Profits uncontained

An analysis of container shipping ETS surcharges

March 2024

Summary

The world's first carbon market for shipping, the EU shipping ETS, entered into force on 1 January 2024. Initially, shipowners will purchase emission allowances for 40% of their emissions, increasing to 70% in 2025 and 100% in 2026. In response, the largest shipping companies - all specialised in transporting containers - announced that they would pass on the ETS costs to their customers in the form of surcharges. In order to compare each company's expected ETS costs to the announced surcharges, this analysis examines over 560 single journeys from 20 ships of each of the four big EU shipping companies: MSC, Maersk, Hapag-Lloyd and CMA CGM. T&E found that European container shipping companies are likely to make significant windfall profits by setting these surcharges higher than their ETS costs.

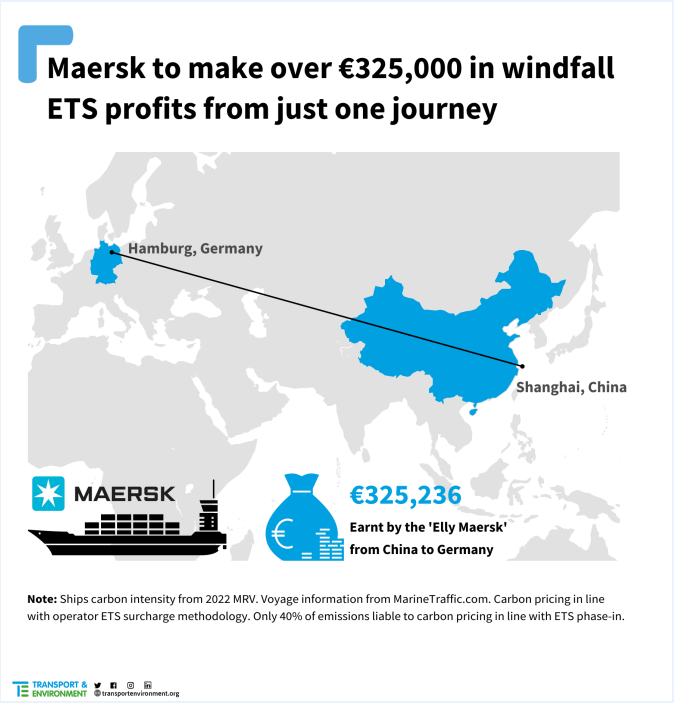

Figure E.1: Maersk to make over €300,000 from just one journey

On a single journey from China to Germany, one Maersk ship will make over €325,000 in windfall profits. A single ship, the Elly Maersk, is forecast to make profits of €1.76 million each year. Significant windfall profits are not limited to a single operator. Of the 565 journeys analysed, 486, or 86%, are estimated to make windfall profits. Hapag Lloyd's most profitable single journey is forecast to earn €204,000, MSC's €125,000 and CMA CGM's €139 000. On individual ship earnings over a year, MSC's Benedikt is forecast to earn €1,371,000, CMA CGM's Alexis €818,000, and Hapag Lloyd's Al Jmelyiyah €639,000 from the ETS surcharges.

The findings come not long after the disruptions in world trade caused by Covid, where container carriers made profits higher than those of the big tech giants.[1] They are relevant in the context of attacks from the shipping industry on environmental legislation. Firstly, container companies have argued that the EU's shipping ETS will cause a loss in traffic for European ports.[2] This analysis demonstrates the contrary: carriers may actually have more of an incentive to visit European ports as they could make money out of it. Secondly, the shipping industry has argued that future legislation from the IMO should get rid of global energy efficiency indicators, such as the carbon intensity indicator (CII).[3] Our analysis demonstrates that emissions pricing alone will not lead to effective price signals in the shipping industry. As such, bespoke energy efficiency legislation at both EU and IMO level is needed alongside emissions pricing.

1. Context

From 1 January 2024, the EU's Emission Trading System (ETS) covers emissions from shipping, for the first time applying the 'polluter pays' principle to shipping companies. The law marks the first ambitious pricing mechanism to regulate international shipping's climate impact and a significant step in the sector's journey towards decarbonisation. The ETS puts a cap on the total amount of pollution for sectors it regulates, which descends over time, eventually forcing those sectors to decarbonise. It will cover 100% of emissions from voyages between European ports and 50% of emissions between EU and non-EU ports.

In late 2023, all major container shipping companies announced that they would charge additional costs to their clients in response to the ETS. These 'ETS-' or 'emissions -surcharges' are ostensibly to cover the costs that the shipping companies will be liable for under the ETS. They apply on a container level, differ for each journey and are higher for refrigerated containers ('reefers'), which require onboard electrical energy. For example, a client that wants to send a standard (non-refrigerated) twenty-foot equivalent (TEU) container from North Europe to North America will have to pay an extra €24 to Hapag-Lloyd, €37 to MSC, €40 to CMA CGM or €40.5 to Maersk.

In order to evaluate the validity of these extra costs, this analysis compares the expected ETS cost for these large European shipping companies to the revenues they will raise from their announced ETS surcharges. In 2024, shipping companies will only be liable to pay for 40% of their ETS-covered emissions. This will increase to 70% in 2025, and 100% from 2026 onwards. Therefore, a further increase in surcharges - and profits - can be expected after 2024.

2. Methodology

This analysis focuses on a total of 80 ships operated by Maersk, CMA CGM, Hapag-Lloyd, and MSC, 20 ships by each company. These ships carried out a total of 565 individual journeys (e.g. from the Far East to

[1] Bloomberg (August 2021). Container Shipping Earnings Now Rival Apple. It's Not a Good Look. Retrieved at https://www.bloomberg.com/opinion/articles/2021-08-19/container-shipping-is-making-a-killing-this-year-but-will-we-have-christmas

[2] World Shipping Council (ongoing). The EU ETS. Retrieved at https://www.worldshipping.org/the-eu-ets

[3] Resolution to the IMO's Marine Environment Protection Committee (MEPC)'s 81st Session (December 2023). Resolution clarifying the current status of the CII rating system. Retrieved from https://www.imo.org/

North Europe, or the Mediterranean to North America) during the period 18/06/2023 - 18/12/2023. Ships in the sample were selected to be representative of the energy efficiency of each company's overall fleet operated under the stope of the ETS Directive.

We define a windfall profit as the difference between the ETS surcharges levied by the shipping companies and the expected ETS costs that they incur. We calculate this using 2023 real operational routes and mapped the journeys made by each ship that correspond to the routes for which each company has announced a surcharge. We multiplied each ship's average emissions per nautical mile, which were derived from the EU MRV regulation, by the distance travelled on each journey.[4] The resulting emissions are multiplied by the ETS prices assumed by the carriers,[5] producing the total emission costs for each journey. These were then converted to per-container ETS costs using load factors also derived from transport work data available in the 2022 MRV database. Finally, total emission costs were subtracted from the ETS emissions surcharge revenue - derived by multiplying the announced route-specific surcharges with the utilised container capacity - to find the ETS profit margin for each journey.

The results from this analysis should be considered conservative for several reasons. Firstly, our emissions efficiency data comes from 2022 annual averages, which will be lower than 2024, especially in the context of new ships running on alternatives to HFO. Secondly, our load factors are lower than the accepted industry average of 70% and we use the same carbon price estimated by the carriers, which is much higher than the actual ETS price. Full methodology and all assumptions can be found in Annex 1.

3. Results

The results clearly show that surcharge pricing systematically outstrips the expected emission cost. On the most profitable journey overall, Maersk's Elly Maersk will likely generate €325,000 in windfall profits. The most profitable ship for MSC is Conti Courage, generating €125,000 on a journey between Sines, Portugal and Savannah, US. For CMA CGM's, it is APL New Jersey earning €139,000 in profits between Bremerhaven, Germany and New Orleans, US. Finally, Hapag-Lloyd's CAl Jimeliyah is estimated to make €204,000 on a journey from Yantian, China and Wilhelmshaven, Germany. Figure 1 shows the ten most profitable journeys in our sample.

[4] A journey is defined as a one-way trip (most often calling at multiple ports) by a ship between the two most distant ports in terms of nautical miles along one route.

