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POLICY UPDATE

DECEMBER 2023



# The maritime sector in the European Union Emissions Trading System

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An emissions trading system (ETS) is a market-based measure that sets a limit (cap) on allowed emissions (allowances) and creates financial incentives to reduce a sector's emissions. Each allowance equals 1 tonne of carbon dioxide ($CO_2$) or carbon dioxide equivalent ($CO_2e$) emissions, and these can be allocated directly by the government or purchased by companies through auctions. The cap can be reduced each year to help achieve the ultimate goal of zero emissions in the sector. Allowances can also be traded between companies as part of efforts to reach their own emission reduction goals.

In the European Union, the Emissions Trading System Directive (EU ETS Directive) has gone through four phases of development, and each has implemented stricter emission reduction targets and broadened the scope to encompass additional industries.[1] The latest phase in 2021 included discussions about adding the maritime sector and, starting in 2024, the EU ETS Directive will expand to include greenhouse gas (GHG) emissions from national and international shipping.

This policy update focuses on the scope of the EU ETS measures introduced for the maritime sector, including their innovations and limitations. We briefly review all phases of the EU ETS Directive and then explain key aspects of extending it to the maritime sector, including the time frame, GHG emissions included, geographical scope, types and sizes of vessels included, and revenue allocation. Lastly, we provide suggestions to consider in upcoming revisions of the EU ETS related to the maritime sector.

1 European Parliament and Council of the European Union, "Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC," October 13, 2003, http://data.europa.eu/eli/dir/2003/87/oj.

**Acknowledgments:** The authors thank Bryan Comer, Jennifer Callahan, and Amy Smorodin for their valuable contributions this paper.

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## PHASES OF THE EU EMISSIONS TRADING SYSTEM DIRECTIVE

Phase 1 (2005–2007) applied to power plants and cement and oil refineries.[1] It covered only $CO_2$ emissions, and allowances were allocated based on the National Allocation Plans for each EU Member State. Almost all allowances were given for free and the caps on emissions were estimates; due to a lack of emission data monitoring, too many free allowances were allocated, and the price dropped to zero in 2007.[2]

During Phase 2 (2008–2012), the Directive reduced the number of free allowances and introduced an auctioning system where a portion of allowances were auctioned instead of given out for free.[3] Coverage was also extended to Iceland, Liechtenstein, and Norway. Starting in 2012, the EU ETS included the aviation sector.

In Phase 3 (2013–2020), the EU ETS Directive promoted the auctioning of allowances by introducing a linear reduction factor that reduced the EU-wide emission cap by 1.74% each year.[4] The scope was expanded to other sectors (aluminum, chemical, and ammonia production) and linked to other ETS markets outside the European Union, which enabled the use of allowances from other systems for compliance. To address the previous issue of a surplus of allowances, the Market Stability Reserve (MSR) was introduced. The MSR was designed to remove unallocated allowances from the market to prevent negative impacts on the market due to overallocation, as occurred during the Phase 1. The New Entrants Reserve was also established to support the development of innovative low-carbon technologies; to finance the development of renewable energy and carbon capture and storage projects, 300 million allowances were added to the reserve.

In the 2018 Amendments to Phase 3 of the EU ETS, the linear reduction factor on free allowances was increased to 2.2% to align it with the EU's 2030 climate targets.[5] The scope was expanded to new sectors and to two additional GHGs, methane ($CH_4$) and nitrous oxide ($N_2O$). Two new funds were introduced: the Innovation Fund, which promotes innovation and deployment of low-carbon technologies, and the Modernization Fund, which helps the 10 lowest-income European member states to upgrade and improve their energy systems.

Phase 4 of the Directive (2021–2030) was launched after adopting the European Green Deal Initiative.[6] To help align with the new EU climate goals, free allowances will be gradually phased out by retiring them through the MSR. Additionally, a Social Climate Fund has been introduced to support vulnerable households that might be affected by the price impact of the ETS. Phase 4 expands the EU ETS to maritime transport and a separate ETS 2 has been created for buildings, road transport, and fuels.

2 "Development of EU ETS (2005-2020)," European Commission, accessed December 6, 2023, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/development-eu-ets-2005-2020_en.

3 European Parliament and Council of the European Union, "Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community," April 23, 2009, http://data.europa.eu/eli/dir/2009/29/oj.

4 European Parliament and Council of the European Union, "Decision No 1359/2013/EU of the European Parliament and of the Council of 17 December 2013 amending Directive 2003/87/EC clarifying provisions on the timing of auctions of greenhouse gas allowances," December 17, 2013, http://data.europa.eu/eli/dec/2013/1359/oj.

5 European Parliament and Council of the European Union, "Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/1814," March 14, 2018, http://data.europa.eu/eli/dir/2018/410/oj.

6 European Parliament and Council of the European Union, "Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system," May 10, 2023, http://data.europa.eu/eli/dir/2023/959/oj.

