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REPORT FROM THE COMMISSION

Review of Regulation (EU) 2015/757 on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport in relation to the potential inclusion of ships below 5 000 gross tonnage but not below 400 gross tonnage

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1. Introduction

Maritime transport plays an essential role in the EU economy and is one of the most energy-efficient modes of transport. However, it is also a significant source of greenhouse gas (GHG) emissions.

Regulation (EU) 2015/757 on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport is an essential part of the EU's action to address climate change in the maritime transport sector. The so-called 'MRV maritime Regulation' 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-efficiency and low-carbon solutions with more transparency and support the implementation of climate mitigation policies, such as the recent extension of the EU Emissions Trading System (ETS) to maritime transport. It also plays a critical role in feeding future policy discussion, as the first step towards mitigation actions is to understand how much is being emitted and where.

Pursuant to Article 22a of the MRV maritime Regulation, the aim of the present report is to assess the possible inclusion of ships below 5 000 gross tonnage but not below 400 gross tonnage (GT) within the scope of this Regulation, with a view to a possible subsequent inclusion of such small ships within the scope of the ETS Directive[1] or to proposing other measures to reduce greenhouse gas emissions from such ships. The present report will therefore also serve as an input, as deemed relevant, for the planned 2026 review[2] of the ETS Directive.

The present report is structured as follows:

- Overview of the implementation of the MRV maritime Regulation, notably in light of recent changes;
- Review of the current scope of the MRV maritime Regulation;
- Assessment of scenarios to extend the scope of MRV maritime Regulation to smaller vessels (400 to 4 999 GT).

[1] 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 (OJ L 275, 25.10.2003, p. 32).

[2] According to Article 3gg(5) of the ETS Directive, no later than 31 December 2026, the Commission should present a report in which 'it shall examine the feasibility and economic, environmental and social impacts of the inclusion in [that] Directive of emissions from ships, including offshore ships, below 5 000 gross tonnage but not below 400 gross tonnage, building, in particular, on the analysis accompanying the review of Regulation (EU) 2015/757 due by 31 December 2024.'

The analysis presented in this report builds on a study carried out by a consortium of contractors.[3]

2. Overview of the implementation of the MRV maritime Regulation

2.1 Presentation of the MRV maritime Regulation and its recent modifications

Since 1 January 2018, large ships over 5 000 gross tonnage loading or unloading cargo or passengers at ports in the European Union (EU)[4] must monitor and report related GHG emissions (only CO_2 emissions between 2018 and 2023, but also nitrous oxide and methane emissions since January 2024) and other relevant information. Monitoring, reporting and verification of information must be done in conformity with the MRV maritime Regulation.

The MRV maritime Regulation sets requirements for shipping companies to monitor and report their emissions for each of their ships, each calendar year, on a cyclical basis. All ships performing voyages within the scope of the MRV maritime Regulation, regardless of their flag state, must submit a monitoring plan detailing how they intend to collect emission data within two months of their first call to a port in the EU. The monitoring plan must be assessed satisfactorily by an accredited verifier prior to data collection, and the collected data (compiled in an annual emission report) has to be verified at the end of each reporting period. Upon verification, a Document of Compliance is issued by the verifier and the reports are submitted to the Commission via the THETIS MRV portal. The enforcement of the EU MRV process is done by Member States by inspecting ships that enter ports under their jurisdiction and by taking all the necessary measures to ensure that ships flying their flag are compliant with the Regulation.

The MRV maritime Regulation was conceived as a first step before the inclusion of these emissions within the scope of the EU Emissions Trading System (ETS). Such inclusion materialised through the 2023 revision of the EU ETS Directive, which – among others – brought maritime transport emissions within its scope as from January 2024.[5]

The MRV maritime Regulation itself was amended in 2023[6] to adapt the MRV rules to the inclusion of maritime transport activities in the EU ETS. It was also amended to include other emissions than CO_2, namely nitrous oxide (N_2O) and methane (CH_4) within its scope as of 1 January 2024. Furthermore, it was agreed to extend its scope, from 1 January 2025, to general cargo vessels of 400 GT and above, and to offshore ships of 400 GT and above.[7] As such, the MRV maritime Regulation already applies (from 2025) to two types of smaller vessels; this is taken into consideration in the present report.

[3] Ricardo et al., 2025 – "Supporting study for the implementation of the ETS directive and MRV requirements for maritime transport", publication upcoming

[4] References to the EU as a region in this report include non-EU countries that are part of the European Economic Area (EEA), unless specified otherwise

[5] For more information on the ETS extension to maritime transport emissions and its overall timeline, please refer to the Commission's dedicated webpage and Frequently Asked Questions: https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector/faq-maritime-transport-eu-emissions-trading-system-ets_en

[6] by Regulation (EU) 2023/957

[7] For more information on the MRV maritime Regulation, please refer to the Commission's dedicated webpage and Frequently Asked Questions: https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector/faq-monitoring-reporting-and-verification-maritime-transport-emissions_en

In addition, the MRV maritime Regulation contributes to supporting the implementation of the FuelEU Maritime Regulation[8], which enters into application in 2025. All monitored and recorded data under the MRV maritime Regulation can indeed be used for FuelEU calculations, subject to confirmation by FuelEU Verifier, if different from the MRV Verifier.