[5] €90/t CO_2 in the case of MSC, Maersk, and Hapag-Lloyd,€80/t CO_2 for CMA CGM

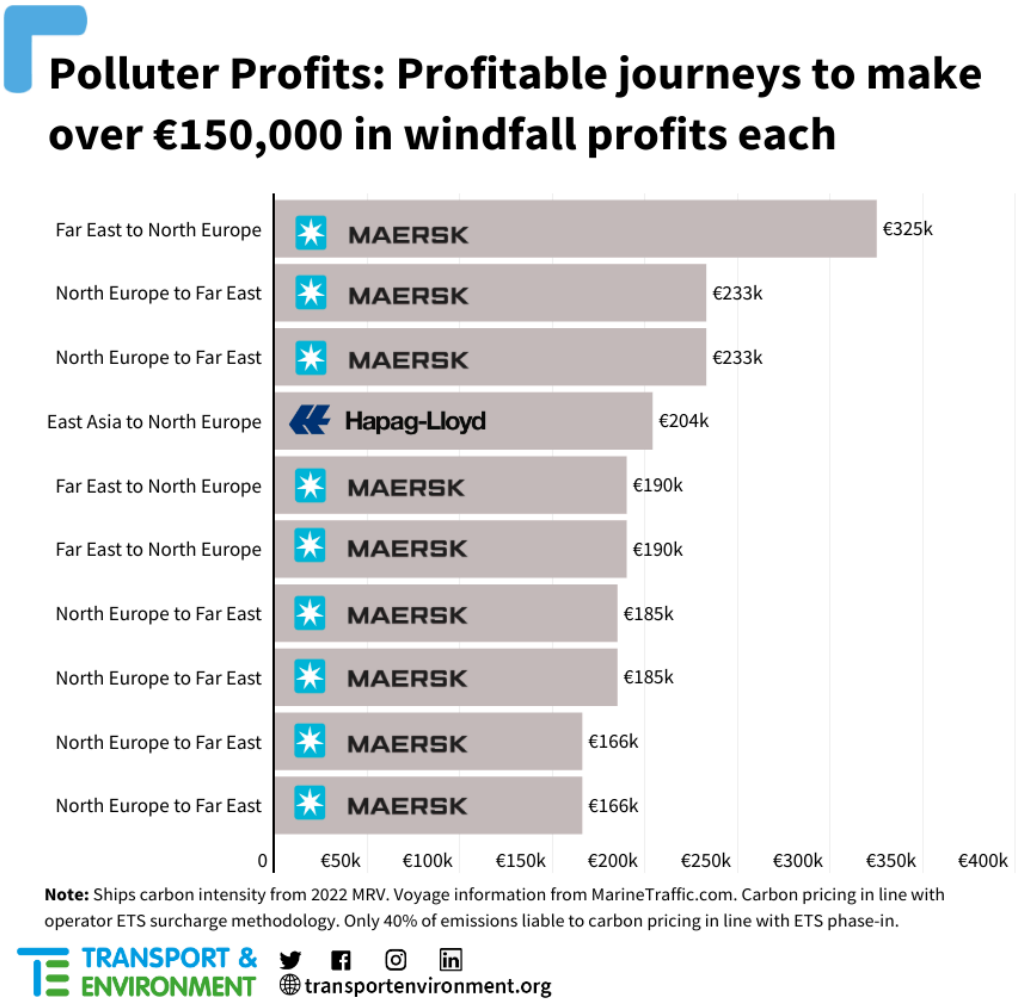

Figure 1: Most profitable individual journeys

Looking at profits over one year in our sample, Maersk's Elly Maersk ranks as the most profitable ship overall, projected to make €1,765,000 in windfall ETS profits in 2024.[6] For the other carriers, MSC's Benedikt CMA CGM's Alexis, and Hapag-Lloyd's Al Jameliyah follow with substantial additional annual profits of €1,371,000, €818,000, and €639,000 respectively, as shown in Figure 2. In our sample, the 6 most profitable ships - 5 of which are operated by Maersk - generate annual cumulative profits exceeding €1,000,000. An overview of the most and least profitable ships and journeys can be found in Annex 2.

[6] Yearly profits calculating scaling 2023 AIS data from a 6-month sample.

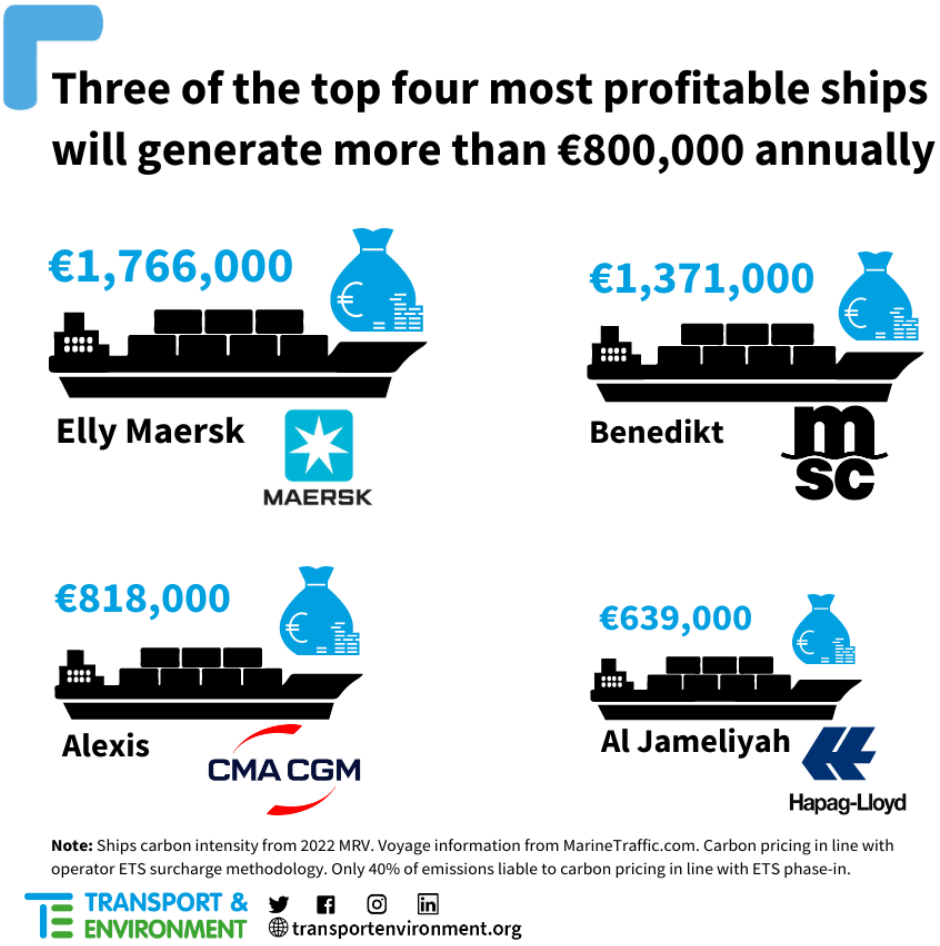

Figure 2: Most profitable vessel for four large container ship operators

Out of a total of 565 journeys, only 79, or 14%, did not produce profits in our analysis. 5 of the 10 most loss-generating journeys were operated by CMA CGM, followed by MSC (4) and Maersk (1). On the other hand, 9 of the 10 most profitable journeys belong to Maersk, one being operated by Hapag-Lloyd. Comparing the volume of the loss-making journeys shows that they are far outstripped by their profitable counterparts. Aggregated, the 25 largest losses account for -€934,000. In comparison, the 4 most profitable journeys alone generate €996,000 in windfall profits. Total cumulative windfall profits are €15,156,000 across our sample. Given that our sample only is a small share of each company's fleet that will call in Europe and charge surcharges, this will only be a small part of the windfall profits earned by carriers.

Looking at company averages, Maersk is projected to gain the highest profits across our sample, at €59,909, followed by Hapag-Lloyd (€23,000), MSC (€16,000) and CMA CGM (€14,000). The average profits for each journey in our sample was €25,000 in windfall profits (Figure 3).