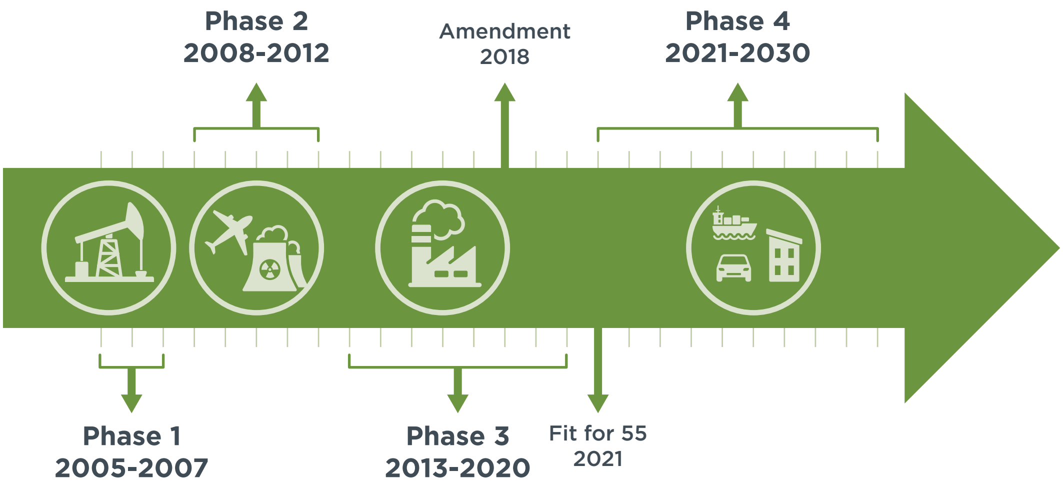


**Figure 1.** Timeline of the European Union Emissions Trading System Directive.

## EXPANSION OF THE EU EMISSIONS TRADING SYSTEM DIRECTIVE TO MARITIME

Key aspects of the agreement to include shipping in the EU ETS, which came into force in July 2023, are shown in Table 1. Ship owners and shipping companies are generally responsible for compliance. However, if the charterer is responsible for the decisions that directly affect the ship's emissions, ship owners are entitled to reimbursement for the costs of the corresponding allowances.

**Table 1.** Key aspects of the EU ETS Directive for maritime transport.

| | | EU ETS Directive – Maritime |
|---|---|---|
| **Percentage of regulated GHG emissions covered** | | 40% by 2024<br>70% by 2025<br>100% from 2026 onward |
| **Scope** | **Geography** | Applies to 100% of tank-to-wake emissions from voyages between EU ports of call and 50% of voyages between EU and non-EU ports of call. Special rules are applied for preventing carbon leakage from transshipment. Exemptions are applied to small islands and outermost regions. |
| | **Greenhouse gases covered** | $CO_2$ starting in 2024<br>$CO_2$, $N_2O$, and $CH_4$ starting in 2026 |
| | **Vessel size** | 5,000 gross tonnage (GT) and above |
| | **Vessel type** | All ship types covered by the EU Monitoring, Reporting and Verification (MRV) regulation. Some ice-class ships may surrender 5% fewer allowances than their verified emissions through the end of 2030. |
| **Revenues** | | Revenues will be distributed to the Innovation Fund. Twenty million allowances will be allocated to support investments in zero- and low-carbon maritime technologies, improve the energy efficiency of ships and ports, and protect marine biodiversity. |

### REGULATED GHG EMISSIONS

Starting in 2026, maritime GHG emissions, including $CO_2$, $CH_4$, and $N_2O$, must be surrendered as allowances in the following year, and there are interim goals set for 2024 (40% of $CO_2$ emissions only) and 2025 (70% of GHG emissions). No free allowances are allocated to the sector, and each non-compliant allowance will be subject to a €100 penalty. If a shipping company fails to comply in two consecutive years, it may face restrictions from calling at EU ports. Notably, this is the first time interim goals have been introduced in the EU ETS Directive; these are intended to help the maritime sector adapt to the new system and provide sufficient time for gradual integration into the system. In future revisions, additional guidelines will be provided to ensure a more transparent and robust data-sharing process that will enhance the reliability, credibility, and accuracy of verification and monitoring.

## GEOGRAPHICAL SCOPE

The Directive includes 100% of emissions from intra-EU voyages and 50% of emissions from extra-EU voyages. To prevent transshipment activities and calls to ports outside the EU for the purpose of evading compliance, the scope explicitly excludes certain stops at non-EU ports where the risk of evasion is highest. The European Commission is required to provide a first list of these ports by December 2023 and then update it biannually. The exclusion zone extends 300 nautical miles from a port under the jurisdiction of an EU Member State. This exclusion applies only to container ships in non-EU ports where transshipment of containers was at least 65% of container traffic during the preceding 12 months.

Islands that have fewer than 200,000 inhabitants and that lack road or rail connections to the mainland are exempt from surrendering allowances until 2030, as are the nine outermost regions (EU regions most geographically distant from the European continent).[7] This exemption applies to passenger ships and excludes cruise passenger and roll-on/roll-off passenger (ro-pax) ships traveling between an island's port under the jurisdiction of an EU Member State and the respective Member State.