2.2 Implementation of the MRV maritime Regulation

The MRV maritime Regulation has applied since 2018 and has delivered robust data and indicators on GHG emissions from maritime transport. The 2022 *Supporting study for the implementation of Regulation (EU) 2015/757 on the monitoring, reporting and verification of CO_2 emissions from maritime transport*[9] notably underlined that one of the main advantages of the Regulation is the insights gained in the environmental performance of the vessels entering or leaving EU ports, by allowing for the systematic collection of vessel performance data. That study also highlighted some obstacles in the implementation, such as the persistence of some delays in the submission of the emissions reports – with several stakeholders indicating that fulfilling the requirements was challenging, especially in the first year (2018).

To help relevant stakeholders familiarise themselves with the 2023 changes to the MRV maritime Regulation and reduce potential implementation challenges, the Commission carried out outreach activities and developed guidance and material available online. The Commission has for instance published two sets of Frequently Asked Questions[10] – on the MRV maritime Regulation and on the ETS extension to maritime transport emissions – as well as two main Guidance Documents[11]. Between September 2023 and April 2024, the Commission has also held five webinars on key aspects of the changes brought to the MRV maritime Regulation and ETS Directive (such as on updates to the monitoring plans), together with the European Maritime Safety Agency (EMSA)[12]. Besides, a dedicated helpdesk[13] was established to address questions from shipping companies and other stakeholders – with more than 1 400 tickets closed between September 2023 and October 2024.

Preliminary monitoring of compliance and implementation for the 2024 reporting year are encouraging. At the time of writing this report, more than 15 000 ships have updated and submitted their monitoring plans to the administering authorities for approval, in line with the new

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[8] Regulation (EU) 2023/1805 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC

[9] Supporting study for the implementation of Regulation (EU) 2015/757 on the monitoring, reporting and verification of CO_2 emissions from maritime transport, European Union, 2022: https://climate.ec.europa.eu/document/download/55b302ef-c819-4a2f-9b83-c57c2bcfbe7e_en?filename=policy_transport_maritime_study_eu_mrv_en.pdf

[10] See under 'FAQ' section: https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en#faq

[11] See under 'Documentation' section: https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en#documentation

[12] See recordings under the 'Events' section: https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en#events

[13] Fitfor55@emsa.europa.eu

requirements that entered into force in 2023. The next key milestone will be the submission of emissions reports at ship-level and at company-level, which are due by end March 2025.

For additional context, the emissions reported under MRV for 2023 originated from a fleet of over 12 000 ships. The monitored voyages for the 2023 reporting year emitted 126,7 million tonnes of CO_2 into the atmosphere. At the time of writing this report, the system encompasses around 5 000 shipping companies.[14]

Every year, the Commission publishes a report to inform the public about the GHG emissions and energy efficiency information of the monitored fleet falling within the scope of MRV maritime Regulation.[15]

3. Review of the current scope of the MRV maritime Regulation

This review aims to respond to the general question whether the scope of vessels under the MRV maritime Regulation (size thresholds and vessel types) has been appropriate so far and whether reasons to exclude certain vessels between 400 and 4 999 GT are still valid. The initial threshold of 5 000 GT was selected in 2015 after detailed objective analysis of sizes and emissions of ships going to and coming from EU ports. The objective of this non-discriminatory threshold was to cover the most relevant emitters, while finding the right balance between administrative burden and environmental effectiveness of the MRV maritime Regulation. At that time, analysis suggested that using a threshold of 5000 GT instead of 400 GT would substantially reduce estimated administrative costs, with a relatively small decrease of CO_2 emissions covered.

3.1 Effectiveness and relevance

The MRV maritime regulation aims to establish a standardized system for monitoring, reporting and verifying GHG emissions from vessels calling at EU ports, with harmonized rules and public access to verified data. The transparency and robustness behind this data are key to help shipping companies address existing market failures and unlock the adoption of decarbonisation measures. Market failures typically includes informational issues, such as the lack of reliable information on GHG savings or asymmetric information between shipowners and charterers that can lead to split incentives issues.

A 2022 EC study[16] asked shipping companies on their use of MRV data. They reported that systematically measuring and documenting emissions provides a coherent baseline of environmental performance, providing the companies with knowledge and insights on their fleet emissions. These insights led to easier and simplified communication with their clients (shippers, forwarders, etc). Shipping companies reported that they can transfer emissions-related information to their clients, which raises awareness on the receiving end of the supply chain. However, a previous study (CE Delft, 2014) highlights that these positive effects are most likely to materialise if companies invest in accurate and comprehensive monitoring and data analysis systems.

[14] This includes companies registered in THETIS-MRV with active ships in their fleet.

[15] MRV annual reports are available under the 'Documentation' section of the following webpage: https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en#documentation

[16] Supporting study for the implementation of Regulation (EU) 2015/757 on the monitoring, reporting and verification of CO_2 emissions from maritime transport, 2022

In relation to small vessels, the effectiveness analysis aims to understand the extent to which the current MRV scope (vessel size and type) may prevent smaller vessels from seizing the various benefits coming from the MRV Regulation.

