rauma (Finland)	Riga (Latvia)	Rotterdam (Netherlands)
Tallinn (Estonia)		
EU ports control group (South)		
Western Mediterranean basin		
Leixoes (Portugal)	Lisboa (Portugal)	Marseille (France)
Santa Cruz de Tenerife (Spain)		
Central Mediterranean basin		
Genova (Italy)	La Spezia (Italy)	Livorno (Italy)
Napoli (Italy)	Rijeka (Croatia)	
East Mediterranean		
Thessaloniki (Greece)		
Black Sea		
Constanta (Romania)		

7.3. Appendix 3 Detailed results by port

To provide greater insight into the results of the analyses of port calls presented in Section 3, this appendix contains greater detail of results at an individual port level, for the relevant research questions.

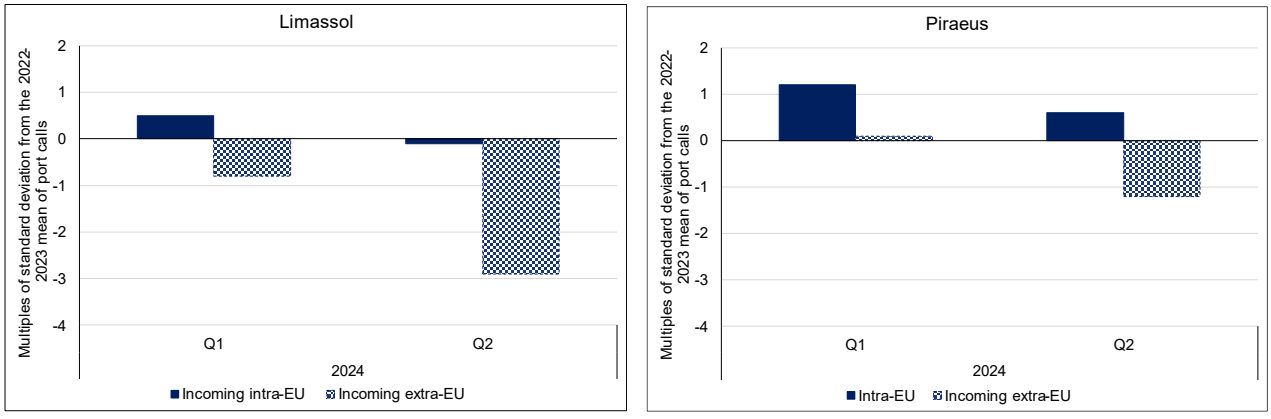
7.3.1. TRE1

EU transhipment ports

To look at the changes in the numbers of port calls in 2024 in greater detail, Figure 7-1 shows the changes in the first two quarters of 2024, relative to the quarterly average across 2022 to 2023, separately for the two EU transhipment ports included in the East Mediterranean category (Limassol and Piraeus), also separating port calls on intra-EU routes (i.e. a port call at an EU port where the previous call was at another EU port) and incoming extra-EU routes (i.e. a port call at an EU port where the previous call was at a non-EU port)[200]. These changes are expressed in terms of numbers of standard deviations from that mean (also calculated across 2022 to 2023).

For a statistical analysis, based on a Normal distribution, it would be expected that 95% of all data would lie within ±1.96 standard deviations from the mean. While the numbers of ports calls at a port is unlikely to be randomly distributed, values significantly greater than ±2 standard deviations from the mean are likely to indicate changes beyond routine variations.

Figure 7-1: Multiples of standard deviation from the 2022-2023 mean of port calls, for Limassol and Piraeus



Source: Ricardo analysis of EMSA MARINFO data

[200] For clarity, please note that a 'port call' is always one port call, whether it is on an EU route or an incoming extra-EU route.

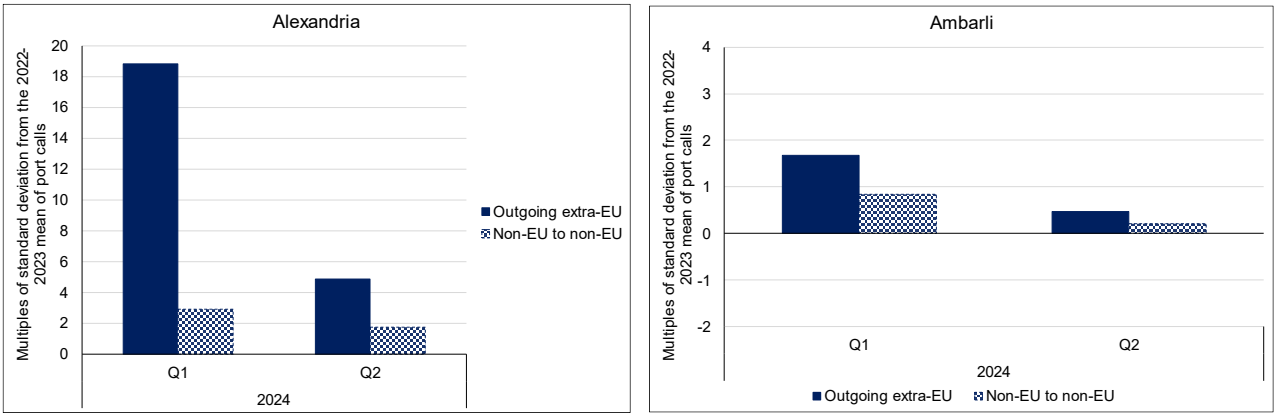
At the Port of Limassol, there is a decline observed in Q1 and Q2 for incoming extra-EU voyages. In particular, a sharp drop is noted for Q2 (with a difference of over 3 standard deviations from the average), which could be related to a lower amount of traffic through the Suez Canal. In the case of intra-EU voyages, it is observed that they remain within an approximate range of ±1 standard deviation, with a slight decrease in Q2.

At the Port of Piraeus, a decrease is observed in Q2 for incoming extra-EU voyages, remaining within an absolute range of less than 1.5 standard deviations. This effect compared to 2022-2023 values, is likely related to the Red Sea conflict. In the case of intra-EU to EU voyages, there is an increase in Q1 and Q2. Values for both quarters stay within a range of ±1.5 standard deviations. According to Cosco Shipping Ports' data[201], container traffic at Piraeus port (Greece) recorded a 12.7% decrease in January 2024, which is likely due to changes in routes imposed by the Red Sea crisis. This trend is supported by our data analysis.

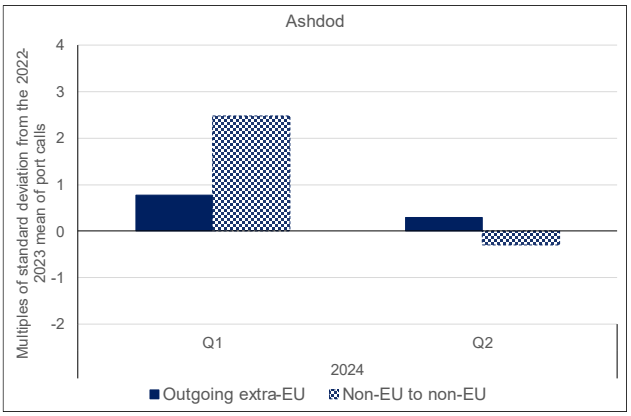
Neighbouring non-EU ports

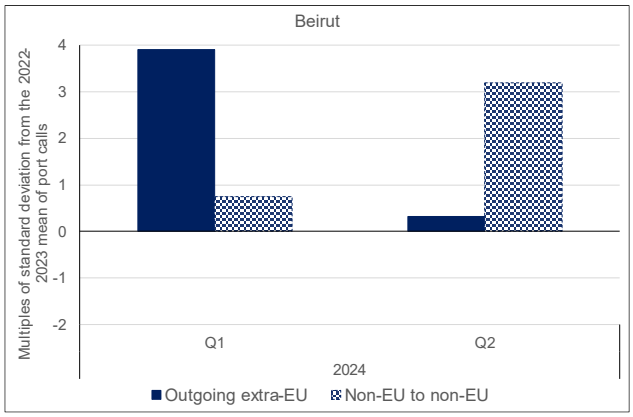
To look at the changes at neighbouring non-EU transhipment ports, Figure 7-2 shows the changes in the first two quarters of 2024, relative to the quarterly average across 2022 to 2023, separately for Ambarli, Ashdod, Beirut, Haifa, Izmir, Mersin, Nemrut Bay and Tekirdag. These changes are expressed in terms of numbers of standard deviations from that mean (also calculated across 2022 to 2023).

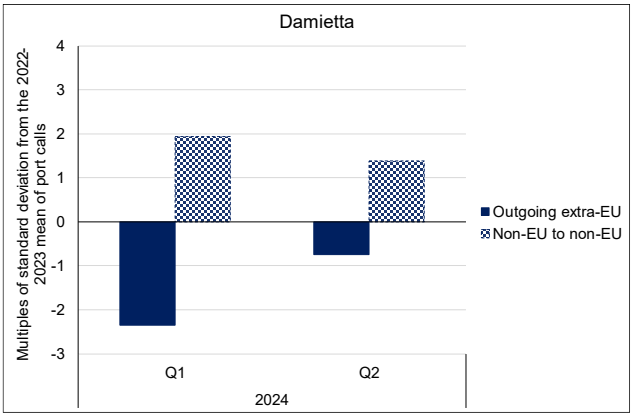
Figure 7-2: Multiples of standard deviation from the 2022-2023 mean of port calls, for Alexandria, Ambarli, Ashdod, Beirut, Damietta, El Dekheila, Haifa, Izmir, Mersin, Nemrut Bay, East Port Said, Port Said, Sokhna and Tekirdag

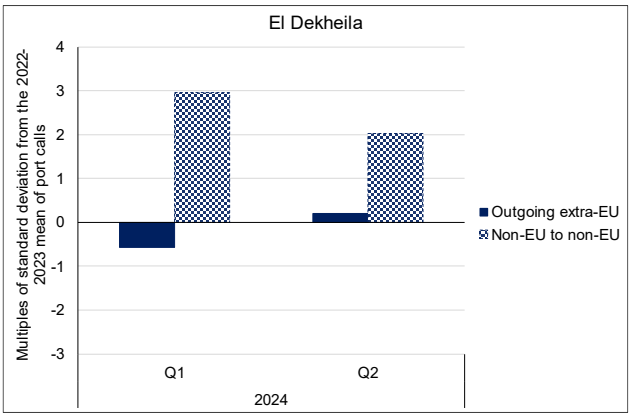


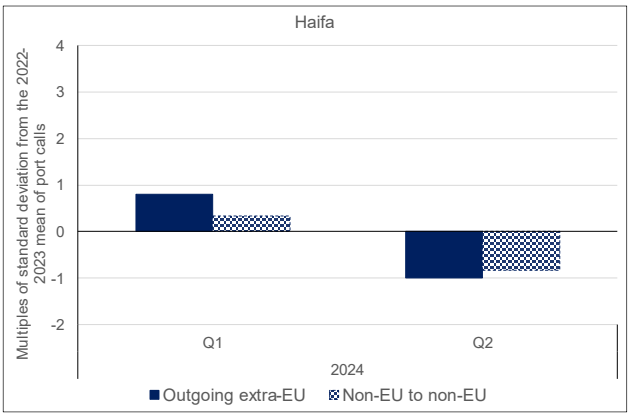
[201] The new port data arising from the situation in the Red Sea | Social Newspaper | Nea Piraeus (koinoniki.gr)" Τα νέα «δεδομένα» στο λιμάνι από την κατάσταση στην Ερυθρά Θάλασσα | Εφημερίδα Κοινωνική | Νέα Πειραιάς (koinoniki.gr)

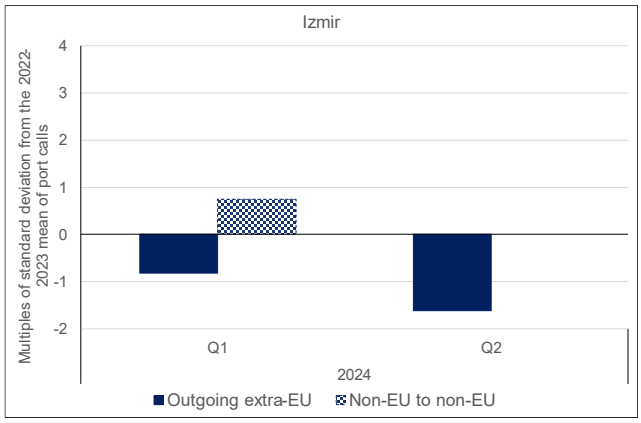

Ashdod
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU

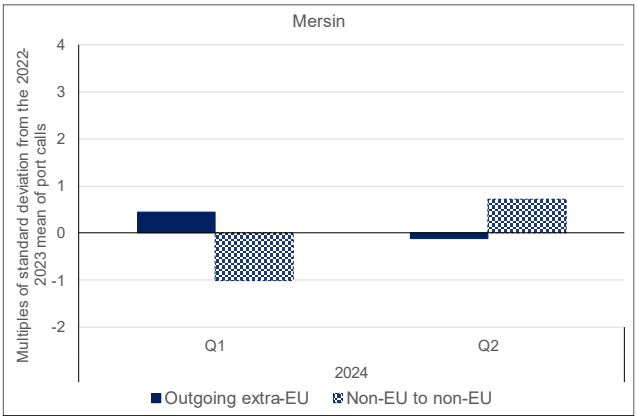

Beirut
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU

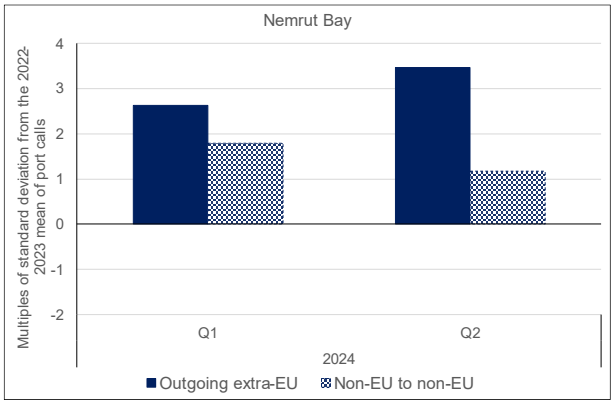

Damietta
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
-3
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU

