Guidance Document

The EU ETS and MRV Maritime Regulation
General guidance for shipping companies

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**Disclaimer**

This document is part of a series of documents provided by the Commission services for supporting the implementation of the EU ETS (the European Union Emission Trading System).

The guidance represents the views of the Commission services at the time of publication. It is not legally binding.

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# Introduction

## About this document

## Where should I start reading?

## How to use this document

## What is new for shipping companies?

## Where to find further information

The above sections will be similar to those of [MRR Guidance document 1 for stationary installations](https://climate.ec.europa.eu/document/download/d4f11230-9126-41a8-8c42-6131cd4e742e_en?filename=gd1_guidance_installations_en.pdf) and will be included in the next draft.

# Concepts and definitions

|  |
| --- |
| Note: Throughout this document, “**Member States**” are to be understood to include the 27 EU Member States as well as the EFTA states covered in the **EEA** (European Economic Area), i.e. Norway, Iceland and Liechtenstein, which fully participate in the EU ETS and apply the MRV Maritime Regulation. Therefore, “EU ports” and “EEA ports” are used interchangeably. For details on the geographical scope, see section 2.2.4. |

## Overview: MRV Maritime and EU ETS

MRV Maritime Regulation

Since 1 January 2018, the maritime transport sector has been obliged to monitor and report emissions in accordance with the MRV Maritime Regulation[[1]](#footnote-2). Under this regulation, shipping companies have to provide monitoring plans, emissions reports and verification reports, **for each of the ships** under their responsibility. Shipping companies have to monitor, for each of their ships, greenhouse gas emissions, fuel consumption and other parameters, such as distance travelled, time at sea and cargo carried on a per voyage basis, so as to gather annual data into an emissions report verified by an accredited MRV shipping verifier. Shipping companies must, through THETIS MRV, submit to their responsible administering authority, the Commission and to the authorities of their flag State (in case ships are flagged in the European Economic Area) a satisfactorily verified emissions report for each ship that has performed maritime transport activities in the European Economic Area in the previous reporting period (calendar year).

EU ETS from 2024 onwards

From 2024, they also need to provide data **on a per company basis**, with additional data reported for the EU Emission Trading System (EU ETS[[2]](#footnote-3)), providing an aggregated report of all their ships’ emissions derived from the data monitored under the MRV Maritime Regulation. For this purpose, only one single process of monitoring and reporting is required, although the data to be reported within the EU ETS may deviate, to a certain extent, from those to be reported under the MRV Maritime Regulation, e.g. regarding the scope (GHG gases, coverage of voyages), and the different applicable derogations as established by the EU ETS Directive.

Compliance

Under the MRV Maritime Regulation, shipping companies are in compliance if they fulfil the obligation to submit a verified emissions report in time and if they carry a valid document of compliance on board. Under the EU ETS, however, shipping companies have to purchase and surrender (use) EU ETS emission allowances for each tonne of reported CO2 (or CO2 equivalent) as emitted under the scope of the EU ETS. Emissions from maritime transport are included in the overall ETS cap, which defines the maximum amount of greenhouse gases that can be emitted under the system. The cap is reduced over time to ensure that all ETS sectors contribute to the EU’s climate objectives. In addition, it creates a carbon price signal to incentivise energy efficiency, low-carbon solutions, and reduce the price difference between alternative fuels and traditional marine fuels.

Other relevant legislation

Closely linked to MRV Maritime and the EU ETS, a third piece of legislation requires MRV activities by shipping companies. This is the “FuelEU Maritime Regulation”[[3]](#footnote-4), under which shipping companies have to monitor, calculate and report the average annual carbon intensity of the energy used on board each of their ships. This Regulation requires from January 2025 the reporting of life cycle emissions rather than direct emissions (“Well-to-Wake”, WtW emissions), while the MRV Maritime and EU ETS require the reporting of direct emissions, or “Tank-to-Wake” (TtW) emissions. FuelEU has its own compliance system, but there are many synergies which shipping companies may make use of so that the monitoring of emissions data takes place only once.

## Scope of the MRV Maritime Regulation

### Greenhouse gas emissions covered by the MRV Maritime Regulation

The greenhouse gases (GHG) covered by MRV Maritime Regulation from 2024 are: carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O) released during a voyage or a port of call covered by the Regulation.

### Ships covered by the MRV Maritime Regulation

The MRV Maritime Regulation applies to ships of 5 000 gross tonnage (GT) and above in respect of the greenhouse gas emissions released during their voyages from or/and to ports in the European Economic Area (EEA) for transporting for commercial purposes cargo or passengers.

Starting with 1 January 2025, the MRV Maritime Regulation will also apply to offshore ships of and above 5 000 GT, as well as offshore ships and general cargo ships below 5 000 GT but not below 400 GT.

Ships are subject to the MRV Maritime Regulation regardless of their flag. This means that if a ship changes class or flag, this has no effect on the MRV reporting.

Article 2 of the MRV Maritime Regulation lists ships which are exempted from its scope, namely:

* Warships;
* Naval auxiliaries[[4]](#footnote-5);
* Fish-catching or fish-processing ships;
* Ships not propelled by mechanical means;
* Government ships used for non-commercial purposes.

**Note on ships operated in stationary mode:**

when a ship is calling in a port of the jurisdiction of an EEA country, its emissions should be reported under the MRV Maritime Regulation and the EU ETS for maritime transport. However, when ships are stationary, they fall under the scope of the EU ETS for stationary installations. For this purpose, the Commission’s guidance document on the scope of the EU ETS for stationary installations (GD0)[[5]](#footnote-6) clarifies:

“W*here LNG terminals or other offshore installations such as oil rigs are installed on a ship, the emissions from the ship’s engine would be covered by the EU ETS for maritime transport while it is mobile. However, if the ship’s engine is used during stationary mode (e.g. for the production of electricity or heating), its emissions are to be included in the GHG permit which it requires for being stationary*.”

Operators of such ships therefore have to contact the competent authority of the jurisdiction where the ship is operated in stationary mode in order to obtain a greenhouse gas emissions permit in accordance with Article 4 of the EU ETS Directive, and submit a monitoring plan for approval accordingly. Note that such monitoring plans are not included in THETIS MRV. For more information, see the Commission’s website on guidance for stationary installations[[6]](#footnote-7).

### Activities covered by MRV Maritime Regulation

The MRV Maritime Regulation applies greenhouse gas emissions released during their voyages as discussed below, as well as within ports of call under the jurisdiction of a Member State. Emissions released within a port of call include emissions while the ship:

* is at berth and
* is not at berth, but instead moving within a port of call between two voyages.

The notion of ‘**port of call**’ is used to delineate the **start and the end of a voyage**. It means the port where a ship stops to load or unload cargo or to embark or disembark passengers, or the port where an offshore ship stops to relieve the crew.

Some exclusion cases are foreseen by the Regulation, by which certain stops do not qualify as a ‘port of call’, namely:

* Stops for the sole purposes of refuelling; obtaining supplies (including fodder for vessels transporting animals as cargo); relieving the crew of a ship other than an offshore ship; going into dry-dock or making repairs to the ship and/or its equipment;
* Stops in port because the ship is in need of assistance or in distress;
* Ship to ship transfers carried out outside ports;
* Stops for the sole purpose of taking shelter from adverse weather or rendered necessary by search and rescue activities;
* Stops of containerships in a neighbouring container transhipment port identified in Implementing Regulation (EU) 2023/2297[[7]](#footnote-8).

The fact that the above stops are excluded from the definition of ‘port of call’ does not mean that relevant emissions are always out of scope, because whether emissions will fall within scope will ultimately depend on the previous and the next stop and more specifically on whether one of these two stops is a port of call within the MRV Regulation.

As an example, for the types of stops which are not considered port calls, Figure 1 explains the case of a stop carried out by a ship for the sole purpose of refuelling. The emissions falling within the MRV scope, marked by the green arrow, are those taking place during the voyage between the previous port of call and the next port of call, including emissions released during the stop for refuelling purposes.



Figure 1: Example for port of call exclusion cases (in this figure for refuelling purposes), and the related emissions covered by the MRV Maritime Regulation.

Table 1 provides an overview of significant cases specifying whether the relevant activities or voyages in their context fall within MRV scope. All emissions released during an MRV voyage should be monitored. It is not allowed to exclude certain part of the voyage, such as deducting the emissions caused by deviations from the scheduled passage due to force majeure or safety events. Further details on the accounting of emissions within port may be provided in a future version of the present document.

Table 1: Activities and their impact on whether they impact the voyage covered by the MRV Maritime Regulation, specific cases.

| **Activity** | **Defines a port call under MRV Maritime Regulation?** | **Additional information** |
| --- | --- | --- |
| Partial loading or discharge operation | Yes | There is no minimum quantity of cargo loaded or unloaded in order to be recognized as a port of call within the MRV Maritime Regulation. |
| Loading and unloading of cargo for technical reasons (e.g. loading of LNG to cool down cargo tanks) | Yes | Any loading/unloading of cargo operation, since associated to the activity of transporting cargo for commercial purposes by the ship, determines a port of call. Note that there are some exclusions listed in the definition of port of call in the MRV Maritime Regulation Article 3 (b). |
| Passengers leaving and returning on board the ship within the same day (leisure stops) | Yes | Leisure stops (e.g. for sightseeing) are to be considered as port of call within the MRV Maritime Regulation. |
| Ballast voyages | Yes (starting and/or ending in an EEA port of call) | Ballast voyages, from the last port of call where the ships have discharged cargo or disembarked passengers to the next port of call where cargo is loaded or passengers embark, also serve the purpose of transporting cargo or passenger. |
| Ship to ship transfer carried out outside ports  | No, such transfer does not establish a port of call.  |  When ship to ship transfer occurs outside the limit of a port, as part of an MRV voyage, variations of cargo arising from the ‘ship to ship’ transfer should be taken into account. In those cases, an average for cargo carried, weighted by distance travelled, should be calculated and applied to the entire voyage.Example: Ship to ship transfer outside of a port (e.g. vessel leaves an EEA port, arrives in Houston and performs ship to ship operation outside the Houston port limits and then goes to South Korea for a cargo operation within port limits). The whole emissions released during the whole voyage from the EEA port of call until the port of call in South Korea fall within MRV Maritime scope. If the ship to ship transfer were carried out within Houston port limits, that operation would constitute a port of call. The voyage covered by the MRV Maritime Regulation would then be EEA port of call – Houston port of call. |
| Stops of ships for repairs/dry-docking | Stops for the sole purpose of going into dry-dock or making repairs to the ship and/or its equipment are not considered as ‘ports of call’ within the meaning of the MRV Maritime Regulation. | Emissions falling within the MRV Maritime scope are those taking place during the voyage between the previous port of call and the next port of call, provided that at least one of these two ports of call is a port of call under the jurisdiction of a Member State. Emissions released during that voyage include emissions released during the stop for repairs/dry-docking |
| Stop to relieve the crew | Stops for the sole purpose of relieving the crew are not considered ports of call within the meaning of the MRV Maritime Regulation, except for offshore ships. | Emissions falling within the MRV Maritime scope are those taking place during the voyage between the previous port of call and the next port of call, provided that at least one of these two ports of call is a port of call under the jurisdiction of a Member State. Emissions released during that voyage include emissions released during the stop for relieving the crew. The situation is different for offshore ships as a stop for relieving the crew is considered as a port of call for these ships. |
| Stops for refuelling purposes | Stops for the sole purpose of refuelling are not considered ports of call within the meaning of the MRV Maritime Regulation. | Emissions falling within the MRV Maritime scope are those taking place during the voyage between the previous port of call and the next port of call, provided that at least one of these two ports of call is a port of call under the jurisdiction of a Member State. Emissions released during that voyage include emissions released during the stop for refuelling purposes. |
| Stops in neighbouring container transhipment ports, as identified in Implementing Regulation (EU) 2023/2297.  | Stops by containerships at neighbouring container transhipment ports identified in the legislation as presenting a high risk of evasion are not considered ports of call within the meaning of the MRV Maritime Regulation. Hence, they do not count to determine the start or the end of a voyage | Emissions released during the voyage include emissions released during the stop at the neighbouring container transhipment port. |
| First voyage from a new built ship from its shipyard to its first stop to load cargo or embark passengers | No, if neither cargo nor passenger are transported for commercial purposes during that voyage | Provided that no cargo nor passengers are transported for commercial purposes during that voyage, the maiden voyage of a ship from its shipyards to its first port of call under the jurisdiction of a Member State is not covered by the MRV.By contrast, If the ship transports cargo or passenger for commercial purposes during its maiden voyage, the voyage is covered by the MRV Maritime Regulation scope, provided that this maiden voyage starts and/or ends with a port of call under the jurisdiction of a Member State. |
| Voyage of an empty ship to the decommissioning facility | No | The last voyage of an empty ship to the decommissioning facility is not covered by the MRV Maritime obligations. |

### Geographical scope covered by the MRV Maritime Regulation

The expression ‘ports of call under the jurisdiction of a Member State’ refers to ports of call located in European Union territory (in other words, where EU law fully applies). Not all ports belonging to a Member State are EU territories (see list below). For a voyage to be covered by the MRV Maritime Regulation, at least one of the ports of call must be located in an EU territory.

Ports of call in the nine EU outermost regions are ports of call under the jurisdiction of a Member State:

|  |  |
| --- | --- |
| **Member State** | **Outermost Regions (included)** |
| Spain | * Azores
 |
| France | * Guadeloupe;
* French Guyana;
* Martinique;
* Mayotte;
* Saint Martin;
* Reunion;
 |
| Portugal | * Madeira;
* Canary Islands
 |

Ports of call in Norway (except those on Svalbard) and Iceland also qualify as ports of call under the jurisdiction of a Member State, since the MRV Maritime Regulation and the EU ETS Directive are incorporated into the EEA Agreement.

Ports in **Overseas Countries and Territories (‘OCT’) of the European Union do not qualify as ports of call** under the jurisdiction of a Member State. These are:

| **Member State** | **Overseas Countries and Territories(excluded)** |
| --- | --- |
| Denmark | * Greenland
 |
| France | * French Polynesia;
* French Southern and Antarctic Territories;
* New Caledonia;
* Saint Barthélémy;
* Saint Pierre and Miquelon;
* Wallis and Futuna;
 |
| Netherlands | * Aruba;
* Bonaire;
* Saba;
* Sint Eustatius;
* Curaçao;
* Sint Maarten
 |

Further regions *excluded* are:

* Faroe Islands (Denmark);
* Svalbard (Norway).

In practical terms, this implies that:

* Voyages between a port of call located in the excluded territories listed above and a port of call under the jurisdiction of an EEA State constitute "incoming"/ "outgoing" voyages and are to be monitored and reported;
* Voyages between two ports of call located in the excluded territories listed above do not fall under the MRV Maritime Regulation;
* Emissions within ports of call located in the excluded territories listed above do no fall under the MRV Maritime Regulation.

## The EU ETS scope

The scope of emissions covered by the EU ETS is based on the scope of the MRV Regulation. Therefore, the shipping company has to perform the monitoring of all emissions in principle only once. However, it is important for the shipping to implement a procedure to identify for each individual voyage whether it falls under one or both systems. This section explains the similarities and differences between the scope of the EU ETS and the MRV Maritime Regulation.

### Greenhous gas emissions covered by the EU ETS Directive

The greenhouse gases covered by the EU ETS Directive are: CO2, and from 2026 onwards CH4 and N2O.

The EU ETS Directive covers emissions as follows:

* 100% of emissions from ships performing voyages departing from a port under the jurisdiction of an EU Member State and arriving at a port under the jurisdiction of an EU Member State (e.g. Hamburg to Marseille and Marseille to Hamburg);
* 100% of emissions from ships within a port under the jurisdiction of an EU Member State (e.g. in the port of Antwerp), i.e. emissions released at berth and during movements within such a port;
* 50% of emissions from ships performing voyages departing from a port under the jurisdiction of an EU Member State and arriving at a port outside the jurisdiction of an EU Member State (e.g. Rotterdam to Shanghai);
* 50% of the emissions from ships performing voyages departing from a port outside the jurisdiction of an EU Member State and arriving at a port under the jurisdiction of an EU Member State (e.g. Shanghai to Rotterdam)

**Phase-in of obligation under EU ETS**

Shipping companies must surrender EU ETS allowances corresponding to the amount of aggregated emissions data at company level by 30 September every year following the reporting year, i.e. the first time by 30 September 2025 for emissions reported for the year 2024.

The share of emissions that must be covered by the surrender of allowances gradually increases each year:

* 2025: 40% of emissions reported for 2024 must be covered by emission allowances;
* 2026: 70% of emissions reported for 2025;
* 2027 and beyond: 100% of reported emissions.

Note that the total emissions have to be reported in the annual emissions report as well as the mentioned percentages.

### Ships covered by the EU ETS Directive

The EU ETS has been extended to include maritime transport emissions from 2024. Cargo and passenger ships of or above 5 000 gross tonnage (GT) are included in the EU ETS. From 2027 onwards, offshore ships of or above 5 000 GT will also be included.

