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2025 Report from the European Commission on greenhouse gas emissions from maritime transport

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1. Introduction

Maritime transport is fundamental to the EU economy and stands out as one of the most energy-efficient modes of transport. However, it remains a major source of greenhouse gas (GHG) emissions.

This 2025 report on GHG emissions from ships entering and leaving ports in the European Economic Area (EEA) presents data collected under the EU Regulation on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport, adopted in 2015 ([1]) (the EU Monitoring, Reporting and Verification (MRV) Maritime Regulation). The report covers data collected over the period 2018-2024. It provides a comprehensive comparison and analysis of trends in emissions and energy efficiency over the years and sheds light on the factors influencing GHG emissions from maritime transport. It takes into account the implementation of the EU emissions trading system (ETS) up to the 2024 reporting period, the first year the system applied to maritime transport.

2. Policy development

As part of the package to deliver the European Green Deal, the European Parliament and the Council adopted a series of measures in 2023 to ensure that the maritime transport sector contributes to achieving the EU's climate ambitions. These include the revision of the **EU ETS** ([2])**,** which has extended the scope of the EU ETS to cover CO_2 emissions from large ships entering EU ports as from 1 January 2024, regardless of the flag they fly. Furthermore, the **FuelEU Maritime Regulation** ([3]) ensures, as from 2025, that the greenhouse gas intensity of energy used onboard ships gradually decreases over time.

Compliance with the obligations arising from both the EU ETS and the FuelEU Maritime Regulation builds on the monitoring, reporting and verification system established by the **EU MRV Maritime Regulation**, as revised in 2023 ([4]). The 2024 reporting period was the first to apply the revised rules, which were adopted in 2023 to enable the ETS to be implemented in shipping and to include methane (CH_4) and nitrous oxide (N_2O) emissions within the scope of the MRV Regulation.

In addition to legislative measures, the EU is further supporting the successful implementation of shipping decarbonisation through **support for research and innovation**. The Innovation Fund, which will draw on 20 million EU allowances (EUR 1.5 billion) ([5]) by 2030 to fund projects to decarbonise the maritime sector, also covers the production and use of sustainable fuels, the electrification of the maritime transport system, and the building and/or retrofitting of low- and

([1]) Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport, and amending Directive 2009/16/EC, OJ L 123, 19.5.2015, p. 55, http://data.europa.eu/eli/reg/2015/757/2025-01-01.
([2]) Through Directive (EU) 2023/959, OJ L 130, 16.5.2023, p. 134, http://data.europa.eu/eli/dir/2023/959/oj.
([3])Regulation (EU) 2023/1805, OJ L 234, 22.9.2023, p. 48, http://data.europa.eu/eli/reg/2023/1805/oj.
([4]) Regulation (EU) 2023/957, OJ L 130, 16.5.2023, p. 105, http://data.europa.eu/eli/reg/2023/957/oj.
([5]) Based on a carbon price of EUR 75/tonne.

zero-emission vessels. Since early 2026, and after just two calls for proposals, the Innovation Fund has provided support for 21 maritime projects for a total of EUR 1.03 billion, including EUR 365.3 million through auctions for hydrogen-based fuels and EUR 202.3 million for projects related to construction and/or retrofitting of vessels.

While the Innovation Fund focuses on projects at a higher technology readiness level (TRL) and deployment, the EU has also invested in lower TRL projects for the maritime sector through Horizon Europe, in particular in the zero-emission waterborne transport partnership. Under that partnership, the EU will invest up to EUR 530 million until 2027, in six areas: (i) use of sustainable alternative fuels, (ii) electrification, (iii) energy efficiency, (iv) design and retrofitting, (v) digital and (vi) green ports.