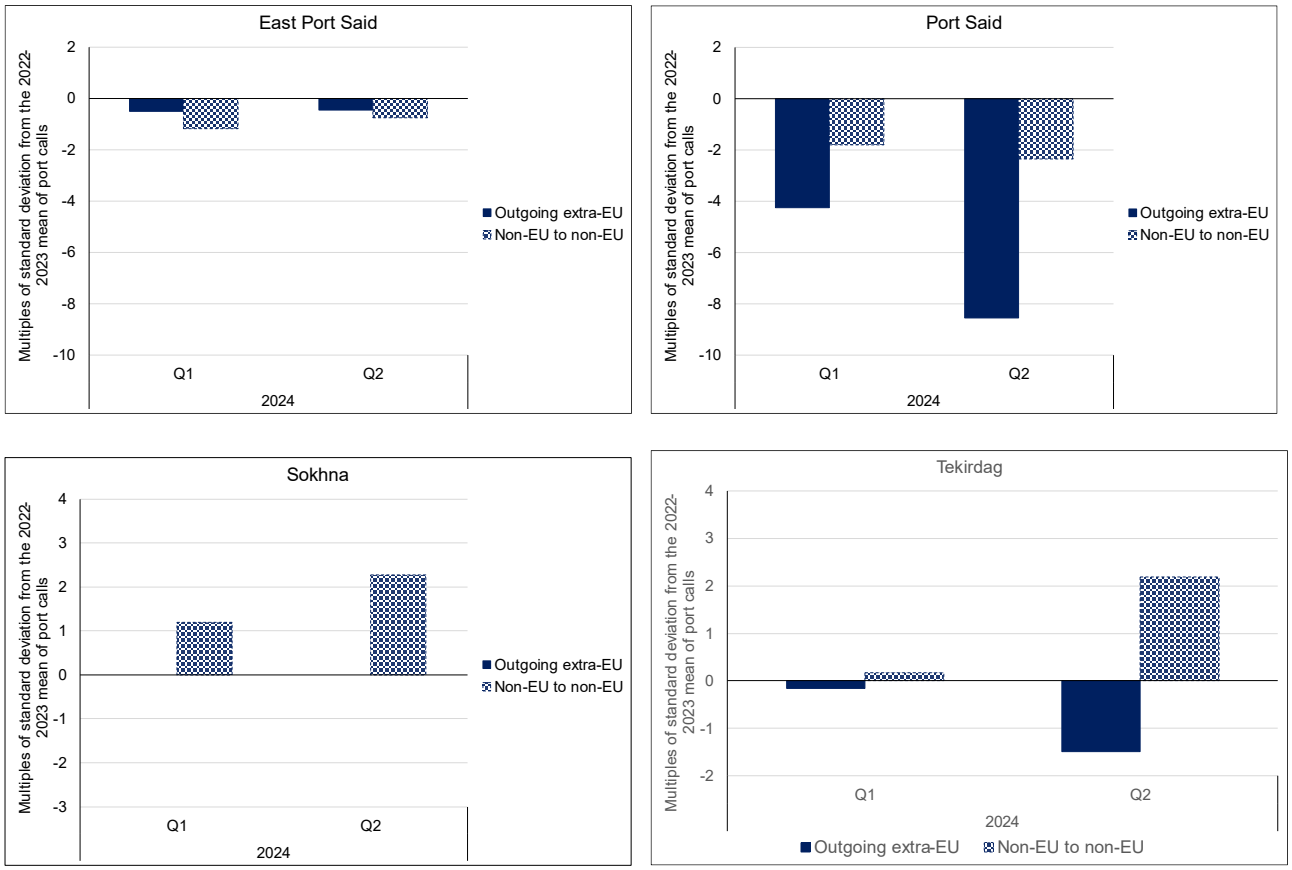

El Dekheila
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
-3
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU


Haifa
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU


Izmir
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU


Mersin
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU


Nemrut Bay
Multiples of standard deviation from the 2022-2023 mean of port calls
4
3
2
1
0
-1
-2
Q1
Q2
2024
Outgoing extra-EU
Non-EU to non-EU



Source: Ricardo analysis of EMSA MARINFO data

In Alexandria, there is a significantly large increase in Q1 for outgoing extra-EU voyages, followed by a smaller but still substantial rise in Q2. An increase is also observed in non-EU to non-EU voyages during both Q1 and Q2, though it is less pronounced than for outgoing extra-EU voyages.

In Ambarli, there is an increase in outgoing extra-EU voyages during both periods, with the rise being more pronounced in Q1. There is also an increase in non-EU to non-EU voyages in both periods, although the growth is smaller compared to outgoing extra-EU voyages. In Ashdod, outgoing extra-EU voyages increase across both periods, particularly in Q1. There is also a significant increase in non-EU to non-EU voyages in Q1, followed by a slight decrease in Q2.

In Beirut, there is a notable rise in outgoing extra-EU voyages in both periods, particularly in Q1, reaching almost a value of four. Additionally, there is an increase in non-EU to non-EU voyages during both periods, though it is significantly higher in Haifa, where a slight increase in outgoing extra-EU voyages is observed in Q1, followed by a slight decrease in Q2. Non-EU to non-EU voyages show a modest increase in Q1 and a decrease in Q2.

In Damietta, there is a decrease in outgoing extra-EU voyages in Q1 and Q2, with the drop being more significant in Q1. Regarding non-EU to non-EU voyages, there is an increase in both quarters, more notable in Q1.

In East Port Said, a slight decrease is observed in both outgoing extra-EU voyages and non-EU to non-EU voyages. The decrease in non-EU to non-EU voyages is slightly larger than that in outgoing extra-EU voyages. In Port Said, there is a significant decrease in outgoing extra-EU voyages, particularly in Q2 (with an absolute value greater than eight). A smaller, yet noticeable, decrease is also observed in non-EU to non-EU voyages, remaining consistent across both Q1 and Q2.

In El Dekheila, a decrease in outgoing extra-EU voyages is observed in Q1, followed by a slight increase in Q2. Non-EU to non-EU voyages show an increase in both periods, with a notable rise in Q1. In El Sokhna, no outgoing extra-EU voyages are shown, while an increase in non-EU to non-EU voyages is observed, particularly in Q2.

In Izmir, there is a decrease in outgoing extra-EU voyages and a slight increase in non-EU to non-EU voyages only in Q1. In Mersin, there is a slight increase in outgoing extra-EU voyages in Q1, followed by a slight decrease in Q2. Non-EU to non-EU voyages show a decrease in Q1 and a slight increase in Q2.

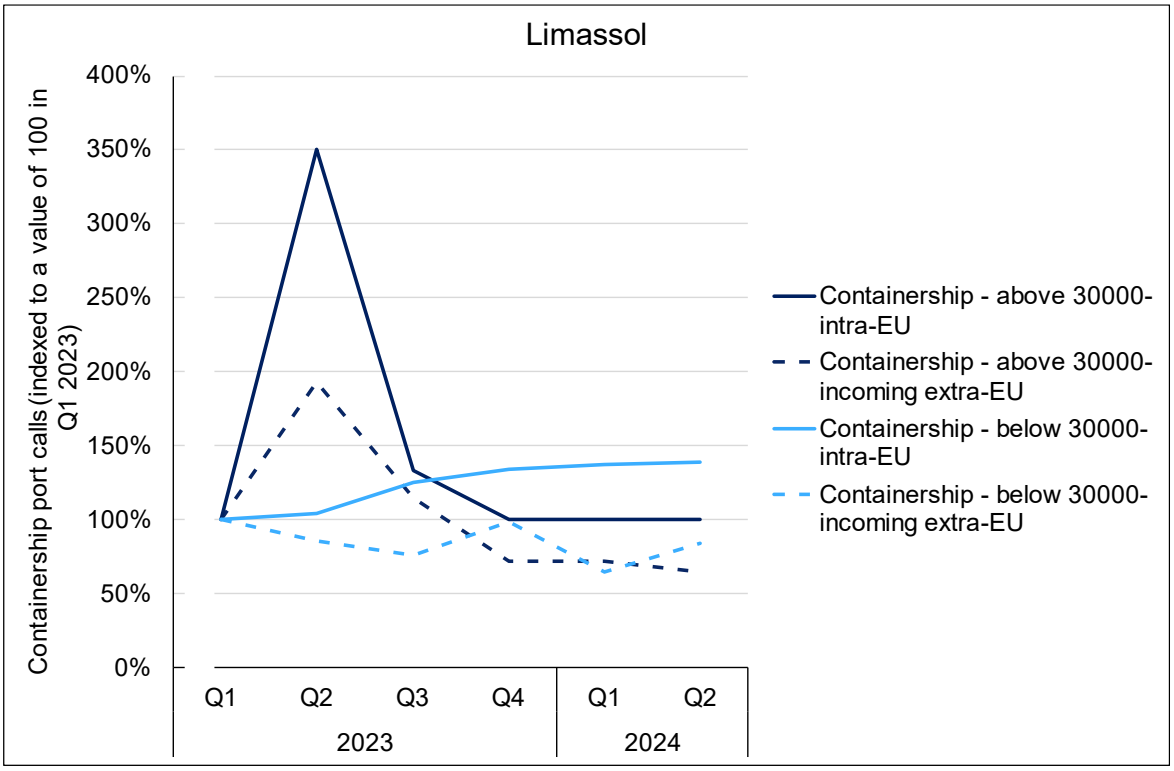
In Nemrut Bay, there is an increase in both outgoing extra-EU voyages and non-EU to non-EU voyages, with the increase in outgoing extra-EU voyages being more significant. In Tekirdag, a slight decrease in outgoing extra-EU voyages is observed in Q1, followed by a larger decrease in Q2. On the other hand, there is a slight increase in non-EU to non-EU voyages in Q1, with a more substantial increase in Q2.

7.3.2. TRE2

Container vessels

To complement the previous analysis, the number of containerships port calls at the ports of Limassol and Piraeus is examined individually in Figure 7-3 and Figure 7-4.

Figure 7-3: Quarterly port calls, for container ships over and below 30,000 GT. Limassol

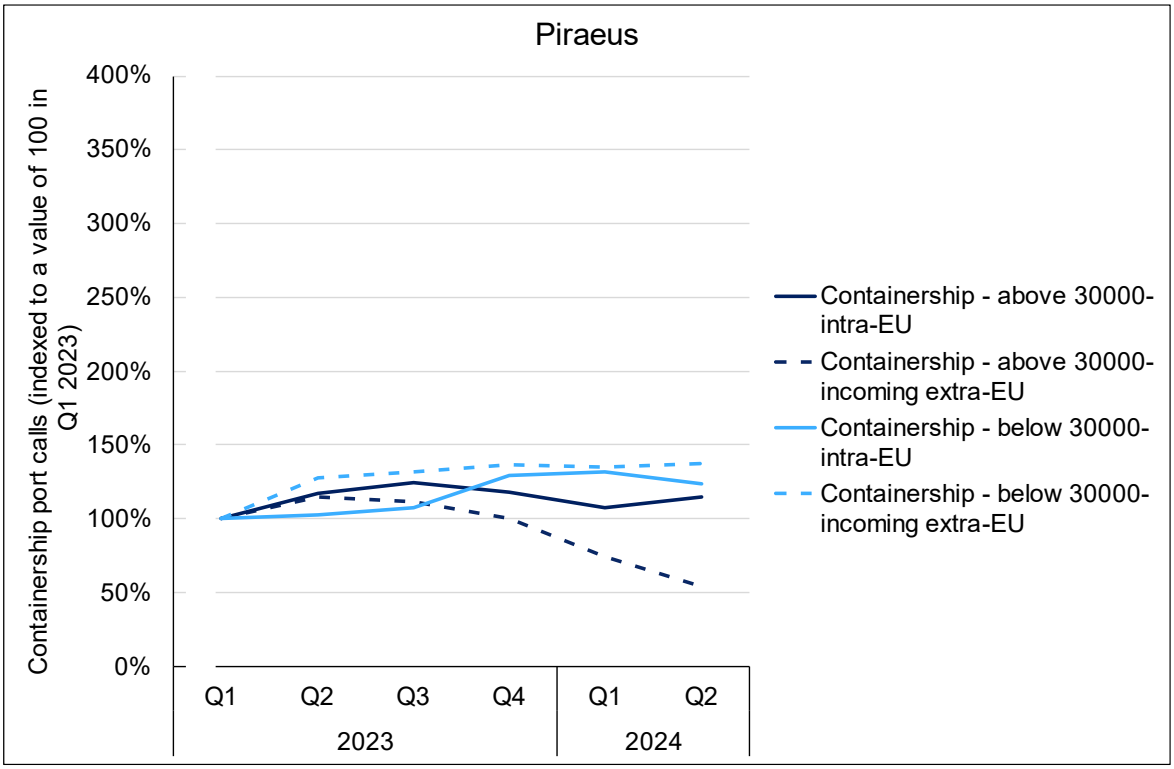


Source: Ricardo analysis of EMSA MARINFO data

For Limassol, containerships over 30,000 GT show a similar trend across the different quarters for both intra-EU and extra-EU voyages. There is a considerable increase in Q2 2023, particularly for intra-EU voyages. However, in 2024, the variation in intra-EU voyages is practically zero compared to Q1 2023, while extra-EU voyages decrease slightly. This behaviour aligns directly with the previous graph, which shows a decline in port calls for ships over 30,000 GT arriving in the EU.

For containerships below 30,000 GT, there is a slight increase over time from Q1 2023 to Q2 2024, while extra-EU voyages show a slight decline over the same period, which might be related to the situation in the Red Sea.