### Exemptions under the EU ETS for maritime transport

According to the ETS Directive, the emissions of the following voyages shall be monitored and reported, but no allowances have to be surrendered in respect of these voyages if they take place before 31 December 2030:

* Voyages performed by passenger ships, other than cruise passenger ships, and by ro-pax ships, between a port of an island listed in the implementing act[[8]](#footnote-9) under Article 12(3-d) of the EU ETS Directive, and a port under the jurisdiction of that same Member State.
* 12(3-c): Voyages performed by passenger or ro-pax ships in the framework of a transnational public service contract or a transnational public service obligation, listed in the implementing act8 pursuant to Article 12(3-c) of the EU ETS Directive.
* Voyages between a port located in an outermost region of a Member State and a port located in the same Member State, including voyages between ports within an outermost region and voyages between ports in the outermost regions of the same Member State (Article 12(3-b) of the EU ETS Directive). For a list of outermost regions please see section 2.2.4.

The emissions occurring within port associated to such derogation cases, including the ones from the previous/next port of call, are also covered by the derogation[[9]](#footnote-10).

In addition to these derogations, shipping companies may surrender 5 % fewer allowances than their verified emissions released until 31 December 2030 from ice-class ships, provided that such ships have the ice class IA or IA Super or an equivalent ice class, established based on HELCOM Recommendation 25/7.

## The administering authority

For a smooth and effective operation of the EU ETS, each shipping company is assigned to exactly one administering authority in one Member State. This is the Member State to which the shipping company submits the monitoring plan for approval, to which it submits the annual emissions report, and which administers the shipping company with regard to its Registry account.

Each shipping company is assigned to its administering Member State by applying the following rules (Article 3gf(1) of the EU ETS Directive):

* In case of a shipping company registered in an EU Member State, it is the EU Member State where the shipping company is registered;
* In case of a shipping company not registered in an EU Member State, it is the EU Member State with the greatest estimated number of port calls from voyages performed by that shipping company over the last four monitoring years;
* In case of a shipping company that is not registered in an EU Member State and that did not carry out any voyage covered by the EU ETS Directive in the preceding four monitoring years, the administering authority is the EU Member State where a ship of the shipping company has arrived or has started its first voyage falling within the scope of the EU ETS Directive.

For providing legal certainty, the Commission regularly publishes a **list of all shipping companies and their respective administering authorities[[10]](#footnote-11)**. To ensure stability, a shipping company remains assigned to the Member State indicated in the list regardless of subsequent changes in the shipping company’s activities or changes in registration, until those variations are reflected in a new version of the list. The list will be updated every two years for companies registered in an EEA state, and only every four years for non-EEA companies attributed to a Member State based on their ports of call in the last four monitoring years.

**If your shipping company is not yet found on that list**, you can identify your administering authority via the THETIS-MRV[[11]](#footnote-12) system. If a ship of your company has performed an activity falling under the EU ETS, your company has to fulfil all relevant requirements of the EU ETS, irrespective of whether the company is found on the list or not.

## The shipping company

Every ship performing activities falling within the scope of the EU ETS or MRV Maritime Regulation must be under the responsibility of a single shipping company. 2.4 The shipping company is the entity that is responsible for:

* Establishing the ship’s monitoring plan in THETIS-MRV;
* Ensures assessment of the monitoring plan by an accredited verifier;
* Submits the ship’s monitoring plan to the administering authority for approval, if the ship performs activities falling under the EU ETS;
* Monitors the ship’s emissions and keeps the monitoring plan up-to-date;
* Compiles the ship’s annual emissions report in THETIS-MRV;
* Contracts an accredited verifier for verification of the annual emissions report;
* Submits the verified annual emissions report to the administering authority, Flag State (in case the ship is flagged in an EU Member State) and to the Commission;
* If the company is responsible for ships that perform EU ETS activities:
* Compile an aggregated emissions report at company level, get it verified and submit it to the administering authority;
* Purchase and surrender the quantity of allowances equivalent to the aggregated emissions at company level;
* All other aspects of compliance with the MRV Maritime Regulation and EU ETS, such as ensuring that the ships carry the relevant Documents of Compliance, paying potential penalties, etc.

The **shipping company is defined** as ‘*the shipowner or any other organisation or person, such as the manager or the bareboat charterer, 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*.’

In the context of EU ETS and MRV, this means that the entity responsible for compliance in respect of the emissions of a given ship can be either the shipowner (i.e., the registered owner) or the ISM Company[[12]](#footnote-13) of that ship, if different from the shipowner. The registered owner and the ISM Company have to decide who is the most appropriate entity to take on responsibilities for complying with the EU ETS and MRV obligations. In the absence of an explicit decision by the registered owner and the ISM Company, **the registered owner[[13]](#footnote-14) will be considered, by default**, responsible for compliance with ETS and MRV obligations.

In accordance with Implementing Regulation (EU) 2023/2599[[14]](#footnote-15), shipping companies must share information on the ships for which they assume responsibility with their administering authority.

If the registered owner decides to assume responsibility for EU ETS and MRV obligations, the registered owner must provide the administering authority with a document listing the ships for which the registered owner assumes responsibility.

**If the ISM Company agrees to assume responsibility** for EU ETS and MRV obligations in respect of one or several ships, the ISM Company **must provide a document to the administering authority** that demonstrates the existence of an agreement according to which the ISM Company is mandated by the registered owner to comply with ETS and MRV obligations in respect of one or several ships. In the absence of such a document, the registered owner is considered the entity responsible for compliance with ETS and MRV obligations, by default.

The ISM Company that assumes EU ETS and MRV responsibilities in respect of a given ship must also provide to its verifier the document demonstrating the mandate between the registered owner and the ISM Company, as part of the documents accompanying the monitoring plan of the ship.

**In case of transfer of ownership of a ship** between shipping companies during the reporting year, the following rules apply:

* With regard to **MRV Maritime emissions reporting**, the shipping company which is responsible for the ship at the end of the year must report the ship’s emissions during the **whole reporting period** (i.e. calendar year);
* In order to provide the relevant information to the new shipping company, the company previously owning the ship must provide a “**partial emissions report**” in accordance with Article 11(2) of the MRV Maritime Regulation[[15]](#footnote-16). This report has the same content as the annual emissions report but covers only the time period between start of the year and end of the company’s responsibility for the ship. As this report is sent (amongst other recipients) to the shipping company through THETIS MRV, the latter can compile the whole calendar year’s emission report.
* With regard to **surrender of allowances** for the ship’s emissions under the EU ETS, each shipping company is responsible for the emissions of each of its ships **for the period during which it was responsible** for the ship.

**Example**

Company A (administered by Portugal) sells a container ship (“*The Example of the Seas*”) to Company B (administered by Greece) effective from 24 May 2024. She flies the flag of Spain. Since Company B becomes the shipping company in respect of *The Example of the Seas* starting from that day, the following needs to happen:

* No later than by 24 August 2024, Company A provides the verified partial emissions report covering the period 1 January to 23 May 2024 to the administering authorities of both companies (Portugal and Greece), and to Company B.
* By 31 March 2025, Company B provides the annual emissions report under the MRV Maritime Regulation for “*The Example of the Seas*” to its administering authority (Greece), and to the ship’s Flag State (Spain), as the latter is an EU Member State.
* By 31 March 2025, Company A submits to its administering authority (Portugal) the verified aggregated emissions report for its company-level emissions for the purpose of the EU ETS. It includes the emissions of “The Example of the Seas” from 1 January to 23 May 2024. For this quantity, Company A surrenders allowances.
* By 31 March 2025, Company B submits to its administering authority (Greece) the verified aggregated emissions report for its company-level emissions for the purpose of the EU ETS. It includes the emissions of “The Example of the Seas” from 24 May to 31 December 2024. For this quantity, Company B surrenders allowances.

## Underlying principles for MRV

Articles 5 to 9 of Regulation 2018/2066 (the **MRR****[[16]](#footnote-17)** or Monitoring and Reporting Regulation for the EU ETS with regard to installations, aircraft operators and the “ETS2”) outline guiding principles which operators of stationary installations under the EU ETS have to follow when fulfilling their obligations. These guiding principles can also be used as best practice for shipping companies:

1. **Completeness:** The completeness of emission sources (i.e. fuel-consuming equipment, not limited to engines) and source streams (i.e. fuels) is at the very core of the MRV Maritime and EU ETS monitoring principles. That means in practice that all fuel consumption taking place onboard the ship from all emissions sources shall be monitored and reported. It also includes that there are no exceptions to emissions except for what was discussed regarding voyages in sections 2.2.3 and 2.3.3). Also emissions happening due to unforeseen situations (e.g. accidents) have to be included, as no deduction within a voyage falling within scope is admissible.
2. **Consistency and comparability**: Time series of data need to be consistent throughout the years. Arbitrary changes of monitoring methodologies are prohibited. This is why monitoring activities have to follow a monitoring plan, which has to be assessed by an independent verifier and approved by the administering authority.
3. **Transparency**: All data collection, compilation and calculation must be made in a transparent way. This means that the data itself, the methods for obtaining and using them (in other words: the whole data flow) have to be documented transparently, and all relevant information has to be securely stored and retained allowing for sufficient access by authorised third parties[[17]](#footnote-18). In particular, the verifier and the administering authority must be allowed access to this information.

It is worth mentioning that transparency is in the own interest of the shipping company: It facilitates transfer of responsibilities between existing and new staff and reduces the likelihood of errors and omissions. In turn this reduces the risk of over-surrendering, or under-surrendering and penalties. Without transparency, the verification activities are more onerous and time-consuming.

1. **Accuracy:** Shipping companies have to take care that data is accurate, i.e. neither systematically nor knowingly inaccurate. Due diligence is required by shipping companies, striving for the highest achievable accuracy. Although the MRV Maritime Regulation does not explicitly mention it, the cost-effectiveness principle known from the MRR for installations may be applied. This means that “highest achievable” may be read as “where it is technically feasible and without incurring unreasonable costs”.
2. **Integrity of the methodology and of the emissions report:** This principle is at the very heart of any MRV system. The following is considered best practice:
* The monitoring methodology and the data management must allow the verifier to achieve “reasonable assurance ” on the emissions report, i.e. the monitoring must be able to endure intensive testing;
* Data shall be free from material misstatements and avoid bias;
* The data shall provide a credible and balanced account of a ship’s emissions.
* When looking for greater accuracy, shipping companies may balance the benefit against additional costs. They shall aim for “highest achievable accuracy, unless this is technically not feasible or would lead to unreasonable costs”.
1. **Continuous improvement:** Shipping companies shall endeavour to take account of the recommendations included in the verification reports and shipping companies must check regularly on their own initiative, whether the monitoring methodology can be improved.

# The MRV and EU ETS Compliance Cycle

## Importance of MRV in the EU ETS

Monitoring, reporting and verification (MRV) of emissions play a key role in the credibility of any system for the control of emissions, and in particular for an emission trading system. Without MRV, compliance would lack transparency and be much more difficult to track, and enforcement compromised. This holds true also for the European Union Emission Trading System (EU ETS). It is the complete, consistent, accurate and transparent monitoring, reporting and verification system that creates trust in emissions trading. Only in this way can it be ensured that operators, aircraft operators and shipping companies meet their obligation to surrender sufficient allowances. MRV is furthermore considered the first essential step in any roadmap to a climate policy. In context of maritime transport, a mandatory MRV system was therefore established already years before the sector’s inclusion in the EU ETS.

Furthermore, the importance of MRV is based on the twofold nature of the EU ETS: on the one hand it is an instrument for achieving an environmental benefit. But in contrast to other environmental legislation, the goal is not to be achieved by individuals, but the whole group of EU ETS participants having to achieve the goal jointly. On the other hand, it is a market-based instrument. It has allowed a significant market to evolve, in which market participants want to know the monetary value of the allowances they get allocated, they trade and they have to surrender. On the other hand, it is an instrument for achieving an environmental benefit. This requires a considerable level of fairness between participants, ensured by a solid MRV system. The competent authorities’ oversight activities contribute significantly to ensuring that the goal set by the cap is reached, meaning that the anticipated emission reductions are delivered in practice, and emissions data accurate. It is therefore the responsibility of the competent authorities together with the accreditation bodies to protect the integrity of the EU ETS by supervising the well-functioning of the MRV system.



Both, carbon market participants and competent authorities want to have assurance that one tonne CO2 equivalent emitted finds its equivalent of one tonne reported (for the purpose of one allowance to be surrendered). This principle has become known already from the early days of the EU ETS as the proverbial postulation: **“A tonne must be a tonne!”**

In order to ensure that this is achieved in a robust, transparent, verifiable and yet cost effective way, the EU ETS Directive provides a solid basis for a good monitoring, reporting and verification system. For installations, aircraft operators and the sectors in the “ETS2” this is achieved by the Monitoring and Reporting Regulation” (MRR) and the Accreditation and Verification Regulation (AVR), for maritime transport the earlier established “MRV Maritime Regulation” was updated in 2023[[18]](#footnote-19) to also cover the requirements of the EU ETS for shipping companies.

However, a complex and technical legislation such as the MRV Maritime Regulation needs to be supported by further guidance, in order to ensure harmonised implementation throughout all Member States, and for paving the way to smooth compliance through pragmatic approaches wherever possible.

## Overview of the compliance cycle

The annual process of monitoring, reporting, verification of emissions, surrender of allowances, and the administering authority’s procedure for accepting emission reports are often referred to as the “compliance cycle”. Figure 2 shows the main elements of this cycle.

On the right side of the picture there is the “main cycle”: The shipping company monitors the emissions throughout the year. After the end of the calendar year (by 31 March[[19]](#footnote-20)) they must prepare the annual emissions report (AER) at company level, seek verification and submit the verified report to the administering authority (AA). The verified emissions must correlate with the surrender of allowances in the Union Registry[[20]](#footnote-21). Here the principle “a tonne must be a tonne” translates into “a tonne must be an allowance”, i.e. at this point the market value of the allowance is correlated with the costs of meeting the environmental goal of the EU ETS. Thereafter the monitoring goes on, as shown in the picture. More precisely, the monitoring continues without any stop at the end of the year.

The monitoring process needs a firm basis. Resulting data must be sufficiently robust for creating trust in the reliability of the EU ETS, including the fairness of the surrender obligation, and it must be consistent throughout the years. Therefore, the shipping company must ensure that the monitoring methodology is documented in writing and cannot be changed arbitrarily. In the case of the MRV Maritime Regulation and the EU ETS, this written methodology is called the Monitoring Plan (MP) of the ship (see Figure 2).

The figure also shows that the monitoring plan, although very specific for an individual ship, must follow the requirements of the EU-wide applicable legislation, in particular the MRV Maritime Regulation. As a result, the MRV system of the EU ETS is able to square the circle between strict EU-wide rules providing reliability and preventing arbitrary and undue simplifications, and allowing for sufficient flexibility for the circumstances of individual ship and shipping company.



Figure 2: Principle of the EU ETS compliance cycle

Figure 2 also shows some key responsibilities of the administering authority. It has to supervise the compliance of shipping companies. As the first step, the AA has to approve every monitoring plan (MP). The MRV Maritime Regulation requires that the MP is assessed by the verifier before it is submitted to the AA for approval. This means that the monitoring plans developed by the shipping companies are checked for compliance with the MRV Maritime’s requirements. Where the shipping company wants to deviate from the MRV Maritime Regulation, e.g. regarding use of other emission factors than the default ones, this must be justified by the shipping company.



It is furthermore the responsibility of the administering authority to carry out checks on the annual emission reports, as appropriate. This includes spot checks on the already verified reports, but also cross-checks with figures entered in the verified emissions table of the registry system, and checking that sufficient allowances have been surrendered.

However, the compliance cycle has a wider perspective. As Figure 2 shows, there is a second cycle. This is the regular review of the monitoring plan, for which the verification report may provide valuable input. Besides, the shipping company is required to continuously strive for further improving the monitoring methodology.

## The importance of the monitoring plan

From the previous section it becomes apparent, that the approved monitoring plan is the most important document for every shipping company participating in the EU ETS and each ship’s crew for complying with the MRV Maritime Regulation. Like a recipe for a cook and like the management handbook for a certified quality management system, it serves as manual for the shipping company’s tasks. Therefore, it should be written in a way that allows all, particularly new staff, to immediately follow the instructions. It must also allow the verifier and the AA to quickly understand the shipping company’s monitoring activities. Finally, the MP is *the* guide for the verifier against which the ship’s and shipping company’s emission reports are to be judged.

Typical elements of a monitoring plan include the following activities of the shipping company (applicability depends on the specific circumstances):

* Data collection (metering data, bunker delivery notes (BDN) and invoices, log books,...);
* Description of calculations and formulae to be used;
* Control activities (e.g. four eyes principle for data collection);
* Data archiving (including protection against manipulation);
* Regular identification of improvement possibilities.

However, monitoring plans must be drafted carefully (see chapter 6), so that administrative burden is minimised. Since the MP is to be assessed by the verifier, it goes without saying that (significant[[21]](#footnote-22)) changes of the MP also need such assessment. In case of ships performing activities covered by the EU ETS, the MP is to be approved by the administering authority after the verifier’s assessment. For these ships, changes of the MP are only allowed with the consent of the AA (after prior assessment by the verifier).



Because of the importance of the monitoring plan, the Commission is also providing templates for monitoring plans. These are implemented in the IT system THETIS MRV.

## Milestones and deadlines

Shipping companies need to submit for assessment a monitoring plan for each of the ships under their responsibility and falling under the EU MRV scope to an independent accredited verifier. For ships whose emissions are falling within the scope of the EU ETS Directive, the monitoring plan must also be submitted to the administering authority responsible for approval after it has been positively assessed by the verifier.