Based on a stakeholder consultation with public authorities and industry organisations, the analysis suggests that MRV data is expected to be highly valuable also for smaller vessels. MRV data is indeed key for informing financial and management decisions that could provide further insights into fleet emissions and help eliminate market barriers. While several companies operating smaller vessels are already voluntarily collecting emissions data, sometimes with the objective to inform investment decisions in energy-efficient and low carbon technologies, the analysis shows that these companies and third parties could still benefit from MRV in ensuring more consistent and reliable monitoring and reporting processes across the board.

Therefore, with its current scope, the MRV maritime Regulation falls short of enabling emissions reductions technology investments on all types of small vessels (i.e. beyond those already within MRV scope as from 2025) and promoting adoption of operational energy efficiency measures, especially for those without existing fuel performance monitoring systems.

In terms of relevance, the MRV maritime Regulation is an important enabler to support the adoption of GHG mitigation measures and policies in the maritime sector. This is relevant as all sectors of the economy, including small and large vessels, need to contribute to achieving the EU climate objectives as well as the objectives of the Paris agreement. By establishing a standardized system for monitoring, reporting, and verifying GHG emissions from vessels, the regulation provides a critical tool for shipping companies to inform financial and management decisions, communicate with stakeholders, and identify opportunities for emissions reductions and technology investments.

3.2 Efficiency

The analysis of efficiency aims to review recent evidence on the trade-off between GHG emissions coverage and administrative costs for shipping companies with respect to the EU MRV scope[17]. For this, the potential MRV-related administrative costs have been estimated for smaller vessels and compared to those of vessels already reporting under MRV.

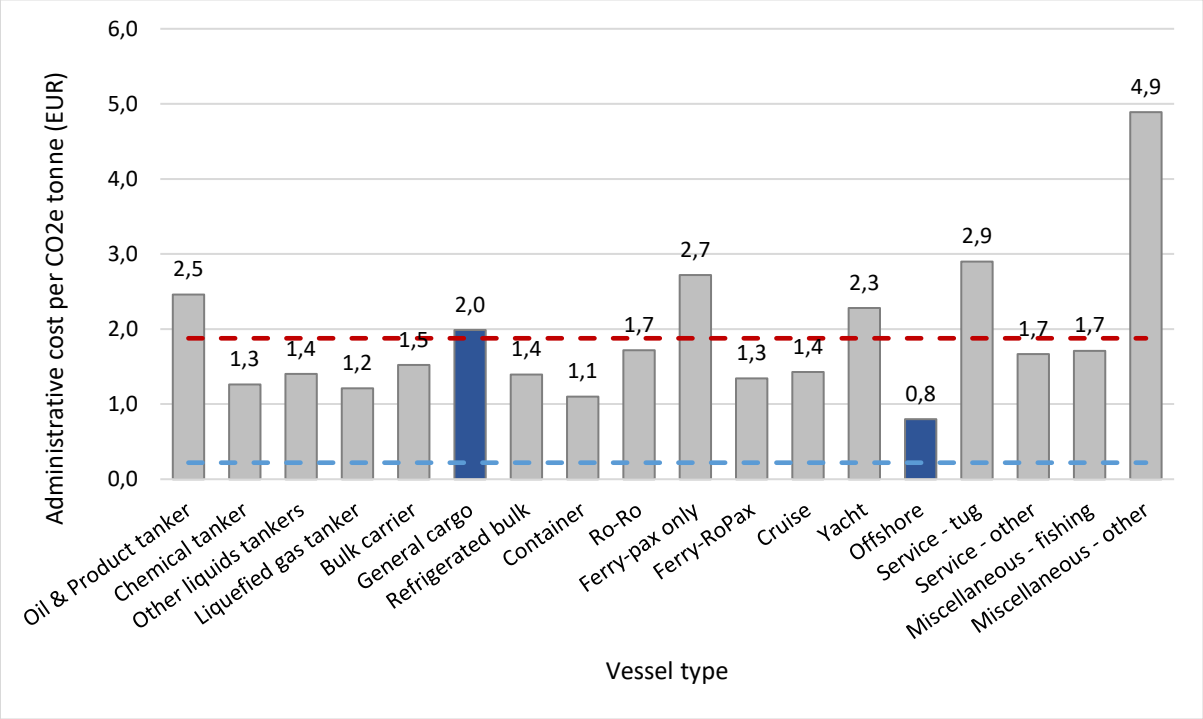
Estimations of administrative costs comes from a consultation of representatives of shipping companies through tailored interviews, including both ship operators and shipowners. The exercise considered both one-off and recurring costs. Shipping companies were asked to estimate recurrent costs from vessels currently under the MRV, based on their current experience, along with expected costs for smaller vessels in the event that these would be included within the scope of the MRV maritime Regulation.

[17] The extension of the MRV maritime Regulation to smaller vessels would also lead to additional costs for public authorities, which are presented in the assessment of scenarios to extend the scope. The present analysis of efficiency looks at the relative ratio of administrative costs and GHG emissions covered, and for this purpose only administrative costs for shipping companies are considered as they represent the main cost component.

The analysis reveals that recurrent annual MRV-related administrative costs per vessel for smaller vessels (estimated at EUR 3 690 per vessel on average) would be similar or slightly higher than those of vessels currently subject to MRV obligations (estimated at EUR 3 390 per vessel on average). Staff limitations and increased frequency of voyages of smaller vessels have been quoted by some shipping companies as the main reasons for higher monitoring costs.