Figure 7-4: Quarterly port calls, for container ships over and below 30,000 GT. Piraeus



Source: Ricardo analysis of EMSA MARINFO data

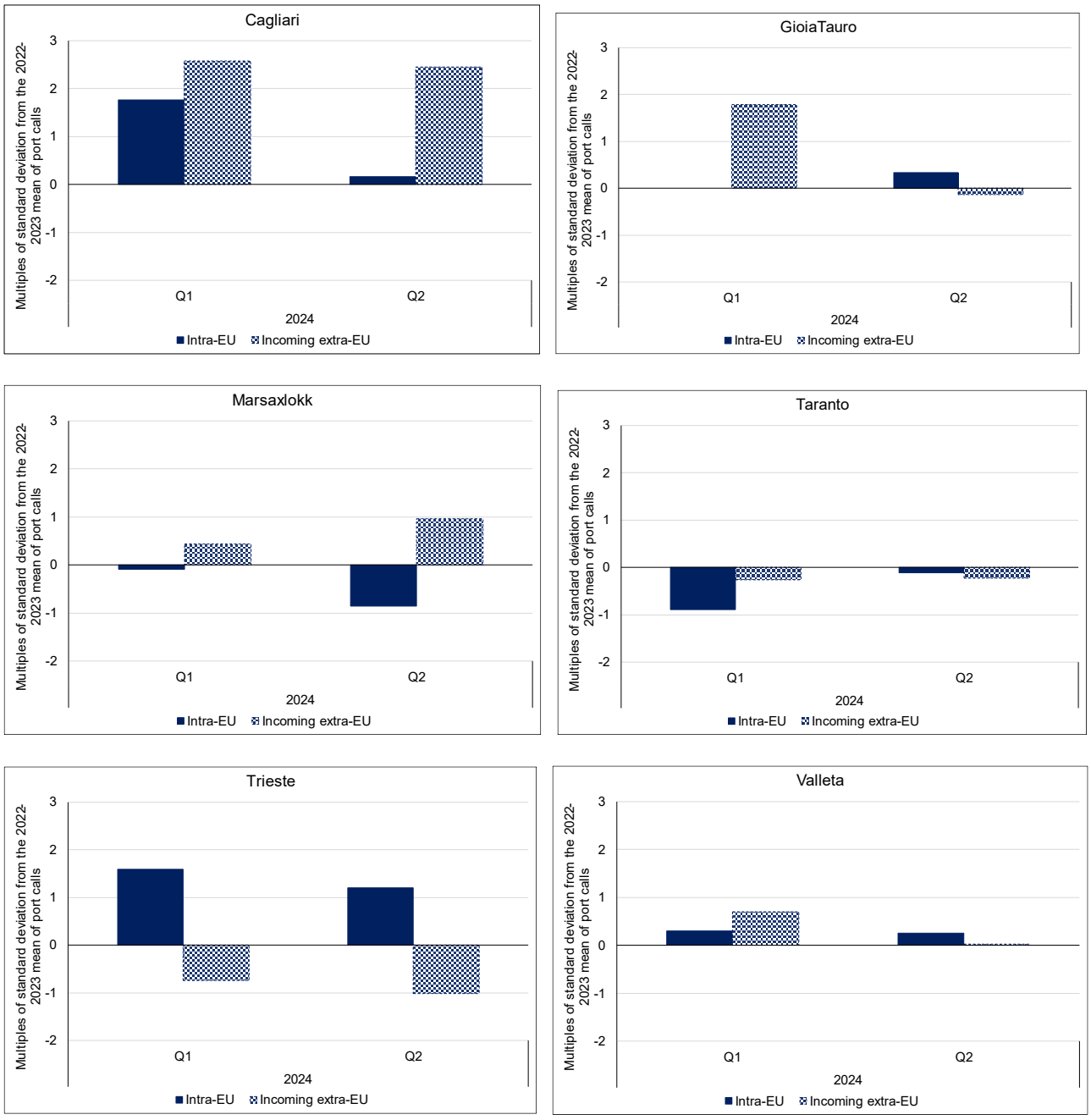
In the case of Piraeus, a relatively similar trend is observed across the quarters for containerships both above and below 30,000 GT, with a few exceptions. For ships above 30,000 GT, port calls associated with intra-EU voyages show a slight increase, though this seems to be almost zero in Q1 and Q2 2024. Regarding extra-EU voyages, there is a slight decline in port calls, becoming more pronounced in Q2 2024. For containerships below 30,000 GT, a slight increase is noted in Q1 and Q2 2024, for both intra-EU and extra-EU voyages. This is consistent with the overall East-Mediterranean trends shown, i.e. a slight decrease in non-EU to EU voyages of containerships above 30,000 GT from Q4 2023 onwards. The timing of this decline, from Q4 2023 to the present, coincides with the onset of the Red Sea Crisis in October 2023, though it cannot be conclusively linked to this event it seems more likely that a decline in traffic for above 30,000 GT vessels is due to this rather than avoidance of EU ETS charges.

7.3.3. TRC2

EU transhipment ports

To complement this analysis, the graphs in Figure 7-5 show multiples of the standard deviation from the 2022-2023 mean of port calls, on a quarterly basis, for select ports in the Central Mediterranean. The analysis is separated by intra-EU voyages and incoming extra-EU voyages.

Figure 7-5: Multiples of standard deviation from the 2022-2023 mean of port calls, for Cagliari, Gioia Tauro, Marsaxlokk, Taranto, Trieste and Valleta



Source: Ricardo analysis of EMSA MARINFO data

In Cagliari, a significant increase is observable in incoming extra-EU voyages in Q1 and Q2, close to three standard deviations. For intra-EU voyages, an increase is also noted in Q1, while in Q2 the value is nearly zero. In Gioia Tauro, there are slight changes in intra-EU voyages, with a value of zero in Q1 and less than one in Q2. For incoming extra-EU voyages, an increase is observed in Q1, close to two standard deviations. In Q2, a slight decrease is noted, approaching zero.

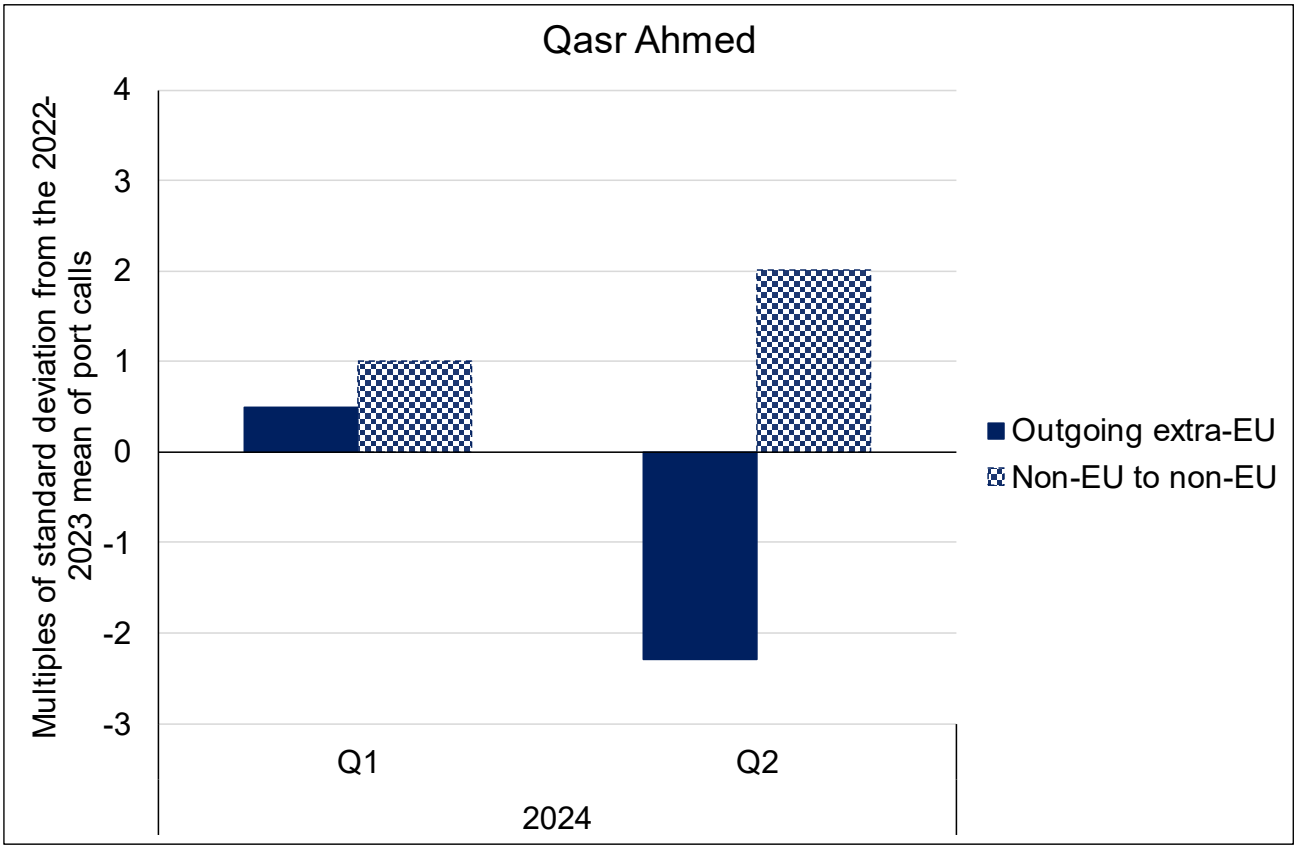
In Marsaxlokk, the variations for both intra-EU and incoming extra-EU voyages are not significant. For incoming extra-EU voyages, there is an increase approaching one standard deviations in Q2. Meanwhile, for intra-EU voyages, there is a more pronounced decrease in Q2, approaching an absolute value of one standard deviations. In Taranto, similar to Marsaxlokk, no significant changes in behaviour are observed in Q1 and Q2. For intra-EU voyages, there is a decrease in both Q1 and Q2 (with a slightly greater decline in Q1). Meanwhile, for incoming extra-EU voyages, there is a very small decrease in both Q1 and Q2.

In Trieste, for intra-EU voyages, an increase is observed in both Q1 and Q2 (with a slightly greater increase in Q1). For incoming extra-EU voyages, a decrease is noted in both Q1 and Q2 (with a slightly greater decline in Q2). In the port of Valletta, the variations are minimal for both incoming extra -EU and intra-EU voyages. The most notable increase is observed for incoming extra-EU voyages in Q1.

Neighbouring non-EU ports

To look at the changes at the neighbouring non-EU transhipment port, Figure 7-6 shows the changes in the first two quarters of 2024, relative to the quarterly average across 2022 to 2023, for Qasr Ahmed. These changes are expressed in terms of numbers of standard deviations from that mean (also calculated across 2022 to 2023).

Figure 7-6: Multiples of standard deviation from the 2022-2023 mean of port calls, for Qasr Ahmed



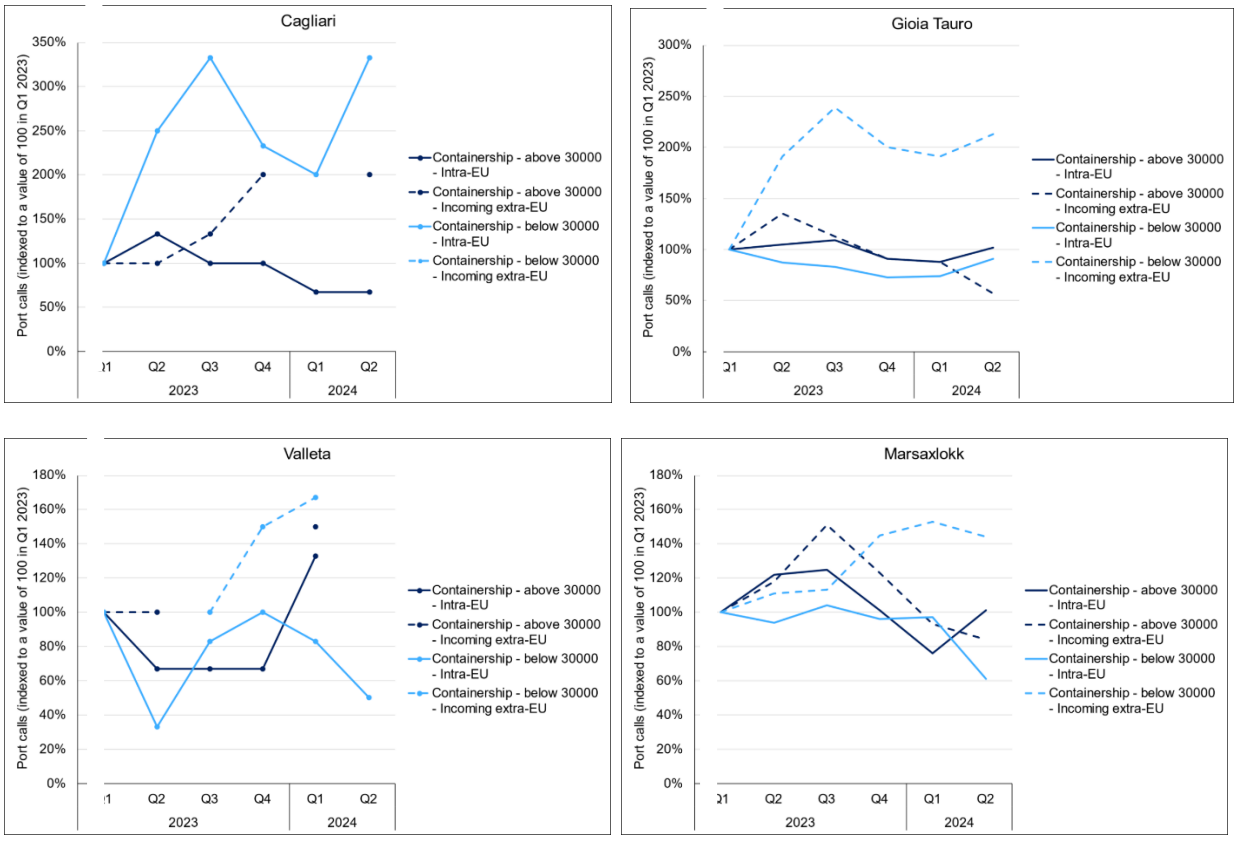
Source: Ricardo analysis of EMSA MARINFO data

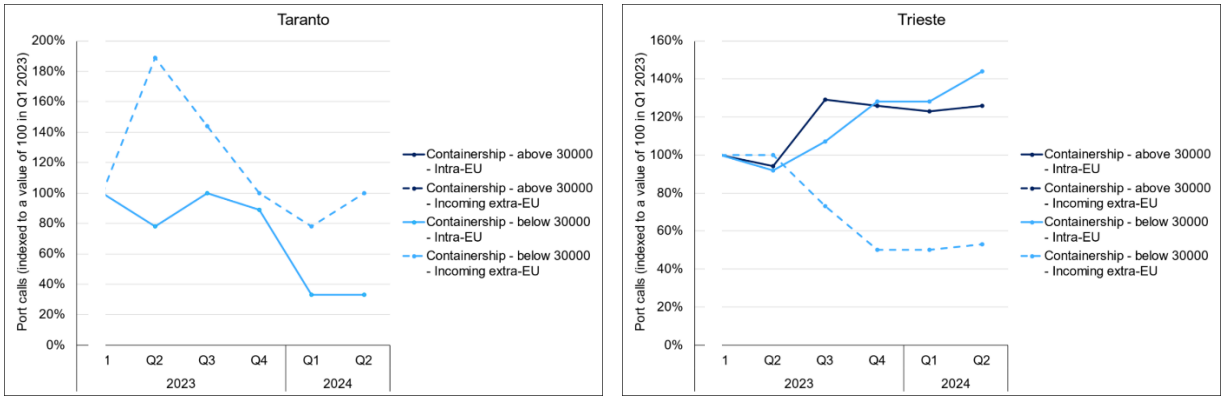
In Qasr Ahmed, a slight increase in outgoing extra-EU voyages is observed in Q1, followed by a considerable decrease in Q2. On the other hand, an increase in non-EU to non-EU voyages is noted in both periods, with a more significant rise in Q2.

7.3.4. TRC2

To complement the previous analysis, the number of port calls of container ships only at the ports in Central Mediterranean are examined individually in Figure 7-7, using a quarterly index base of 100 in Q1 2023.