For each of their ships carrying out voyages to and/or from ports under the jurisdiction of a Member State after 1 January 2024, shipping companies must fulfil the following monitoring and reporting obligation, as shown in Table 2. That table focusses on ships already falling under the MRV Regulation before 1 January 2024, i.e. it starts from the assumption that the ship already has a monitoring plan which requires updating. However, it also shows the timetable for ships which do not have a monitoring plan yet (because they didn’t fall within the scope of the MRV Regulation). In that case, the shipping company shall submit a monitoring plan to the verifier without undue delay and no later than two months after the ship's first port call in a port under the jurisdiction of an EEA State, and to the administering authority not later than three months after that port call.

Table 2: Monitoring and reporting obligations and timeline of MRV Maritime Regulation. For completeness, obligations necessary for implementation of the EU ETS Directive – in blue italics – are included as well. Rows in normal font are based on the Maritime MRV Regulation.

| **When?** | **Who?** | **What?** |
| --- | --- | --- |
| Without undue delay | Shipping companies | Revise the monitoring plan (MP) of each of their ships to be in in conformity with the requirements of the revised MRV Maritime Regulation, i.e. inclusion of new GHGs and monitoring for EU ETS purposes, if applicable.Submit the updated MP to the verifier for assessment. |
| 1 January 2024 | Shipping companies | Start of monitoring period: CO2, CH4 and N2O |
| Before 1 April 2024 (or no later than two months after the ship’s first call in an EEA port)  | Verifier | Assessment of the revised monitoring plan |
| *1 April 2024 (or no later than three months after the ship’s first call in an EEA port)*  | *Shipping company* | *Submission of a positively assessed monitoring plan to the administering authority* |
| 31 December 2024, or each year thereafter | Shipping companies | End of monitoring period; prepare annual emission report for each ship and send to verifier as soon as possible |
| *Between 1 January and 31 March each year from 2025*  | *Shipping companies* | *Prepare annual report of aggregated emissions at company level and send to verifier as soon as possible* |
| From 2025, by 31 March of each year[[22]](#footnote-23) | Verifier | Finish verification and issue verification report to shipping company |
| From 2025, by 31 March of each year22  | Shipping companies | Submit verified annual emissions report for each ship to:* the administering authority responsible;
* the authorities of the flag States concerned for ships flying the flag of a Member State; and
* the European Commission.
 |
| *From 2025, by 31 March of each year22*  | *Shipping companies* | *Submit aggregated emissions data at company level to the administering authority.* |
| By 6 June 2025 (or no later than four months after the ship’s first call in an EEA port) | Administering authority | Approve the ship’s monitoring plan. |
| *From 2025, by 30 September of each year* | *Shipping companies* | *Surrender EU ETS allowances (amount corresponding to verified annual emissions determined in accordance to Part C of Annex II)* |
| In case of a change of shipping company within 3 months[[23]](#footnote-24) | Previous shipping company | Submit a verified “partial emission report” to the new shipping company, the administering authority and the authorities of the Flag State concerned for ships flying the flag of a Member State  |

# Monitoring and reporting of emissions

## What must be monitored?

The MRV Maritime Regulation requires shipping companies to perform comprehensive data determination and collection (“monitoring”) on emissions and further parameters that help to put the emissions into context. In principle, monitoring has to be done on a “**per-voyage**” basis, this means that the data has to be separately recorded and reported for each voyage and separately for the time spent within ports. What a voyage is and which voyages are covered by the MRV Maritime Regulation has been outlined in section 2.2, and for the EU ETS in section 2.3. There is, however, the possibility to deviate from the per-voyage reporting. The conditions for this exemption are explained in section 4.2.

The information to be monitored includes (Articles 8 to 10 of the MRV Maritime Regulation):

* The consumption of each fuel (see section 4.5);
* The greenhouse gas emissions. For this purpose, the Regulation allows the use of four methods (see section 4.3). The “calculation-based approaches” (Methods A to C) require the determination of emission factors (see section 4.6), the “measurement-based approach” (Method D) requires continuous measurement of GHG concentration in the flue gas and of the gas flow (section 4.8).
* Information regarding the voyage (see also section 5.1.1):
* port of departure and port of arrival including the date and hour of departure and arrival;
* distance travelled;
* time spent at sea;
* cargo carried;
* transport work;
* (voluntarily / if applicable): information relating to the ship's ice class and to navigation through ice.

In addition to the above per-voyage information, the shipping company must determine the annual totals of these data (see section 5.1.2). For ships falling under the scope of the EU ETS, these data are used to determine the relevant aggregated emissions data at company level (see section 5.2). Where the company intends to make use of derogations under the EU ETS, some additional data need to be collected, such as proofs of sustainability for biofuels (see section 5.2.2 and [Annex II](#_Annex_III_–). The aggregation of annual data for reporting purposes is discussed in section 5.2.1.

For monitoring and reporting of data not directly related to emissions (like the distance travelled, cargo, passengers and efficiency of the engines), please consult chapter 5.1.

## Exemption from monitoring on a per-voyage basis

As explained in section 4.1, by default, the shipping company must monitor all relevant activity data separately for each voyage. Companies have to document their procedures to monitor and then calculate aggregated data in the monitoring plan, using the official template. However, a general derogation to this rule is applicable for certain ships, which are allowed to monitor at annually aggregated level. In accordance with Article 9(2) of the MRV Maritime Regulation, a shipping company is exempt from the obligation to monitor emissions and other relevant data on a per-voyage basis, if:

* all of the ship’s voyages during the reporting period are EEA-related voyages (i.e. they either start or end at a port of call within the EEA); and
* the ship, according to its schedule, performs more than 300 voyages during the reporting period (i.e. calendar year).

In practical terms this exemption implies that providing data to the verifier on per voyage monitoring is not compulsory to the extent that other documents and data (such as Bunker Delivery Notes) can be used to calculate the ship's aggregated data. The electronic reporting System (THETIS MRV) offers nevertheless the option to enter all emissions data on a per-voyage basis.

However, for the purpose of the EU ETS, there is a further exemption[[24]](#footnote-25): where emissions would fall under the scope of any of the specific EU ETS derogations (provided for in Article 12(3-b), 12(3-c) or 12(3-d) of the EU ETS Directive[[25]](#footnote-26)), shipping companies must monitor relevant information on a per-voyage basis, unless all voyages in the reporting period fall under the derogation[[26]](#footnote-27).

## Applicable monitoring methods

This chapter provides an introduction to the methods to determine GHG emissions from ships. The methods provided by the MRV Maritime Regulation can be classified as follows:

1. Calculation-based approach (differing in the method how fuel consumption is determined):
2. Method A
3. Method B
4. Method C
5. Measurement-based approach:
6. Method D

Ships are not obliged to solely rely on one method. Any combination of methods A, B, C and D may be used if it enhances the overall accuracy of the emission determination. The choice of methodology needs to be laid down in the monitoring plan, assessed by the verifier, and submitted for the approval of the administering authority.

In section 4.4, the calculation-based method and the necessary formulae are explained. As can be seen there, the basic principle is to multiply the fuel quantity by emission factors to obtain the emissions. Thereafter, the three methods (A to C) for determining fuel quantity are introduced in section 4.5. The requirements for selecting or determining emission factors are then discussed in section 4.6.

Section 4.8 explains the principle of the measurement-based approach (method D). The possibility to combine methods on a single ship are then discussed in section 4.9.

After these sections that explain the monitoring of GHG emissions, the next sections explain the reporting requirements, i.e. which and how to aggregate data for the annual emissions report. It is important to understand these reporting requirements in order to ensure that the gathering of all necessary information will be considered when developing the monitoring plan. In this regard, the reporting rules under the MRV Maritime Regulation are presented in section 5.1 for the MRV Regulation, and in section 5.2 for the purposes of the EU ETS. In particular the latter section will explain the main steps for coming from the emissions reported for MRV Maritime purposes to the number of emissions for which allowances have to be surrendered.

## Calculation-based approach

The principle of this method is the calculation of emissions by means of fuel quantity (actual fuel consumption for each voyage) times an emission factor. The greenhouse gases covered by MRV Maritime Regulation are CO2, CH4 and N2O. The EU ETS covers CH4 and N2O only from 2026 onwards.

**Total GHG emissions of each ship** shall be calculated by summing up the individual emissions of each GHG multiplied by their Global Warming Potential (GWP, see Table 3) using the following formula:

$$GHG\_{MRV}= CO\_{2,MRV}+ CH\_{4,MRV} ∙ GWP\_{CH\_{4}}+ N\_{2}O\_{MRV} ∙ GWP\_{N\_{2}0}$$

Here the index “MRV” signals that the emissions are those to be reported (per each ship) under the MRV Regulation, applying the scope of the MRV Regulation (see section 2.2). Adjustments to be made for obtaining the emissions to be covered by allowances in the EU ETS are presented in section 5.2. All the formulae in this section can be applied in principle either to the total fuel consumption over the reporting year, or separately to each voyage covered by the MRV Regulation and to the fuel consumption while being at berth.

Table 3: Global warming potential over 100 years, according to Commission Delegated Regulation (EU) 2020/1044, to be used for the gases relevant to MRV Maritime

| **GHG** | **GWP** |
| --- | --- |
| CO2 | 1 |
| N2O | 265 |
| CH4 | 28 |

Companies shall calculate **CO2 emissions** by adding the CO2 emissions of all fuels *i* used aboard the ship, either separately for each engine or for the sum of all engines, applying the following formula:

$$CO\_{2,MRV}= \sum\_{i}^{n fuel}M\_{i} ∙EF\_{CO\_{2}, i}$$

Companies shall calculate **CH4 emissions** by adding the CH4 emissions resulting from the combustion of all fuels *i* used and the emissions caused by CH4 slippage, applying the following formula:

$$CH\_{4,MRV}= \sum\_{i}^{n fuel}(M\_{i} ∙EF\_{CH\_{4}, i})+CH\_{4,S}$$

Companies shall calculate **N2O emissions** by adding the N2O emissions of all fuels *i* used, applying the following formula:

$$N\_{2}O\_{MRV}= \sum\_{i}^{n fuel}M\_{i} ∙EF\_{N\_{2}O, i}$$

Where:

*GHGMRV*……Greenhouse gas emissions to be reported under the MRV Maritime Regulation, expressed in tonnes CO2 equivalent;

*CO2,MRV*……Total aggregated CO2 emitted;

*CH4,MRV*……Total aggregated CH4 emitted;

*N2OMRV*……Total aggregated N2O emitted;

*GWPCH4*……Global warming potential of CH4.

*GWPN2O*……Global warming potential of N2O.

*i*……Index corresponding to the fuels used on board the ship in the reporting period.

*Mi*……Fuel consumption, as total mass of the specific fuel *i* used

*EFCO2;i*…… CO2 emission factor for fuel *i*;

*EFCH4;i*…… CH4 emission factor for fuel *i*;

*EFN2O;i*…… N2O emission factor for fuel *i*;

*Cj*……Emission factor of slipped fuel (slippage coefficient) as a percentage of the mass of the fuel *i* used by the emission source *j* [%]. *Cj* includes fugitive and slipped emissions. Fugitive and slipped emissions are emissions caused by the amount of fuel that does not reach the combustion chamber of the emission source or that is not consumed by the emission source because they are un-combusted, vented, or leaked from the system. Note that slippage factors are relevant only for methane used as fuel, i.e. LNG (Liquified Natural Gas) and biogas/biomethane.

*Mi,NC*……Total mass of fuel *i* not combusted but released into the atmosphere.

$$ M\_{i,NC}= \sum\_{i}^{}\sum\_{j}^{}M\_{i,j }∙ C\_{j}/100 $$

*CH4,S*……Amount of CH4 non combusted but released into the atmosphere. For the purpose of determining such amount, companies shall apply the following formula: $CH\_{4,S}= M\_{i,NC}$

All emission factors to be used here are to be understood as **Tank to Wake emission factors**, as listed in the table under point 2 of part A of Annex I to the MRV Maritime Regulation. They are further discussed in section 4.6

## Methods for fuel quantity

For determining the fuel quantity consumed, the MRV Maritime Regulation allows three different approaches: method A, method B or method C.

Fuel consumption shall be determined separately for emissions from voyages between ports under a Member State’s jurisdiction, from voyages which departed from ports under a Member State’s jurisdiction, from voyages to ports under a Member State’s jurisdiction, and for emissions within ports under the jurisdiction of a Member State. Also fuel consumption within ports under the jurisdiction of a Member State at berth shall be determined separately.

Sources of uncertainty (see section 4.10) and associated levels of uncertainty shall be considered when selecting any of the methods A, B or C.

As a general rule, the monitoring of fuel consumption can take place at aggregate level, i.e. resulting from the aggregation of all emissions source installed on board the ship. However, where an emission factor specific for the emission source[[27]](#footnote-28) is applied, companies will have to monitor the specific fuel consumption of that emissions source separately, which in some cases might be possible only through application of method C[[28]](#footnote-29).

### Common elements of Methods A to C

In the following descriptions of Methods A to C (sections 4.5.2 to 4.5.4 below) there are recurring elements which are explained here jointly:

* Where a “period” is mentioned in the description of methods A to C, it means the time between two port calls or time within a port.
* For each fuel used during a period, the fuel type and the sulphur content of the fuel need to be specified.
* The method used for tank readings (whether by automated systems, soundings or dip tapes) shall be laid down in the monitoring plan. Uncertainty associated to the chosen method shall be specified. The relevant tank tables should be attached to the monitoring plan or at least made available to the verifier and to the administering authority upon request.
* Where the amount of fuel uplift or the amount of fuel remaining in the tanks is determined in units of volume, expressed in cubic meters, the shipping company shall convert that amount from volume to mass by using *actual density values*. The company shall determine the actual density by using one of the following methods:
* On-board measurement systems;
* The density measured by the fuel supplier at fuel uplift and recorded on the fuel invoice or BDN; or
* The density measured in a test analysis conducted in an accredited fuel test laboratory, where available.

The actual density is expressed in tonnes per cubic meter (t/m3) and shall be determined for the applicable temperature for a specific measurement. In cases for which actual density values are not available, a standard density factor for the relevant fuel type shall be applied once the monitoring plan has been found in conformity by the verifier.

### Method A: BDN and periodic stocktakes of fuel tanks

This method is based on the quantity and type of fuel as indicated on the **Bunker Delivery Note (BDN)** combined with periodic stocktakes of fuel tanks based on tank readings. The fuel consumed is calculated as follows[[29]](#footnote-30):

M = B + D – E – S

Where

M……Mass of fuel consumed;

B……Mass of fuel contained in tanks at the Beginning of the period;

D……Mass of fuel Deliveries during the period;

E……Mass of fuel in tanks at the End of the period;

S……Mass of de-bunkered (“Sold”) fuel during the period.

This method shall not be used when BDN are not available on board ships, especially when cargo is used as a fuel, for example, liquefied natural gas (LNG) boil-off.

Under existing MARPOL Annex VI regulations, it is mandatory to retain the BDN on board for 3 years after the delivery of the bunker fuel and is to be readily available.

The periodic stocktake of fuel tanks on board is based on fuel tank readings. It uses tank tables relevant to each fuel tank to determine the volume at the time of the fuel tank reading. The uncertainty associated with the BDN shall be specified in the monitoring plan. Fuel tank readings shall be carried out by appropriate methods such as automated systems, soundings and dip tapes. The method for tank sounding and uncertainty associated shall be specified in the monitoring plan.

Further guidance on details for applying Method A may be provided in a future version of the present document.

### Method B: Bunker fuel tank monitoring on board

Annex I Part B point 2 specifies: *“This method is based on fuel tank readings for all fuel tanks on board. The tank readings shall occur daily when the ship is at sea and each time the ship is bunkering or de-bunkering.”*

The cumulative variations of the fuel tank level between two readings constitute the fuel consumed over the period. The calculation formula is therefore in principle the same as given for Method A (section 4.5.2). The difference is that Method B is fully relying on measurements onboard the ship instead of using the BDN. This requires more frequent tank readings, i.e. daily, and before and after each bunkering or de-bunkering activity. For the methods of tank readings, the same requirements apply as for Method A.

Further guidance on details for applying Method B may be provided in a future version of the present document.

### Method C: Flow meters for applicable combustion processes

Annex I Part B point 3 specifies: “*This method is based on measured fuel flows on board. The data from all flow meters linked to relevant greenhouse gas emission sources shall be combined to determine all fuel consumption for a specific period.*”

This means that not the change in the mass contained in tanks is monitored, but the continuous flow of fuels to the engines (and residual flows back to the tanks) are monitored, and added up over the period. While this may provide more accurate data than tank readings, the failure of a flow meter will mean that there is a data gap. This is a point to consider in the risk assessment. Relevant control measures will have to be put in place, and a method to prevent or to close data gaps.

The calibration methods applied and the uncertainty associated with flow meters used shall be specified in the monitoring plan.

Further guidance on details for applying Method C may be provided in a future version of the present document.

## Selection and determination of emission factors

Regarding the emission factor, the shipping company shall identify the emission factor values to be applied to each fuel type reported over the reporting period. As a general rule, the shipping company should apply the default (tank-to-wake) emission factor values as listed under point 2, Part A of Annex I to the MRV Maritime Regulation, which cover both those applicable to fuel combustion (for CO2, CH4, N2O) and to slippage (Cj values)[[30]](#footnote-31).

When there is fuel blending, ships shall not report the weighted average of the emission factors for the respective fuels but instead report separately the emissions factors of the pure fuel fractions composing the blend, in accordance with Annex I of the MRV Maritime Regulation.