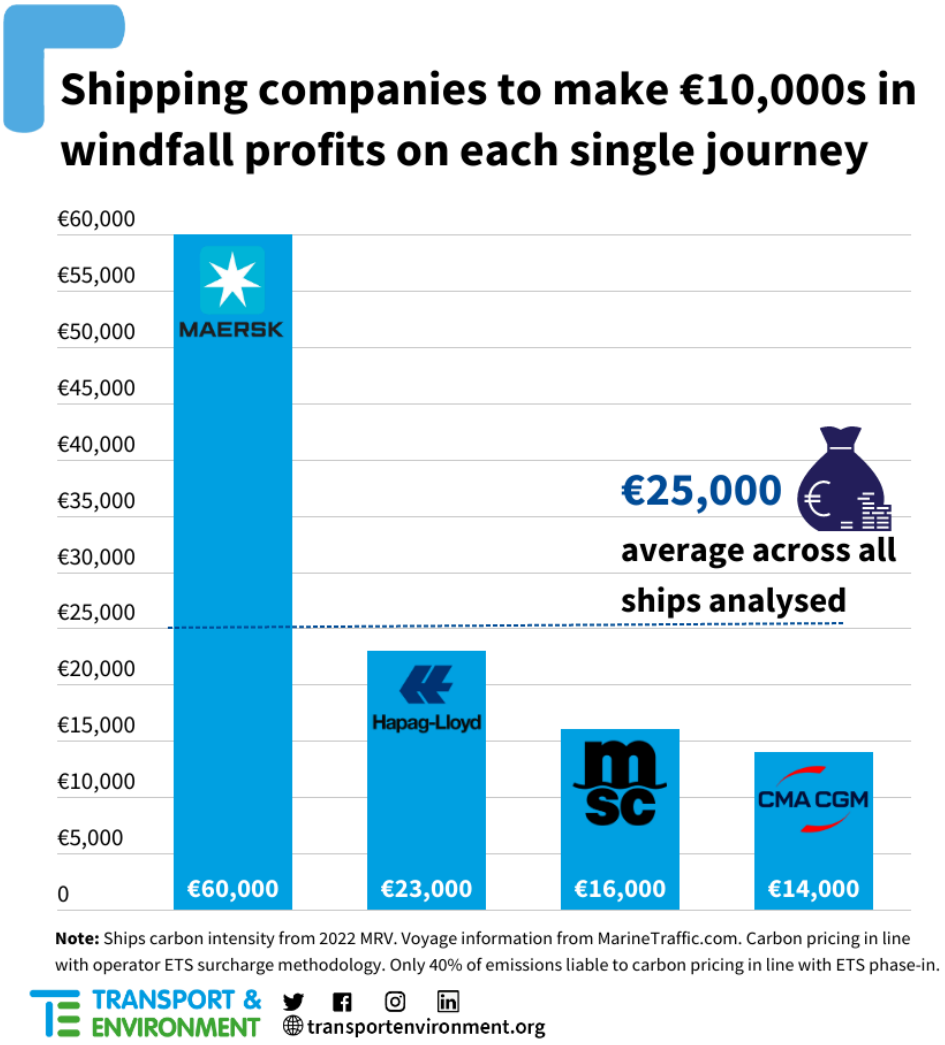

Figure 3: Average journey profits for each company across all routes

Looking at the routes where all carriers trade and have announced profit, there is strong variation in the windfall profits earned (Figures 2.1, 2.2 and 2.3 in Annex 2). On the route from West Africa to Europe, Maersk earns €53,000, while Haag-Lloyd incurs losses of -€3,000. However, on routes between Mediterranean ports, Hapag-Lloyd generates the highest average profits of €75,000 per journey compared to CMA CGM's lowest €5,000. On journeys from North Europe to the Mediterranean, CMA CGM generates windfall profits of €25,000 per journey, with Maersk leading the field with €83,000 on average. From the sampled journeys, we found that the company with the largest windfall profits on average per journey is Maersk, with €60,000, followed by Hapag-Lloyd (€23,000), MSC (€16,000) and CMA CGM (€14,000) for every single one of their many journeys to and from the EU.[7]

[7] Beyond these routes, our sample allows the estimation of profits on the level of individual journeys and ships. Company-level figures and their comparison are limited, as different surcharge schemes and operating profiles may favor specific routes not covered by this analysis.

Our analysis also considered the fluctuating price of the EU's ETS. While the carriers all assumed prices of €90/tCO_2 (or €80tCO_2 in the case of CMA CGM), these prices are all notably higher than the current ETS price, of €56.75/tonne CO_2.[8] Figure 4 shows that windfall profits would be much higher than previously analysed if we take into account the currently lower ETS price. Given that entities can buy ETS allowances on the ETS spot market at even lower prices than this, it is likely that the carriers wait for favourable ETS prices to buy their EUAs for the first quarter and have made profits far above those analysed above. If Maersk bought their EUAs for the first quarter of 2024 at the ETS price at the time of writing of €56,75, their average profits for each journey would increase by 18% (€60,000 to €71,000). For Hapag-Lloyd, profits would increase 74% (€23,000 to €40,000), for MSC, profits would increase 54% (€16,000 to €35,000) and for CMA CGM - who estimate a lower ETS price of €80 than their competitors - the increase would be 43% from €14,000 to average profits per journey to €20,000.

Figure 4: Comparison of company average windfall profits per journey across all routes for emission prices of €90/t CO2 and €56,75/t CO2

[8] *as of the 12/03/2024, retrieved from https://sandbag.be/carbon-price-viewer/

In our analysis, we also considered the possibility of varying load factors, i.e. that the containerships will not always carry the same amount of containers. Although the container industry uses default load factors of 70% cargo load,[9] our main analysis considered load factors calculated from reported values for transport work under the EU's MRV and default reefer load factors of 25%, making our analysis conservative. A sensitivity analysis provided in Annex 2.4 found that even at lower load factors of 35% - i.e. half the agreed industry default value - carriers would generate windfall profits on two-thirds (i.e. in 371) of journeys, with average profits of just under €4,000 per journey.

4. Conclusions

Our analysis shows that profits from the ETS surcharges are likely to outstrip shipping companies' actual ETS costs. Based on these findings, container liners are projected to generate considerable windfall profits up to €325,000 per journey. Annually, some ships will bring in more than €1 million in windfall profits. Their clients and final consumers bear not only the emissions costs, while the carriers earn substantial new profits. The economies of scale with which shipping operates enable this type of cost pass-through; consumers would pay negligible amounts for final products while shipping companies increase their margins.[10] This conclusion is conservative, as it follows the container carriers' assumed emission cost of 90€/tCO2, almost twice the current ETS price of €56,75 (as of 12/03/2024). While carriers may argue that these costs will be distributed across different routes and through their whole fleet, our results demonstrate that loss-making ships and routes are only a small minority of each company's fleet. As such, it is clear that the ETS surcharges will be profit-making - rather than a cost pass-through - exercise.

This analysis has a number of implications for policy-makers. Firstly, it shows that fears that the ETS will lead to 'business leakage' or the transfer of port activity from European to non-European ports is unfounded. Carriers will have an incentive to call at European ports, in order to make surcharge profits, rather than avoid European ports.

Secondly, it suggests that emission pricing on its own may not completely decarbonise the shipping industry. The ETS will be important in implementing the 'polluter pays principle' and in raising revenues for public authorities to reinvest in public services and decarbonisation projects that may otherwise not receive funding. Moreover, the difference in ETS surcharges per company suggests that the ETS introduces an element of competition for emissions efficiency between carriers. This is, however, limited by the concentrated nature of container shipping and the ease at which the shipping industry can pass on costs to their clients and the final customer (that is, maritime shipping's low price elasticity of demand). Therefore, bespoke additional legislation is needed in addition to the ETS to ensure operational and technical energy efficiency improvements are made. This is highly relevant in the context of the shipping

[9] All major container companies are part of the Clean Cargo Working Group, whose methodology for ascribing emissions to individual containers states that ' Historical analysis of carrier-reported vessel utilization data reflected an average capacity utilization of 70% across the largest historical Clean Cargo tradelanes.' Smart Frieght Centre (January, 2024). Clean Cargo GHG Emission INtensity Calculation Methods. Retrieved from https://www.smartfreightcentre.org/en/our-programs/clean-cargo-1/clean-cargo/

[10] Transport & Environment (June 28, 2022). The small price to pay to clean up shipping. Retrieved from https://www.transportenvironment.org/discover/the-small-price-to-pay-to-clean-up-shipping/

industry lobbying against energy efficiency measures (the CII) at the IMO.[11] Policy-makers must recognise that shipping decarbonisation is not simple; it will need multiple measures (such as emissions pricing, fuel standards, energy efficiency measures and subsidies) working at the same time to chart the path to green shipping.