Overall, the trade-off between administrative costs for shipping companies and additional monitored GHG emissions would be less favourable for smaller vessels. The ratio between administrative costs and coverage of GHG emissions would be on average seven times higher for smaller vessels, compared to the larger vessels already reporting under MRV (Figure 1). This is because the administrative costs are comparable, while smaller vessels emit much less emission than bigger vessels.

Figure 1 Recurring administrative cost for shipping companies per tonne of CO_2 covered for smaller vessels by type (calculated as the results of total estimated recurring administrative costs based on average costs reported by consulted stakeholders per the total CO_2e emissions for each vessel category for 2023)



Source: Ricardo analysis

Ships included in MRV from 2025

Ships not included in MRV

Average administrative cost per tCO_2e for small vessels (400-4,999 GT)

Average administrative cost per tCO_2e for large vessels (above 5,000 GT)

The analysis of efficiency also aims to review evidence on the capacity of companies managing smaller vessels to accommodate MRV processes, compared to those already reporting under MRV. Examined data suggests that companies managing smaller vessels tend to be on average smaller

(in terms of number of vessels managed per company) than those already reporting under MRV. Indeed, companies currently reporting under the MRV system (i.e. for large vessels) are responsible for 2,6 vessels on average. For smaller vessels, it is estimated[18] that the average number of small vessels per company would be 1,6, which is significantly lower. Since the companies managing smaller vessels are expected to be responsible for less ships, they would less likely benefit from economies of scale associated with MRV-related implementation costs.

In addition, the majority of companies managing smaller vessels would be new to the MRV system. Only 29% of the ISM companies[19] and 3% of the shipowners managing smaller vessels are already registered on THETIS-MRV. This suggests that the majority of companies managing smaller vessels would need to set up and familiarise themselves with MRV processes as they are not already reporting under MRV.

3.3 Coherence

Another key objective of the EU maritime MRV Regulation is to support the implementation of recently adopted policies to reduce GHG emissions in the EU maritime sector, particularly the EU ETS extension to maritime transport and the FuelEU Maritime Regulation[20]. The analysis of coherence therefore looks into whether the current MRV scope is appropriate to contribute to the implementation of these specific climate policies, as well as their possible future review.

In that respect, the analysis shows that the MRV maritime Regulation is already effectively supporting the roll out of these important EU policies. It directly provides the GHG emission data needed to implement the EU ETS extension to maritime transport, and it offers a robust reporting platform to support the implementation of the FuelEU Maritime Regulation.

With regards to potential future policy developments, the current scope of the MRV maritime Regulation would already enable the possible extension of the EU ETS scope to GHG emissions from small general cargo and offshore vessels (400-4 999 GT). For instance, policy makers would know the possible impact of such an extension in terms of the ETS cap increase or the number of additional Maritime Operators Holding Accounts to be expected. Shipping companies operating these vessels would also be in much better position, being already familiarised with the MRV process.

[18] As we do not know which of the entity (between the shipowner or ISM company, if different) would take MRV responsibility for small ships, the study assumes that the same share of shipowners and ISM companies will endorse MRV responsibility for the smaller vessels as for larger vessels (i.e. 53% of shipowners and 47% of ISM companies as extracted from THETIS MRV in October 2024). Based on MARINFO database information, the fleet of smaller vessels under consideration is related to 1 262 ISM companies and 4 014 shipowners.

[19] 'ISM company' is an organisation or person that has assumed the responsibility for the operation of the ship from the shipowner and that, on assuming such responsibility, has agreed to take over all the duties and responsibilities imposed by the International Management Code for the Safe Operation of Ships and for Pollution Prevention, set out in Annex I to Regulation (EC) No 336/2006 of the European Parliament and of the Council.

[20] Regulation (EU) 2023/1805 of the European Parliament and of the Council on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC (OJ L 234, 22.9.2023, p. 48–100).

However, the present MRV maritime Regulation would not enable in the same way the possible extension of the ETS scope to GHG emissions from the other types of small vessels, not yet included under the MRV scope.

Furthermore, the analysis looked at the scope of the EU maritime MRV Regulation in comparison to the vessels covered under the current IMO Data Collection System (DCS). The latter is an equivalent, although simplified, monitoring and reporting system at global level. The analysis highlights that the slight differences in scope in terms of vessel size and activity covered were not identified as a particular concern in terms of increasing resources needed to complete reporting requirements.

4. Assessment of scenarios to possibly extend the scope of the MRV maritime Regulation to other smaller vessels

4.1 Overview of activity and emissions from smaller vessels

This analysis aims to provide information on the activity and emissions from smaller vessels (400 to 4 999 GT) focusing on the following indicators:

- Number of smaller vessels calling at EU ports, by vessel category;
- GHG emissions for smaller vessels calling at EU ports, differentiated by intra-EU and extra-EU voyages and by vessel category;
- Number of port calls by year, differentiated by intra-EU and extra-EU voyages[21] and by vessel category.

The analysis shows that **8 525 vessels between 400 – 4999 GT called at EU ports in 2023**. When excluding general cargo and offshore vessels, which are already incorporated in the MRV maritime Regulation from 2025, the number of smaller vessels drops to 5 309. This compares to 12 344 vessels of or above 5000 GT under MRV in 2023.