The shipping company may provide actual emission factors diverging from the default ones in accordance with the conditions and restrictions provided in Article 10 (5) and (6) of Regulation (EU) 2023/1805 (‘FuelEU Maritime Regulation’). That Article requires that actual emissions factor values are *“certified by means of laboratory testing or direct emissions measurements”* in accordance with rules (“*international standards and certification references”*) to be laid down in an implementing act. At the time of writing (XX), such conditions and restrictions are under development and, until their finalisation, shipping companies shall apply default emissions factor values only.

Note that it is not possible to apply an emissions factor of zero to sustainable biofuels for the determination of emissions for the purpose of the MRV Maritime Regulation. Since emissions factors are based on a tank-to-wake approach, zero-rating is not allowed for emissions within the scope of the MRV Maritime Regulation. However, the zero-rating of the CO2 emissions factor for sustainable biofuels is foreseen by the derogation established under point 1.2, Part C, of Annex II to the MRV Maritime Regulation, which defines the rules for the determination of emissions within EU ETS scope. In practice, that means that the consumption of the same fuel batch may result in emissions to be reported under MRV, but zero emissions under the EU ETS. Where a company wishes to apply the derogation established in point 1.2, Part C, of that Annex II, the procedures, systems and responsibilities used to this end shall be documented in accordance with Table B.9 of the Monitoring Plan template. More information on monitoring within EU ETS can be found in chapter 5.2. Details on the relevant proof of sustainability to be provided for the purpose of zero-rating are given in [Annex II](#_Annex_III_–).

## Calculation approach: Examples

**Example 1:**

As an example, where a ship has reported 200 tonnes of Maritime Diesel Oil (MDO) consumption, the following calculations shall apply:

$$GHG\_{MRV}= CO\_{2MRV}+ CH\_{4MRV} ∙ GWP\_{CH4}+ N\_{2}O\_{MRV} ∙ GWP\_{N20}$$

Note that for MDO no slippage needs to be taken into account since the use of MDO on board the ship does not cause slipped emissions[[31]](#footnote-32). Disaggregated by greenhouse gas, through the application of the default values as in Annex I of the MRV Maritime Regulation, the above formula will produce:

$$CO\_{2,MRV}= \sum\_{i}^{n fuel}M\_{i} ∙EF\_{ CO\_{2}, i }=200 ∙ 3,206=641,2 tCO\_{2}$$

$$CH\_{4,MRV}= \sum\_{i}^{n fuel}(M\_{i} ∙EF\_{CH4, i})+CH\_{4,S}=200 ∙ 0,00005+0=0,01 t CH\_{4}$$

0,01 t CH4 to be multiplied by the global warming potential value of methane (28) thus resulting in 0,28 t CO2,e

$$N\_{2}O\_{MRV}= \sum\_{i}^{n fuel}M\_{i} ∙EF\_{N2O, i}=200 ∙ 0,00018=0,036 t N\_{2}O$$

0,036 to be multiplied by the global warming potential value of nitrous oxide (265) thus resulting in 9,54 t CO2,e

$$GHG\_{MRV}= 641,2 tCO\_{2, e}+ 0,28 tCO\_{2,e}+ 9,54 tCO\_{2, e}=651,02 tCO\_{2, e}$$

**Example 2**

As a further example, we take the case of a ship using the following fuel mix during the reporting period:

|  |  |
| --- | --- |
| **Fuel** | **Consumed quantity** |
| Heavy Fuel Oil (HFO) | 100 tonnes |
| Hydrotreated Vegetable Oil (HVO) | 200 tonnes |
| Liquified Natural Gas (LNG) | 300 tonnes |

For these fuels, the following default emission factors for a dual-fuel Otto engine apply in accordance with point 2, Part A of Annex I to the MRV Maritime Regulation:

| **Type of Fuel** | $$EF\_{CO\_{2}}$$ | $$EF\_{CH\_{4 }}$$ | $$EF\_{N\_{2}O}$$ | $$C\_{j}$$ |
| --- | --- | --- | --- | --- |
|  | t CO2/t | t CH4/t | t N2O/t | % |
| Heavy Fuel Oil (HFO) | 3,114 | 0,00005 | 0,00018 | N.A. |
| Hydrotreated Vegetable Oil (HVO) | 3,115 | 0,00005 | 0,00018 | N.A. |
| Liquified Natural Gas (LNG) | 2,750 | 0 | 0,00011 | 3,1% |

Furthermore, the following values are applied for the Global Warming Potential:

|  |  |  |  |
| --- | --- | --- | --- |
|  | CO2 | CH4 | N2O |
| Global warming potential (GWP),t CO2e / t GHG  | 1 | 28 | 265 |

The emissions of each GHG for each fuel are calculated as follows:

$$Em\_{fuel,GHG}= M\_{fuel}∙EF\_{GHG,fuel}∙GWP\_{GHG} $$

Furthermore, for LNG, methane (CH4) slippage must be taken into account, by first subtracting the slipped amount from the mass of fuel burnt, and thereafter adding the slipped methane before multiplying the resulting emissions with the GWP of methane. Thus, for LNG and methane the formula is as follows:

$$Em\_{LNG,CH\_{4}}= \left(M\_{LNG}∙\left(1-C\_{engine}\right)∙EF\_{CH\_{4},fuel}+M\_{LNG}∙C\_{engine}\right)∙GWP\_{GHG} $$

This gives the following emissions:

| **Fuel** | **GHG** | **Emissions (t CO2e)** |
| --- | --- | --- |
| HFO | CO2 | 100 × 3,114 × 1 = 311,4 |
|  | CH4 | 100 × 0,00005 × 28 = 0,14 |
|  | N2O | 100 × 0,00018 × 265 = 4,77 |
| HVO | CO2 | 200 × 3,115 × 1 = 623 |
|  | CH4 | 200 × 0,00005 × 28 = 0,28 |
|  | N2O | 200 × 0,00018 × 265 = 9,54 |
| LNG | CO2 | 300 × (1 – 3,1/100) × 2,750 × 1 = 799,43 |
|  | CH4 | [300 × (1 – 3,1/100) × 0 × 28 + 300 × 3,1/100] × 28 = 0 + 260,4 |
|  | N2O | 300 × (1 – 3,1/100) × 0,00011 × 265 = 8,47 |
| **Total** | **2 017,43 t CO2e** |

## Measurement-based approach

In contrast to the calculation-based approaches, the greenhouse gases in the ship’s off-gases are themselves the object of the measurement in the measurement-based approaches. This means that under this approach, direct greenhouse gas emissions measurements are used, rather than calculations based on fuel consumption[[32]](#footnote-33). The fuel consumption has to be reported nevertheless. For avoiding duplication of the monitoring effort, this may be done via back-calculation using emissions and the CO2 emission factor. However, as explained in section 4.9, it has advantages to apply a second monitoring method for corroborating the results of the main method. In case of method D, such second method will be particularly useful for closing data gaps in case of failure of the Continuous Emission Measurement System (CEMS) equipment. Therefore, using the said back-calculation should be considered only as second-best option.

In addition, the application of this method to determine emissions of a greenhouse gas e.g. CO2 shall not prevent companies from applying another method to determine emissions of any other greenhouse gas. For instance, direct measurement of CO2 through a well-defined measurement point in a stack would not be able to provide measurement for fugitive and slipped emissions (e.g. CH4 emissions).

The MRV Maritime Regulation does not give any specific requirements for the CEMS to be used. For this reason, the provisions Article 42 to 46 of Implementing Regulation (EU) 2018/2066 (the EU ETS Monitoring and Reporting Regulation, “MRR”) should be used as guidance. According to that section (regulating ETS stationary installations), the application of CEMS always requires two elements:

* Measurement of the GHG concentration; and
* Volumetric flow of the gas stream where the measurement takes place.

According to Article 43 of the MRR, emissions are first to be determined for each hour of measurement from the hourly average concentration and the hourly average flow rate. Thereafter all hourly values of the reporting year are summed up for the total emissions of that emission point. Where several emission points are monitored (e.g. two separate gas stacks/funnels), this data aggregation is done first for each source separately, before adding the emissions of all sources to result in the total emissions.

The shipping company must ensure that the measurement equipment is suitable for the environment in which it is to be used, and regularly maintained and calibrated. Nevertheless, the shipping company must be aware that equipment may fail once in a while. Therefore Article 45 of the MRR outlines how data from missing hours are to be conservatively substituted. The shipping company has to make provisions for such data substitution when developing the monitoring plan.

More information about CEMS can be found in MRR Guidance Document No. 1 for installations[[33]](#footnote-34) and MRR Guidance Document No. 7 (CEMS)[[34]](#footnote-35). The latter document explains also the detailed requirements for quality assurance of CEMS using international standards.

## Combinations of approaches

As already mentioned earlier, shipping operators can combine seamlessly the different approaches outlined above, on the condition that no data gaps and no double counting occur. The choice of methodology has to be documented in the monitoring plan, which needs to be assessed by an independent verifier and approved by the administering authority.

This means that a shipping company can apply method A, B or C for the determination of the emissions for one greenhouse gas and can apply method D for other greenhouse gases.

Note that not only for method A, B and C, but also for method D shipping companies have the obligation to monitor the amount and emission factor for each type of fuel consumed on a per-voyage basis and on an annual basis.

When selecting the monitoring method, the shipping company shall consider the following:

* The uncertainty associated with the determination of the emissions (in particular of the fuel quantity) should be as low as possible. Therefore, if the instruments onboard allow for more than one of methods A to C to be applied, the option leading to the lowest uncertainty should be selected.
* The approach leading to the lowest risk for errors (data gaps, misstatements, failing measurement instruments, errors in calculations, etc.) should be selected. Simple data flows, less frequent meter readings, instruments that have a backup, etc. are preferred.

As these two requirements sometimes lead to diverging preferences for one of the methods, there is no absolute rule for a choice. However, there may be situations where the risk and uncertainty assessment give different results for parts of the ship’s equipment, which makes a combination a logical choice, as demonstrated by the following example.

**Example:**

A ship using HFO for the main engine has high-quality flow meters and a fully automated data acquisition system for all engines. It therefore uses method C for the main engine. However, for the auxiliary power unit it uses diesel. As it has its own tanks, its fuel consumption can be independently monitored. This unit has relatively low emissions, as it is used usually only while at berth. Therefore method A is the simplest way of monitoring.

**Note on data flow and control activities:**

It is considered best practice to carry out plausibility checks on emissions data as part of the control system. For this purpose it is useful to have “corroborative” data sources available. In practice this means that where possible, data from different methods should be compared. For this purpose the shipping company selects the best monitoring approach and data source as the main method for approval in the monitoring plan. The second best method and data source is used for corroboration, in order to reduce the risk of severe mistakes in the emissions data.

In the example above, the flow meter is the main data source. However, the shipping company may still request the crew to perform daily tank readings in order to corroborate the main data. This would be part of the procedures for the control activities. In case of divergence of data, the shipping company will investigate the reasons for the divergence. For example the flow meter might need more frequent maintenance and calibration. It is important in case of divergence that the main data source identified in the monitoring plan is used. Only where the analysis of mistakes provides evidence that there is a malfunctioning of the meter or another data gap, the corroborative data source should be used.

Further guidance on data flow and control activities is given in section 6.2.

## Uncertainty and the selection of monitoring approaches

Part B of Annex I requires that “*Sources of uncertainty and associated levels of uncertainty shall be considered when selecting any of the methods A, B or C.*” Furthermore the description of all 4 methods (A to D) state that the shipping company shall specify relevant uncertainties of measurement instruments in the monitoring plan. This section briefly explains the concept of uncertainty.

When somebody would like to ask the basic question about the quality of the MRV system of any emission trading system, he would probably ask: “How good is the data?” or rather “Can we trust the measurements which produce the emission data?” When determining the quality of measurements, international standards refer to the quantity of “uncertainty”. This concept needs some explanation.

There are different terms frequently used in a similar way as uncertainty. However, these are not synonyms, but have their own defined meaning (see also illustration in Figure 3):

* **Accuracy**: This means closeness of agreement between a measured value and the true value of a quantity. If a measurement is accurate, the average of the measurement results is close to the “true” value (which may be e.g. the nominal value of a certified standard material[[35]](#footnote-36)). If a measurement is not accurate, this can sometimes be due to a systematic error. Often this can be overcome by calibrating and adjustment of instruments.
* **Precision**: This describes the closeness of results of measurements of the same measured quantity under the same conditions, i.e. the same thing is measured several times. It is often quantified as the standard deviation of the values around the average. It reflects the fact that all measurements include a random error, which can be reduced, but not completely eliminated.
* **Uncertainty[[36]](#footnote-37)**: This term characterizes the range within which the true value is expected to lie with a specified level of confidence. It is the overarching concept which combines precision and assumed accuracy. As shown in Figure 3, measurements can be accurate, but imprecise, or vice versa. The ideal situation is precise and accurate.



Figure 3: Illustration of the concepts accuracy, precision and uncertainty. The bull’s eye represents the assumed true value, the “shots” represent measurement results.

If a laboratory assesses and optimizes its methods, it usually has an interest in distinguishing accuracy and precision, as this leads the way to identification of errors and mistakes. It can show such diverse reasons for errors such as the need for maintenance or calibration of instruments, or for better training of staff. However, the final user of the measurement result (in the case of the MRV Maritime Regulation and the EU ETS, this is the shipping company, the verifier and the administering authority) simply wants to know how big the interval is (measured average ± uncertainty), within which the true value is probably found.

In the EU ETS, only one value is given for the emissions in the annual emissions report. Only one value is entered in the verified emissions table of the registry. The operator, aircraft operator or shipping company cannot surrender “N ± x%” allowances, but only the precise value N. It is therefore clear that it is in everybody’s interest to quantify and reduce the uncertainty “x” as far as possible. This is the reason why monitoring plans must be approved by the administering authority, and why shipping companies need a basic understanding of this concept[[37]](#footnote-38).

To deal comprehensively with the overall uncertainty figure for emissions monitoring on board a ship, it is to be noted that the measurement accuracy of single equipment (e.g. flowmeters for receiving bunkers, density determination, storage in bunker tank,…) does not provide the full picture of the overall uncertainty levels for all processes of emissions and fuel consumption monitoring on board, which instead result from the combination of all relevant steps and processes. For this purpose, the error propagation law is applied.

For more details, a separate guidance document on the assessment of uncertainty in the EU ETS for stationary installations is provided (Guidance document No. 4[[38]](#footnote-39)). Since ships’ engines are in many aspects similar to combustion units in stationary installations, many concepts of this document are applicable to ships, with the exception that no tier system is defined for maritime transport activities. The use of the error propagation formulae is explained in Annex III of that guidance.

In case the shipping company has not yet performed a detailed uncertainty assessment, it may also apply the following default values for the level of uncertainty associated with emissions and fuel monitoring:

|  |  |
| --- | --- |
| **Monitoring Method** | **Applicable default overall uncertainty level** |
| Method A | ± 7.5% |
| Method B | ± 7.5% |
| Method C | ± 7.5% |

# Monitoring & Reporting of further information

In chapter 4 guidance was given on the elements necessary for GHG emissions monitoring by shipping companies. In chapter 5 now the focus is on the additional information to be monitored and on how these data are to be compiled for the purpose of reporting.

## Reporting requirements under MRV Maritime

Shipping companies shall, based on the monitoring plan, monitor greenhouse gas emissions as well as additional data (e.g. voyage details) for each ship on a per-voyage basis as laid down in Part A of Annex II of the MRV Maritime Regulation, and determine additional information on an annual basis as listed in Part B of Annex II of the MRV Maritime Regulation. From the information obtained that way, the shipping company has to compile the annual[[39]](#footnote-40) emission report per ship. In the cases where a ship is exempted from the monitoring on a per-voyage basis (see section 4.2), only the aggregated annual data needs to be reported.

### Monitoring on a per-voyage basis

For each voyage falling within the scope of the MRV Maritime Regulation (see section 2.2) the shipping company shall monitor the GHG emissions as outlined in sections 4.3 to 4.9, and the fuel consumption for each fuel as discussed in section 4.5. In addition, the data summarized in Table 4 needs to be monitored for each voyage.

**Note:** The data of each voyage must be made available to the verifier. However, for the annual emission report in the IT system (THETIS MRV) it is sufficient to report the annual totals, although a separate entry for each voyage is technically possible[[40]](#footnote-41).