Further information

Jacob Armstrong
Shipping Policy Manager
Transport & Environment
jacob.armstrong@transportenvironment.org

Felix Klann
Junior Shipping Policy Analyst
felix.klann@transportenvironment.org
Mobile: +32 (0) 470 83 55 17

[11] Resolution to the IMO's Marine Environment Protection Committee (MEPC)'s 81st Session (December 2023). Resolution clarifying the current status of the CII rating system. Retrieved from https://www.imo.org/

Annex 1: Full methodology

This analysis considers a total of 80 ships in operation for the companies Maersk, CMA CGM, Hapag-Lloyd, and MSC. To ensure the selected ships do not only represent company fleets, but their fleet operating in the EEA, we first cross-referenced data on ship operation from Alphaliner with the ships in the EU MRV THETIS database[12]. From those that did, the sample was drawn to represent each operator's respective fleets according to their energy efficiency per container. In line with the scope of the current shipping MRV, we only considered ships above 5,000 gross tonnage. Since container shipping companies charges are higher for more energy-intensive refrigerated containers[13], the 'reefer capacity' on each ship was added separately from Clarksons World Fleet Register.[14] Thus, we selected a sample of 20 ships for each company (see Table A.1).

Company	**Energy efficiency of fleet that called in EU/EEA in 2022 (in kg CO2/TEU-nm)**	**Energy efficiency of 20 sampled ships (in kg CO2/TEU-nm)**
Hapag-Lloyd	0.11	0.10
MSC	0.13	0.14
Maersk	0.10	0.10
CMA CGM	0.15	0.15

Table A.1: carbon intensity of ships in our sample compared to that of the fleet that visited EU/EEA *ports in 2022*

We calculated emissions based on a ship's journeys, defined as one-way trips by a ship between two most distant ports in terms of nautical miles along one route.[15] They correspond to the routes for which the container companies have announced surcharges. Additionally, journeys closely represent the origin and destination of containers shipped along global trade lanes. The journeys in this analysis rely on simplified assumptions to the origin and destination of carried containers, namely calculating surcharges for utilised container capacity on the full journey, not accounting for cargo discharge and loading on intermediary port calls. Our use of annual average emissions and used cargo capacity of each individual ship mitigates its impact, as those represent the true annual cargo load factor and emissions spread of a vessel. In our analysis, we included the distances[16] between all port calls[17] within a 6-month window from

[12] EMSA (2023). 2022-v111-22112023-EU MRV. Retrieved from https://mrv.emsa.europa.eu/#public/faq
[13] Smart Freight Centre (2024). Clean Cargo Ocean Containership Greenhouse Gas Emission Intensity Calculation Methods. Retrieved from https://www.smartfreightcentre.org/en/our-programs/clean-cargo-1/clean-cargo/
[14] Clarksons Research (2023). Clarksons World Fleet register. Retrieved from https://www.clarksons.net/wfr/
[15] In our analysis we differentiate between a journey - a full, end to end, route between two regions which may have multiple port calls in between - and a voyage, defined by the EU as 'the last berth or ship-to-ship transfer within a port of call to the first berth or ship-to-ship transfer in the following port of call'. Retrieved from https://climate.ec.europa.eu/system/files/2017-06/20170517_voyages_in_ports_en.pdf
[16] Port-to-port distances were extracted from https://sea-distances.org and http://ports.com/
[17] All port calls within the date range were extracted from https://marinetraffic.com

June 18, 2023, to December 18, 2023, for each ship to ensure a sufficient amount of journeys on longer routes are covered. In line with ETS maritime coverage, anchorages were not considered. Figure A.2 shows a full overview of our approach.

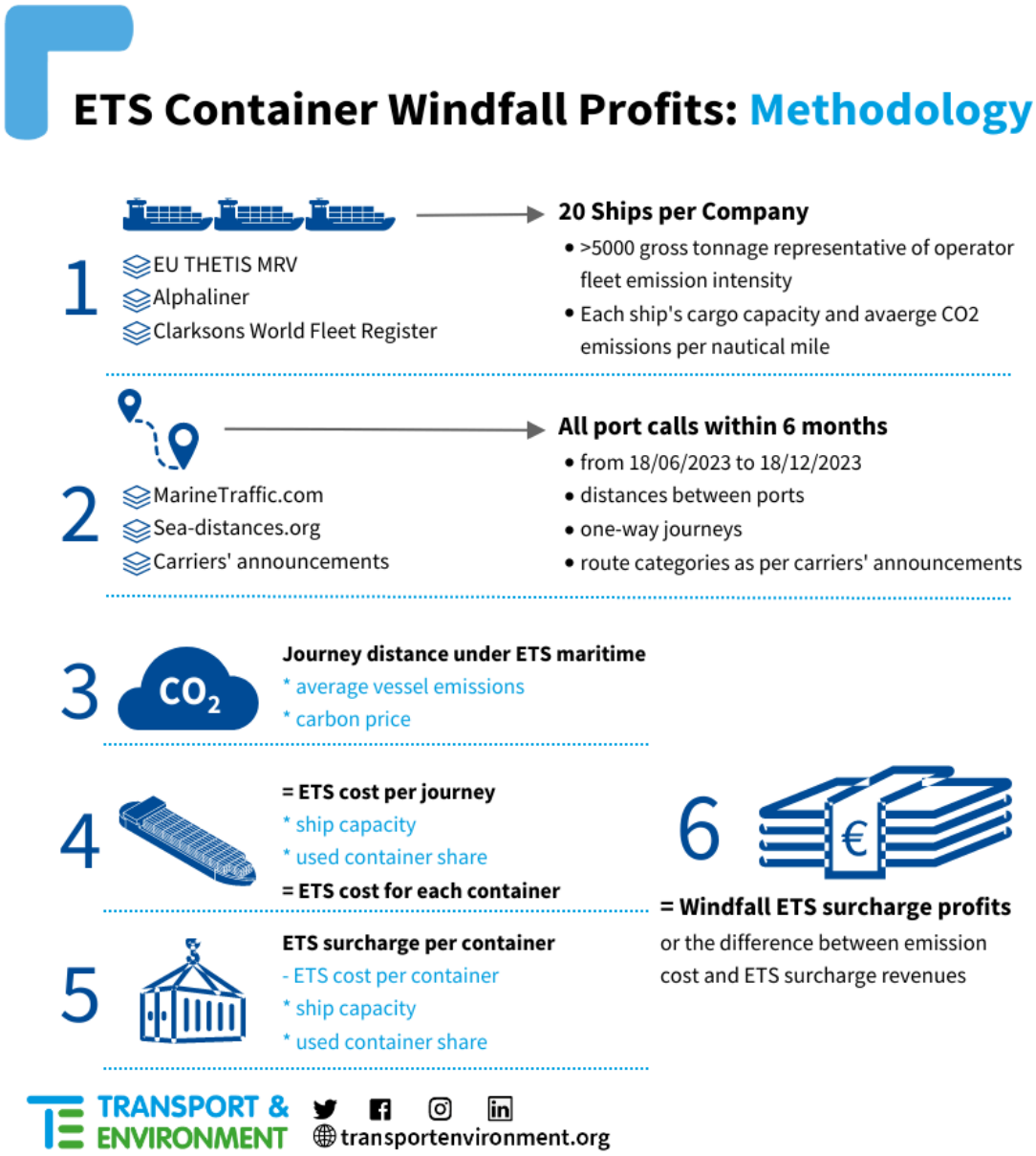

Figure A.2: Our approach to calculating windfall profits

The emissions considered under the ETS were then calculated by multiplying a ship's average emissions per nautical mile by the miles travelled on each journey, with respect to the specific rules on the coverage of voyages. In line with the coverage of the ETS, we counted 50% of the emissions from voyages between EEA and non-EEA ports (Figure A.3). The resulting emissions were then multiplied by the expected carbon

price announced by each carrier: €90 for each tonne of CO_2 for Maersk,[18] Hapag-Lloyd[19] and MSC,[20] €80 for CMA CGM.[21] As this is now above current carbon price levels, a sensitivity analysis using a price of €53 per tonne of CO_2 Is provided in Annex 2.