GHG emissions were estimated based on a model relying on ship-tracking data (i.e. Automatic Identification System data) and ship technical information. The model estimated CO_2, CH_4 and N_2O as CO_2-equivalent emissions. The result of this work shows that **smaller vessels calling at EU ports in 2023 are estimated to emit around 19.28 $MtCO_2e$** (or 18.99 $MtCO_2$, i.e. when disregarding CH_4 and N_2O). General cargo and offshore vessels are the highest emitters within this segment, as they represent 22% and 18% of GHG emissions from smaller vessels, respectively. When deducting emissions from these two categories already in MRV from 2025, total GHG emissions from the remaining smaller vessel categories are estimated at 11.32 $MtCO_2$[22], which compares to 126.70 $MtCO_2$ from vessels of or above 5 000 GT under MRV in 2023.[23]

In terms of activity, analysis of port call data from smaller vessels suggests that **most voyages performed by smaller vessels were intra-EU in the period 2019 – 2023 (around 90%)**. Of

[21] For the purpose of this report, 'intra-EU voyages' correspond to voyages between two EU ports, while 'extra-EU voyages' correspond to voyages between an EU port and a non-EU port.

[22] This result is presented in CO_2 emissions (rather than the default metric in CO_2e) to allow for comparison with MRV 2023 data, only available in CO_2 emissions.

[23] Disregarding CH4 and N2O emissions facilitates comparisons with 2023 MRV data, since these two GHG emissions were not yet falling within MRV scope in that year.

those, the majority are domestic, that is voyages starting and ending in the same country (around 75% of total voyages).

To sum up, this analysis shows that the **smaller vessels not already included in the MRV Regulation from 2025 (i.e. other than general cargo and offshore ships) are mostly active in intra-EU voyages and that they represent 43% of vessels and 9% of CO_2 emissions under MRV in 2023.**

The table below summarises, by vessel type, the number of vessels and amounts of emissions they represent.

Table 1: CO_2 emissions from smaller vessels by vessel type compared to total MRV emissions in 2023

Type of vessel	Number of 400-4,999 GT vessels (2023)	Share of vessels compared to number of large vessels under MRV in 2023[24]	Total CO_2 emissions ($MtCO_2$) (2023)	Share of CO_2 emissions compared to total CO_2 emissions under MRV in 2023[25]
General cargo	2,296	18.6%	4.26	3.4%
Offshore	921	7.5%	3.41	2.7%
Miscellaneous - fishing	1,065	8.6%	2.30	1.8%
Chemical tanker	756	6.1%	2.21	1.7%
Ferry-RoPax	571	4.6%	1.57	1.2%
Yacht	896	7.3%	1.45	1.1%
Service – other	349	2.8%	0.77	0.6%
Cruise	217	1.8%	0.56	0.4%
Service - tug	385	3.1%	0.49	0.4%
Liquefied gas tanker	143	1.2%	0.44	0.3%
Oil & Product tanker	256	2.1%	0.38	0.3%
Ferry-pax only	253	2.0%	0.34	0.3%
Bulk carrier	111	0.9%	0.27	0.2%
Refrigerated bulk	53	0.4%	0.14	0.1%
Container	38	0.3%	0.13	0.1%
Miscellaneous - other	154	1.2%	0.12	0.1%
Other liquids tankers	42	0.3%	0.11	0.1%
Ro-Ro	20	0.2%	0.04	0.0%

[24] 2023 MRV scope, hence excluding smaller (400-4,999 GT) general cargo and offshore vessels to be incorporated from 2025.

[25] 2023 MRV scope, hence excluding smaller (400-4,999 GT) general cargo and offshore vessels to be incorporated from 2025.

Total vessels 400 – 4,999 GT	**8,525**	**69.1%**	**18.99**	**15.0%**
Total vessels 400 – 4,999 GT excluding general cargo and offshore	**5,309**	**43.0%**	**11.32**	**8.9%**

4.2 Presentation of possible scenarios

The main scenario under consideration for the present assessment is the possible extension of the scope of the MRV maritime Regulation to vessels between 400 and 4 999 GT, for vessel types other than general cargo and offshore vessels. This scenario aims to increase the share of GHG emissions covered by the MRV maritime Regulation, which would notably allow for a possible integration of additional vessels between 400 and 4 999 GT into maritime decarbonisation policies such as the EU ETS and Fuel EU.

Potential variants for the expansion of the MRV scope to smaller vessels are defined along the following dimensions:

a) Different smaller vessel categories in scope

Scenarios A	Description
A.1. Including the most emitting vessel categories	Scope expansion to tankers, RoPax ships and passenger ships between 400 and 4 999 GT
A.2. Including all vessel categories except the ones exempted by MRV	Expansion to all non-exempt categories[26] for vessels between 400 and 4 999 GT (i.e. all ships transporting cargo/passengers for commercial purposes as well as offshore ships)
A.3. Including all vessel categories (including categories currently excluded from MRV)	Expansion to all non-exempt categories for vessels between 400 and 4 999 GT, plus fishing ships, any service and tug vessels not already covered, and voyages by yachts not already covered (i.e. those not carried out for transporting passengers for commercial purposes).