Table 4: Monitoring on a per-voyage basis: parameters in accordance with Annex II of the MRV Maritime Regulation

| **Parameter to be reported** | **Additional rules to be taken into account** |
| --- | --- |
| **Description of voyage** |  |
| Port of departure and port of arrival  |  |
| Date and hour of departure and arrival at berth | Using Greenwich Mean Time (GMT/UTC) |
| Time spent at sea | Calculated based on port departure and arrival information, excluding anchoring |
| Distance travelled | Either the distance of the most direct route between the port of departure and the port of arrival or the real distance travelled.In the event of the use of the distance of the most direct route between the port of departure and the port of arrival, a conservative correction factor should be taken into account to ensure that the distance travelled is not significantly underestimated. The monitoring plan shall specify which distance calculation is used and, if necessary, the correction factor used. The distance travelled shall be determined from berth of the port of departure to berth of the port of arrival and shall be expressed in nautical miles. |
| **Transport work and cargo** |  |
| Transport work | Determined by multiplying the distance travelled with the amount of cargo carried |
| Cargo carried in metric tonnes or as standard cubic meters of cargo | Cargo shall be expressed for passenger ships as the number of passengers, and for all other ships as metric tonnes or as standard cubic metres, as appropriate.For definition of cargo per ship type see Table 5. |
| **Optional information** | Information relating to the ship's ice class and to navigation through ice  |

Table 5: Definition of cargo for different ship types

| **Ship type** | **Definition of Cargo** |
| --- | --- |
| Passenger ships | Number of passengers |
| Ro-ro ships[[41]](#footnote-42) | Mass of cargo on board, determined as the actual mass or as the number of cargo units (trucks, cars, etc.) or occupied lane-metres multiplied by default values for their weight |
| Container ships[[42]](#footnote-43) | Total weight in metric tonnes of the cargo or, if not available, the amount of 20-foot equivalent units (TEU) multiplied by default values for their weight. Where cargo carried by a container ship is defined in accordance with applicable IMO Guidelines or instruments pursuant to the Convention for the Safety of Life at Sea (SOLAS Convention), that definition shall be deemed to comply with this Regulation. |
| Other ships[[43]](#footnote-44) | The cargo is to be defined in a way that, where applicable, the weight and volume of cargo carried and the number of passengers carried are taken into account. |

### Monitoring on an annual basis

For each ship and for each calendar year, shipping companies shall determine emissions annual data using the per-voyage data collected as described in section 5.1.1, and annual data on the parameters required under the MRV Maritime Regulation, i.e. the parameters listed in Table 6. That table provides further guidance on how to determine the relevant data by aggregation of the respective per voyage data.

Table 6: Monitoring on an annual basis: parameters:

| **Parameter** | **Additional information** |
| --- | --- |
| Amount of each type of fuel consumed in total | Aggregated data of all voyages of the year[[44]](#footnote-45) determined in accordance with chapter 5 of this guidance |
| Emission factor used for each type of fuel consumed | These are the factors laid down in the monitoring plan, except where actual factors are used (see section 4.6).For each fuel used, the emission factors for all relevant GHGs need to be listed, and – where applicable – the slippage coefficient for each relevant source type. |
| Total aggregated greenhouse gas emitted within the scope of MRV Maritime Regulation | Aggregated data of all voyages of the year44 determined in accordance with chapter 5 of this guidance. **Note that emissions of each greenhouse gas need to be reported separately.** |
| Aggregated greenhouse gas emissions:* from all voyages between two EEA ports[[45]](#footnote-46)
* from all voyages which departed from EEA ports and arrived in non EEA ports
* from all voyages from non-EEA ports to EEA ports
* which occurred within EEA ports (and which occurred when at berth within EEA ports)
 | Sums to be derived from the per-voyage monitoring. The differentiation by port is required in particular for determination of the emissions to be reported under the EU ETS (see section 5.2).Note that emissions of each greenhouse gas need to be reported separately. |
| Total distance travelled | Sum of all voyages, using data in accordance with Table 4. |
| Total time spent at sea |
| Total transport work |
| Average energy efficiency | See below. |
| Total aggregated GHG emissions relevant under the EU ETS[[46]](#footnote-47) | For details please see section 5.2. |
| **Optional information** | Annual aggregated information relating to the ship's ice class and to navigation through ice, building on the respective per-voyage data |

Average energy efficiency shall be reported by using at least the following four indicators (including the applicable calculation formulae):

* **Fuel consumption per distance** = total annual fuel consumption / total distance travelled
* **Fuel consumption per transport work** = total annual fuel consumption / total transport work
* **Greenhouse gas emissions per distance** = total annual greenhouse gas emissions / total distance travelled
* **Greenhouse gas emissions per transport work** = total annual greenhouse gas emissions/total transport work.

In addition, when relevant, ships may (voluntarily) report the average energy efficiency by using the two following energy efficiency indicators:

* **Fuel consumption per time spent at sea** = total annual fuel consumption / total time spent at sea
* **Greenhouse gas emissions per time spent at sea** = total annual greenhouse gas emissions / total time spent at sea

Finally, shipping companies may report voluntarily a differentiated average **energy efficiency of laden voyages** (fuel consumption and greenhouse gases emitted per cargo transported[[47]](#footnote-48)).

## Reporting requirements for the EU ETS

Although the data described in this section is relevant for the EU ETS, the legal basis for the reporting is enshrined in the MRV Maritime Regulation, Article 11a. This requires that a verified report regarding the aggregated emissions data of the shipping company is submitted to the administering authority. The content of that “company-level report” is defined in a delegated act and reflected in the implementing act[[48]](#footnote-49) on MRV templates. This report basically requires that the data already reported and verified for each individual ship under the control of the shipping company is aggregated into the new report. However, before doing so, the total emissions per ship falling under the scope of the MRV Regulation have to be further modified in accordance with Part C of Annex II of the MRV Maritime Regulation. All these reporting steps have to be included in the ship’s emission report (as mentioned in Table 6). The respective calculation and reporting steps for each ship are described in this section. The shipping company shall bear the needs of these calculation steps in mind when developing the ship’s monitoring plan and associated procedures in order to monitor all the relevant parameters throughout the year.

### Step-by-step emission calculation per ship for the purpose of the EU ETS

**Starting point**: The shipping company has monitored all the relevant (per-voyage) data for the ship listed in section 5.1.1. The emissions data is available separately for each GHG, and the voyages to which the data relates are clearly identified.

**Step 1** (Part C, point 1.1, of Annex II of the MRV Maritime Regulation)[[49]](#footnote-50): **Only the greenhouse gases covered** by the scope of the EU ETS are carried over to the next step. The emissions of gases not covered by Annex I of the EU ETS Directive are set to zero. In practice this means that for the reporting years 2024 and 2025, only CO2 is reported. From 1 January 2026, methane (CH4) and nitrous oxide (N2O) are covered, too.

The result of this calculation is to be reported in the ship’s annual emission report, and is used for performing the next applicable step. The same is done after each of the following steps.

**Step 2**: **CO2** **Zero-rating of sustainable biofuels and other renewable fuels[[50]](#footnote-51)**:

The emission factors to be used for reporting under the MRV Maritime Regulation are “tank-to-wake” emission factors, i.e. they relate to the physical amount of GHG molecules that are emitted from the combustion process. However, under The IPCC guidelines for national GHG inventories, biomass emissions are accounted for at the point where the biomass is harvested. Emissions from combustion of biofuels would therefore be double counting. Consequently, the EU ETS allows to account CO2 emissions of biofuel as zero provided that the biofuel complies with certain sustainability and GHG savings criteria defined by the Renewable Energies Directive[[51]](#footnote-52) (“RED”). For rules on zero-rating, the MRV Maritime Regulation refers to the rules of the MRR[[52]](#footnote-53) which establishes the link between the RED and the EU ETS.

The ETS also allows zero-rating some other “renewable” fuels regulated by the RED. These are Renewable Fuels of Non-Biological Origin (RFNBOs[[53]](#footnote-54)) and Recycled Carbon Fuels (RCFs[[54]](#footnote-55)). RFNBO/RFC have to comply with a certain level of GHG savings compared to conventional fossil fuels in order to be eligible for zero-rating.

Under this Step 2, shipping companies may replace the CO2 emission factor for the biofuel, RFNBO or RCF used with an emission factor of zero for this fuel, under the condition that they obtain the relevant evidence for compliance with the relevant “RED criteria” together with the purchase of that fuel. Such evidence includes the proof that the same fuel is not claimed by any other user. For this purpose the RED requires a mass balance that ensures that the respective “proof of sustainability” is issued only to one user.

**Notes:**

* Only CO2 emissions can be zero rated. In particular, the slippage coefficient and emission factors for CH4 for biogas *cannot* be zero-rated.
* As the MRV Regulation requires that in case of mixed or blended fuels each component is reported separately. It therefore does not contain any rules for determining a “biomass fraction” of a fuel, as the MRR for installations would require. The shipping company must therefore ensure that the fuel supplier provides the necessary evidence for the biomass fraction of a blended fuel separately, as if it were a neat biofuel.
* The exact rules for zero-rating of RFNBO/RCFs are currently under development. If necessary, this guidance will be updated when the respective amendment of the MRR will have been published.

More guidance on the conditions for zero-rating is given in section 5.2.2.

**Step 3**: Correction for **voyages between EEA ports and ports outside the EEA[[55]](#footnote-56)**:

As mentioned in section 2.3, not all GHG emissions from maritime transport covered by the MRV Maritime Regulation are covered by the EU ETS. The latter covers 100 % of the emissions from voyages within the EEA and 50 % of emissions from voyages from third countries to EEA and from EEA to third countries. It also covers 100% of emissions released within EEA ports. This means that the ship’s total aggregated emissions of greenhouse gases resulting from step 2 need to be considered per type of activity in the reporting year. For all voyages either starting or ending in a non-EEA port the emissions of each GHG shall be multiplied by 50 %.

**Step 4**: **CO2** **Emissions verified as captured** and transported for permanent storage or permanently chemically bound[[56]](#footnote-57):

The MRV Maritime Regulation stipulates that the use of CCU/CCS is accounted for by multiplying with zero the amounts of such emissions calculated in accordance with Step 1, Step 2 and Step3 above. In practice, this means that if CO2 emissions are captured and transported for permanent storage or to be permanently chemically bound in relation to voyages starting or ending outside of the EEA, only 50% of the captured CO2 during these voyages should be multiplied with zero. More detailed rules may be developed as soon as the relevant legal framework of the EU ETS is known, and this guidance will then be updated accordingly.

Further information on CCU/CCS is provided in section 5.2.3.

**Step 5:** Specific **EU route exemptions[[57]](#footnote-58)**:

In section 2.3.3 it was explained that certain routes for certain ship types are excluded from the EU ETS until 31 December 2030. That section also refers to the respective legal acts listing the islands and transnational public service obligations or contracts to which the exemption applies.

In practice this rule means that the shipping company needs to identify the voyages of the ship to be exempted under this step, and multiply its GHG emission (as determined in accordance with all the previous steps 1 to 4) by zero. The remaining GHG emissions are the input to the next step.

**Step 6**: **Rebate for Ice-class ships[[58]](#footnote-59)**

If a shipping company wants to benefit from this rebate, which is applicable until 31 December 2030, and if the ship has ice-class “*IA or IA Super or an equivalent ice class, established based on HELCOM Recommendation 25/7*”, the shipping company may reduce the emissions determined in accordance with Steps 1 to 5 by 5%.

**Step 7: Phase-in[[59]](#footnote-60)** of requirements for maritime transport

As has been explained in section 2.3.1, the EU ETS for maritime transport activities is introduced gradually. Therefore, the emissions determined following the previous steps, are reduced accordingly. The emissions of the year 2024 are to be multiplied with 40 %, and the 2025 emissions by 70 %.

The result of this calculation is the quantity of allowances to be surrendered by the shipping company in respect of that ship.

**Step 8: Company-level aggregation:**

Having reported the GHG emissions resulting from each of the Steps 1 to 7 (where relevant) for each GHG separately, and having made the respective per-voyage data available to the verifier, the shipping company may proceed to aggregating the results of each step and of each ship to obtain the respective data for the whole shipping company.

|  |
| --- |
| **Important note:** As explained in section 2.5, in case of transfer of ships between companies, the company responsible for the ship at the end of the year is responsible for reporting the whole year’s emissions under MRV Maritime. However, under the EU ETS, each company involved in the transfer is responsible for the emissions during the period when the ship was under the company’s responsibility. Therefore, if a company has transferred a ship to another company, it will still have to include the relevant emissions within EU ETS scope in its aggregated company-level emissions report. This means it includes emissions of a ship for which it does not submit an annual emissions report under MRV Maritime but only a partial emissions report[[60]](#footnote-61). Therefore the shipping company must have in place suitable procedures that ensure the completeness of its emissions data that takes into account the possible impact of the transfer of a ship.  |

**Note:** Point 2, Part C of Annex II to the MRV Maritime Regulation requires the monitoring of data justifying the calculation of the different steps listed above. However, if the data collected in accordance with what was stated in section 5.1, all the relevant data is already available. It is to be noted though that shipping companies should establish relevant procedures as part of their monitoring plan that links each voyage monitored to the respective steps above, and to establish relevant control procedures for ensuring the correct application of those procedures.

### Zero rating of sustainable biofuels and other renewable fuels

Part C, point 1.2, of Annex II of the MRV Maritime Regulation stipulates that shipping companies shall apply a CO2 emission factor of zero instead of the default factor provided by Annex I of MRV Maritime Regulation (see section 4.6)[[61]](#footnote-62) where the company uses a **biofuel** **complying with the sustainability criteria and greenhouse gas emission saving criteria** for the use of biomass established by Directive (EU) 2018/2001 (the Renewable Energy Directive, “RED”). Applying the rules of the MRR[[62]](#footnote-63), such fuels may be zero-rated (i.e. their emission factor is considered zero) if the biofuels comply with the sustainability and GHG savings criteria of Article 29(2) to (7) and (10) of the RED.

A shipping company usually does not have to know how to apply these criteria in detail. In practice, a defined quantity of fuel may be zero-rated if the shipping company receives a “Proof of Sustainability” (PoS) from the fuel supplier for exactly this quantity, issued under a certification scheme complying with Article 30 of the RED. These certification schemes may operate world-wide.

For information sources and more detailed rules on the zero-rating of biofuels please see [Annex II](#_Annex_III_–).

For the zero-rating of RFNBOs and RCFs, the relevant rules under the EU ETS (requiring an amendment of the MRR) are currently under development. An update of this guidance document will be provided as soon as these rules will be available.

### Detailed rules on carbon capture onboard ships

The rules on CCS (Carbon Capture and Storage) and CCU (Carbon Capture and Utilisation) under the EU ETS in general are currently being updated. Therefore, only preliminary guidance can be given here. The following principles apply:

* Where a ship captures a part of its CO2 emissions[[63]](#footnote-64) such that the CO2 is neither released to the atmosphere nor in another way to the environment[[64]](#footnote-65), the respective quantity of CO2 can be accounted for to reduce the ship’s GHG emissions for EU ETS purposes (taking into account the ETS geographical scope). However, the total emissions before capture are to be reported for the purpose of the MRV Maritime Regulation.
* The EU ETS Directive requires that the CO2 is geologically stored in a storage site compliant with the “CCS Directive”[[65]](#footnote-66). Without such storage, the CO2 is not eligible for deduction from the emissions. Therefore, it is not the amount of CO2 captured, but the amount handed over to a CO2 transport system operator or directly to a storage site (within the meaning of the MRR) which is the relevant parameter for further calculation. This means that e.g. the capacity for temporary storage of CO2 onboard the ship may limit the amount deductible from the ship’s emissions.
* Besides geological storage, the EU ETS Directive also allows “permanent CCU”[[66]](#footnote-67) as reason for deducting CO2 from actual emissions. More detailed rules in that regard are currently under development and will be taken into account in a later update of this guidance document.
* CO2 capture is an energy-intensive process. Any additional emissions caused by engines in order to provide that additional energy have to be included in the ship’s monitoring plan and annual emissions like any other engine’s emissions.
* Where a ship is transporting CO2 as cargo, emissions from leakage or boil-off from that loaded CO2 will fall under the “normal” EU ETS rules for CO2 transport and are outside the scope of the MRV Maritime Regulation and will not be included in the monitoring plan under the MRV Maritime Regulation (but under a permit and monitoring plan for the “normal” EU ETS).

# The monitoring plan

The shipping company shall indicate in the monitoring plan which monitoring method is to be used to determine the greenhouse gas emissions for each ship under its responsibility and ensure that once a method has been chosen, it is consistently applied. The following sections give detailed guidance on related issues.

## Drafting and modifying a monitoring plan

### Monitoring Plan

The Monitoring Plan is a document in which the shipping company describes the design of the management system the ship has in place in order to monitor and report several data parameters related to the GHG emissions and Energy Efficiency of the vessel.

The Monitoring Plan should consist of a complete and transparent documentation of the monitoring method for the ship concerned along with the description of the relevant procedures, systems and responsibilities used to monitor the completeness and accuracy of the data provided in the Emissions Report in conformity with the MRV Maritime Regulation.

The submission date along with the minimum content of the Monitoring Plan is laid down in Article 6 of the MRV Maritime Regulation. More detailed requirements on the monitoring plan are laid down in Commission Implementing Regulation (EU) 2023/2449.

The shipping company shall produce and submit one Monitoring Plan for each ship under its responsibility which carries out activities covered by the MRV Maritime Regulation. To facilitate the process, THETIS MRV allows the shipping company to extract and reuse previously entered information from one ship which applies in an identical manner to their entire fleet ('company-specific parts') so that the company will only have to enter separately the information which reflects the ship's technical characteristics and specific procedures (‘ship-specific parts’).[[67]](#footnote-68)

To maximise synergies between the procedures for compliance with the obligations from the MRV Maritime Regulation and those established by the FuelEU Regulation[[68]](#footnote-69), THETIS MRV allows the shipping company also to reuse relevant information previously entered in the system when preparing the Monitoring Plan referred to in Article 8 of the FuelEU Regulation[[69]](#footnote-70).

When developing a monitoring plan, operators should follow some guiding principles:

* Knowing in detail the situation of their own ships, the shipping company should make the monitoring methodology as simple as possible. This is achieved by attempting to use the most reliable data sources, robust metering instruments, short data flows, and effective control procedures.
* Shipping companies should imagine their annual emission report from verifier’s perspective. What would a verifier ask about how the data has been compiled? How can the data flow be made transparent? Which controls prevent errors, misrepresentations, omissions?
* Because ships usually undergo technical changes over the years, monitoring plans must be considered living documents to a certain extent. In order to minimise administrative burden, shipping companies should be careful which elements must be laid down in the monitoring plan itself, and what can be put into written procedures supplementing the MP.