As the shipping sector benefits from a 'phase-in' of their ETS liabilities (companies will only have to pay for 40% of their total ETS-covered emissions in 2024 and 70% in 2025), we have adjusted each journey's emissions to reflect their lesser liabilities in 2024. The resulting emissions are multiplied by the ETS price announced by each carrier,[22] producing the per-container and total emission costs for each journey. The emission costs were subtracted from the ETS emissions surcharge revenue to assess the windfall profits resulting from container operators' ETS surcharges.

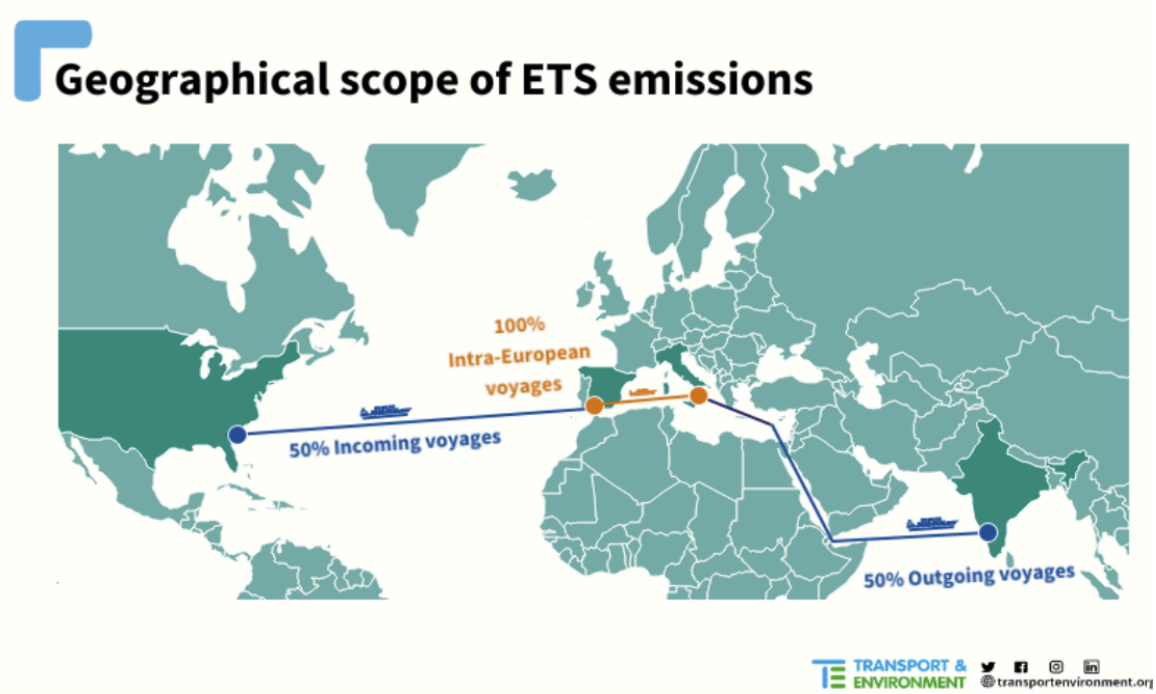

Figure A.3: Geographical scope of ETS emissions

This analysis produces conservative profit estimates, as it uses emission efficiency data from 2022 (the most recently available through the EU's MRV). Efficiency improvements since then - and in particular the uptake of new vessels that do not use HFO and have lower emissions factors, like LNG - mean that 2024

[18] Maersk (15 September 2023). EU Emissions Trading System (ETS) effective January 1, 2024. Retrieved from https://www.maersk.com/news/articles/2023/09/15/eu-emissions-trading-system-ets

[19] Hapag-Lloyd (1 December 2023). Here's an update on the EU Emission Trading System (ETS) and Emission Allowance Surcharge. Retrieved from https://www.hapag-lloyd.com/en/services-information/news/2023/12/here-s-an-update-on-ets.html

[20] MSC (10 November 2023). Implementing EU Emissions Trading System (ETS) from 1 January 2024. Retrieved from https://www.msc.com/en/newsroom/customer-advisories/2023/october/implementing-eu-ets-from-1-january-2024

[21] CMA CGM (1 December 2023). Launching of EU Emissions Trading System application to shipping. Retrieved from https://www.cma-cgm.com/local/vietnam/news/187/launching-of-eu-emissions-trading-system-application-to-shipping

[22] €90/t CO_2 in the case of MSC, Maersk, and Hapag-Lloyd and €80/t CO_2 for CMA CGM.

emissions efficiency will be greater. This would tend to reduce carriers' ETS liabilities and increase surcharge profits.

Additionally, the shipping ETS has specific rules for certain neighbouring transhipment ports. Under the legislation, port calls in Tanger Med in Morocco and Port Said in Egypt will not be considered port calls. This means that, for example, a journey from Singapore (non-EU) to Valencia (EU) through (only) Tanger Med (non-EU neighbouring port) is considered to be one inbound voyage from Singapore to Valencia, as if the stop in Tanger Med did not take place. Similarly, specific rules for journeys to, from, and within EU outermost regions were applied to the analysis.[23]

Our analysis also takes into account the fact that container vessels rarely use their full cargo capacity, as well as the phase-in period of the shipping ETS. We calculated each ship's load factor using data reported by each company to the European Commission.[24] In addition to average emissions per nautical mile, shipping companies also report total annual CO_2 emissions, and CO_2 emissions per transport work (measured in tonne-nautical miles). From this data, it is possible to calculate the average tonnes of cargo and thus the number of containers onboard (Figure A.4). Where no ship-based load factor was found,[25] we assumed a load factor of 70%, as per the standard agreed by container companies themselves based on historical capacity. The load factors we use in our analysis are typically lower than 70% and therefore lead to lower surcharge profits than what would be generated under the carriers' own assumptions. This buffer in used capacity accounts for containers that do not travel the full journey distance. For refrigerated "reefer" containers, we used a fixed load factor of 25% (which is also an industry standard).[26]

[23] In line with EU ETS maritime guidelines' specific rules and derogations. Retrieved from https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector/faq-maritime-transport-eu-emissions-trading-system-ets_en

[24] For the conversion of cargo in tonnes to 20-foot-containers assuming a default weight of 12 tonnes in line with the Shipping MRV Monitoring sub-group of the European Sustainable Shipping Forum (2017). Retrieved from https://climate.ec.europa.eu/system/files/2017-06/20170517_guidance_cargo_en.pdf

[25] This exception exclusively applies to the AMALTHEA.