[26] MRV exempted categories are defined in Article 2(2) of the MRV maritime Regulation; those are 'warships, naval auxiliaries, fish-catching or fish-processing ships, wooden ships of a primitive build, ships not propelled by mechanical means, or government ships used for non-commercial purposes'.

b) Monitoring requirements for smaller vessels

Scenarios B	Description
B.1. Same MRV requirements	MRV requirements for small vessels (and other vessel types) are the same as those for vessels currently under MRV
B.2. Lower threshold to be exempted from monitoring on a per voyage basis	Minimum threshold of 300 voyages per year[27] would not apply to vessels below 5 000 GT, i.e. all ships performing intra-EU voyages only during a reporting period would be exempted from monitoring on a per voyage basis (regardless of the number of voyages).

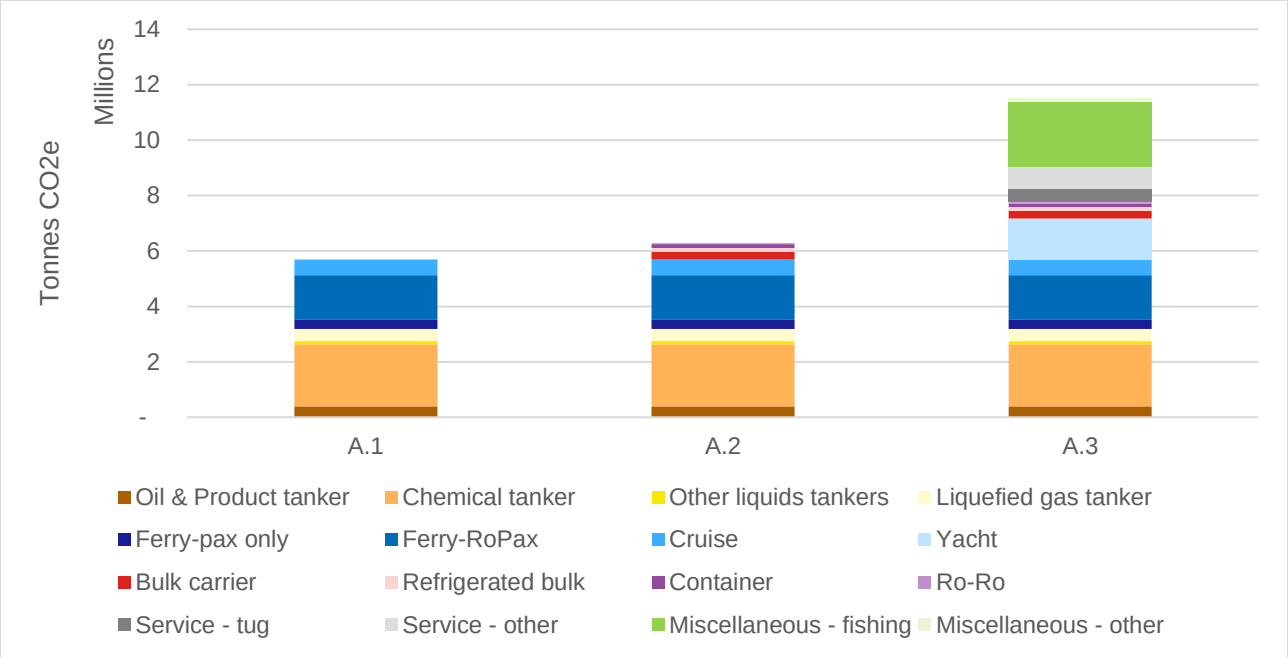
4.3 Environmental impacts from scenarios A (different smaller vessels categories in scope assuming no changes in MRV requirements)

Increased GHG emissions coverage

Expanding the scope of the EU Maritime MRV Regulation would increase the share of EU maritime emissions captured by the MRV requirements and directly impact GHG emissions data availability (Figure 2). The GHG emissions associated with scenario A.1 represent a 4.2% increase (i.e. 5.61 $MtCO_2$) compared to what is included in the revised MRV scope (i.e. including emissions from general cargo and offshore vessels between 400 and 4 999 GT to be added from 2025). Scenario A.2 would lead to a marginally higher emissions coverage compared to scenario A.1, with an increase of 4.6% (i.e. 6,19 $MtCO_2$) compared to the MRV revised scope. The option to expand also to other categories (scenario A.3) would lead to a more significant expansion in the emissions coverage with an 8.4% increase (i.e. 11,32 $MtCO_2$).

[27] Article 9(2) of the MRV maritime Regulation lays down a derogation according to which a company 'shall be exempt from the obligation to monitor the information […] on a per-voyage basis in respect of a specified ship, if: (a) all of the ship's voyages during the reporting period either start from or end at a port under the jurisdiction of a Member State; and (b) the ship, according to its schedule, performs more than 300 voyages during the reporting period.' The scenario under consideration here would consist in removing the condition under point (b) for smaller vessels.

Figure 2 Additional coverage of GHG emissions for scenarios A.1, A.2 and A.3 by vessel category based on 2023 emissions data



Source: Ricardo analysis

Direct energy and GHG emissions savings

Even though the MRV maritime Regulation does not impose direct limits on emissions or mandate emission reducing practices, an expansion of the MRV scope would be expected to lead to direct energy and GHG emissions reductions due to the potential of MRV data to help overcome some of the existing market barriers, which can unlock the adoption of technical and operational energy efficiency improvements. A conservative 0.7% cumulative reduction rate was assumed to apply to baseline GHG emissions from smaller vessels included in the MRV scope within the period 2025-2050.[28] This would lead to relatively small cumulative GHG emission savings presented below in Table 2.