### When has a shipping company to modify the Monitoring Plan?

Shipping Companies are required to check at least once a year whether a ship’s monitoring plan reflects the nature and functioning of the ship and whether the monitoring methodology can be improved. The MRV Maritime Regulation (Article 7) provides for certain (non-exhaustive) situations when companies are required to modify the monitoring plan, such as:

1. a change of company[[70]](#footnote-71);
2. new greenhouse gas emissions[[71]](#footnote-72) are generated due to new emission sources or due to the use of new fuels not yet contained in the monitoring plan;
3. a change in availability of data which may affect the accuracy of the measurement of greenhouse emissions, due to the use of new types of measuring equipment, new sampling methods or analysis methods or other reasons;
4. data resulting from the monitoring method has been found to be incorrect;
5. any part of the monitoring plan is identified as not being in conformity[[72]](#footnote-73) with the requirements of the MRV Maritime Regulation.

In case of modifications of the monitoring plans, shipping companies shall notify the verifiers without undue delay.

In circumstances provided by points 2, 3 and 4 above, modifications of the monitoring plan shall be subject to assessment by the verifier. Following the assessment, the verifier shall notify the shipping company whether those modifications are in conformity with the requirements of the MRV Maritime Regulation.

Once a shipping company has received a notification of conformity, and for ships falling within the scope of the EU ETS Directive, it shall submit its modified monitoring plan to the responsible administering authority. Shipping companies shall also submit modifications provided under points 1 and 5 of the above to the responsible administering authority.

The administering authority responsible shall approve the revised monitoring plan by 6 June 2025 or, for ships falling within the scope of Directive 2003/87/EC for the first time after 1 January 2024, within four months of the ship’s first call in a port under the jurisdiction of a Member State.

### Describing a procedure

The monitoring plan should ensure that the shipping company carries out all the monitoring activities consistently over the years, like according to a recipe book. In order to prevent incompleteness, or arbitrary changes by the shipping companies, the administering authority’s approval is required. However, there are always elements in the monitoring activities, which are less crucial, or which may change frequently. Such monitoring activities may (or even shall) be put into “written procedures”, which are mentioned and described briefly in the MP, but are not considered part of the MP.

Article 6(3) of the MRV Maritime Regulation requires procedures for the following purposes:

* Regular updating the list of emission sources onboard each ship;
* Monitoring of the completeness of voyages;
* Monitoring fuel consumption of the ship, including for the measurement of fuel uplifts and fuel in tanks, and density, if applicable;
* Determining activity data per voyage (distance, passengers and cargo carried, time spent at sea between port calls, and if applicable, also the distance travelled and the time spent at sea when navigating through ice);
* Determine surrogate data for closing data gaps.

Furthermore, Part C of Annex I to the MRV Maritime Regulation requires written procedures for the purpose of describing data flow activities, the risk assessment, and control activities, and for avoiding data gaps. Such written procedures may be contained in full in the Monitoring Plan or described through references to external written procedures. More information about procedures can be found in Annex I of this document (section 7.3).

## Control system and data flow

As human beings (and, in many cases, different information technology systems) are involved, mistakes in data flow activities can occur. Therefore, a control system is necessary. Both the risk assessment and control activities are part of a well-functioning control system, allowing the verifier to carry out more efficient verification activities. Both must be described in written procedures supplementing the Monitoring Plan.

The relevant provisions for shipping companies, as amended through Commission Delegated Regulation (EU) 2023/2776, are closely aligned to those applicable to stationary installations and aircraft operators contained in Commission Implementing Regulation (EU) 2018/2066. Therefore, the Guidance Document No. 6: ‘Data flow activities and control system’[[73]](#footnote-74), can be used by shipping companies to access detailed information on these topics. The document is almost directly applicable to the maritime transport sector and, for that purpose, ‘operator’ and ‘aircraft operator’ should be read as ‘shipping company’.

### Control system

A control system sets measures that help minimise risks. A well-functioning control system helps to comply with monitoring and reporting principles within the EU ETS, namely: completeness, consistency, comparability, transparency, accuracy, integrity and continuous improvement.

In accordance with Part C of Annex I to the EU MRV Maritime Regulation, the control system for shipping companies must consist of the following elements:

* Written procedures for control activities;
* Written procedures for data flow activities;
* Risk assessment.

A control system should not be rigid, but dynamic. The shipping company is required to monitor the effectiveness of the control system, including by carrying out internal reviews and considering the findings of the verifier during the verification of emission reports.

When a company finds the control system ineffective or not commensurate with the risks identified, it must seek to improve it and update the monitoring plan or the underlying written procedures for data flow activities, risk assessments and control activities accordingly.

### First steps of setting up a control system

As a first step, the shipping company creates the data flow providing a logical sequence of data collection and processing steps. Then, the shipping company must carry out a risk assessment to identify sources of risks of errors in the data flow from primary data (e.g. in case the engineer performs manually daily tank soundings) to final data in the annual emissions report (e.g. aggregated data from an IT system).

Thereafter, the shipping company must establish, document, implement and maintain written procedures, separately from the monitoring plan, for data flow activities as well as for control activities. The company must also describe those procedures and include references to them in the monitoring plan. The effectiveness of the control system is to be monitored and, when necessary, the procedures need to be improved.

### Written procedures of a control system

The shipping company is required to establish, document, implement and maintain written procedures, for data flow activities as well as for control activities. This must be done separately from the Monitoring Plan.

Written procedures for control activities must at least include:

* Quality assurance of the measurement equipment;
* Quality assurance of the information technology system;
* Segregation of duties in the data flow activities and control activities, and management of necessary competencies;
* Internal reviews and validation of data;
* Corrections and corrective action;
* Control of out-sourced processes;
* Keeping records and documentation, including the management of document versions.

The updated template for the Monitoring Plan (implemented in THETIS MRV) provides the relevant fields for the description of these procedures.

### Data flow activities

Monitoring of emissions data implies more than just reading instruments or carrying out chemical analyses. For the monitoring and reporting of greenhouse gas emissions, it is important for shipping companies to ensure that data is retrieved, collected, transported and stored in a controlled manner.

Therefore, the shipping company must define instructions on ‘who takes data from where and does what with it’. These ‘data flow activities’ are laid down in written procedures accompanying the Monitoring Plan, which must be made available to the verifier and the Administering Authority upon request. The shipping company must describe those written procedures and include references to them in the Monitoring Plan.

When the shipping company starts designing the Monitoring Plan, it creates the data flow providing a logical sequence of data collection and processing steps. As errors may occur in the obtaining or transmission of data, an effective control system is necessary, as explained in the questions and answers below.

Data flows can be described in writing in different forms. For simple data flows, a short description may be sufficient, while in complex cases a data flow diagram will be indispensable. Furthermore, detailed checklists for each department involved and training material for staff may need to be developed.

Examples of how data flows can be described:

* Data flow diagram
* Task list
* Written procedures
* Check lists and lists of incidents or deadlines triggering activities.

Examples of these different data flows can be found in MRR Guidance Document No. 6: Data flow activities and control system[[74]](#footnote-75).



Figure 4: Example of a data flow diagram

Figure 4 shows an example with the information about the procedure alongside a diagram: The Captain receives information from the Chief Engineer after taking the soundings of the fuel tanks using sounding tape, then he inserted into the daily noon report.

### Risk assessment

A risk assessment is the first step to follow when establishing a control system. It helps the shipping company to identify points in the data flow where control activities are needed, and where they can be applied more effectively. The shipping company should regularly update its risk assessment, adapting it to relevant changes (e.g. to the ship configuration or to new IT systems). This may lead to the identification of new risks and a need to update the control procedures as well.

Please note that Article 15(1) of the MRV Maritime Regulation requires the verifier to carry out a risk analysis. Such risk analysis, however, is distinct from the risk assessment to be carried out by the shipping company pursuant to Part C of Annex I to the MRV Maritime Regulation, since its purpose is to support the verifier with the identification of necessary verification activities.

#### What does ‘risk’ for a shipping company mean in the context of MRV?

‘Risk’ (R) is a parameter which takes into account both the probability (P) of an incident and its impact (I). In terms of emissions monitoring, the risk refers to the probability of a misstatement (omission, misrepresentation or error) being made, and its impact in terms of annual emission figures.

To simplify, it can be said that R = P × I.

Therefore, if either probability or impact is high, the risk will be high as well, unless the other parameter is very low. Where probability and impact are high, the risk will be very high, as indicated in Figure 5.



Figure 5: Example for how to classify risks

#### What steps are shipping companies required to take after carrying out the risk assessment?

Once the shipping company has assessed the risks associated with its data flow, the second part of the control system must be established, i.e. appropriate control activities to mitigate the identified risks. A typical example of control activity is the four-eyes principle, i.e. the review of data/information/reports by an independent second person. The shipping operator can establish that it should at least be applied to the overall annual emissions report (in analogy to the independent review of the verifier). Other examples of control activities are: keeping backups of data in IT systems, data quality checks like trend analyses or data completeness checks, or checking (calibrating) measurement instruments at regular intervals.

In a next step the shipping company must assess the risks (now mitigated) once more to determine if the control measure will be effective and applied properly.

This is an iterative process. If the result is not satisfactory, the shipping company will have to take a step back and re-develop its control activities. In some cases it might be necessary to go back to the early steps of monitoring plan development, selecting more appropriate data sources or rearranging the data flow in a sequence which is less prone to errors.

## The improvement principle

The MRV Maritime Regulation requires the shipping company to explore possibilities to improve the monitoring methodology when the ship itself is unchanged. For implementing this “improvement principle”, there are two requirements:

* Shipping companies shall endeavour to take account of the recommendations included in the verification reports (Article 4(7)), and
* Shipping companies must check regularly on their own initiative, whether the monitoring methodology can be improved (Article 7(1) MRV Maritime Regulation).

A recommendation of improvement is a suggestion from the verifier to improve the shipping company's performance in monitoring and reporting GHG emissions, cargo carried, transport work, distance travelled and /or time spent at sea.

During verification following a year in which recommendations for improvement were made in a verification report, the verifier shall verify whether the shipping company has implemented those recommendations for improvement and the manner in which this has been done. If the shipping company has not implemented those recommendations, the verifier shall assess whether this increases or may increase the risk of misstatements.

# ANNEX I – How to prepare and revise the monitoring plan

The aim of this Annex is to provide best practices on how shipping companies should prepare their monitoring plans in accordance with the template contained in Annex I to Implementing Regulation (EU) 2023/2449. It has been written to support the implementation of the MRV Maritime Regulation by explaining its requirements in a non-legislative language and providing some examples. However, it should always be remembered that the MRV Maritime Regulation and the related Delegated and Implementing Regulations set the primary legal requirements.

This Annex follows the monitoring plan template structure as contained in Annex I to Implementing Regulation (EU) 2023/2449. It has to be noted that the electronic template available in THETIS MRV may sometimes differ from such a structure, as different tables may be grouped or sliced into different section of the IT interface. Tutorial videos available on the THETIS MRV page[[75]](#footnote-76) explain in detail how the requirements established in Implementing Regulation (EU) 2023/2449 have been implemented in the THETIS MRV IT environment.

## Use of electronic templates and monitoring plan submission

Shipping companies must use standardised monitoring plans based on the templates defined by the Commission[[76]](#footnote-77). Starting 1 January 2024, the monitoring plans need to be submitted through **THETIS-MRV[[77]](#footnote-78)**.

The drafting of the monitoring plan in accordance with such templates can be done either by filling in the online form in THETIS-MRV or by uploading files in THETIS-MRV in accordance with IT format made available onTHETIS-MRV.

Unless otherwise specified in Annex I to Implementing Regulation (EU) 2023/2449[[78]](#footnote-79), all fields of the monitoring plan are mandatory and shall be duly filled in by the shipping company to produce a complete monitoring plan. If the mandatory fields are not applicable, the shipping company should indicate “N/A” in those fields. Checking the completeness of the monitoring plan further falls within the verifier’s assessment tasks[[79]](#footnote-80).

THETIS MRV offers users the possibility of attaching documents to the monitoring plan, through pre-defined labels or free description. Those can include for instance the assessment report issued by the verifier (as referred to in Article 9 of the Commission Delegated Regulation on verification activities, accreditation, and approval of monitoring plans[[80]](#footnote-81)), a copy of the mandate to be provided in line with Commission Implementing Regulation (EU) 2023/2599 (when applicable), or the risk assessment in accordance with Part C of Annex I to the EU MRV Regulation. Once attached to the Monitoring Plan of a ship,[[81]](#footnote-82) such documents will be available to all users in the Monitoring Plan workflow established in the system, including Administering Authorities (where applicable). This is relevant also considering that, pursuant to Article 73 of the Commission Delegated Regulation on verification activities, accreditation, and approval of monitoring plans, the company ‘*shall provide the administering authority responsible with the verifier’s conclusions of the assessment of the monitoring plan and any additional information that enables it to carry out the approval procedures*’. Therefore, pending guidance from each administering authority, THETIS MRV might be used as a tool to provide such documents (including as attachments to the monitoring plan).

Because of their potential volatility, hyperlinks to external servers do not qualify as accepted attachments to the Monitoring Plan and may be disregarded by the Administering Authorities.

## Using the appropriate Language

Monitoring plans can be established in any language agreed between the shipping company and the accredited verifier. However, there is an obligation to ensure that an English translation of the satisfactorily assessed monitoring plan is available.

Companies should communicate to the verifiers and, where applicable[[82]](#footnote-83), administering authorities the content of the monitoring plan in an easy and clear way.

## Describing a procedure

By default, the monitoring plan shall include a description of each relevant procedure. Please note that the complete procedure itself does not have to be included. This is to ensure flexibility in cases where smaller details of the procedure can change frequently (e.g. the name of the responsible person): such minor changes do not justify an update of the monitoring plan. The description in the monitoring plan must be sufficiently detailed to fit the purpose of the monitoring plan, namely:

* to provide clear and transparent information to the verifier as a basis for its assessment;
* to provide sufficient information that allows the administering authority to make an informed decision on whether or not to approve the monitoring plan. This is only possible where the content of the procedure is described in sufficient detail to assess whether it is in compliance with the legal requirements of the MRV Maritime Regulation.

In addition, the full text of the procedure has to be sufficiently clear and complete to provide unambiguous instructions to the staff of the shipping company and the ship’s crew.

Simple procedures will be completely reflected by the description. However, when the procedure is more elaborated, it may be established and described in an external source (such as a written procedure or harmonised quality, environmental or energy management standards[[83]](#footnote-84)). In the latter case, a brief description will suffice, although it should contain a reference to the full procedure and indicate where its full version is stored. In any case, the shipping company will have to grant access to such external sources to the verifier or the Administering Authority upon their request. While existing procedures established outside the monitoring plan should be used and referred to in the monitoring plan to the best extent possible, it has to be noted that a mere reference to an existing procedure without a brief description of the same will not suffice. In addition to the description of the procedure itself, Tables describing procedures in the monitoring plan shall contain the following elements:

***Title of procedure***

The procedure shall be identified as indicated in the monitoring plan template contained in Annex I to Implementing Regulation (EU) 2023/2449.

***Reference to existing procedure***

A reference to an external procedure shall be entered when the monitoring plan contains a brief description of the procedure. The reference could for instance include the name of the relevant manual, the chapter and/or paragraph where the procedure is stored (e.g. *Operations Manual, Chapter 7.2.1*). In cases where the monitoring plan contains the full description of the procedure, the value N/A shall be entered.

***Version of existing procedure***

The version and date of the procedure shall be entered (e.g. *Version 2, November 2023*). This information is critical to ensure the access to the correct version of the procedure. In cases where the monitoring plan contains the full description of the procedure, the value N/A shall be entered.

***Name of Person or position responsible for this procedure***

The company should mention in the Monitoring Plan the name or the position of the person responsible for the procedure, as referred to in its internal organigram (e.g. *The Operational Manager*). This enables the shipping company to record responsibilities and identify whom to contact in case queries are raised about the procedure.

***Location where records are kept***

The location of where records are kept should be specified in order to ensure availability of information in case of need, for instance in the course of verification activities, of activities carried out by the Administering Authority during the approval process, but also for the shipping company itself in case of changes to the monitoring plan. A reference to exact location where hard and/or e-copies of the relevant records are stored shall be included (e.g. *Technical Department Files at the Headquarters of SafeSea Ltd., Willow road, 13, Houston - USA*)

***Name of the IT system used (where applicable)***

The name, version and module of the system used within the relevant procedure, as per IT system provider manual, shall be inserted (e.g. *Best Navigate Software, Module: vessel manager*). For internal system, characteristics for identification can be specified.

***Data sources (where applicable)[[84]](#footnote-85)***

The source from where the data is collected shall be indicated (e.g*. BDN, GPS, etc.)*

What follows below is an example of a full table describing a procedure, as per Table B.7 of the monitoring plan template. In this example the shipping company provides a full description of the procedure within the monitoring plan, as it is short enough for this purpose, and keeping a separate more extensive version of the procedure is not necessary.