[26] Smart Freight Centre (2024) Ocean Containership Greenhouse Gas Emission Intensity Calculation Methods. Retrieved from: https://smart-freight-centre-media.s3.amazonaws.com/documents/Clean_Cargo_GHG_Emission_Intensity_Calculation_Methods_2024-01-12_yyIIsag.pdf

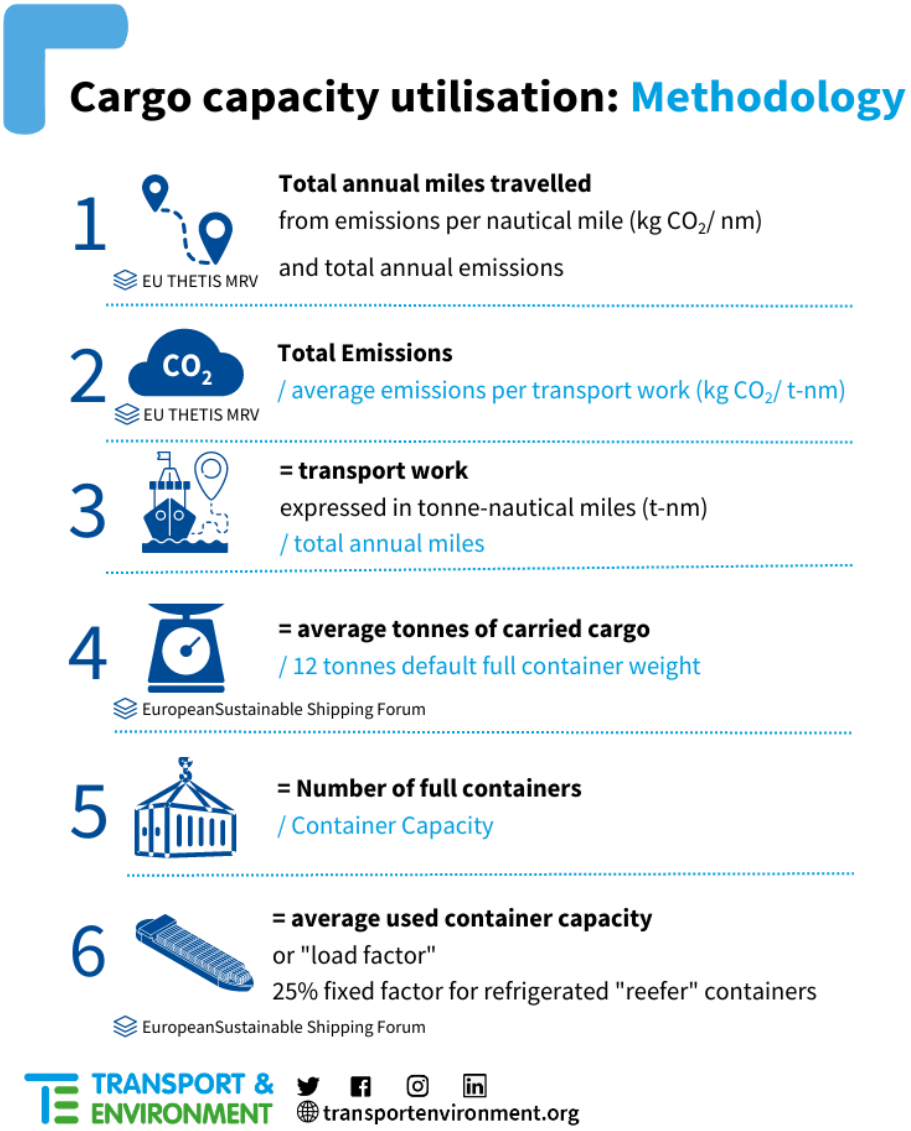

Figure A.4: Our approach to calculating utilized container capacity (load factors)

Annex 2: Additional data

Most profitable journeys

Vessel	Journey	Port Of Origin	Country of Origin	Total Profit	Company
ELLY MAERSK	Far East to North Europe	Port SHANGHAI	China	**€325,000**	**Maersk**
ELLY MAERSK	North Europe to Far East	Port HAMBURG	Germany	**€233,000**	**Maersk**
ELLY MAERSK	North Europe to Far East	Port HAMBURG	Germany	**€233,000**	**Maersk**
AL JMELIYAH	East Asia - North Europe	Port YANTIAN	China	**€204,000**	**Hapag-Lloyd**
EDITH MAERSK	Far East to North Europe	Port YANTIAN	China	**€190,000**	**Maersk**
EDITH MAERSK	Far East to North Europe	Port YANTIAN	China	**€190,000**	**Maersk**
EDITH MAERSK	North Europe to Far East	Port HAMBURG	Germany	**€185,000**	**Maersk**
EDITH MAERSK	North Europe to Far East	Port HAMBURG	Germany	**€185,000**	**Maersk**
EBBA MAERSK	North Europe to Far East	Port HAMBURG	Germany	**€166,000**	**Maersk**
EBBA MAERSK	North Europe to Far East	Port HAMBURG	Germany	**€166,000**	**Maersk**
ELEONORA MAERSK	Far East to North Europe	Port QINGDAO	China	**€151,000**	**Maersk**
APL NEW JERSEY	North Europe to USA	Port BREMERHAVEN	Germany	**€139,000**	**CMA CGM**
APL NEW JERSEY	North Europe to USA	Port BREMERHAVEN	Germany	**€135,000**	**CMA CGM**
ELEONORA MAERSK	North Europe to Far East	Port ANTWERP	Belgium	**€134,000**	**Maersk**
CAP SAN TAINARO	Europe to East Coast South America	Port HAMBURG	Germany	**€128,000**	**Maersk**
CONTI COURAGE	Europe to NAM (USA, Canada & Mexico)	Port SINES	Portugal	**€125,000**	**MSC**

CAP SAN JUAN	Mediterranean to Middle East & Indian Subcontinent	Port ALGECIRAS	Spain	**€125,000**	**Maersk**
CAP SAN JUAN	Mediterranean to Middle East & Indian Subcontinent	Port ALGECIRAS	Spain	**€125,000**	**Maersk**
CAP SAN JUAN	Mediterranean to Middle East & Indian Subcontinent	Port ALGECIRAS	Spain	**€125,000**	**Maersk**
CAP SAN LAZARO	Mediterranean to Middle East & Indian Subcontinent	Port ALGECIRAS	Spain	**€124,000**	**Maersk**
CAP SAN LAZARO	Mediterranean to Middle East & Indian Subcontinent	Port ALGECIRAS	Spain	**€124,000**	**Maersk**
CAP SAN LAZARO	Mediterranean to Middle East & Indian Subcontinent	Port ALGECIRAS	Spain	**€124,000**	**Maersk**
LE HAVRE	Europe to Oceania & Indian Ocean Islands	Port HAMBURG	Germany	**€122,000**	**MSC**
APL FULLERTON	Asia to North Europe	Port BUSAN NEW PORT	South Korea	**€120,000**	**CMA CGM**
APL FULLERTON	Asia to North Europe	Port BUSAN NEW PORT	South Korea	**€120,000**	**CMA CGM**

Table 2.1: 25 most profitable journeys

Least profitable journeys

Vessel	Journey	Port Of Origin	Country of Origin	Total Profit	Company
LE HAVRE	Oceania & Indian Ocean Islands to Europe	Port ADELAIDE	Australia	**- €185,000**	**MSC**
APL NEW YORK	Oceania to Europe	Port ADELAIDE	Australia	**- €79,000**	**CMA CGM**
APL NEW YORK	Oceania to Europe	Port ADELAIDE	Australia	**- €79,000**	**CMA CGM**
APL MEXICO CITY	Oceania to Europe	Port ADELAIDE	Australia	**- €69,000**	**CMA CGM**
C HAMBURG	Oceania & Indian Ocean Islands to Europe	Port ADELAIDE	Australia	**- €61,000**	**MSC**
APL MEXICO CITY	Oceania to Europe	Port BOTANY	Australia	**- €58,000**	**CMA CGM**
APL FULLERTON	North Europe to Far East	Port ROTTERDAM MAASVLAKTE	Netherlands	**- €56,000**	**CMA CGM**
CONTI CORTESIA	NAM (USA, Canada & Mexico) to Europe	Port LOS ANGELES	United States	**- €46,000**	**MSC**