## VESSEL SIZE AND TYPE

All cargo and passenger vessels greater than or equal to 5,000 GT are included in the EU ETS Directive. Offshore vessels will be required to report MRV data in 2025 and will be subject to the EU ETS starting January 1, 2027. Cargo and offshore vessels between 400 GT and up to but not including 5,000 GT will be required to report data in 2025 and a preliminary feasibility and impact assessment regarding adding them to the ETS Directive is to be completed by the end 2026. Certain ice-class vessels (1A and 1A Super) may reduce their surrendered allowances for verified emissions by 5% through 2030.

## FUND AND REVENUE ALLOCATION

All auctioning revenues from shipping will be allocated to the Innovation Fund. During negotiations, the EU Parliament proposed establishing a dedicated Ocean Fund that would ensure the revenue is spent on the maritime sector. However, the dedicated fund was not established, and the EU ETS directs maritime shipping revenues to the Innovation Fund and earmarks a portion of them to support the energy transition in the shipping sector. These investments will support pilot projects and infrastructure development to accelerate the deployment of zero-emission vessels and the uptake of alternative fuels, the retrofitting of old ships to use alternative energy sources (e.g., e-fuels, wind propulsion, fuel cells, and batteries), improvements in energy efficiency, and the financing of climate-related and adaptation projects in less-developed countries and small island states.

Until 2030, 20 million allowances will be allocated specifically for decarbonizing the shipping sector. Assuming the average 2022–2025 carbon price of €84.5 per $tCO_2$, that is estimated to result in €1.7 billion going to the maritime sector.[8] According to

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7 "The EU and its Outermost Regions," European Commission, accessed December 6, 2023, https://ec.europa.eu/regional_policy/policy/themes/outermost-regions_en.

8 International Emissions Trading Association, "GHG Market Sentiment Survey 2023, 18th Edition," (2023), https://k5x2e9z8.rocketcdn.me/wp-content/uploads/2023/09/IETA_GHGSentimentSurvey_2023.pdf

the European Commission's impact assessment report, the additional revenues that could be generated by including the maritime sector in the ETS system could reach €4.5 billion by 2030, assuming same average carbon price.[9] Thus, under the current scope, 38% of the total expected revenue generated from including maritime to the EU ETS will be directed to decarbonize the maritime sector.

## CONSIDERATIONS FOR FUTURE PHASES

The extension of the EU ETS Directive to maritime transport is an important step. Since its inception in 2005, the EU ETS has been updated in phases, and such work is scheduled to continue. In particular for maritime transport, there will be a review by December 31, 2024 about whether to include ships smaller than 5,000 GT in the EU ETS, and a review by December 31, 2026 about whether to include offshore vessels. Future policy revisions could consider the following to further improve the policy's impact on the marine sector:

» **Regulated GHG emissions:** Black carbon (BC), a potent short-lived climate pollutant, is not currently within the scope of regulation. These emissions from international shipping accounted for about 7% of all $CO_2e$ emissions in 2018, based on 100-year global warming potentials, and emissions of BC from shipping increased by 12% from 2012 to 2018.[10] To include BC in future revisions of the Directive, shipping companies could report BC emissions to the European Union for incorporation in the EU ETS Directive the following year.

» **Geographical scope:** Currently, only 50% of emissions from extra-EU voyages are included in the EU ETS Directive. According to 2021 MRV data, this leaves 41.8 Mt of $CO_2$ annual emissions outside the scope.[11] Additionally, a European Commission study estimated that maintaining the geographic scope at 50% would result in €37 billion in missed revenues between 2020 and 2050.[12] Future revisions of the Directive could consider extending the scope to 100% of extra-EU voyages for voyages that are not already subject to a carbon price equal to or greater than the EU ETS price. This would help limit the climate impact of maritime transport and unlock additional revenue.

» **Vessel size and type:** Fishing vessels, yachts, service vessels, and military vessels are currently excluded from the scope of the Directive, as are smaller vessels between 400 GT and up to but not including 5,000 GT. While the smaller vessels will be the subject of the aforementioned feasibility study in 2026, it remains uncertain whether they will subsequently be included in the EU ETS. Smaller ships account for 15% of maritime emissions and typically offer more decarbonization options than larger vessels; this makes them particularly good candidates for testing new zero-carbon technologies. Policymakers could consider including all ship types in the ETS Directive and expanding it to cover ships of 400 GT and above, after the feasibility and impact assessment.

9 Impact assessment report accompanying European Parliament and Council of the European Union, "Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757," July 14, 2021, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021SC0601.

10 Jasper Faber et al., "Fourth Greenhouse Gas Study 2020" (London: International Maritime Organization, 2020), https://www.imo.org/en/OurWork/Environment/Pages/Fourth-IMO-Greenhouse-Gas-Study-2020.aspx.

11 European Maritime Safety Agency, "THETIS-MRV," (Lisbon: 2021), https://mrv.emsa.europa.eu/#public/emission-report.

12 Impact assessment report accompanying European Parliament and Council of the European Union, "Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757."