

Emission Analysis of the Turkish Shipping Sector under the EU Emissions Trading System (EU ETS) – 2024

General Analysis Based on THETIS MRV Data and Allowance Obligations



Turkish Shipowners Association

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1- Overview and Key Reminders Regarding the European Union Emissions Trading System (EU ETS)

As part of the European Union's climate change mitigation efforts, the EU Emissions Trading System (EU ETS) has incorporated the shipping industry into its regulatory framework as of 2024.

Within this framework:

- The monitoring and reporting of carbon dioxide (CO₂) emissions is mandatory for intra-EU voyages, as well as voyages arriving at or departing from EU ports.
- Emissions are tracked and reported through the THETIS-MRV platform.

Shipping companies are obliged to surrender emission allowances equivalent to 40% of their verified 2024 emissions by 30 September 2025. This obligation will increase to 70% in 2025 and reach 100% in 2026.

This report presents a consolidated overview of emissions generated by the Turkish maritime transport sector under the EU ETS during the year 2024. The analysis is based on emission data extracted from the THETIS-MRV platform, compiled and simplified by Maruxa Heras, Head of the Maritime Division at GLOBAL FACTOR, and subsequently evaluated by the Turkish Shipowners' Association.

ASSESSMENT WITHIN THE SCOPE OF TURKISH-OWNED FLEET

2. Key Figures Related to Turkish Owned Fleet under the EU ETS (2024)

- **Number of reporting companies:** 220 (74% of the EU total)
- **Number of ships reported:** 792 (11% of the EU total)
- **Total fuel consumption:** 1,213,409 tons (2.0% of the EU total)

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- **Total CO₂ emissions reported:** 3,770,212 tons (2.8% of the EU total)
- **CO₂ emissions subject to the EU ETS:** 2,267,529 tons (2.7% of the EU total)
- **Allowances to be surrendered by 30 September 2025 (40% of covered emissions):**
907,012 tons of CO₂
→ Estimated financial liability: approximately **€72.6 million** (based on €80 per ton)

3. Distribution of Emission Types (Total, in metric tons of CO₂)

Emission Types	Total	Rate
Intra-EU voyages	604.115	16,0%
Voyages from the EU	1.378.733	36,6%
Voyages TO the EU	1.626.634	43,2%
At berth	160.730	4,3%

4. Total CO₂ Emissions by Ship Type

Vessel Type	CO ₂ emissions [tones]	Number	Share of CO ₂ emissions from Turkish-owned ships among same-type vessels calling at EU ports	Per Vessel Emissions
Bulk carrier	672.032	255	%4,72	2.635
Chemical tanker	555.920	114	%6,81	4.877
Container ship	646.385	94	%1,25	6.877
Gas carrier	48.062	12	%2,06	4.005
General cargo ship	501.574	204	%10,16	2.458
Oil tanker	578.562	55	%3.34	10.519
Ro-Ro ship	665.211	18	%12.80	36.956

Vessel Categories with the Highest Emissions per Unit

- Ro-Ro vessels have by far the highest emission intensity (approximately 37,000 tons per vessel).
- They are followed by Crude Oil/Product Tankers (10,519 tons) and Container Ships (6,877 tons).

Vessel Categories with the Lowest Emissions per Unit

General Cargo Ships (2,458 tons) and Bulk Carriers (2,635 tons) have the lowest values.



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5. The CO₂ EU ETS / CO₂ TOTAL Ratio: A Metric for Assessing EU ETS Exposure

The ratio of CO₂ emissions covered under the EU Emissions Trading System (EU ETS) to a company's total reported CO₂ emissions serves as an indicator of the extent to which the company's operations fall within the regulatory scope of the EU ETS. This metric reflects

the balance between a company's activities within the European Union and its operations outside the EU. For practical purposes, this indicator may be referred to as the "EU ETS Coverage Ratio." (This ratio was generated through AI-assisted analysis.)