GSL KALLIOPI	North Europe to Middle East & Indian Subcontinent	Port THAMES	United Kingdom	**- €41,000**	**Maersk**
CONTI CORTESIA	Oceania & Indian Ocean Islands to Europe	Port MELBOURNE	Australia	**- €33,000**	**MSC**
APL NEW YORK	North Europe to Far East	Port ROTTERDAM MAASVLAKTE	Netherlands	**- €30,000**	**CMA CGM**
C HAMBURG	Oceania & Indian Ocean Islands to Europe	Port ADELAIDE	Australia	**- €29,000**	**MSC**
GSL KALLIOPI	North Europe to Middle East & Indian Subcontinent	Port BREMERHAVEN	Germany	**- €28,000**	**Maersk**
MSC AJACCIO	South America East Coast to Europe	Port SANTOS	Brazil	**- €27,000**	**MSC**
CSL MANHATTAN	North Am East Coast incl MX East Coast - South Europe	Port HOUSTON	United States	**- €12,000**	**Hapag-Lloyd**
CHACABUCO	North Am East Coast incl MX East Coast - North Europe	Port ALTAMIRA	Mexico	**- €11,000**	**Hapag-Lloyd**
CHACABUCO	North Am East Coast incl MX East Coast - North Europe	Port ALTAMIRA	Mexico	**- €11,000**	**Hapag-Lloyd**
CHACABUCO	North Am East Coast incl MX East Coast - North Europe	Port ALTAMIRA	Mexico	**- €11,000**	**Hapag-Lloyd**
CHACABUCO	North Am East Coast incl MX East Coast - North Europe	Port ALTAMIRA	Mexico	**- €11,000**	**Hapag-Lloyd**
MSC AJACCIO	Europe to South America East Coast	Port LIVORNO	Italy	**- €10,000**	**MSC**
EMMA A	Central America / Caribbean - South Europe	Port PANAMA ATLANTIC	Panama	**- €10,000**	**Hapag-Lloyd**
MSC ADELAIDE	Mediterranean to North Europe	Port NAPOLI	Italy	**- €10,000**	**MSC**
CELSIUS LONDON	Middle East & Indian Subcontinent to North Europe	Port ALEXANDRIA	Egypt	**- €9,000**	**Maersk**
MSC AJACCIO	South America East Coast to Europe	Port RIO DE JANEIRO	Brazil	**- €8,000**	**MSC**
DALLAS EXPRESS	West Africa - Europe	Port LUANDA	Angola	**- €8,000**	**Hapag-Lloyd**

Table 2.2: 25 least profitable journeys

Most profitable ships

Company	Vessel Name	Annual Profit
Maersk	ELLY MAERSK	**€1,766,000**
Maersk	EDITH MAERSK	**€1,500,000**
Maersk	CAP SAN JUAN	**€1,436,000**
MSC	BENEDIKT	**€1,371,000**
Maersk	CAP SAN LAZARO	**€1,255,000**
Maersk	EBBA MAERSK	**€1,027,000**
Maersk	CAP SAN ANTONIO	**€912,000**
CMA CGM	ALEXIS	**€818,000**
MSC	CAPE SOUNIO	**€752,000**
MSC	CONTI COURAGE	**€746,000**

Table 2.3: 10 Most profitable ships

Least profitable ships

Company	Vessel Name	Annual Profit
CMA CGM	APL NEW YORK	**- €375,000**
CMA CGM	APL MEXICO CITY	**- €205,000**
MSC	LE HAVRE	**- €127,000**
Hapag-Lloyd	CHACABUCO	**- €66,000**
Maersk	CELSIUS LONDON	**- €47,000**
MSC	C HAMBURG	**- €42,000**
CMA CGM	ATLANTIC GENEVA	**- €32,000**
Maersk	AS PALINA	**- €15,000**
Hapag-Lloyd	EMMA A	**- €9,000**
MSC	MSC AGADIR	**€11,000**
Hapag-Lloyd	EMOTION	**€28,000**

Table 2.4: 10 least profitable ships

Sensitivity analysis

Company	Baseline average windfall profits per journey	Average windfall profits per journey at €53/tCO_2	Average windfall profits per journey at 35% load factor
Hapag-Lloyd	**€23,000**	**€40,000**	**-€5,000**
MSC	**€16,000**	**€35,000**	**€4,000**
Maersk	**€60,000**	**€71,000**	**€25,000**
CMA CGM	**€14,000**	**€20,000**	**€2,000**
All sampled ships	**€25,000**	**€35,000**	**€4,000**
Profitable journeys	**486 (86%)**	**553 (98%)**	**371 (66%)**
Loss-making journeys	**79 (14%)**	**12 (2%)**	**194 (34%)**
Profitable ships	**71 (89%)**	**79 (99%)**	**51 (64%)**
Loss-making ships	**9 (11%)**	**1 (1%)**	**29 (36%)**

Table 2.5: Sensitivity analysis for ETS price. The companys' estimated price of €90/tCO_2 for Maersk, Hapag-Lloyd and MSC, €80/tCO_2 for CMA CGM. €56.75/tCO_2 (ETS price on 20/02/2024). Load factor of 35% half of accepted industry average of 70%.

Route comparisons

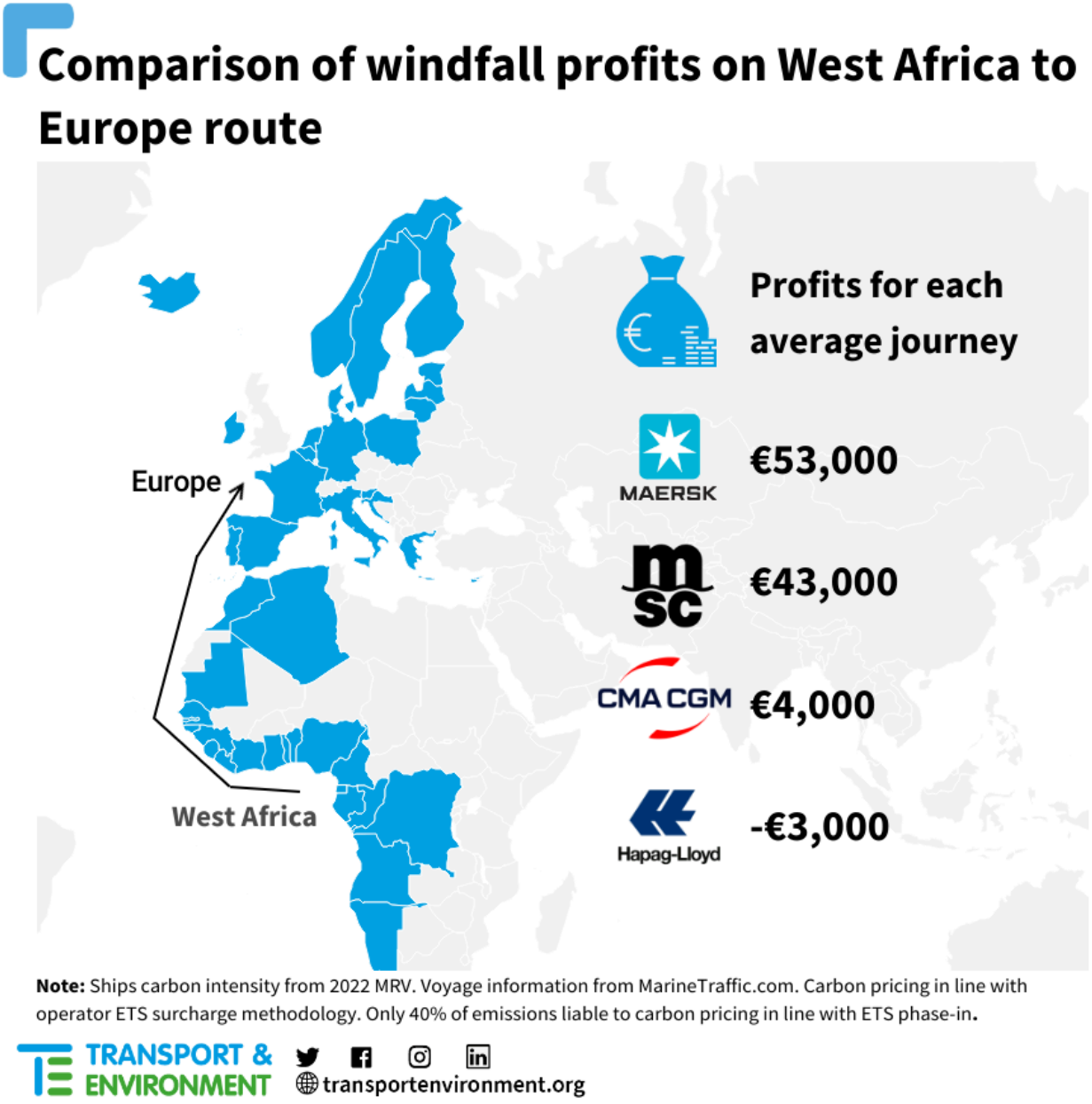

Figure 2.1: Average journey profits for each company from West Africa to Europe; "Abidjan to Antwerp", "Abidjan to Marseille", and "Nouakchott to Lisbon" for CMA CGM