***Example***

|  |  |
| --- | --- |
| **Title of procedure** | **Review of completeness of data sources** |
| **Reference to existing procedure** | Expl.B7 |
| **Version of existing procedure** | V 3 (in force: 24 March 2024) |
| **Name of Person or position responsible for this procedure** | Assigned Superintendent Engineer (Technical Department) |
| **Short description of procedure** (a brief description of the procedure can be provided if already existing outside the monitoring plan) | In case of known changes to an emission source onboard the ship, the technical manager shall inform the assigned Superintendent Engineer of the changes and provide them with all the necessary information. Periodic comparisons between the engine room drawings of the ship and the actual situation on board are carried out throughout the year. In the absence of known changes, the technical manager shall confirm at least once a year, by the end of the first semester, whether any relevant changes have occurred. The responsible assigned Superintendent Engineer reviews and updates the list of the emission sources in the related Monitoring Plan and in any other report and document that the shipping company maintains with the latest information of the emission sources on board, when applicable, in order to ensure completeness and accuracy of monitoring and reporting in accordance with the Regulation. |
| **Location where records are kept** | The Monitoring Plan of the ship (accessible online through THETIS MRV). A back up hard copy of the monitoring plan is made available onboard and a further copy is stored at the Company's Office/ Technical Department Files. |
| **Name of the IT system used (where applicable)** | *Ship Engineering Tool (SET)* V 3.42 (at tech. department)THETIS MRV  |
| **Data sources (where applicable)** | Engine room drawings; Maintenance Log, company’s investment documentation. |

## Detailed guidance to the Monitoring plan Template

### Part A Revision record sheet

This Part shall include reference to parts where revisions or modifications have been made, including a brief explanation of changes. The version number, reference date, and status at reference date are automatically attributed by the THETIS MRV IT system and cannot be edited by the shipping company.

***Example***

Table B.2. Change of address, Table C.2.1. Change of method to determine fuel consumption.

### Part B Basic Data

#### Table B.1. Identification of the ship and shipowner details

This table gathers identification data on the ship and shipowner details. Where the shipowner is also the responsible entity assuming responsibility for MRV and, where applicable, EU ETS compliance (i.e. ‘the shipping company’) some of the same information data will also have to be reported under Table B.2.

***IMO ship identification number***

Refers to unique seven digit IMO number as assigned by IHS Maritime and shown on the ship’s hull, in accordance with SOLAS regulation XI-1/3.

***IMO unique company and registered owner identification number of the registered owner***

Refers to the IMO number of the registered owner as number as recorded under the IMO Unique Company and Registered Owner Identification Number Scheme accordance with SOLAS regulation XI-1/3-1.

***Name of the shipowner***

The legal entity that owns the vessel. This shall correspond to the registered owner, i.e. the owner specified on a ship’s certificate of registry.

***Gross Tonnage***

Gross tonnage (GT) means the gross tonnage calculated in accordance with the tonnage measurement regulations contained in Annex I to the International Convention in London on 23 June 1969, or any successor convention[[85]](#footnote-86).

***Voluntary open description field***

This may concern certain information related to the characteristics of the business activities of the ship based on its type (cruise line etc.).

This information may help to gain a better understanding of the potential fluctuation of energy efficiency between certain voyages or reporting periods (e.g. dry docking, breakdown, etc.).

Furthermore, shipping companies may insert additional technical characteristics that may affect the energy efficiency of the vessel (e.g. Mewis Duct, Propeller boss cap fin, Anti-fouling, Hull surface coating).

#### Table B.2. Company information

This table shall contain the information of the company assuming responsibility for MRV and, where applicable, EU ETS compliance in respect of the ship, i.e. ‘the shipping company’[[86]](#footnote-87).

The information provided about the ‘Contact person’ will help the Administering Authority to establish direct contact for any questions about the Monitoring Plan. The contact person for the ‘shipping company’ should notably be a person authorised to act on behalf of the ‘shipping company’ (i.e. the entity assuming responsibility for MRV and EU ETS compliance, when applicable) and should be accessible by the Administering Authority.

An additional contact person, such as someone working for a third party assisting the ‘shipping company’ in fulfilling its monitoring and reporting obligations (i.e. a contact within the technical manager or bareboat charterer), can be indicated in the ‘Additional information’ section under the ‘Further info.’ tab within the Monitoring Plan page of THETIS MRV.

#### Table B.3. Emissions sources and fuel types used

The monitoring and reporting must be complete and cover greenhouse gas emissions from the combustion of all fuels. Therefore, all emissions sources onboard the ship must be listed and described in the monitoring plan, irrespective of the amount of emissions produced over the reporting period. The list of standard emissions source types as in Commission Implementing Regulation (EU) 2023/2449 includes ‘Main engines’, ‘Auxiliary engines’, ‘Gas turbines’, ‘Boilers’, ‘Inert gas generators’, ‘Fuel cells’, ‘Waste incinerators’[[87]](#footnote-88), and the category ‘Other’, to cover any other emissions source type. Where an emissions source does not match any of the default types, the type ‘Other’ will apply.

The emissions source class allows for the segregation of specific emission source types where different emissions factors (including slippage coefficients) may apply within the same emissions source type[[88]](#footnote-89).

The shipping company must list all fuel types applicable over the reporting period in respect of the different emissions sources installed on board. When identifying the applicable fuel types[[89]](#footnote-90), the shipping company shall refer to the default fuel types listed in Annex I to the MRV Maritime Regulation. Where there is fuel blending, each component of the blended fuel must be considered as a separate fuel. The Monitoring Plan should therefore list separately all the relevant fractions of a blend, indicated as pure fuels.

***Example***

| **Emission source reference no.**  | **Name of the emissions source**  | **Type of the emissions source** | **Emissions source class** | **Technical description of emission source (performance/power, specific fuel oil consumption (SFOC), year of installation, identification number in case of multiple identical emission sources, etc.)**  | **(Potential) Fuel types used**  |
| --- | --- | --- | --- | --- | --- |
| 1 | Hitachi Zosen Type MAN B & W 6S60MC Mk6  | Main Engine  | ICE (other) | Serial No: 3896Year of Installation: 2001 Rated Power (MCR): 10750 kW @ 99 RPM SFOC (MCR): 172 g/ kWh | HFOLFOMGO |
| 2 | HYUNDAI-HIMSEN 6H21/32 | Auxiliary Engine  | ICE (other) | Serial No: BA5832-1Year of Installation: 2016Rated Power (MCR): 1200kW @ 900RPMSFOC: 195g/kWh | HFOLFOMDOMGO |
| 3 | WARTSILAW6L20DF | Auxiliary Engine | LNG Otto (dual fuel medium speed) | Serial No: PAA124785Year of Installation: 2017Rated Power (MCR): 1123kW @1200RPMSFOC: 198g/kWhSFC: 7010(kJ/kWh) | MDOMGOLNG |
| 4 | WARTSILA MOSS AS | Inert Gas Generator  | Inert Gas Generator  | Serial No: n/a Year of Installation: 2016Performance: 4500 Nm3/hSFOC: 333 kg/h | MDOMGO |

When providing the technical description of the emissions source, if an emissions source underwent engine power limitations, the shipping company should include both the power before and after the limitation.

#### Table B.4. Emission factors referred to in Annex I to Regulation (EU) 2015/757

The shipping company must identify the emission factor to be applied to each fuel type applicable over the reporting period. As a general rule, the shipping company should apply the default (tank-to‑wake) emission factor values listed in Annex I to the MRV Maritime Regulation, which cover those factors applicable to both fuel combustion (for CO2, CH4, N2O) and slippage (Cj values). The possibility to provide actual emission factors diverging from the default ones can still be pursued in accordance with the conditions and restrictions provided in Annex I to the MRV Maritime Regulation, which refers to Article 10, paragraphs (5) and (6) of Regulation (EU) 2023/1805 (‘FuelEU Maritime Regulation’). For further details on the determination and use of actual emission factors, please refer to section 4.6.

In case of use of other non-fossil fuels without a default emission factor in Annex I to the MRV Maritime Regulation, the company should provide the emission factor determined in accordance with Articles 32 to 35 of Commission Implementing Regulation (EU) 2018/2066, along with the methodology for sampling, methods of analysis and a description of the laboratories used, if any.

#### Table B.5 Slippage coefficient referred to in Annex I to Regulation (EU) 2015/757

Companies should indicate the emission factor of slipped fuel (slippage coefficient), as defined in point 1, Part A of Annex I to Regulation (EU) 2015/757. Slippage coefficients are dependent on the emission source class. The possibility to demonstrate actual values diverging from the default values presented in point 2, Part A of Annex I is subject to the same conditions and restrictions as the ones for the emission factors referred to under Table B.4.

Where an emissions source type is not listed (and therefore the category ‘Other’ shall apply as in the case of gas turbines or boilers), companies should apply a slippage coefficient of zero.

#### Table B.6. Application of carbon capture and storage technologies referred to in Part C, point 1.4, of Annex II to Regulation (EU) 2015/757

Companies should specify, when applicable, which carbon capture and storage technologies are installed onboard, and list the emissions sources to which they are applied and the reference to evidence for compliance with the requirements referred to in Directive 2003/87/EC.

#### Table B.7. Procedures, systems and responsibilities used to update the completeness of emission sources

Companies should provide details about the systems, procedures and responsibilities used to track the completeness of the list of emission sources over the reporting period.

***Example***

**Description of procedure**: In case of known changes to an emission source onboard the ship, the Technical manager shall inform the assigned Superintendent Engineer for the changes and provide them with all the necessary information.

Periodic comparisons between the engine room drawings of the ship and the actual situation on board are carried out throughout the year. In the absence of known changes, the Technical manager shall confirm at least once a year, by the end of the first semester, whether any relevant changes have occurred.

The responsible assigned Superintendent Engineer must review and update the list of the emission sources in the related Monitoring Plan(s) and in any other report and document that the Company maintains with the latest information of the emission sources on board, when applicable, in order to ensure completeness and accuracy of monitoring and reporting in accordance with the Regulation.

**Name of person or position responsible for this procedure**: Assigned Superintendent Engineer/ Technical Department

**Location where records are kept**: The list is saved in the Monitoring Plan of the ship, which is accessible online through THETIS MRV. A back up hard copy of the monitoring plan is made available onboard and a further copy is stored at the Company's Office/ Technical Department Files.

#### Table B.8. Procedures, systems and responsibilities used to determine and update emission factors in accordance with Annex I to Regulation (EU) 2015/757

Where a shipping company intends to deviate from default emission factors, the shipping company must provide details about the systems, procedures and responsibilities used to determine and update emissions factors applicable over the reporting period. The description of the procedure should include reference to the relevant information sources from which emission factors values have been derived.

Where the company provides actual emission factors diverging from the default ones the Table must contain the description of the procedures established to this end, including the method by which compliance with the conditions and restrictions provided in Annex I to the MRV Maritime Regulation is demonstrated.

If laboratory analyses are used, the applicable sampling plan and evidence for the competence of the used laboratory should be attached to the monitoring plan.

The procedure should also ensure that changes of fuel type and/or the applied emissions factors are tracked effectively over the reporting period.

#### Table B.9 Procedure used to determine the CO2 emission factors of biofuels and RFNBOs/RCFs referred to in Part C, point 1.2, of Annex II to Regulation (EU) 2015/757

The procedure should include the method by which compliance with the applicable sustainability and GHG savings criteria for biofuels and GHG savings criteria for RFNBOs/RCFs is demonstrated.

### Part C Activity Data

#### Table C.1. Conditions of exemption related to Article 9(2)

If all of a ship's voyages during the reporting period either start from or end at a port under the jurisdiction of a Member State and if the ship, according to its schedule, is planned to perform more than 300 voyages during the reporting period, the company may be exempted from the obligation to monitor relevant information on a per-voyage basis (Art. 9 (2) of the MRV Maritime Regulation) within the limits of point 2, Part C, of Annex II[[90]](#footnote-91). It is up to the decision of the company to make use of the exemption while providing evidence for meeting the eligibility criteria for the exemption.

Companies will be asked to lay down in their monitoring plans whether they opt for the exemption, respectively.

Further information on how to prepare the Monitoring Plan for companies making use of the exemption is provided in section 4.2 of the best practices document on monitoring and reporting.

#### Table C.2. Monitoring of fuel consumption

#### Table C.2.1. Methods used to determine greenhouse gas emissions and fuel consumption of each emission source

Companies can insert as an emission source one of the following categories: ‘All sources’, ‘Main engines’, ‘Auxiliary engines’, ‘Gas turbines’, ‘Boilers’, ‘Inert gas generators’, ‘Fuel cells’, ‘Waste incinerators’ or ‘Other’. Companies can select one (or more if it enhances the overall accuracy of the measurement) of the following categories: ‘Method A: BDN and periodic stock takes of fuel tanks’, ‘Method B: Bunker fuel tank monitoring on-board’, ‘Method C: Flow meters for applicable combustion processes’ or ‘Method D: Direct greenhouse gas emissions measurement’.

***Example***

|  |  |
| --- | --- |
| **Emission source** | **Chosen methods for fuel consumption** |
| All sources | Method B |

#### Table C.2.2. Procedures for determining fuel bunkered and fuel in tanks

The procedure must describe how bunkering is performed to ensure that tanks are fuelled with the agreed quantity[[91]](#footnote-92). Another procedure must describe how fuel consumption is monitored in a consistent and accurate manner. In addition, a procedure can be in place in case where an external, independent Bunker Quantity Survey (BQS) Surveyor comes on board so as to provide extra support in the procedure of fuel bunkering. Companies can create a list of forms involved during the bunkering procedure (Bunker Plan Record, Bunkering Checklist, Oil Transfer Procedures Table etc.). Companies furthermore must also develop dataflow activities with reference to fuel determination. When describing the procedures, companies should also indicate the responsible person(s), the locations where records are kept and, when applicable, the IT system used

#### Table C.2.3. Regular cross-checks between bunkering quantity as provided by BDN and bunkering quantity indicated by on-board measurement

The procedure must describe how the shipping company cross-checks the bunkering quantity between on board measurements vs. the quantity provided by the supplier as displayed on the BDNs.

***Example***

The Chief Engineer performs cross-checks between the sounding readings and the Bunker Delivery Note(s), every time upon completion of the bunkering operations. The quantity and receipt number of the Bunker Delivery Note(s) are recorded into the Sounding Form located on board.

#### Table C.2.4. Description of the measurement instruments involved

Companies must insert the name of the measurement instrument (i.e. tank sounding, flowmeter) involved (relevant to method A, B, C, D), the sources used (tanks, boilers, etc.) along with the technical characteristics (year of installation or purchased, maintenance period, accuracy etc.) in order to signify that the measurement equipment is in good condition. Measurement instruments must be regularly maintained, checked for correct functioning and calibrated. In case of malfunctioning detected, they must be replaced without undue delay[[92]](#footnote-93).

***Example***

|  |  |  |
| --- | --- | --- |
| **Measurement Equipment**  | **Elements applied to (Emission sources, tanks)** | **Technical Description (age, specification, maintenance intervals)** |
| Name of manufacture, Type (sounding tape, flowmeter, CO2 sensor), Model | Main engine | Date of Installation, Reference to manufacture specifications, Calibration and interval standards used, maintenance intervals. |

#### Table C.2.5. Procedures for recording, retrieving, transmitting and storing information regarding measurements

Shipping companies shall describe the whole process of how data information related to fuel is recorded, retrieved, transmitted and stored before it is reported into the annual emission report. Data flow diagrams and task lists are proven and helpful tools to understand the procedure, and should be provided unless similar information can be provided in a different way.

***Example***

**Recording and retrieving**: The Chief Engineer responsible for recording fuel measurements performs manually daily tank soundings (always as near as possible to xxx o’clock). Chief Engineer then informs the Master who is responsible for retrieving these values and entering them into the X system in order to be transmitted to shore.

**Transmitting and Storing**: The exchange of information or “transmitting” regarding fuel measurements for all greenhouse gas emissions sources installed on board, is governed by internal procedure (reference) sets clearly the steps which need to be followed: four types of reports (arrival, departure, noon and port) are sent from the Master through the system X to the Technical and Operations departments on shore each with specific values on the fuel consumed per greenhouse gas emission source at specific time intervals.

#### Table C.2.6. Method for determination of density of fuels

In the case where the amount of fuel bunkered or the amount of fuel remaining in the tanks is determined in units of volume or is measured through a volume flow meter, the company should convert that amount from volume to mass by using actual density values by using one of the following options:

1. on-board measurement systems;
2. the density measured by the fuel supplier at fuel bunkering and recorded on the fuel invoice or BDN;
3. the density measured in a test analysis conducted in an accredited fuel test laboratory, where available.

***Example***

Further information along with the usage of standard default values temperature correction have been provided in section 5.1 of the best practices document on monitoring and reporting.

#### Table C.2.7. Level of uncertainty associated with fuel monitoring

Fuel quantity determination is inherently subject to uncertainty. Point (f)(iv) of Article 6(3) of the MRV Maritime Regulation specifies that companies should develop a procedure to ensure the total uncertainty of fuel measurements is consistent with the requirements of the MRV Maritime Regulation. In order to limit administrative burden, the use of default values for the level of uncertainty associated with fuel monitoring may be considered, unless the shipping company has more detailed information available. Companies are encouraged to use actual uncertainty values in their procedures and in the monitoring plan. The purpose of knowing the uncertainty associated with emissions monitoring is to improve data quality over time, in particular when selecting the most appropriate monitoring method, and when measurement instruments need to be replaced.

For applicable default uncertainty values see section 4.10 of this document.