Table 2: Cumulative GHG emissions savings (2025-2050) from scenarios A.1, A.2 and A.3

	Cumulative GHG emission savings ($MtCO_2e$) 2025 - 2050
Scenario A.1	1.51
Scenario A.2	1.67
Scenario A.3	3.06

Source: Ricardo analysis

[28] This assumption is based on a study looking into the benefits of MRV maritime Regulation with its findings assumed to be applicable to smaller vessels (European Commission, 2019)

Indirect environmental impacts from potential inclusion of smaller vessels into other climate policies

While direct GHG emissions savings coming from the expansion of the MRV scope to additional smaller vessels would be relatively marginal, the potential environmental impacts from the possible inclusion of these smaller vessels into other climate mitigation policies, such as the EU ETS and Fuel EU maritime, following the MRV scope expansion would be much more significant. For instance, including additional GHG emissions in the EU ETS would lead to an environmental impact in line with the ETS annual cap reduction. However, such additional benefits are not considered for the purpose of this assessment as it focusses on the potential inclusion in the MRV scope only.

4.4 Economic impacts from scenarios A (different smaller vessels categories in scope assuming no changes in MRV requirements)

Regulatory costs for shipping companies and authorities

Additional administrative costs for shipping companies would include both one-off and recurring costs relating to preparing and setting up a monitoring system (for companies not already reporting under the MRV), along with recurrent monitoring, reporting and verification activities to comply with the MRV maritime Regulation for additional vessels covered. Table 3 presents the total additional one-off and recurrent administrative costs for shipping companies for each scenario, based on the outcomes of the stakeholders' consultation. In addition, it includes information on the recurrent administrative cost per tonne of CO_2 based on the total GHG emissions added to the scope in each scenario.

Table 3: Additional administrative cost for shipping companies for each scenario, based on 2023 cost data

	Number of vessels	One-off cost (total cost, EUR)	Recurring cost (cost per year, EUR)	Recurring cost per tCO_2 (EUR/tCO_2)
Cost per vessel	-	3,193	3,690	-
Scenario A.1	2,238	7.1 million	8.3 million	1.2
Scenario A.2	2,460	7.9 million	9.1 million	1.2
Scenario A.3	5,309	17.0 million	19.6 million	1.6

Source: Ricardo analysis

The costs of enforcement activities for national authorities associated with the MRV maritime Regulation include those related to Port State Control activities and Flag State obligations. Cost estimates were derived from the outcomes of a questionnaire distributed to Member States, which encompassed both administrative and enforcement costs. Recurrent enforcement costs are assumed to increase linearly with the number of additional vessels under each scenario both for Port State Control and Flag State obligations. Table 4 presents the resulting additional costs related to enforcement activities.

Table 4: Additional costs related to enforcement activities for national authorities, based on 2023 cost data

Type of cost	Scenarios		
	Scenario A.1	Scenario A.2	Scenario A.3
Port State Control cost (EUR per year)	47,307	51,999	112,221
Flag State obligations cost (EUR per year)	58,866	64,705	139,641
Total estimated cost for national authorities (EUR per year)	**106,173**	**116,704**	**251,862**

The costs for European authorities (European Commission and EMSA) resulting from the inclusion of additional smaller vessels (400-4 999 GT) in the MRV scope include one-off costs related to IT adjustments and developments in THETIS-MRV and recurring costs related to additional human resources, from analysing information, helpdesk support and designing/updating information material. Resulting additional costs for each scenario are presented below in Table 5.

Table 5: Additional costs related to enforcement activities for European competent authorities, based on 2023 cost data

	One-off cost (total cost, EUR)	Recurring cost (cost per year, EUR)
Scenario A.1	100,000	40,000
Scenario A.2	100,000	42,891[29]
Scenario A.3	100,000	80,000

Source: Ricardo analysis

Total regulatory costs were estimated by adding administrative costs for shipping companies and enforcement costs for competent authorities, as described above. One-off costs were assumed to be spent entirely in the first year of the implementation (assumed at 2025), while recurrent costs for shipping companies and competent authorities were assumed to proportionally increase with the number of vessels over the period 2025-2050. These additional administrative costs are expected to be too small to generate any significant market distortion with social implications (e.g. on consumers or workers). Total regulatory costs are presented in Table 6 with a 3% discount rate.

Level playing field

The extension of the MRV scope to additional smaller vessels would be expected to have a positive impact on the level playing field by ensuring similar regulatory requirements for vessels just above or below the 5 000 GT threshold, which might be competing for similar market segments. An

[29] The value for scenario A.2 is calculated as the proportionate value between scenarios A.1 and A.3., considering the provided data.

analysis of vessel data segmented by size suggests that a large proportion of additional vessels under policy scenarios considered would be just below the 5000 GT threshold. Indeed, vessels between 4 000 and 4 999 GT would represent 32% of the considered fleet under scenario A.1, 31% under A.2, and 19% under A.3.