The Commission is also committed to supporting global action to encourage the decarbonisation of the sector, notably in its work with the **International Maritime Organization (IMO)**. In April 2025, the EU welcomed the approval by the IMO of the net-zero framework for reducing greenhouse gas emissions from international shipping. The framework includes a global standard for gradually reducing the GHG intensity of marine fuels and a pricing mechanism for GHG emissions. The agreement, pending its adoption, is a meaningful step towards the goal of net-zero emissions from maritime transport by or around, i.e. close to, 2050 as set in the 2023 IMO GHG strategy. Discussions on the adoption of the agreement have been postponed to October 2026.

3. Record maritime emissions in 2024 as a consequence of the Red Sea crisis

In the 2024 reporting year, the monitored voyages emitted **144.9 million tonnes of CO_2** into the atmosphere. These emissions, reported by a fleet of around 12 700 ships, were the highest recorded since the MRV system was set up. They were **12.9% higher** than those reported in 2023, and 5.7% higher than those reported pre-COVID-2019 ([6]). For the first time, ships also reported non-CO_2 emissions within the scope of the MRV system. These emissions amounted to an additional 3.7 million tonnes of CO_2-equivalent, with nitrous oxide (N_2O) emissions accounting for 2.2 million tonnes of CO_2-equivalent and methane (CH_4) emissions accounting for 1.6 million tonnes of CO_2-equivalent.

The increase in the reported CO_2 emissions occurred in a year when the volume of goods handled in EU ports remained almost unchanged (-0.2% compared with 2023), partly due to a drop in energy goods imports. However, 2024 was marked by a considerable increase in the total fleet activity as a consequence of the Red Sea crisis and the subsequent drop in transits through the Suez Canal and rerouting, which significantly increased the total distance travelled and time spent at sea (by 9.3% and 8.6%, respectively).

The **container ship** segment was the most affected, accounting **for most of the increase in emissions** (+46%, corresponding to 16.7 million tonnes of CO_2). The established routes connecting European ports with the Far East had to be rerouted around the Cape of Good Hope, substantially affecting the operational behaviour of the segment. More container ships within the scope of the MRV system had to be deployed (+8%) to meet the increased demand for transporting

([6]) Excluding the emissions resulting from the application of the EU Maritime MRV Regulation to the United Kingdom for the reporting years 2018-2020.

containerised goods in EU ports (+ 4.4%) and the need for longer travel distances (+29%) and higher speeds (+2.2%).

Apart from container ships, 8 out of the 14 remaining ship types recorded an increase in emissions compared with 2023. This was often driven by the higher emissions from extra-EEA voyages due to the Red Sea crisis, as in the case of oil tankers (+4%), chemical tankers (+7%), general cargo ships (+8%), and vehicle carriers (+4%). The most significant drop in reported emissions was recorded for liquefied natural gas (LNG) carriers (-24%), as European LNG imports returned to pre-2022 levels.

Container ships, oil tankers and bulk carriers were confirmed as the top emitters in 2024, as in all previous reporting years since 2018. The significant increase in emissions from container ships raised their share of total reported emissions to the highest level recorded (37%, up from the 30% yearly average for the period 2018-2023). The relative share for most ship types remained stable, except for LNG carriers, whose contribution fell to 5% of total emissions, returning to the level before the 2022 Russian full-scale invasion of Ukraine.

The distribution of the fleet's total CO_2 emissions between the different types of voyages and within ports was deeply affected by the Red Sea crisis. The longer travel distances on extra-EEA trade routes increased the relative **share of emissions from extra-EEA voyages from 65.7% in 2023 to 70.6% in 2024**, the highest recorded since 2018. This trend is consistent with the increase in the activity of the fleet segments that are most active on extra-EEA trade routes.

In terms of **fuel consumption**, the monitored ships consumed 46.8 million tonnes of fuel in 2024. Fuel consumption over the period 2018-2024 remained dominated by conventional fossil marine fuels (heavy fuel oil, light fuel oil, gas oil, diesel oil) which accounted for over 91% of the total mass of fuels reported in 2024. As in previous years, the system recorded an increase in the consumption of heavy fuel oil, almost entirely offset by a decrease in the consumption of light fuel oil, the latter being driven by the increasing uptake of exhaust gas cleaning systems in the fleet.