Figure 7-7: Quarterly port calls, for container ships over and below 30,000 GT. Cagliari, Gioia Tauro, Valletta, Marsaxlokk, Taranto and Trieste





Source: Ricardo analysis of EMSA MARINFO data

In Cagliari, vessels above 30,000 tonnes show a decrease in intra-EU voyages in Q1 and Q2. However, a significant increase is observed for non-intra-EU voyages in Q2 2024. For vessels below 30,000 tonnes, there is a notable increase in port calls for intra-EU voyages in Q1 and Q2 2024, while no non-intra-EU voyages are observed in 2024. In the case of Gioia Tauro, when analysing vessels above 30,000 tonnes, there is a decrease in non-intra-EU voyages in 2024, while intra-EU voyages show almost no variation. For vessels below 30,000 tonnes, intra-EU voyages exhibit a slight decrease in Q1 and Q2, whereas non-intra-EU voyages show a significant increase from Q2 2023 to Q2 2024.

In Valletta, a heterogeneous behaviour is observed over time. For containerships over 30,000 tonnes, both non-intra-EU and intra-EU voyages show an increase in Q1 2024. For vessels below 30,000 tonnes, there is a decrease in intra-EU voyages in Q1 and more pronounced in Q2 2024. Meanwhile, non-intra-EU voyages show an increase in Q1 2024. In Marsaxlokk, containerships over 30,000 tonnes show a decrease in Q1 for intra-EU voyages and no change in Q2. There is a slight decrease in incoming extra-EU voyages in Q1 and Q2 2024. Containerships below 30,000 tonnes show a decrease in intra-EU voyages in Q2 2024, whereas incoming extra-EU show a significant increase from Q4 2023 up to Q2 2024.

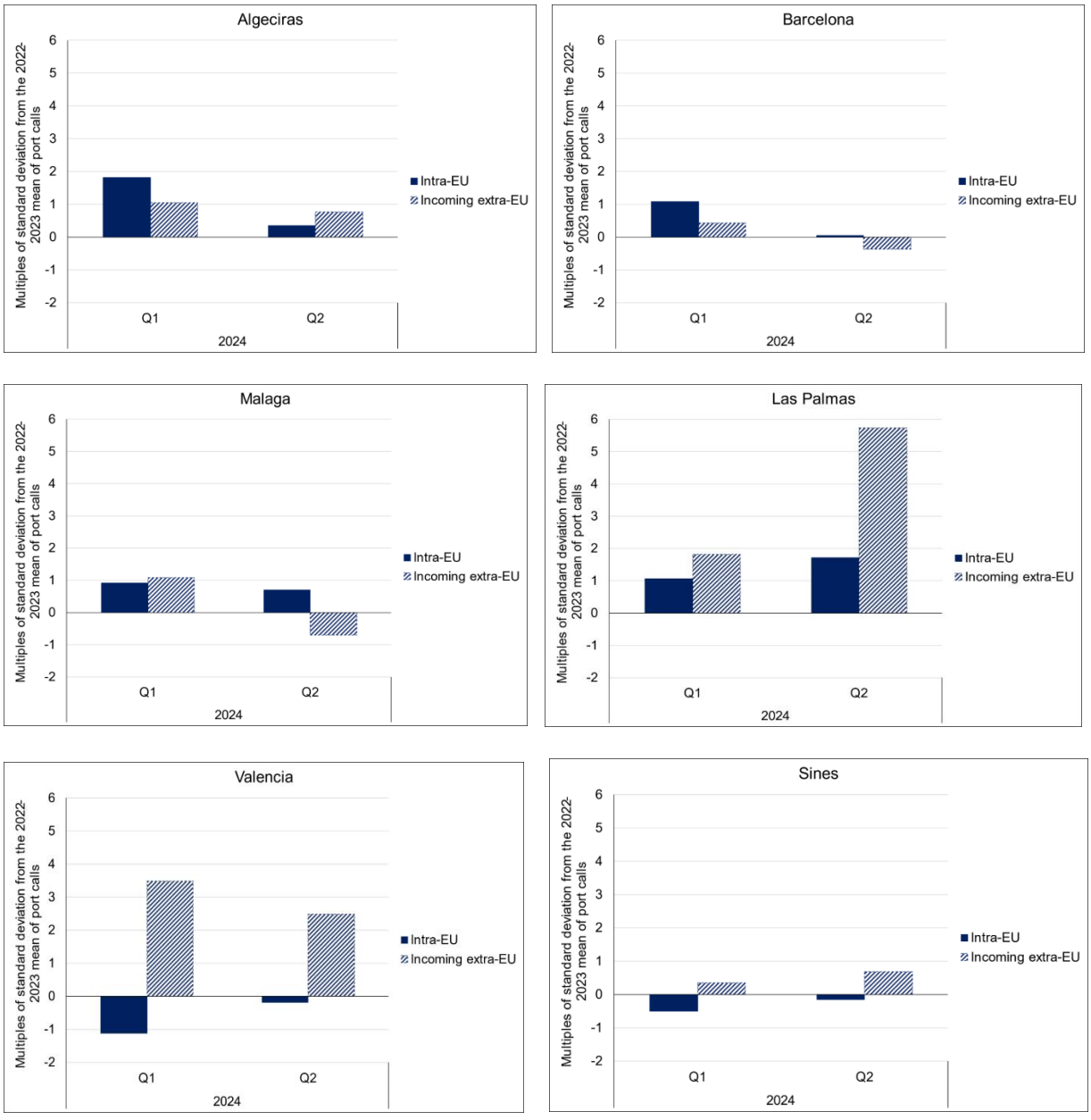
In Taranto, there is no evidence of containerships voyages above 30,000 tonnes. Containerships below 30,000 tonnes exhibit a decrease in intra-EU voyages in Q1 and Q2 2024. In the case of incoming extra-EU voyages, a trend to decrease can be seen from Q2 2023 up to Q1 2024, meanwhile no change are observed in Q2 2024. In Trieste, containerships above 30,000 tonnes exhibit a constant increase from Q3 2023 up to Q2 2024 in intra0-EU voyages, while there are no incoming extra-EU voyages observed. Containerships below 30,000 tonnes show a decrease in incoming extra-EU voyages, from Q3 2023 up to Q2 2024, meanwhile in the same period, an increase is observed in intra-EU voyages.

7.3.5. TRW1

EU transhipment ports

To complement this analysis, the graphs in Figure 7-8 show multiples of the standard deviation from the 2022-2023 mean of port calls, on a quarterly basis, for select ports in the West Mediterranean. The analysis is separated by intra-EU voyages and incoming extra-EU voyages, for the ports of Algeciras, Barcelona, Malaga, Las Palmas, Valencia and Sines.

Figure 7-8: Multiples of standard deviation from the 2022-2023 mean of port calls, for Algeciras, Barcelona, Malaga, Las Palmas, Valencia, Sines



Source: Ricardo analysis of EMSA MARINFO data

In the Port of Algeciras, an increase is observed in both intra-EU and incoming extra-EU voyages, with the most significant rise occurring in Q1 for both types of voyages. In

Barcelona, there is a slight increase in intra-EU voyages in both periods, with a greater rise in Q1. Incoming extra-EU voyages see a slight increase in Q1 but a slight decrease in Q2.

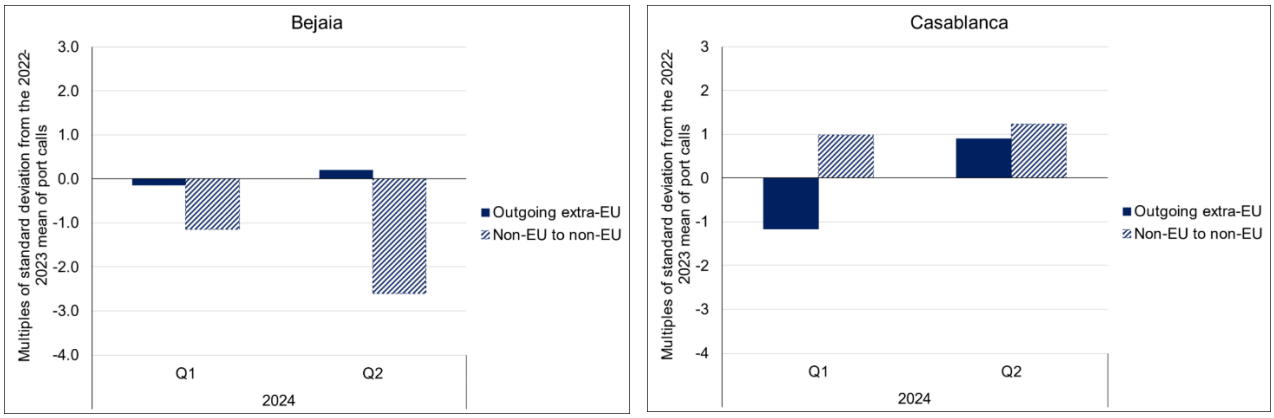
In Malaga, a slight increase in intra-EU voyages is observed, remaining almost constant across Q1 and Q2. There is an increase in incoming extra-EU voyages in Q1, but a slight decrease in Q2. In Las Palmas, a slight increase in intra-EU voyages is noted in Q1, followed by a more significant rise in Q2. For incoming extra-EU voyages, there is an increase in both Q1 and Q2, with the latter showing a considerable rise.

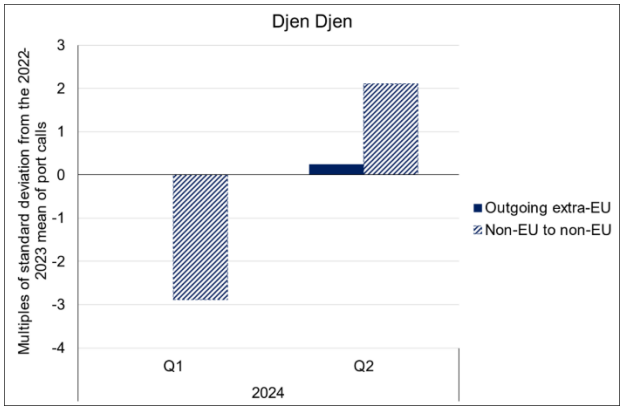
In Valencia, there is a decrease in intra-EU voyages in both Q1 and Q2, while a significant increase in incoming extra-EU voyages is observed for the same periods. In Sines, a slight decrease in intra-EU voyages is noted in both Q1 and Q2, while a slight increase in incoming extra-EU voyages is also observed in both quarters.

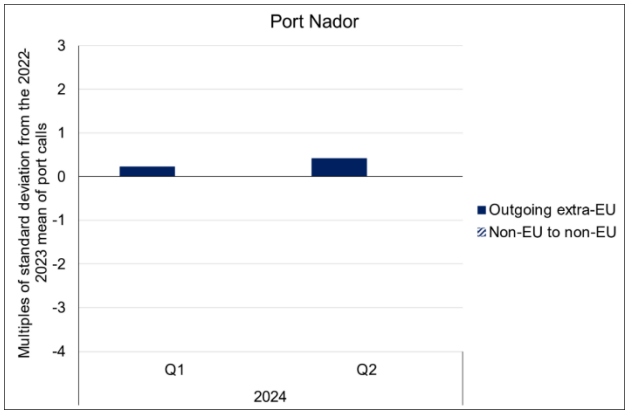
Neighbouring non-EU ports

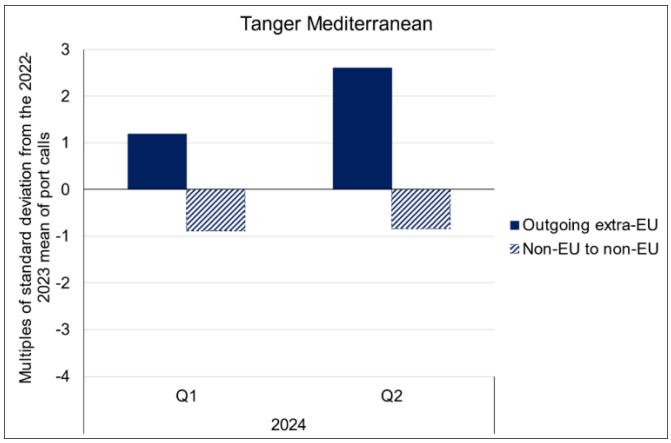
Examining the changes at neighbouring non-EU transhipment ports, Figure 3 presents the changes in port calls in the first two quarters of 2024, relative to the quarterly average across 2022 to 2023, separately for Bejaia, Casablanca, Djen-Djen, Port Nador and Tanger Med. These changes are expressed in terms of numbers of standard deviations from that mean (also calculated across 2022 to 2023).

Figure 7-9: Multiples of standard deviation from the 2022-2023 mean of port calls, for Bejaia, Casablanca, Djen-Djen, Port Nador and Tanger Med









Source: Ricardo analysis of EMSA MARINFO data

In Bejaia, there is a decrease in non-EU to non-EU voyages across both periods, with the drop being more pronounced in Q2. There is also a very slight decrease in outgoing extra-EU voyages in Q1, followed by a slight increase in Q2. In Casablanca, a decrease in outgoing extra-EU voyages is seen in Q1, which is offset by an increase in Q2. Additionally, there is an increase in non-EU to non-EU voyages in both Q1 and Q2.