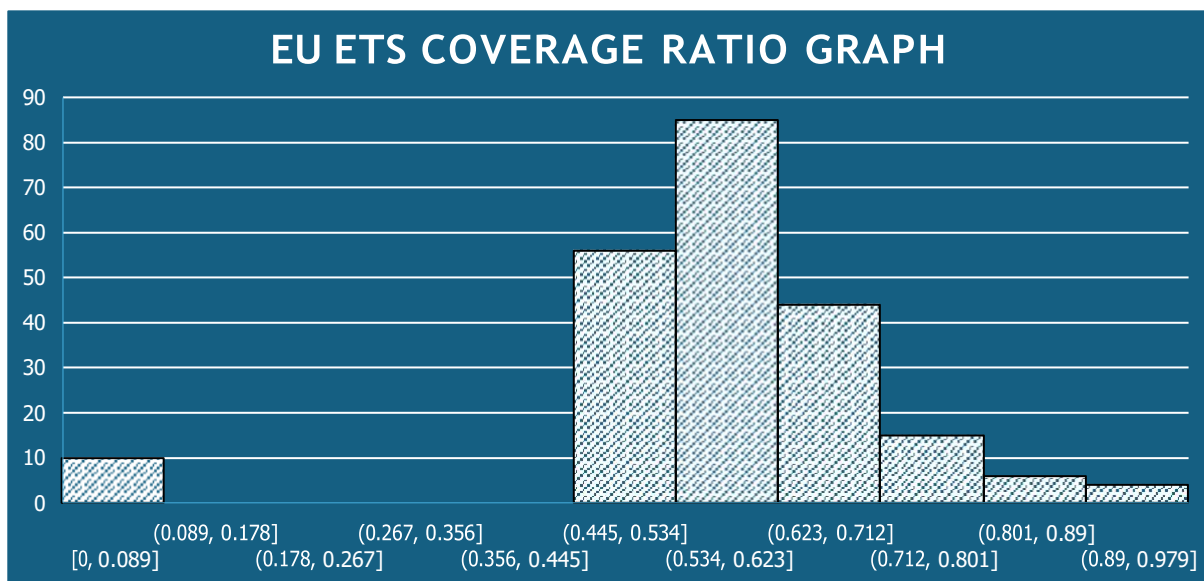
The level of this ratio—whether low, medium, or high—carries distinct strategic implications regarding a company's exposure to EU ETS obligations:

- A high coverage ratio suggests that the majority of the company's voyages take place within the EU or fall under the regulatory purview of the EU ETS.
- A low coverage ratio implies that the company's operations are predominantly composed of non-EU voyages or are subject to exemptions. However, it is important to note that, at present, the rate of exemption utilization is minimal to nonexistent.

To facilitate interpretation, companies have been categorized into three exposure segments based on the EU ETS Coverage Ratio:

- 0.7 – 1.0 → High Exposure
- 0.4 – 0.7 → Moderate Exposure
- 0.0 – 0.4 → Low Exposure

These classifications provide a structured framework for evaluating the degree to which companies are affected by EU ETS-related financial and operational obligations.



Note: Note: Based on the formula defined above, companies are encouraged to assess their position within the relevant segment and interpret their exposure to the EU ETS accordingly.



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Ratios and Segments:

a. 0.7 – 1.0 (High Impact)

In this segment, more than 70% of companies' CO₂ emissions fall within the scope of the EU Emissions Trading System (EU ETS). These companies are more frequently engaged in intra-EU voyages and/or spend more time at EU ports. As a result, they are significantly affected by the EU ETS. Additionally, the number of inbound and outbound voyages to and from the EU may be relatively lower compared to intra-EU voyage.

For these companies, developing emission reduction strategies is of critical importance. Companies falling under a high level of EU ETS obligation may be required to pay substantial allowance costs. This can have a significant impact on their carbon trading expenses and should be considered as a key factor in strategic decision-making processes.

There are 30 companies in this segment, accounting for 13.5% of all reporting companies.

0.4 – 0.7 (Moderate Impact)

In this segment, more than half of the companies' emissions fall within the scope of the EU ETS. These companies are involved in intra-EU voyages and/or call at EU ports at an average level, and therefore are not as heavily impacted by the EU ETS as companies in Segment 1. The balance between inbound/outbound EU voyages and intra-EU voyages is generally based on operational needs. These companies tend to have a more balanced focus on both intra-EU operations and international routes.