4.5 Comparison of scenarios A in terms of social net present value (different smaller vessels categories in scope assuming no changes in MRV requirements)

The social net present value (NPV) across all scenarios considered to expand the scope is negative over the period 2025-2050 (Table 6). This is because the present value of additional administrative costs for companies and authorities is higher than the monetised GHG emission savings solely attributable to the MRV maritime Regulation.

However, this NPV calculation should be interpreted cautiously as it does not take into account the possible indirect environmental benefits that would come from the possible subsequent integration of smaller vessels in other GHG mitigation policies, such as the EU ETS and Fuel EU, or any other equivalent measures, following their prior inclusion within MRV scope. It is expected that including costs and benefits from the integration of smaller vessels into EU ETS and/or Fuel EU, in conjunction with MRV, would be showing a very different picture, most likely a positive NPV.

Table 6: Social Net Present Value (NPV) of scenarios A.1, A.2 and A.3 compared to the baseline (million EUR over the period 2025-2050) (3% discount rate)

	Scenario A.1	Scenario A.2	Scenario A.3
GHG emission savings	3.7	4.1	7.5
Regulatory costs	-17.6	-17.6	-41.7
Social NPV	**-13.9**	**-13.5**	**-34.2**

Source: Ricardo analysis

Note: GHG emission savings have been monetised using climate change avoidance cost included in the 2019 Handbook of external costs (EUR 100/tCO_2e) corrected to 2023 price levels (EUR 133/tCO_2e by 2030 and EUR 358/tCO_2e post-2030).

4.6 Impacts from scenario B2 related to changes in monitoring requirements for smaller vessels

Removing the threshold of 300 voyages per year (scenario B.2) would benefit a large proportion of vessels undertaking intra-EU voyages only (32% of total smaller vessels)[30], significantly expanding the scope of the exemption to report on a per journey basis.

Reporting on an aggregate basis, rather than on a per journey basis, could allow companies under this exemption to use simpler monitoring systems (e.g. bunker notes with limited stocktaking), which would be associated with lower monitoring costs. Thus, while no quantitative analysis was

[30] Vessel categories with the highest share of vessels performing intra-EU voyages only include RoPax and passenger vessels.

performed in relation to this scenario B.2, a qualitative analysis shows that it could allow for a significant reduction in administrative costs compared to scenario B.1. This reduction is not quantified due to lack of quantitative evidence of the difference in costs between monitoring on a per voyage and on an aggregate basis.

5. Conclusions

The analysis carried out with regard to GHG emissions from ships below 5 000 gross tonnage but not below 400 gross tonnage confirms that the two ship categories that will be included under the scope of the EU MRV maritime Regulation as from 2025, are actually the ones with the highest emissions within this segment. GHG emissions from smaller vessels in the offshore and general cargo categories represent respectively 22% and 18% of all GHG emissions from smaller vessels.

When putting aside emissions from these two categories, total GHG emissions from the remaining smaller vessel categories are estimated at 11.32 $MtCO_2$, i.e. 9% of CO_2 emissions covered under MRV in 2023. At the same time, those represent 5 309 vessels, i.e. 42% of the number of vessels that were subject to MRV obligations in 2023.

Based on a consultation with representatives of shipping companies, the analysis reveals that recurrent annual MRV-related administrative costs per vessel for smaller vessels would be similar (or slightly higher) than those of larger vessels currently subject to MRV obligations. As a result – and because they emit less GHG emissions than larger vessels – the trade-off between administrative costs for shipping companies and additional monitored GHG emissions would be less favourable for smaller vessels. The ratio between administrative costs and coverage of GHG emissions would be on average seven times higher for smaller vessels, compared to the larger vessels currently subject to MRV obligations.

The analysis also reveals that extending the scope of the MRV maritime Regulation to additional categories of smaller vessels would help unlock the implementation of energy efficiency measures and low carbon technologies due to the ability of MRV data to inform decision making process. However, the direct environmental benefits are estimated to be rather small, based on conservative assumptions.

In turn, the Social Net Present Value (NPV) is negative for all the considered extension scenarios. It shows that the present value of additional administrative costs for companies and competent authorities is higher than the monetised GHG emission savings solely attributable to the MRV maritime Regulation. However, the picture would look different, with much higher environmental benefits and most likely a positive NPV, when considering the possible indirect benefits that would be associated with GHG emission savings from the possible integration of smaller vessels in other GHG mitigation policies, such as the EU ETS and FuelEU, following their prior inclusion within MRV scope.

Related to this, it is worth mentioning that equivalent measures other than integration within FuelEU and/or EU ETS scope might be envisaged – notably if this would enable a reduction of the administrative burden. Such measures could be taken at national level, including for instance taxation-related measures or ‘opt-ins’ within the ‘ETS2’ for buildings, road transport and additional sectors. Some Member States, including Austria, the Netherlands and Sweden, have

already decided to include within the scope of ETS2 emissions from some smaller vessels and/or inland navigation.

In any case, the additional benefits that could result from integration of smaller vessels in other GHG mitigation policies were not considered in this report, which only deals with the potential inclusion of additional smaller ships within the scope of the MRV maritime Regulation and the direct impacts of such a change. An assessment including such additional benefits will be carried out in the context of the 2026 review of the EU ETS Directive.