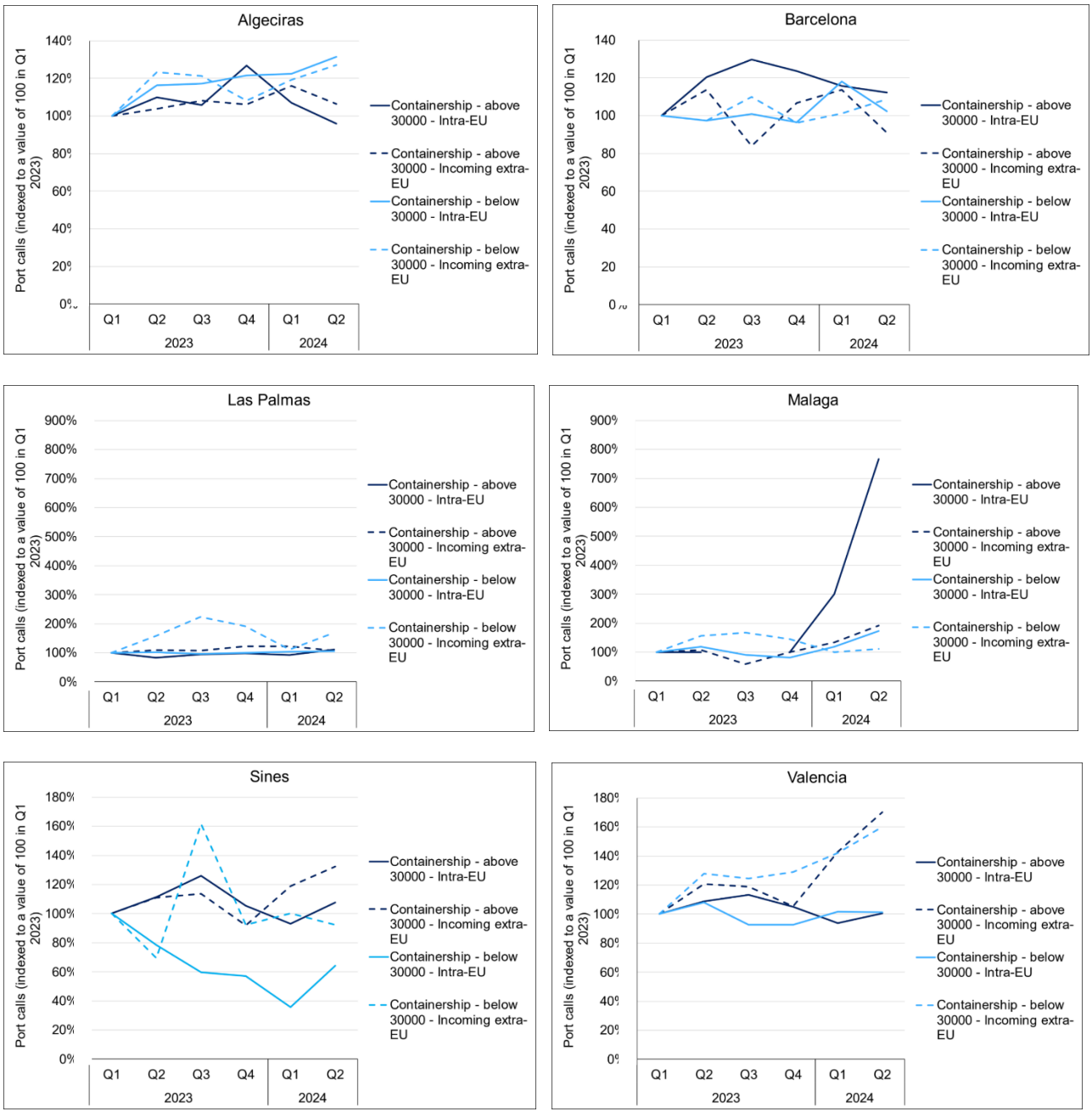
In Djen-Djen, a significant decrease in non-EU to non-EU voyages is observed in Q1, while an increase is seen in Q2. Meanwhile, there is only a slight increase in outgoing extra-EU voyages in Q2 2024. In Port Nador, there is only a slight increase in outgoing extra-EU voyages during both Q1 and Q2.

Finally, in Tanger Med, there is an increase in outgoing extra-EU voyages during both periods, with a larger rise in Q2. At the same time, there is a consistent decrease in non-EU to non-EU voyages in both Q1 and Q2.

7.3.6. TRW2

To complement the previous analysis, the number of port calls of container ships only at the ports in the West Mediterranean are examined individually in Figure 7-10, using a quarterly index base of 100 in Q1 2023.

Figure 7-10: Quarterly port calls, for container ships over and below 30,000 GT, Algeciras, Barcelona, Las Palmas, Malaga, Sines and Valencia.



Source: Ricardo analysis of EMSA MARINFO data

In Algeciras, containerships over 30,000 tonnes show an increase in intra-EU voyages in Q1 2024, followed by a decrease in Q2 2024. Incoming extra-EU voyages also increase

over the same periods, though less so in Q2 2024. Containerships below 30,000 tonnes display a similar increase in both Q1 and Q2 2024 for both intra-EU and incoming extra-EU voyages, with intra-EU voyages being slightly higher.

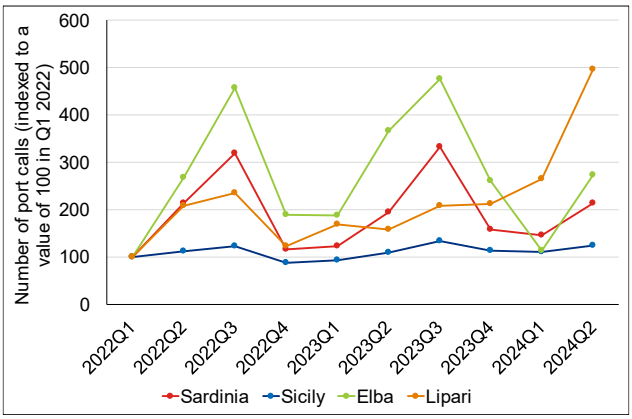
In Barcelona, containerships over 30,000 tonnes exhibit an increase in intra-EU voyages for both Q1 and Q2 2024. However, for incoming extra-EU voyages, there is an increase in Q1 2024 and a slight decrease in Q2. Containerships below 30,000 tonnes show an increase in intra-EU voyages in both Q1 and Q2 2024, though the rise is smaller and almost negligible in Q2. Meanwhile, there was a slight increase of incoming extra-EU voyages in both quarters.

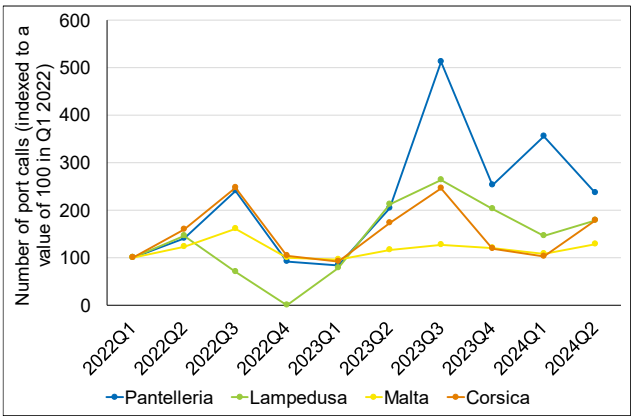
In Las Palmas, there is a relatively stable trend over time for containerships both above and below 30,000 tonnes, for both intra-EU and incoming extra-EU voyages. The main difference occurs with containerships below 30,000 tonnes, where incoming extra-EU voyages show a slight increase in Q1, followed by a more pronounced rise in Q2 2024. In Málaga, there is a significant increase in port calls from containerships above 30,000 tonnes in 2024, particularly in Q2, for intra-EU voyages. Incoming extra-EU voyages also see a notable rise (albeit on a smaller scale) during both periods. Containerships below 30,000 tonnes show an increase in intra-EU voyages, mainly in Q2 2024, while incoming extra-EU voyages remain steady throughout 2024.

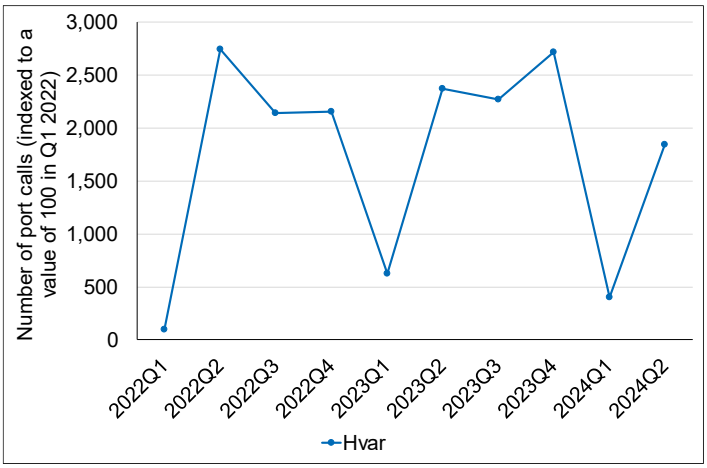
In Sines, containerships above 30,000 tonnes decreased in Q1 2024 and an increase in Q2 2024 for intra-EU voyages, while there is a considerable increase in incoming extra-EU voyages during both periods.

7.3.7. Impacts on shipping services for territorial continuity

Impact on EU islands in the Central Mediterranean

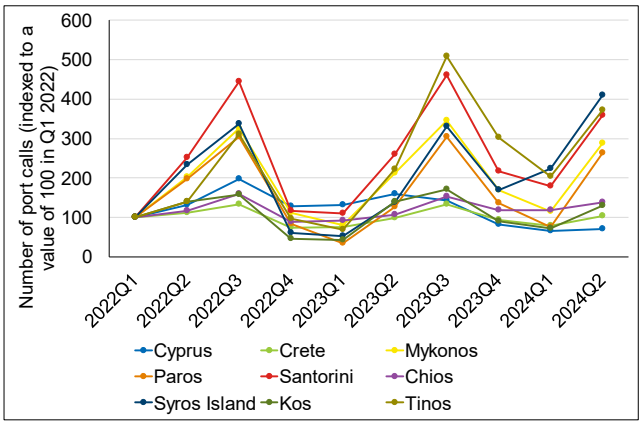


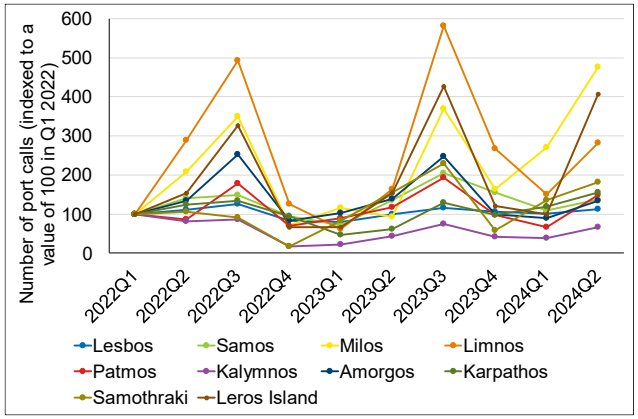


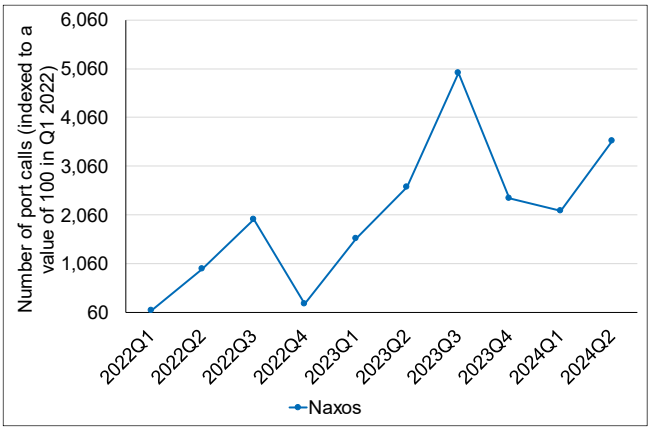


Source: Ricardo analysis of EMSA MARINFO data

Impact on EU islands in the East Mediterranean

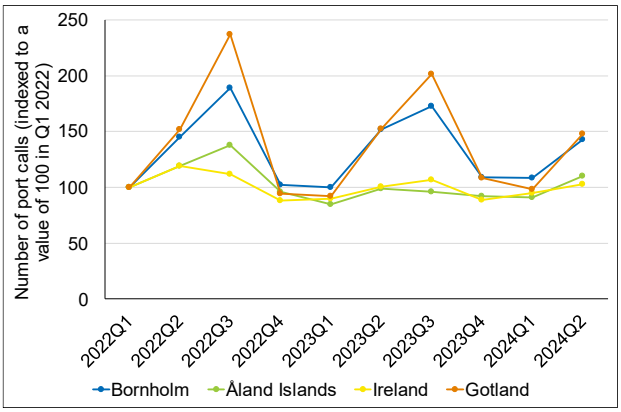




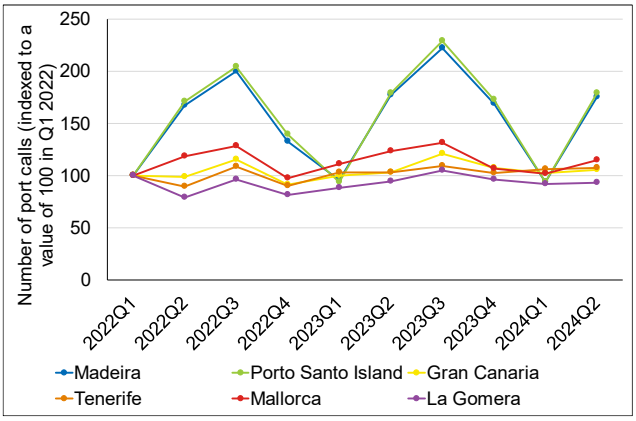


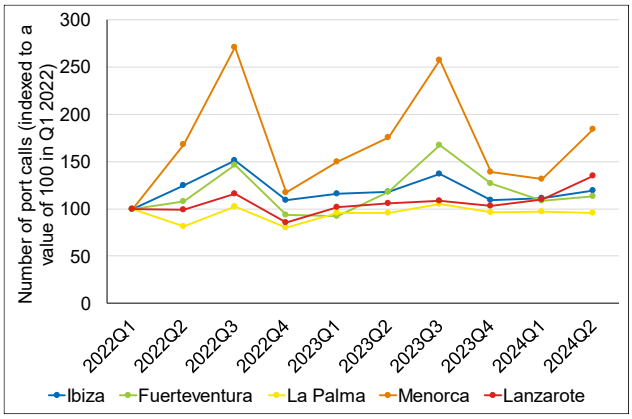
Source: Ricardo analysis of EMSA MARINFO data

Impact on EU islands in the North Mediterranean



Impact on EU islands in the West Mediterranean





Source: Ricardo analysis of EMSA MARINFO data

7.4. Appendix 4 Numbers of vessels included in efficiency index analyses

The following table present the numbers of vessels included in the analyses of the 'Best performing vessels' (BPV) research question in Section 3.7 of the report.

.Parameter	Total vessels/port calls	Percentage of total
Total vessels	19065	
Vessels with EEDI	4138	21.7%
Vessels with EEXI	6140	32.2%
Vessels with EIV	6815	35.7%
Total with index	**17093**	**89.6%**
Total calls 2022	265855	
Calls 2022 with EEDI	26882	10.1%
Calls 2022 with EEXI	112778	42.4%
Calls 2022 with EIV	112941	42.5%
Total with index	**252601**	**95.0%**
Total calls 2023	271598	
Calls 2023 with EEDI	28649	10.5%
Calls 2023 with EEXI	119998	44.2%
Calls 2023 with EIV	108550	40.0%
Total with index	**257197**	**94.7%**
Total calls 2024	288431	
Calls 2024 with EEDI	33069	11.5%
Calls 2024 with EEXI	121437	42.1%
Calls 2024 with EIV	110011	38.1%
Total with index	**264517**	**91.7%**

Source: Ricardo analyses of THETIS-MRV data

7.5. Appendix 5 Announced investments at EU and non-EU ports

The following tables provide a breakdown of announced investments at EU and non-EU ports.