For these companies, it may not be entirely possible to avoid EU ETS obligations. However, during the strategy development phase, careful carbon reduction and emission trading planning is required.

The cost implications of cargo contracts involving the EU should also be taken into account.

There are 180 companies in this segment, making up 82% of all reporting companies.

0.0 – 0.4 (Low Impact)

In this segment, up to 40% of companies' emissions fall within the scope of the EU ETS. These are companies with limited maritime transport activity involving the EU and are thus less affected by the EU ETS. This suggests that their operations within the EU are relatively limited, and their activities are likely focused outside the EU.

Nonetheless, companies in this segment may still consider developing strategies against potential impacts. It is also possible that some of these companies operate entirely outside the EU ETS scope.

There are 10 companies in this segment, none of which have submitted reports. These are companies with a 0.0 EU ETS Coverage Ratio.



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6. EU ETS Allowance Payments of Our Companies

The payment amounts for our 220 companies over the next three years are presented below. The listed years correspond to the payments for the previous year — for example, payments made in 2025 will cover the emissions from 2024. (The EU Allowance price has been assumed as €80.)

2025: **72.560.613€**

2026: 126.981.5982027: **181.402.283€**

TOTAL: 380.944.794€

This entire amount is payable to the EU.

ASSESSMENT WITHIN THE SCOPE OF GLOBAL FLEET

7. Key Figures Related to Global Fleet under the EU ETS (2024)

- Number of reporting countries: **83**
- Number of reporting companies: **3,262**
- Number of ships reported: **12,952**
- Total fuel consumption: **45.598.572 million tons**
- Total CO₂ emissions reported: **140.665.823 million tons**
- CO₂ emissions under the scope of the EU ETS: **83.719.788 million tons**
- Allowances to be surrendered by companies by September 30 (40%): **33.5 million tons of CO₂** (approximately **€2.7 billion** financial liability – based on an assumed €80/ton price)
- Amount to be paid by the top 10 countries: **€1.72 billion**
- Based on current data and values, the total amount to be paid to the European Commission over 3 years is estimated at **€14 billion**.

8. Global CO₂ Emissions by Ship Type

Ship Type	Total CO ₂ Emissions [tone]
Bulk carrier	14.209.192
Chemical tanker	8.162.889
Combination carrier	38.892
Container ship	51.501.694
Container/ro-ro cargo ship	1.243.731
Gas carrier	2.328.657
General cargo ship	4.934.978
LNG carrier	7.878.722
Oil tanker	17.313.244
Other ship types	2.307.250

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Other ship types (Offshore)	2.356
Passenger ship	6.762.441
Passenger ship (Cruise Passenger ship)	315.542
Refrigerated cargo carrier	880.477
Ro-pax ship	13.376.114
Ro-ro ship	5.194.279
Vehicle carrier	4.215.364
Total general	140.665.823

9. Top 20 Countries by EU ETS CO₂ Emissions

No	ISM Company - Country	EU ETS	Percentage Share of Countries in Total EU ETS Emissions
1	Greece	11.419.587	%13,64
2	Germany	7.748.419	%9,25
3	Italy	6.935.229	%8,28
4	Cyprus	6.160.366	%7,36
5	Denmark	5.362.863	%6,41
6	Singapore	5.338.436	%6,37
7	United Kingdom	4.627.006	%5,52
8	Norway	3.346.948	%3,99
9	France	3.012.817	%3,59
10	Netherlands	2.635.489	%3,14
11	United States Of America	2.512.497	%3,00
12	China, People's Republic Of	2.329.411	%2,78
13	Türkiye	2.267.529	%2,70
14	Hong Kong, China	1.878.713	%2,24
15	Japan	1.689.173	%2,01
16	Finland	1.499.686	%1,79
17	Korea, South	1.367.916	%1,63
18	Sweden	1.119.667	%1,33
19	Canada	1.109.390	%1,32
20	Bermuda	1.012.729	%1,20

OTHER MATTERS

10. Monitoring Methods Used by Ships Calling at EU Ports

As part of the monitoring plan, companies are allowed to choose one or more of the following four methods for each monitored source of fuel consumption:



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Method A – Use of bunker delivery notes (BDNs) and periodic stock takes of fuel tanks (This method is not applicable to vessels that use cargo as fuel.)