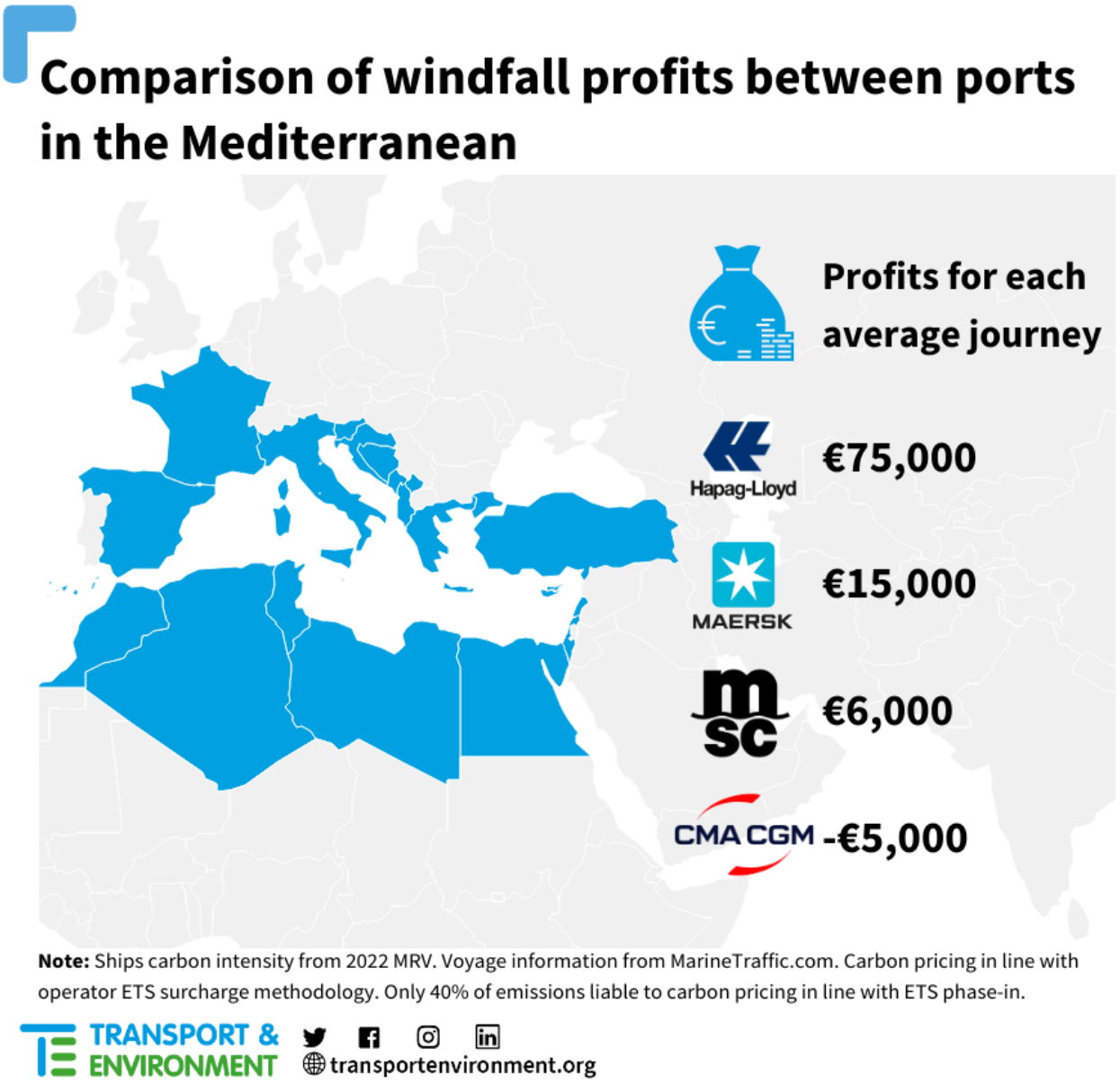

Figure 2.2: Average journey profits for each company within the Mediterranean; "Middle East to South Europe" for Hapag-Lloyd

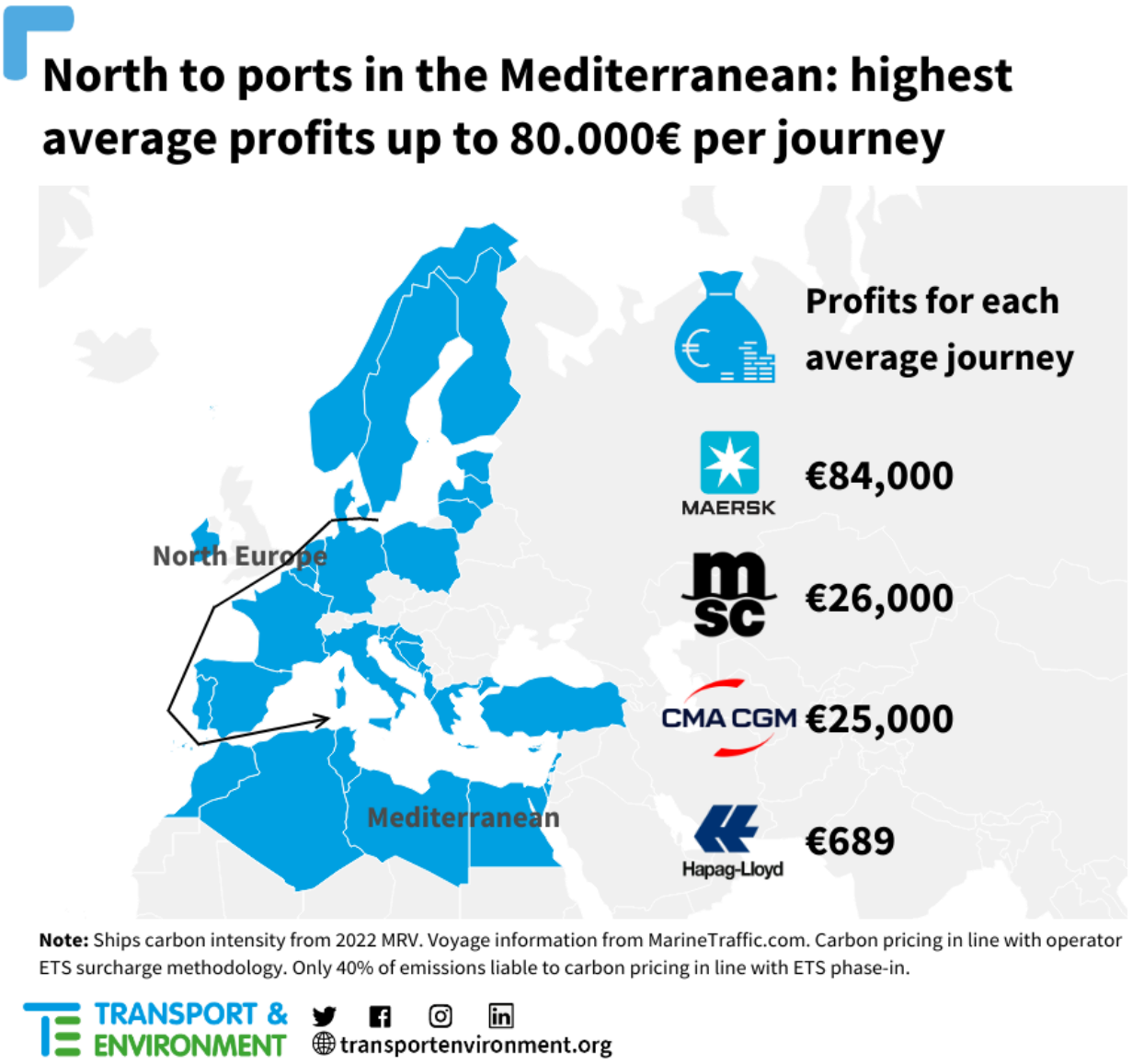

Figure 2.3: *Average journey profits for each company from North Europe to the Mediterranean; "Intra"-EU for Hapag-Lloyd*