Table 7-8: Main ongoing and planned container terminals' investments identified in non-EU ports

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
Misrata / Qasr Ahmed	Libya	Central Mediterranean	Expansion for constructing 8 berths	0.4	3.0	3.4	n.d.	n.d.	n.d.
Alexandria	Egypt	East Mediterranean	New Container Terminal (B100 project)	0.8	1.4	2.2	2023	n.d.	2025 - 2035
Damietta	Egypt	East Mediterranean	Damietta Alliance Container Terminal	1.8	3.3	5.1	2023	2025	2025 - 2035
East Port Said	Egypt	East Mediterranean	SCCT to invest $500m in expanding East Port Said port's capacity	3.5	2.0	5.5	2022	2025	2025 - 2035
El Dekheila	Egypt	East Mediterranean	New Container Terminal (El Dekhelia)	0.8	1.5	2.3	n.d.	2024	2024

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
El Dekheila	Egypt	East Mediterranean	- 2 x investments, for multipurpose terminal and dry port - Development of permanent marine facilities station at the port	0.8	0.5	1.3	2024 - 2027	n.d.	2025 - 2035
Sokhna	Egypt	East Mediterranean	New Container Terminal (Ain Sokhna Port)	0.9	3.5	4.4	2023	2025 - 2026	2025 - 2035
Abu Qir	Egypt	East Mediterranean	New Container Terminal (Hutchinson Ports)	-	2.0	2.0	2021	Ongoing	2025 - 2035
Beirut	Lebanon	East Mediterranean	Beirut Container Terminal expansion	0.8	0.5	1.3	2022	2032	2025 - 2035
Ambarli	Türkiye	East Mediterranean	Expansion project - cranes ordered to Marport	3.2	n.d.	3.2	2023	2024	2024
Izmir	Türkiye	East Mediterranean	Alsancak Port expansion via the "Izmir Bay and Alsancak Port Rehabilitation Project"	0.3	2.0	2.3	After 2020	n.d.	n.d.

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
Mersin	Türkiye	East Mediterranean	Capital dredging for the expansion of Mersin Port	1.9	n.d.	1.9	n.d.	2024	2024
Mersin	Türkiye	East Mediterranean	Phase 2 of the EMH Project ("EMH2")	1.9	1.0	2.9	n.d.	2026	2025 - 2035
Adana	Türkiye	East Mediterranean	New container terminal	-	9.0	9.0	2024	n.d.	2025 - 2035
Felixstowe	UK	UK	Port expansion – delivery of five new automated electric RTG cranes	3.4	n.d.	3.4	n.d.	2024	2024
London Gateway	UK	UK	Opening of a fourth berth	2.1	1.0	3.1	2024	2029	2025 - 2035
Liverpool	UK	UK	New container storage	0.9	0.0	0.9	n.d.	2024	2024
Sheerness	UK	UK	New Ro-Ro berth	0.3	n.d.	0.3	2025	2025	2025 - 2035
Greenock	UK	UK	Port expansion, ship-to-shore cranes	0.1	n.d.	0.1	2024	2024	2024
Kribi	Cameroon	West African	Phase II port expansion	0.3	0.7	0.9	n.d.	2024	2024

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
Tema	Ghana	West African	Second phase of Tema Port Expansion Project	1.2	1.2	2.4	2023	2025	2025 - 2035
Nouadhibou	Mauritania	West African	Extension of the Nouadhibou deep-water port	0.1	0.2	0.3	n.d.	2035	2025 - 2035
Free Town	Sierra Leone	West African	Construction & expansion of dry port	0.2	0.1	0.3	2022	2025	2025 - 2035
Djen-Djen	Algeria	West Mediterranean	Container terminal at the Djen Djen Port in Jijel	0.2	2.3	2.5	2024	2025	2025 - 2035
Tanger Med	Morocco	West Mediterranean	Port expansion, phases 1-3	8.6	3.0	11.6	2023	2025	2025 - 2035
Nador	Morocco	West Mediterranean	New East Container Teminal	0.1	3.4	3.5	2015	2027	2025 - 2035

Source: Review of available literature

Table 7-9: List of announced investments at EU ports

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
Burgas	Bulgaria	Black Sea	New deep-water berth	0.1	0.2	0.3	2023	2025	2025 - 2035
Constanta	Romania	Black Sea	Port expansion, addition of project cargo facilities	0.8	0.7	1.5	2023	2024	2024
Rijeka	Croatia	Central Mediterranean	New Rijeka Gateway Terminal	0.4	0.7	1.1	2025	2025	2025 - 2035
Cagliari	Italy	Central Mediterranean	New Ro-Ro Terminal - Basic port infrastructure - ongoing	0.2	n.d.	0.2	n.d.	2029	2025 - 2035
Gioia Tauro	Italy	Central Mediterranean	Delivery of 6 cranes	2.8	0.2	2.9	2023	2024	2024
Livorno	Italy	Central Mediterranean	Construction of the Darsena Europa container terminal	0.6	0.8	1.4	2024	2026	2025 - 2035
Taranto	Italy	Central Mediterranean	Infrastructure upgrades, equipment modernization	0.0	2.0	2.0	2020	2030	2025 - 2035

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
Trieste	Italy	Central Mediterranean	New container terminal at Pier VIII	0.8	1.6	2.4	2025	2027	2025 - 2035
La Spezia	Italy	Central Mediterranean	- New Ravano container terminal - New del Golfo container terminal (no details found)	1.7	0.6	2.3	n.d.	2026-2028	2025 - 2035
Marsaxlokk/Malta Freeport	Malta	Central Mediterranean	Terminal 2 Northern Europe Quay extension	2.8	0.4	3.2	2024	2024	2024
Limassol	Cyprus	East Mediterranean	Expansion of Terminal 2 (Vassiliko)	0.2	n.d.	0.2	2024	n.d.	2025 - 2035
Piraeus	Greece	East Mediterranean	Extension of car terminal	4.6	0.0	4.6	n.d.	2024	2024
Thessaloniki	Greece	East Mediterranean	Expansion project of Pier 6 (Terminal area	0.8	n.d.	0.8	n.d.	2025 - 2028	2025 - 2035
Antwerp	Belgium	NW Europe	Europa Terminal expansion & Extra Container Capacity Antwerp (ECA) project	11.4	7.2	18.6	2022	2030	2025 - 2035

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
Esbjerg	Denmark	NW Europe	Expansion of capacity	0.0	n.d.	0.0	2024	n.d.	2025 - 2035
Rauma	Finland	NW Europe	Expansion area to be taken in use step by step	0.2	n.d.	0.2	n.d.	n.d.	n.d.
Bremerhaven	Germany	NW Europe	Container quay extension	4.2	2.1	6.3	2026	2030-2040	2025 - 2035
Cork	Ireland	NW Europe	Construction of two berth expansions	0.3	n.d.	0.3	n.d.	n.d.	2025 - 2035
Riga	Latvia	NW Europe	Extension of the berth line at the container terminal	0.4	n.d.	0.4	2023	2024	2024
Rotterdam	Netherlands	NW Europe	Expansion of terminals in Prinses Amaliahaven of Maasvlakte II	13.1	3.8	16.9	2023	2026	2025 - 2035
Gdynia	Poland	NW Europe	New Outer Port in the Port of Gdynia	0.9	2.5	3.4	2021	2028	2025 - 2035
Gdansk	Poland	NW Europe	Construction of T3 terminal - phase 3	2.2	1.5	3.7	2022	2025	2025 - 2035

Port	Country	Basin relevance	Investment type	2023 port throughput (mteu)	Increase in capacity via investment (mteu)	Potential new throughput of port (mteu)	Start year	Completion year	Capacity increase implemented
Koper	Slovenia	NW Europe	Expansion of Pier 1 container terminal	1.0	0.3	1.3	2025	2027	2025 - 2035
Helsingborg	Sweden	NW Europe	New container terminal	0.2	n.d.	0.2	n.d.	2031	2025 - 2035
Sines	Portugal	West Mediterranean	Extension of Container Terminal (Terminal XXI)	1.7	1.8	3.5	2021	2028	2025 - 2035
Barcelona	Spain	West Mediterranean	Accommodation of seven more container blocks, and 14 automated cranes	3.3	0.7	4.0	2021	2024	2024
Bilbao	Spain	West Mediterranean	Construction of a new terminal for storage of biofuel and other bulk liquid products	0.5	n.d.	0.5	2025	2027	2025 - 2035
Valencia	Spain	West Mediterranean	New container terminal in the Northern European extension of the port	4.8	5.0	9.8	2025	2030	2025 - 2035

Source: Review of available literature

7.6. Appendix 6 Literature review of route changes

The following tables provide a summary of findings from a literature review carried out in 2024, looking into publicly reported route changes that might impact the ports that have been monitored for evasive behaviours.

7.6.1. West Mediterranean

Region	Country	Port(s) affected	Notes	Source	Link	Source date
West Mediterranean	Portugal	Sines	Announcement for the **new lines in the port connecting Europe with Asia** while avoiding the Suez Canal (MSC). Port of Sines added to Dragon Service MSC route, connecting PT to Far East.	Web Article	Port of Sines with new routes	27/01/2024
West Mediterranean	Spain, Morocco	Algeciras, Tanger Med	The new Morocco Bridge solution is a multimodal service that connects Morocco with Spain and the rest of Europe. Here, the route reportedly calls at Tanger Med (Morocco), before arriving at Algeciras (Spain) and distributed throughout the rest of Europe. The route is reportedly aimed at driving growth in trade between Morocco and the EU, by reducing congestion. Maersk report that this is driven behind the becoming of Morocco as a strategic hub of North Africa, as a result of supply chain disruptions elsewhere, due to COVID-19, the geopolitical environment and recessionary trends.	Web Article	Connecting the dots between Morocco and the south of Europe	14/02/2024

Region	Country	Port(s) affected	Notes	Source	Link	Source date
West Mediterranean	Spain, Malta	Valencia, Malta Freeport	MSC and CMA CGM have reportedly re-routed their vessels, by cancelling the Malta stopover and taking cargo to Valencia instead for transhipment, with feeder ships distributing cargo to neighbouring countries.	Web Article	MSC and CMA CGM choose Valencia as the export hub for their line between Europe and Australia	19/01/2024
West Mediterranean	Spain	Malaga	The port of Malaga reported increased container traffic, driven by vessels stopping here after re-routing from the Red Sea, as well as MSC shipping agreements.	Web Article	Red Sea crisis sparks huge increase in container ship movements with wave of new traffic at Port of Malaga	16/04/2024

Region	Country	Port(s) affected	Notes	Source	Link	Source date
West Mediterranean	Spain	Tanger Med	**Hapag Lloyd extending a goods transport service line, for the delivery of oranges, from South Africa (Durban port), to call at Tanger Med before arriving in the Mediterranean**; this service was announced to operate in 2024. The use of Morocco as a distribution centre is explained by Hapag-Lloyd as due to the goods in South Africa competing with those in European countries. It should be noted that the shipping company also provides a direct service line from Durban to European port Rotterdam.	Report	Crossing the "European Green Deal" Maritime Measures and the Unfair Competition on the ETS Tax Regime— The Deviation Traffic Danger Between EU and non-EU Hub Ports Shipping from South Africa? Get ready for our Citrus Loader	12/07/2024
West Mediterranean	Spain	Valencia	Hapag Lloyd reports the inclusion of Valencia port as its "third hub" in connection with the port of Jeddah (Saudi Arabia); this previously rotated between Tanger Med, and Damietta (Egypt), with Valencia introduced to the Jeddah express (JDX) shuttle rotation in April 2024, to improve the connectivity from West Mediterranean ports to Red Sea	Web Article	Hapag-Lloyd incluye Valencia en su línea feeder con el Mar Rojo y elimina a Tanger Med	28/03/2024

Region	Country	Port(s) affected	Notes	Source	Link	Source date
West Mediterranean	Morocco	Tanger Med	Tanger Med Port Complex expands its maritime connectivity with a new weekly service linking the Far East to the Mediterranean, operated by Maersk and MSC.	Web Article	NEW MARITIME SERVICE LINKING THE FAR EAST TO THE MEDITERRANEAN OPERATED BY MAERSK AND MSC: AE12 / PHOENIX	05/02/2024
West Mediterranean	Morocco	Tanger Med	Maersk to add new service ME8 for further connection between the Middle East with Europe. In Europe, Port Tangiers and Port Said will serve as transshipment hubs, while Salalah and Jebel Ali will serve as Transshipment hubs in the Middle east for cargo connections. Its rotation consists of Jebel Ali, United Arab Emirates – Doha, Qatar – Dammam, Saudi Arabia – Al Jubail, Saudi Arabia – Jebel Ali, United Arab Emirates - Abu Dhabi, United Arab Emirates - Duqm, Oman - Salalah, Oman – Port Tangiers, Morocco – Port Said, Egypt – Barcelona, Spain – Port Tangiers, Morocco – Algeciras, Spain – Salalah, Oman.	Web Article	Maersk to add new service ME8 for further connection between the Middle East with Europe	05/02/2024

Region	Country	Port(s) affected	Notes	Source	Link	Source date
West Mediterranean	Spain, France	Marseille, Barcelona, Valencia	CMA CGM to reshuffle its service offering from West Mediterranean to West Africa. Ports of Marseille, Barcelona and Valencia are omitted from the MEDWAX service as of February 2022, and are to be offered via Tanger Med/Algeciras hubs via the EURONAF loops. New MEDWAX rotation: Tanger Med - Algeciras - Dakar - Conakry - Monrovia - San Pedro - Abidjan - Freetown - Tanger Med. Marseille, Barcelona and Valencia will be offered via Tanger Med/Algeciras hubs for further connections with EURONAF loops.	Web Article	CMA CGM to reshuffle its service offering from West Mediterranean to West Africa EURONAF loops	15/02/2024
West Mediterranean	Spain	Barcelona, Fos-sur-Mer	Mediterranean Shipping Company (MSC) is revising its former standalone Türkiye/West Mediterranean to US service, by adding direct coverage from Barcelona, Spain and Fos-sur-Mer, France. Tekirdag – Gebze – Aliaga – Haifa – Fos-sur-Mer – Barcelona – Valencia – Sines – Boston – New York – Philadelphia – Savannah These new calls in Barcelona and Fos-sur-Mer aim to further expand MSC’s transatlantic coverage, and increase trade connectivity between Europe and the US.	Web Article	MSC reshuffles Mediterranean – US service	20/06/2024