Method B – Monitoring of bunker fuel tanks

Method C – Use of flow meters for applicable fuel consumption processes (Including gas flow meters for LNG carriers)

Method D: Direct Emission Measurements

According to this, the measurement method preferences of approximately 13,000 ships are as follows:

Method A – 50.91%

Method B and C combined – 15.44%

Method B – 15.34%

Method A, B, and C combined – 2.55%

Method C – 15.75%

Method D – 0%

For example, **MSC** uses **Methods B and C together** on nearly all of its vessels.

Conclusion and Recommendations

Analyses based on 2024 THETIS MRV data clearly demonstrate that the inclusion of Turkish-owned vessels in the EU Emissions Trading System (EU ETS) represents a significant financial burden. The total financial obligation is projected to exceed €380 million over the next three years, with these payments being directly transferred to the EU's Climate and Innovation Funds. Within this framework, the following strategic recommendations should be carefully considered:

Strategic Use of Emission Intensity and Operational Profile Analysis

Segmenting companies based on their CO₂ EU ETS / CO₂ TOTAL ratio enables a better understanding of how each company is impacted by the EU ETS. This ratio is not merely a numerical indicator, but a reflection of geographic scope, port stay durations, and operational characteristics. Accordingly:

- Companies with a high ratio should prioritize optimizing intra-EU operations and invest in technological measures to reduce emissions per vessel.
- Companies with a low ratio should anticipate higher carbon cost exposure if their operations expand within the EU in the coming years and prepare accordingly.

Prioritization of Ro-Ro and Container Vessels

Emission intensity per vessel is significantly higher for Ro-Ro vessels, followed by oil/product tankers and container ships. Therefore, these vessel types should be prioritized for energy efficiency measures and carbon-reduction technologies.

Impact of At Berth Durations on Emissions

Extended port stays in EU ports constitute a considerable share of total emissions. Thus:



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- Digitalization and coordination should be enhanced to ensure faster and more efficient port operations.
- Voyage planning should incorporate Just-In-Time (JIT) arrival practices, adoption of Onshore Power Supply (OPS) systems, and speed optimization (slow steaming) to minimize port stay durations and associated emissions.

Enhancement of Data Collection and Reporting Processes

To improve the accuracy of emissions reporting per vessel and optimize monitoring processes, it is crucial to periodically review existing methodologies and integrate emerging technologies. All applied methods should be assessed in terms of usability, cost-effectiveness, and accuracy.

We particularly recommend wider adoption of flowmeter-based monitoring, provided that the selected technologies meet high technical accuracy standards.

Training and Awareness Development Programs

Operational efficiency and fuel-saving behavior among ship personnel should be promoted as a short-term cost-effective mitigation tool. Internal corporate CO₂ awareness programs are highly encouraged.

Training and information programs should be expanded to enhance companies' capabilities in fuel monitoring and emissions reporting. These programs would also promote the uptake of new technologies and methods.

Strategy for Accessing the EU Innovation Fund

Given that Turkey's projected three-year payment obligation constitutes approximately 2.7% of the EU-wide total, Turkish companies and public institutions should actively seek to benefit from the EU Innovation Fund in proportion to their contributions.

Development of National Support Mechanisms

To prevent the EU ETS-related financial burden from eroding the competitiveness of the maritime sector, the establishment of national incentive programs should be recognized as a policy priority. Financial support mechanisms should be explored for **alternative fuels, retrofit investments, and green port initiatives.**

Establishment of Data-Driven Decision-Making Processes

Regular analysis of data from the THETIS MRV system is essential to monitor sectoral trends and conduct company-level risk assessments.

The EU publishes emissions data annually, accessible via the following link: <https://mrv.emsa.europa.eu/#public/emission-report>. Through this platform, all companies can transparently access and verify their own data and review operational data for vessels owned by other companies.