In 2024 the fleet recorded the highest level of LNG consumption (around 1% higher than in 2023, accounting for 7.5% of the total fuel consumption reported in 2024). This increase was due to LNG being used by ships other than LNG carriers, with container ships, Ro-Pax (roll-on/roll-off passenger) ships, and passenger ships making up the lion's share. Liquified petroleum gas and methanol consumption considerably increased compared with 2023 (+38% and +428%), yet still representing a minor share of total consumption (0.1% each) by the monitored fleet. Other non-standard fuels accounted for 0.9% of the total fuel consumption reported (0.42 million tonnes), with 0.22 million tonnes reported as biodiesel.

4. The monitored fleet: shipping routes, speed and technical and operational efficiency

In terms of maritime transport flows, Eurostat data ([7]) shows that the total gross weight of seaborne goods handled in EU ports slightly decreased by 0.2% in 2024.

([7]) Eurostat. (2024). *Maritime transport of goods - annual data*. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Maritime_transport_of_goods_-_annual_data

Compared with 2023, the inflows from countries such as Ukraine, Canada, Türkiye and China increased in 2024, contributing to a 1.2% increase in the total volume of **inward trade flows**. The total 2024 volume of **outward trade flows** in 2024 decreased by 3.2%. The most significant decreases affecting outward flows concerned the United States (East Coast) and China.

MRV data for the period 2018-2024 shows **no indication of a structural reduction in speed** for the MRV fleet. In 2024, 10 out of 15 ship types recorded higher average speed than in 2018. Some types recorded considerable increases in speed, as in the case of combination carriers (+32%), gas carriers (+16%), other ships (+16%), and oil tankers (+13%). However, compared with 2023, 11 out of 15 ship types decreased their average speed in 2024. Both container ships and LNG carriers considerably increased it, by 2.2% and 2.4%, respectively.

A graphical analysis of key **technical and operational efficiency** indicators confirmed the gradual increase in data correlation values between key technical and operational efficiency indicators ([8]) and the size of the ships reporting under the EU MRV Maritime Regulation, thus highlighting the increased maturity of the MRV framework. Efficiency trends generally remained stable, especially among the fleet's top emitters, while some segments (e.g. container ships) showed improvements in the technical efficiency reported.

5. Implementation of the EU MRV Maritime Regulation

In terms of implementation of the EU MRV Maritime Regulation, the results confirm the robustness and completeness of the reported data. Both shipping companies and accredited verifiers coped well with the new reporting requirements brought in to support the ETS extension to maritime transport as from 2024. This is evidenced by the **improved punctuality** indicators (69%, up from 52% in 2023), despite an earlier deadline for the submission of annual reports ([9]).

The **quality of the submitted data** remained generally consistent with the previous reporting period (2023). The share of reports with outliers only slightly increased to 0.5% of the total, still considerably lower than the average of 1.1% for the period 2018-2024.

The **MRV compliance checks** carried out during port state control inspections confirmed the improvements recorded in previous years. In 2025 only 2% of inspected ships failed to provide a valid document of compliance to demonstrate compliance with the EU MRV obligations in the previous year. The maturity of the implementation of the EU MRV Maritime system played a key role in ensuring high compliance with ETS maritime obligations, reflecting the sector’s adaptation to these requirements, as in 2025 shipping companies surrendered allowances by the legal deadline for more than 99% of surrendering requirements ([10]).

([8]) The Energy Efficiency Design Index, the Estimated Index Value, and the Energy Efficiency Existing Ship Index are assessed for the technical efficiency of ships. The Energy Efficiency Operational Indicator and the Annual Efficiency Ratio are assessed for their operational efficiency.
([9]) The deadline was moved from 30 April to 31 March, starting from the 2024 reporting period.
([10]) Determined on the basis of figures reported by shipping companies in the Union Registry by 1 October 2025 in respect of 2024 emissions.