Region	Country	Port(s) affected	Notes	Source	Link	Source date
West Mediterranean	Spain	Barcelona	MSC will merge its two Mediterranean-Canada strings – Canex1 and Canex2 – into one service. Effective July 2024 The new Mediterranean-Canadian Service will offer a rotation of Gioia Tauro-Naples-Livorno-Genoa-Valencia-Sines-Halifax-Montreal, indicating that only a call at Barcelona is due to be dropped. MSC added that the merged service would also result in fewer greenhouse gas emissions. “As demand grows for more efficiency and fewer supply chain emissions, consolidating cargo onto a single line not only drives operational efficiency, but also helps reduce CO2 emissions,” it said. Barcelona is currently suffering from high levels of congestion, and it is likely MSC would prefer to see ex-Spain shipments funnelled through its Valencia hub. Barcelona added back in Türkiye/West Mediterranean mentioned above	Web Article	MSC unveils new Mediterranean-North America transatlantic network	19/06/2024

Region	Country	Port(s) affected	Notes	Source	Link	Source date
West Mediterranean	Spain, France, Egypt	Barcelona, Marseille, Alexandria	The Swiss/Italian ocean carrier has trimmed its West Mediterranean to Red Sea service by removing France's Marseilles port and Spain's Barcelona port from the port rotation and adding Egypt's Alexandria port. The updated port rotation now includes Valencia (Spain), Gioia Tauro (Italy), Malta, Alexandria (Egypt), Jeddah (Saudi Arabia), King Abdullah (Saudi Arabia), Aqaba (Jordan), Port Said (Egypt), and back to Valencia (Spain).	Web Article	MSC updates European service network	20/09/2024

Source: Review of available literature

7.6.2. Central Mediterranean

Region	Country	Port(s) affected	Notes	Source	Title	Source date
Central Mediterranean	Italy	Gioia Tauro,	**Addition of Gioia Tauro to MSC line, in Red Sea rerouting:** - Port of Gioia Tauro included in a rotation which includes calls at Sines, Valencia, Barcelona, Gioia Tauro, Khalifa, Dubai, Dammam, Jubail, Khalifa, Dubai, Mundra, Nhava Sheva, Colombo and Sines again. - Not only that: the port has also been added to the Aegean Service that serve the connections between the Mediterranean and Northern Europe by calling at the ports of London (Gateway), Rotterdam, Antwerp, Piraeus, Thessaloniki, Izmir, Piraeus, Gioia Tauro, Sines and London again.	Web Article	The port of Gioia Tauro welcomes Prime Minister Meloni with two new MSC lines	15/02/2024
Central Mediterranean	Italy	, Rijeka	**Addition of Rijeka to MSC line, in Red Sea rerouting:** - Additionally, Cosco's regional company Diamond Line has added the port of Rijeka to the service renamed Adriatic Greece Turkey (AGT) served by 3 container ships of 1,700 TEUs that call at Piraeus, Rijeka, Koper, Venice, Ancona and Piraeus again.	Web Article	The port of Gioia Tauro welcomes Prime Minister Meloni with two new MSC lines	15/02/2024

Region	Country	Port(s) affected	Notes	Source	Title	Source date
Central Mediterranean	Malta	Malta Freeport	Have lost four mainline services in one week since January 2023; the lost services include NEMO Westbound, NEMO Eastbound, EPIC Westbound and INDUS express Upon further investigation, with the former two services, the port of Malta Freeport is replaced by Valencia. With the latter two services, however, there is no replacement of the port, Malta Freeport is merely omitted.	Port authority questionnaire		
Central Mediterranean	Italy	Genova	In May, Ocean Alliance revised the port rotation of its service between Asia and the North Mediterranean by dropping the port call at Genoa. MEX (CMA CGM), MEX1 (Evergreen), WM2 (OOCL), AEM2 (COSCO) Port rotation: Singapore - Valencia - Barcelona - Fos Sur Mer - Marsaxlokk - Port Klang - Qingdao - Busan - Shanghai - Ningbo - Xiamen - Nansha - Shekou - Singapore Effective May 2024	Web Article	Carrier Service Update (7 - 23 May)	07/05/2024

Region	Country	Port(s) affected	Notes	Source	Title	Source date
Central Mediterranean	Malta	Malta Freeport	Changes are being made to MSC's Himalaya Express. Türkiye's port of Izmit and a second stop at the regional hub in Gioia Tauro will be added, with Malta being dropped. The updated itinerary will include Mundra (India), Nhava Sheva (India), Colombo (Sri Lanka), Sines (Portugal), Valencia (Spain), Gioia Tauro (Italy), Piraeus (Greece), Tekirdag (Turkiye), Izmit (Turkiye), Gioia Tauro (Italy), Barcelona (Spain), Valencia (Spain), Malaga (Spain), Jebel Ali (United Arab Emirates), Abu Dhabi (United Arab Emirates), Hamad (Qatar), Dammam (Saudi Arabia), Jubail (Saudi Arabia), Abu Dhabi (United Arab Emirates), and back to Mundra (India).	Web Article	MSC updates European service network	20/09/2024

Source: Review of available literature

7.6.3. East Mediterranean

Region	Country	Port(s) affected	Notes	Source	Title	Source date
East Mediterranean	Greece	Piraeus	The changes in routes from the Far East to Europe, via the crossing of Africa, favour mainly the ports of Western and Northern Europe, to the detriment of Piraeus, which is no longer the first port in Europe to be encountered by ships crossing the Suez Canal.	Web Article	The new "data" in the port from the situation in the Red Sea	20/02/2024

East Mediterranean	Türkiye, Egypt, Greece, Cyprus, Libya	Ambarli, Aliaga, Gebeze, Damietta, Port Said East, Bingazi, Limassol, Tripoli	Announced reshuffling of TULYB and GTL services, covering services between Türkiye, Greece, Cyprus, Lebanon, Malta and Libya. TULYB now omits Gebeze (Türkiye) and Damietta (Egypt), and switches round the ports of Ambarli and Aliaga (Türkiye). GTL now omits Port Said East, and Bingazi (Libya), and adds ports Limassol (Greece) and Tripoli (Libya). It also reorders the port call at Piraeus, such that it is called at on the forward route, as opposed to previously called at Piraeus on the return route. There is no effect on EU ports with the first route; with the second route, there is an extension of the route to include EU as well as non-EU ports, but it merely extends the existing route, as opposed to including non-EU ports where they previously were not included. The TULYB revamped configuration is tailored to cater to the North Türkiye – Egypt – Libya markets, ensuring swift and direct connections. The updated GTL setup is designed to serve Greece– Cyprus – Lebanon – South Türkiye – Libya markets. These modified weekly services aim to sustain robust maritime links across the entire East Mediterranean region and Libya. TULYB rotation: Aliaga – Gemlik – Ambarli – Alexandria Old Port – Misurata – Aliaga Previous rotation: Ambarli – Gebze – Gemlik – Aliaga – Damietta – Alexandria – Misurata	Web Article	CMA CGM to reshuffle its services connecting East Med, Malta and Libya Previous TULYB route Previous GTL route	30/10/2023

Region	Country	Port(s) affected	Notes	Source	Title	Source date
			GTL rotation: Thessaloniki – Piraeus – Limassol – Beirut – Iskenderun – Malta – Tripoli – Misurata – Thessaloniki. Previous rotation: Thessaloniki – Port Said East – Beirut – Iskenderun – Malta – Misurata – Bingazi – Malta – Piraeus – Thessaloniki			
East Mediterranean	Egypt	Damietta	Revised port rotations by the ALLIANCE, effective from April 2024: From TPWC – Tokyo - Shimizu – Kobe – Nagoya – Tokyo – Singapore – (Suez) – **Damietta** - Rotterdam – Hamburg – Le Havre – (Suez) – Singapore – Kobe – Nagoya – Tokyo – To TPWC Xingang – Qingdao – Pusan – Shanghai – South PRC – Colombo - (Suez) – Algeciras – Rotterdam – Hamburg – Antwerp – **London Gateway** - Tangiers – (Suez) – Singapore – Xingang Other port rotations include the addition of EU ports also.	Web Article	THE Alliance announces service network adjustments for 2024	13/12/2023

Region	Country	Port(s) affected	Notes	Source	Title	Source date
East Mediterranean	Egypt	Piraeus, Limassol, Damietta, Beirut	ONE redesigns its Egypt Lebanon Turkey Service (ELT): Piraeus - Limassol - Damietta - Beirut - Iskenderun - Piraeus This service will continue to offer customers an enhanced coverage in the European region by offering direct connections from Piraeus and Damietta to Beirut, Lebanon and Iskenderun, Türkiye and will now start to also feature a new direct connection from Piraeus to Limassol, Cyprus. Effective from 6 July 2024	Web Article	ONE redesigns its Egypt Lebanon Turkey Service (ELT)	04/06/2024
East Mediterranean	Egypt		Egypt has launched a new shipping service linking the port of Dekheila in Alexandria with the ports of Novorossiysk and St. Petersburg in Russia to transport agricultural produce.	Web Article	Egypt launches maritime shipping line to 2 Russian ports	03/11/2024

Region	Country	Port(s) affected	Notes	Source	Title	Source date
East Mediterranean	Egypt	Alexandria	The ocean carrier has trimmed its West Mediterranean to Red Sea service by removing France's Marseilles port and Spain's Barcelona port from the port rotation and adding Egypt's Alexandria port: The updated port rotation now includes Valencia (Spain), Gioia Tauro (Italy), Malta, Alexandria (Egypt), Jeddah (Saudi Arabia), King Abdullah (Saudi Arabia), Aqaba (Jordan), Port Said (Egypt), and back to Valencia (Spain). Changes are also being made to MSC's Himalaya Express. Türkiye's port of Izmit and a second stop at the regional hub in Gioia Tauro will be added, with Malta being dropped. The updated itinerary will include Mundra (India), Nhava Sheva (India), Colombo (Sri Lanka), Sines (Portugal), Valencia (Spain), Gioia Tauro (Italy), Piraeus (Greece), Tekirdag (Turkiye), Izmit (Turkiye), Gioia Tauro (Italy), Barcelona (Spain), Valencia (Spain), Malaga (Spain), Jebel Ali (United Arab Emirates), Abu Dhabi (United Arab Emirates), Hamad (Qatar), Dammam (Saudi Arabia), Jubail (Saudi Arabia), Abu Dhabi (United Arab Emirates), and back to Mundra (India).	Web Article	MSC updates European service network	20/09/2024

Region	Country	Port(s) affected	Notes	Source	Title	Source date
East Mediterranean	Egypt	Alexandria	CMA CGM – Short Sea Lines Division has announced a terminal change in Alexandria on EMED 2 service as from WEEK 39. This loop will call Alexandria TMT as from September 24th, 2024, allowing direct worldwide connections with Levant ports. Rotation: Beirut - Limassol - Port Said East - Port Said West - Alexandria - Tripoli - Beirut - Tartous - Lattakia - Iskenderun - Beirut Effective 18/09/2024	Web Article	CMA CGM terminal change in Alexandria, Egypt on EMED 2 service	10/09/2024

Region	Country	Port(s) affected	Notes	Source	Title	Source date
East Mediterranean	Lebanon, Egypt, Croatia	Port Said, Beirut, Tripoli, Alexandria	The Ocean Alliance has recently removed Port Said from the rotation of its East Mediterranean – Far East Phoenician Express (BEX) and added calls at the Lebanese ports of Beirut and Tripoli, plus a second call to Alexandria. As mentioned, it has also reverted back to Red Sea transit, with a return to the Jeddan eastbound call. As a result of these changes, the revised itinerary is: Shanghai – Ningbo – Pusan – Shenzhen (Shekou) – Singapore – Alexandria – Beirut – Tripoli – Koper – Trieste – **Rijeka** – Alexandria – Jeddah – Port Kelang – Shenzhen (Shekou) - Shanghai With the return to using Suez, the service now offers unrivalled direct link from Far East to Adriatic with shortest transit times. By adding new ports to rotation, it also offers new direct services connecting Adriatic to Egypt and Lebanon. Effective May 2024	Web Article	OCEAN Alliance vessels use Suez/Red Sea transit again adding new ports in rotation	20/05/2024

Region	Country	Port(s) affected	Notes	Source	Title	Source date
East Mediterranean	Türkiye, Egypt, Lebanon	Alexandria, Beirut, Antalya	CMA CGM announces new service linking Türkiye, Egypt and Lebanon. CMA CGM says the weekly loop service will allow freight sent from the Turkish port of Antalya to take advantage of the worldwide connections in Alexandria and Beirut. Alexandria - Beirut - Antalya - Alexandria Effective July 2024.	Web Article	CMA CGM announces new service linking Turkey, Egypt and Lebanon	24/06/2024
East Mediterranean	Saudi Arabia, Lebanon	Jeddah, Beirut	CMA CGM has continued to send its Asia-Mediterranean ships on the Red Sea/Suez route for its services calling at Lebanon. The 16,022 teu CMA CGM JULES VERNE passed the Bab al-Mandab Strait on a northbound transit on 23 October 2024 without incident. The ship will make a stop at Jeddah and Beirut before resuming its regular Mediterranean Club Express (MEX) stops at Malta, Valencia, Barcelona and Fos before returning to Beirut for a second off-schedule call on 20 November.	Web Article	CMA CGM free pass on Red Sea for Lebanon bound ships	26/10/2024

Region	Country	Port(s) affected	Notes	Source	Title	Source date
East Mediterranean	Greece	Piraeus	DBRS explains that many large container transporters (CMA CGM, Cosco Shipping Lines, Evergreen Line and Orient Overseas) decided to stop their itineraries from Asia to Piraeus, which is also an intermediate station for Northern Europe. Maersk and other container shipping companies have changed routes to the Cape of Good Hope and do not enter the Eastern and Central Mediterranean.	Web Article	Containing the Houthi impact on Piraeus port	07/02/2024

East Mediterranean	Greece	Piraeus	Previously, one of these services, known as CES by Evergreen and NEU7 by other alliance members, included Piraeus as its first European westbound port of discharge en route to Antwerp, Hamburg, and Rotterdam. However, in light of the Red Sea crisis, this loop has omitted Piraeus and now operates on a 14-week cycle, with stops in Tianjin, Ningbo, Shanghai, Yantian, Singapore, Colombo, Antwerp, Hamburg, Rotterdam, Tanjung Pelepas, and back to Tianjin. The OCEAN Alliance had to suspend its third Far East – North Europe loop, jointly operated by COSCO (AEU7) and OOCL (LL3), which also called at Piraeus, due to insufficient vessel availability. This required a reconfiguration of services to accommodate Asian exports to Greece. In response, the OCEAN Alliance upgraded the Far East-Mediterranean service, known as AEM1 by COSCO and MD2 by Evergreen, to utilize 20,000 TEU ships. This service has been extended to a 14-week rotation, adding three extra weeks, with Piraeus reinstated as the first European port of call. Following Piraeus, the route includes stops at various Mediterranean ports in Italy, France, and Spain, completing the circuit from Qingdao to Shanghai, Ningbo, Kaohsiung, Hong Kong, Yantian, Singapore, Piraeus, La Spezia, Genoa, Fos, Valencia, and back to Singapore and Qingdao.	Web Article	COSCO & Evergreen Upgrade Joint Far East-Mediterranean Service	07/05/2024

Source: Review of available literature

7.6.4. North region

Region	Country	Port(s) affected	Notes	Source	Title	Source date
North	Netherlands, Germany, UK, Spain, Morocco	Rotterdam, Felixstowe, Bremerhaven Algeciras and Tanger Med	Maersk has announced its enhancement of the ME2 service line between India and North Europe, which now includes ports of Rotterdam, Felixstowe and Bremerhaven, scheduled in between the ports of Algeciras and Port Tangiers; this introduces EU ports between non-EU ports, which results in improved connectivity to North Europe, but with limited ETS charges.	Web Article	Maersk enhances ME2 service between India and North Europe ensuring shorter transit times	19/04/2024
North	Germany	Hamburg	MSC's revision of its Swan service, connecting Asia with North Europe and Scan Baltic regions; this route now includes the port of Hamburg, to improve connectivity in Germany.	Web Article	Rotation Change - Trade Asia to North Europe	22/05/2024

North	UK	Liverpool	MSC's new Britannia service between Europe and China with the last port of call outside of the EU in Liverpool. The new Britannia service will offer better port connections from China and Vietnam to Liverpool via a unique corridor. MSC mention that this will "complement other direct services to London and Felixstowe to provide a premium service network throughout the UK" and that "the service will enable an improved and more sustainable flow of cargo – increasing supply chain efficiencies, while reducing lead times and landside carbon emissions."	Web Article	Raft of new Asia to US and Europe services as market ramps up https://www.msc.com/en/newsroom/news/2024/june/launches-britannia-new-standalone-loop-connecting-asia-to-north-europe	01/07/2024
North	UK	Liverpool, Dublin	Stena Line has officially commenced its new Dublin – Liverpool (Birkenhead) freight service, with the addition of the new route expected to further boost the company's freight volumes. The addition of the new service will be Stena Line's seventh route in the Irish Sea region complementing its Belfast – Cairnryan, Belfast – Heysham, Belfast – Liverpool, Dublin – Holyhead, Rosslare – Fishguard and Rosslare – Cherbourg services. This new freight service connects an EU port (Dublin) with a non-EU port (Liverpool) into the Stena Line services. Likely driven by service expansions, considering it complements many other services between the UK and Republic of Ireland.	Web Article	Stena Line officially commences Dublin-Liverpool freight route	15/02/2024

North	UK	-	The intermodal set-up includes a renovated connection between the UK and Poland. This introduces a non-EU port, and intermodal transport.	Web Article	Expanding Trade Routes all around Europe: The New Intermodal Connection Between the UK and Poland	11/01/2024
North	UK	Southampton, London Gateway	THE Alliance has **reconfigured its service network setup.** One port rotation includes Southampton (UK): Ningbo – Xiamen – Kaohsiung – South PRC – Cai Mep - Singapore – (Suez) – Rotterdam – Hamburg – Antwerp – Southampton – (Suez) – Singapore – South PRC – Hong Kong – Kaohsiung – Ningbo. Another includes London (UK): Xingang – Qingdao – Pusan – Shanghai – South PRC – Colombo - (Suez) – Algeciras – Rotterdam – Hamburg – Antwerp – London Gateway - Tangiers – (Suez) – Singapore – Xingang.	Web Article	THE Alliance announces updated service network for 2024	13/01/2024

North	UK	Greenock	The port of Greenock is now included as a stop-off on an existing Türkiye-UK route run by MSC. Reportedly, “this direct call will increase trade between Scotland and Turkey, while also providing enhanced UK west coast connectivity, as well as connectivity to the more distant markets in the US and Asia." Full rotation: Piraeus – Izmir – Gebze – Gemlik – Tekirdag – Aliaga – Barcelona – Valencia – Sines – Le Havre – Liverpool – Greenock – Liverpool – Portbury – Le Harve – Valencia – Barcelona – Marsaxlokk This route extends an existing route from Türkiye to the UK, via the addition of two more non-EU port calls in the UK (Greenock, Portbury). As this route already connects to the UK port of Liverpool, the addition of Greenock and Portbury does not introduce a non-EU port of call for the first time, and appears to merely be an extension of services to UK markets. This is reported as the “only direct service in the market to connect Greece and Türkiye to the UK”, aiming to offer “customers a reliable route for cargo transportation between the UK and European markets as well as supporting the reduction of carbon emissions across their supply chain. With weekly direct calls, this revised rotation provides greater flexibility for customers shipping cargo to and from the UK West Coast”.	Web Article	Port of Greenock joins major Turkish trading route	02/08/2024

North	UK	London Gateway	In order to maintain schedule reliability, MSC has decided to adapt the rotation of its Swan- Sentosa service. Therefore, the service will now include London Gateway as the first European port to mitigate challenges of port congestion in Felixstowe. The revised rotation is as follows: Qingdao – Ningbo – Shanghai – Yantian – Tanjung Pelepas – London Gateway – Felixstowe – Zeebrugge – Antwerp – Hamburg – Gdansk – Gdynia – Klaipeda – Bremerhaven – Antwerp – London Gateway – Colombo – Singapore – Laem Chabang – Vung Tau – Busan – Long Beach – Oakland – Busan – Qingdao	Web Article	Port Rotation Change on Swan-Sentosa Service	09/04/2024

North	UK	Le Havre, Rotterdam	Several EU ports removed on current service lines as part of Asia North Europe Network revision Griffin service: Le Havre now omitted, with new call added to Yantian (China). New route: Shanghai – Ningbo – Xiamen – **Yantian (new)** – Tanjung Pelepas – Felixstowe – Rotterdam – Tanger Med – Hong Kong – Shanghai Lion service: addition of Le Havre into route, and omission of Rotterdam (this will be called at via Griffin service). New route: Ningbo – Shanghai – Yantian – Tanjung Pelepas – Sines – **Le Havre (new)** – Antwerp – Felixstowe – Algeciras – Singapore – Laem Chabang – Ningbo Britannia: replacement of London Gateway port by Le Havre. New route: Shanghai – Ningbo – Yantian – Vung Tau – Liverpool – Rotterdam – Hamburg – Antwerp – **Le Havre (new)** – Pointe des Galets – Port Louis – Singapore – Shanghai Condor: **Le Havre omitted** from route. New route: Ningbo – Shanghai – Nansha – Yantian – Tanjung Pelepas – Colombo – Tanger Med – Felixstowe – Hamburg – Antwerp – London Gateway – Tanger Med – Abu Dhabi – Jebel Ali – Ningbo	Web Article	MSC Improves its Asia North Europe Network	08/07/2024

North	Belgium, Netherlands, France	Le Havre, Antwerp, Rotterdam	Maersk have announced changes to Asia-Europe routes in August, in order to mitigate delays; several ports have been dropped in order to improve transit times. Maersk said that due to “exceptional waiting time and congestion faced in North Europe” it would reduce the number of North European port calls by consolidating the Antwerp eb & wb call on AE6, as well as the Rotterdam calls between both the AE6 and AE55 onto AE55. The company also announced that Le Havre will be dropped from AE7 and AE55 and consolidated on the AE6. Maersk also confirmed that the AE55 will no longer include Colombo and Singapore, instead adding Hong Kong and Yantian, with Colombo cargo transhipped at Hong Kong. To summarise, AE6 removes port calls at Antwerp and Rotterdam, and replaces with Le Havre. AE7 and AE55 omit Le Havre, with AE55 adding Yantian, and replacing Colombo & Singapore with Hong Kong. <u>AE6</u> Current Rotation: Ningbo – Shanghai – Yantian – Tanjung Pelepas – Sines – Antwerp – Rotterdam – Antwerp - Felixstowe – Algeciras – Singapore – Laem Chabang Revised Rotation: Ningbo – Shanghai – Yantian – Tanjung Pelepas – Sines – **Le Havre (new)** – Antwerp – Felixstowe – Algeciras – Singapore – Laem Chabang	Web Article	Maersk and MSC announce changes to Asia-Europe routes to mitigate delays	09/08/2024

			AE7 Current Rotation: Ningbo – Shanghai – Nansha – Yantian – Tanjung Pelepas – Colombo – Port Tangiers – Felixstowe – Hamburg – Antwerp – London Gateway – Le Havre – Port Tangiers – Abu Dhabi – Jebel Ali Revised Rotation: Ningbo – Shanghai – Nansha – Yantian – Tanjung Pelepas – Colombo – Port Tangiers – Felixstowe – Hamburg – Antwerp – London Gateway – Port Tangiers – Abu Dhabi – Jebel Ali AE55 Current Rotation: Shanghai – Ningbo – Xiamen – Tanjung Pelepas – Felixstowe – Rotterdam – Le Havre – Port Tangiers – Colombo – Singapore Revised Rotation: Shanghai – Ningbo – Xiamen – **Yantian (new)** – Tanjung Pelepas – Felixstowe – Rotterdam – Port Tangiers – Hong Kong			

North	Belgium, Netherlands, India	Nhava Sheva (India)	Hapag-Lloyd announces a reshuffle of ports in a shipping line connecting the Middle East, India and Northern Europe; however, the ports being switched around are located in India and does not affect the first or last ports of call at a non-EU port before arriving at an EU port	Web Article	Port call shuffle at Nhava Sheva, while ex-India rates keep rising	02/07/2024

North	UK	London Gateway	As carriers prepare for a new liner alliance landscape next year, moves are under way to rejig service networks, with some of the biggest changes to take place on the Asia-North Europe trade. At the end of last week, it emerged that Gemini partners Maersk and Hapag-Lloyd had elected London Gateway to serve as their UK port on Asia-North Europe, in preference to Felixstowe, leaving MSC by far the largest carrier calling at the UK's biggest port – although the Ocean Alliance has two Asia-North Europe calls at Felixstowe, its NEU1 and NEU6 strings. One local forwarder told The Loadstar: "Felixstowe will suffer, obviously, and increases the importance of MSC, primarily. "Ocean Alliance will also still have regular calls on multiple services, but it's still a major kick in the teeth for the UK's biggest port." Maersk: "we have concluded that London Gateway is the most optimal port to serve our customers importing/exporting cargo to/from the UK". This change will affect the Asia – Europe trades under the scope of the Gemini cooperation. The previously announced Middle East – Europe (London Gateway) and Trans-Atlantic (Southampton) Gemini services remain unchanged. The rest of our own operated services outside the scope of the Gemini Cooperation also remain unchanged. Effective February 2025.	Web Article	Hapag-Lloyd reveals rotation changes to Asia-Europe CGX service https://www.maersk.com/news/articles/2024/11/18/the-network-of-the-future-uk-port-of-call-update	18/11/2024

North	UK, Netherlands, Belgium	Rotterdam, Southampton, Antwerp	Hapag Lloyd announces reshuffle of its China-Germany Express service. From the beginning of January, two new Chinese calls, at Shanghai and Ningbo, are to be added, while in Europe, a call at Antwerp will be dropped and calls at Rotterdam and Southampton introduced. The full port rotation is: Yangshan-Ningbo -Yantian-Singapore-Tema-Southampton-Rotterdam-Wilhelmshaven. As part of the rearrangement, Hapag-Lloyd will end its slot charter agreement with the Ocean Alliance on the CMA CGM-led grouping's NEU5 Asia-North Europe service at the end of the year. The first vessel on this new rotation will be on January 3, 2025.	Web Article	Here's an update for our China Germany Express service	18/11/2024
North	UK, Netherlands, Belgium	London Gateway, Antwerp, Rotterdam	Ocean Network Express (ONE) has announced the commencement of two additional Northern Europe/Mediterranean routes, Aegean Express (AEX) and Levant Express (LEX), beginning in January 2025. The Aegean Express port rotation is the following: London Gateway, Antwerp, Rotterdam, Piraeus, Istanbul, Gebze, Gemlik, Aliaga, Piraeus, London Gateway The Levant Express (LEX) port rotation is the following: London Gateway, Rotterdam, Hamburg, Antwerp, Alexandria, Damietta, Mersin, London Gateway		ONE unveils Northern Europe/Mediterranean routes	10/10/2024

North	Germany	Bremerhaven	Bremerhaven removed from ME2 rotation. New rotation: Jebel Ali – Mundra - Jawaharlal Nehru – Port Tangiers - Algeciras – Rotterdam – Felixstowe – Port Tangiers – Salalah. Bremerhaven will continue to be served using the Samba service and transhipping in Port Tangiers. Last call in Bremerhaven will be on Cap San Sounio on October 11th 2024. Reportedly "to enhance our service offering and ensure more consistent schedules".		Middle East to Europe Services ME2, Service change announcement	25/11/2024
North	Multiple	Multiple	Ocean Network Express (“ONE”) is proud to announce its Asia - Europe, Transpacific, Asia - Middle East main trade lane products, scheduled to commence in February 2025. Seven new routes from Asia - Northern Europe, FE1 - FE6 and IOX. Northern European ports include Le Havre, Rotterdam, Hamburg and Antwerp. Five new routes from Asia - Mediterranean, MD1, MS2, MD3, MD4 and IOM. Commonly include Damietta, Barcelona, Valencia, Genoa, Piraeus.		ONE Announces East - West Products Effective from February 2025	09/09/2024

North	UK	Liverpool	ACL's new schedule will see Liverpool used as the first port in and out of Europe and will not stop at any other intermediate European ports to further reduce the transit times. Shipping company ACL's new transatlantic service in partnership with BG Freight Line and Peel Ports Group will have transit times up to two weeks faster than any similar service travelling between Dublin/Belfast and North America via a UK or Continental transshipment port. Effective May 2024.		Fastest container service between Ireland and North America launched	12/05/2024
East Mediterranean	UK, Greece	Piraeus	ZNT service from North Europe to Türkiye & East Mediterranean, will now include an additional call at Piraeus Greece. Felixstowe – Hamburg – Bremerhaven – Antwerpen – **Piraeus** – Izmir /Aliaga – Felixstowe ZNT service will no longer call La Havre port. ZIM will continue to serve Le-Havre to Aliaga (and back) through our ZNI service via Haifa port.		ZIM Announces Changes to its North Europe – Türkiye service (ZNT line)	01/04/2024

Source: Review of available literature

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