#### Table C.2.8. Procedures for ensuring quality assurance of measuring equipment

Companies should describe in the Monitoring Plan the procedures with regards the effective functioning of relevant measuring equipment (calibration; malfunctions, repairs; accuracy, determining reference figures and comparative measurements). Measuring equipment manuals, technical datasheets, certificates can be used as a reference. Often companies include this procedure within the Planned Maintenance System. Forms include but not limited to: Calibration status report or instrument calibration record.

Moreover, training and familiarization of personnel with the measuring equipment can also be included in the procedure.

***Example (in case of manual sounding)***

Before performing a sounding, the Chief Engineer or the crew member assigned by the Chief Engineer to perform the sounding, should make sure that: The sounding tape to be used is of sufficient length for the height of the tank to be gauged. The sounding tape is graduated in feet, inches, and fractions of an inch; feet and hundredths of a foot; or meters, centimetres, and millimetres. Markings are visible. The sounding tape is not kinked or spliced. In case any of the above does not hold, then the sounding tape should be discarded and a sounding tape fulfilling the criteria above should be used.

***Example (in case of flow meters)***

The quality of measuring equipment is supported by the fact that company performs maintenance and calibration of flow meters according to the manufacturer’s specifications and if not feasible by the operating experience. This is outlined in the company’s Planned Maintenance System (PMS) which describes clearly the procedure and the roles of doing so. Additionally the technical department checks periodically the output of the flowmeter to ensure that works properly.

If a flow meter malfunctions, then the chief engineer informs the technical department and all the necessary steps are followed to immediately replace it.

#### Table C.2.9. Method for determining the split of fuel consumption into freight and passenger part (for ro-pax ships only)

Companies should describe in the Monitoring Plan the procedures applied to allocate the amount of fuel consumption and respective greenhouse gas emissions to freight and passenger according to the EN 16258 by selecting either ‘Mass method’ or ‘Area method’.

#### Table C.2.10. Procedures for determining and recording the fuel consumption on laden voyages (voluntary monitoring)

Companies should describe in the Monitoring Plan the relevant procedures with a view to assist on a better understanding of the average energy efficiency indicators; specifically, by removing the ballast - no cargo - transported voyages, an alternative ‘laden’ average energy efficiency indicator could be derived, either using distance travelled or transport work (distance travelled and cargo carried) solely in relation to the laden voyages.

#### Table C.2.11. Procedures for determining and recording the fuel consumption for cargo heating (voluntary monitoring for chemical tankers)

Companies should describe in the Monitoring Plan the above procedures with a view to assist on a better understanding of the average energy efficiency indicators; specifically, by removing the amount of fuel consumed for heating cargo purposes, an alternative average energy efficiency indicator could be derived. This information could potentially serve the purpose of comparing the average energy efficiency indicators of two ships within the same category (type & size), as heated cargoes lead to an increase in the total fuel consumed.

#### Table C.2.12. Procedures for determining and recording the fuel consumption for dynamic positioning (voluntary monitoring for oil tankers and ‘other ship types’):

Companies should describe in the Monitoring Plan the above procedures with a view to assist on a better understanding of the average energy efficiency indicators; specifically, by removing the amount of fuel consumed for dynamic positioning purposes, an alternative average energy efficiency indicator could be derived. This information could potentially serve the purpose of comparing the average energy efficiency indicators of two ships within the same category (type & size), as dynamic positioning leads to an increase in the total fuel consumed.

#### Table C.3. List of voyages

Companies should provide details about the systems, procedures and responsibilities used to ensure the completeness of the list of voyages over the reporting period. The Table should provide a description of the procedure in place to keep an updated detailed list of voyages during the reporting period which are carried out under EU MRV scope, including the necessary information for the application of the methodology foreseen for the determination of emissions within ETS scope[[93]](#footnote-94). The procedures in place should ensure completeness and non-duplication of data.

Data flow procedures of recording, monitoring and reporting voyages along with the IT system diagram (if any) may be used.

***Example***

The recording of all voyages is done through the noon, arrival, departure and port reports which are reviewed by the Operations Department. This information is processed through system X, which maintains information for all in scope voyages. The filtering of EU MRV voyages as well as voyages falling under the EU ETS (either with 50% or 100% of their emissions), including of those benefitting from exemptions from surrendering obligations, is done through system X as per EU voyage definition.

#### Table C.4. Distance travelled

As explained in section 6 of the best practices document on monitoring and reporting, distance travelled is determined as distance over ground. Should the vessel be adrift (i.e. while waiting for a berth) the distance should be included as the vessel is underway.

***Example***

The distance travelled may be calculated by the two Electronic Chart Display and Information System (ECDIS) which are installed on board per vessel and connected with the two GPS apparatus. The Master reports distance travelled through the daily messages (departure/ noon/arrival) and records distance travel on the Log Book.

#### Table C.5. Amount of cargo carried & Number of passengers

Companies have to explain here how the amount of cargo carried will be compiled and calculated. Cargo carried can be recorded and retrieved in different ways. The method to be used actually has to be described in the monitoring plan. Companies will be asked to provide details about the procedures, responsibilities and data sources for determining and recording the cargo carried.

The monitoring plan should also use the units for determining ‘cargo carried’ as specified in Commission Implementing Regulation (EU) 2016/1928.

***Example (for a Tanker ship)***

Before loading, the Chief Officer performs ullage measurements using portable instruments (which are certified and annually inspected). A second ullage measurement is performed again upon completion of loading.

Ullage measurements on all cargo tanks are converted from volume to mass of cargo through utilisation of density. Cargo calculation reports are then cross-checked by the Captain with the Bill of Lading (B/L).

Loading takes place always at the presence of a Cargo Surveyor (who can be from the supplier’s side when loading or buyer’s side when unloading).

As a control, for every loading or unloading operations of more than 50 tonnes, a second measurement shall be obtained from electronic cargo tank soundings conducted by the Chief Officer before and after loading. Further cross-check is performed between cargo tank electronic readings and ullage measurements.

#### Table C.6. Time spent at sea

Determining and recording the time spent at sea from the arrival at the first berth and the departure of the last berth in a port, as explained in section 6 of the best practices document on monitoring and reporting.

Anchorage is excluded from time spent at sea.

***Example***

The Master reports the time as per the GPS indications (or the Master Clock(s) / local time zone or GMT) in the Deck Log Book and in the Daily Noon Reports, Arrival and Departure. Time spent at sea is calculated at the end of each voyage and recorded in the voyage documents.

### Part D Data gaps

The risk of the occurrence of data gaps should be minimized by developing an appropriate monitoring plan. The risk should be further reduced by carrying out a dedicated risk assessment and design of appropriate control activities and procedures (see section 6.2 of this document). However, it is not possible to completely exclude events that require the closure of a data gap.

There are several reasons for data gaps or estimations in order to deliver data to be used in the emissions report. It can be distinguished between events that require the closure of a data gap and those that require the correction of existing data. Corrective measures can be made by using secondary data. In contrast to this, estimations have to be used for real data gaps, i.e. when no information by the applied monitoring approach is available.

Companies will be asked to provide a description of the method to treat data gaps regarding the parameters other than fuel consumption (i.e. list of voyages, distance, total time spent at sea, cargo carried, number of passengers) as well as control activities to prevent missing data.

This may be the case if information is missing, lost or found corrupt. It should include a back-up solution for each parameter and a formula/description of the calculation.

For example, assume that a flow meter did not output values for 1 day. The Chief Engineer is responsible for noticing this data gap and applying the back-up monitoring method e.g. tank sounding. The Chief Engineer should report the failure promptly to the managing office. If for any other reason, the Chief Engineer cannot close or detect this data gap, then the shore side is responsible for closing it, by applying formulae, historic data etc.

#### Table D.1. Methods to be used to estimate greenhouse gas emissions and fuel consumption

For closing data gaps regarding greenhouse gas emissions and fuel consumption, shipping companies can select one of the four methods (A, B, C, D) not used as the main monitoring method, and describe how that is applied to estimate fuel consumption in case of a data gap.

***Example using Method A***

In the event of a data gap due to unexpected conditions, the performance manager (shore) communicates its existence to the Chief Engineer who fills the gap once arrival established using the average of the Remain On Board (ROB) difference between arrival and departure ROBs. He then records the value as an error to the engine log book and communicates this to the Performance Manager (shore).

***Example using Method B***

When the related data is missing, the Chief Engineer requests to perform as soon as possible tank sounding in order to close the gap. In the case where the missing data is not immediately identified then the responsible Superintendent closes the gap manually by using the average fuel consumption of the previous and the next day.

#### Table D.2. Methods to be used to treat data gaps regarding distance travelled

***Example***

In the event of a data gap related to distance travelled, while using an automated/electronic chart navigation system, the master can fill the gap by means of back-up methods such as terrestrial or celestial navigation being documented in the Deck Log Book.

#### Table D.3. Methods to be used to treat data gaps regarding cargo carried

***Example (bulk carrier)***

In the event of a cargo related document been lost and therefore the occurrence of a data gap, then the Master can report values from other cargo related documents such as Bill of Lading, Mate Receipt or Statement of Facts.

If the total transported cargo cannot be ascertained otherwise, the draft readings may be used to estimate it. From the drafts, the total displacement of the ship is calculated (based on the hydrostatic properties included in the stability booklet or loading computer). By subtracting the Light Weight of the ship, the content in all tanks, as well as consumables, provisions, spares and Crew, the Cargo can be derived.

#### Table D.4. Methods to be used to treat data gaps regarding time spend at sea

***Example***

In the event of a data gap related to time spent at sea, the responsible Operator must immediately communicate with the Master and raise the existence of it and close it using the data from the Statement of Facts documents.

The data gap can be filled by using the average of the time difference in hours between Arrival and Departure.

### Part E Management

#### Table E.1. Regular check of the adequacy of the Monitoring Plan

Companies shall check regularly, and at least annually, whether MRV Maritime a ship's monitoring plan reflects the nature and functioning of the ship and whether the monitoring methodology can be improved.

The company should provide a description of the procedure in place to regularly evaluate whether the monitoring plan remains adequate or whether a revision is needed.

The procedure should cover at least: checking the list of emissions sources ensuring that monitoring remains complete and that any relevant change in the nature and functioning of the ship is taken into due account; assessing compliance with the uncertainty values as identified in the monitoring plan; evaluating potential measures for improvement of the applied monitoring methodology.

***Example***

The HSQE manager includes the Monitoring Plan in the official company procedures being subject to review and/or updates through the Management of Change procedure. This should be done at least annually and on a when needed basis, for example when new flow meters are installed, new procedures are in place or roles and responsibilities are amended, and in general changes which can affect the Monitoring Plan of a vessel.

#### Table E.2. Procedures for data flow activities

The procedures should provide a clear picture of how data about fuel consumption, transport work and other relevant information is collected from various sources and aggregated for the emission report in accordance with the requirement of the MRV Maritime Regulation.

Data flow procedures can be described in writing in different forms. For simple data flows, a short description may be sufficient, while in complex cases a data flow diagram may be necessary. Examples for data flow activities include reading from instruments, sending samples to the laboratory and receiving the results, aggregating data, calculating the emissions from various parameters, and storing all relevant information for later use.

Where a number of procedures are used, the company should furthermore provide the details of an overarching procedure which covers the main steps of data flow activities along with a diagram showing how the data management procedures link together.

***Example***

The shipping company provides a brief description of the overarching procedure for MRV data flow management in the form of a task list: 1. Check on a weekly basis if the necessary data is available and complete; 2. Perform calculation; 3. Store results for finalising annual emissions report and verification activities. The procedure further list primary data sources (e.g. mass of fuel consumption, emission factors), further data processing steps, persons responsible for the procedure, and IT system used.

#### Table E.3. Procedures for risk assessment

The procedure contained in the monitoring plan should describe how the assessments of inherent risks and control risks are undertaken when establishing an effective control system, as contained in the risk assessment required under Part C of Annex I to the Regulation[[94]](#footnote-95).

***Example***

The company lists the different steps followed in performing the risk assessment, the impact levels, the probability of occurrence considered for each incident.

#### Table E.4. Control activities: Quality assurance and reliability of information technology

In case of an internal IT system used, the shipping company must ensure that the relevant systems are designed, documented, tested, implemented, controlled and maintained in a way that ensures processing reliable, accurate and timely data in accordance with the risks identified in accordance with the procedure described in Table E.3. In particular, shipping companies should describe the back-up procedure in place (i.e. how often are backups taken? Are they tested? Where are they stored? Who has access to those backups? etc.), the user access management procedure (i.e. who is responsible for granting privileges, are the super privileges reviewed? Password policy etc.), the change management procedure (i.e. how requests / issues are reviewed, tracked, are there any user acceptance tests performed?) as well as the logging & monitoring procedure admin action. The company should further ensure that the IT system’s data processing steps are documented in a transparent way and provide the verifiers with the possibility to test the integrity of the data and the data processing steps.

***Example***

* **Function tests**: Within a week after a new version of the process control software has been installed, the Chief Engineer performs a test for appropriate functioning, e.g. by entering test data from the previous month and comparing results with actual data obtained in the previous software version.
* **Backup to servers** will occur every day after regular business hours. Full backup includes all the primary files. Only one full backup will be done once a week. Incremental Backups includes only files that have changed since the last full backup. The next time an incremental backup is done, this file is skipped (unless it is modified again).
* **Access control**: Only software that logs access to core data is applied. The passwords are assigned by the IT department of the shipping company by applying procedure 123/2024.

#### Table E.5. Control activities: Internal reviews and validation of data relevant to Regulation (EU) 2015/757

Companies should have a procedure which ensures quality of information before submitting the respective reports to verifiers. The procedure should lay down checks to be performed within the shipping company, but to the extent feasible by independent persons not involved in the primary data collection. Minimum review checks may include: data completeness check; trend analysis (relative comparison of data over several years), comparison of fuel consumption reported with purchase records, criteria for rejecting data, etc.

***Example***

For example, this procedure will formalise all actions conducted by the Operations Department with regards to the checks and the reviews applied to measurements related to fuel, time, distance and cargo.

**Cargo**: The reported cargo values are observed so as to make sure that the number is not bigger than the DWT nominal value. If discrepancies are found, communication with the vessel is established.

**Distance**: Distances are validated by the Operations Department with the geographical shape and previous similar voyages. Noon reports and reported distances are checked on a monthly basis and validated. In rare cases where a big deviation is found, communication is established with the vessel directly.

**Time**: The Operations Department performs cross-checks between the sum of steaming hours + non steaming hours + off hire hours versus the difference (in hours) between dates from berth to berth. If a difference higher than 10 hours is identified, communication is established with the vessel directly and it is included as an error in the Logbook.

**Fuel consumption:** The Operations Department performs periodical consistency checks between the total amount and type of fuel purchased and bunkered (via BDNs), the fuel consumed (monitored & reported) together with the respective tanks (storage & service) stock-takes. This cross-check could be carried out on a single voyage basis or within a series of voyages over a given reporting period.

#### Table E.6.Control activities: Corrections and corrective actions

To establish a systematic and controlled way of reporting and reviewing any non-conformity identified within the Company or on board the vessels, and of deciding and following-up on corrections and corrective actions.

Non-conformity is an observed situation where the objective evidence indicates the non-fulfilment of a specific requirement. Such requirements are MRV related procedures, control and MRV management system performance.

The procedure to be described should include: (1) how an MRV non-conformity is reported, (2) Review of a non-conformity, (3) how to implement the corrective action and (4) how corrective actions are followed-up.

#### Table E.7.Control activities: Outsourced activities (if applicable)

A procedure for deciding how to outsource to a third party a service related to the shipping company’s MRV management system, and for ensuring quality of outputs.

The procedure should describe how the decision to outsource an activity related to MRV is taken, and how quality in delivered results is ensured. The Company should develop a Supplier Performance Rating system and a series of criteria (e.g. level of confidence, response and time availability etc.) based upon which the quality of the services received by the third party is assessed at periodic intervals depending on the length of the outsourced service.

#### Table E.8.Control activities: Documentation

All companies which are ISM certified do have in place such a procedure for the relevant documentation. The procedure should further be extended to include all MRV relevant documents and data, specifying the process of document and data retention, including how the data is stored so that any relevant information is made readily available upon request of the Administering Authority or the verifier.

A version management system for relevant documentation should be established, so that users can easily identify the versions in force of relevant documents and track revision history.

All records should be kept in specific files both on board and in the office and be legible, readily identifiable and retrievable. Records should be stored and retained in such a manner as to avoid deterioration or damage.

***Example***

The Company’s filing system is divided in the filing system of each department (i.e. Operations Department, Technical Department and HSQE Department). Each Department is responsible to maintain all hard copies in the floor it is located for at least 5 years after the date of issue. Document of compliance should be kept for at least 18 months.

The filing system on board each ship is divided in the systems of the Master, Chief Engineer, Chief Officer and bridge. All records are retained for at least 5 years after the date of issue. Copies of information not contained in Thetis MRV are kept for 10 years at the office of the shipping company.

### Part F Further Information

#### Table F.1.List of definitions and abbreviations

Companies should list any (individual) abbreviations, acronyms or definitions that they have used in completing this monitoring plan (e.g. PMS: Plant Management System, SMS: ship Management system etc.).

#### Table F.2.Additional information

In this chapter companies may enter any additional information on the MRV matter that they consider relevant for their ship and relevant management procedures (e.g. Data flow diagrams, tasks lists, organizational diagram etc.)

# Annex II – Biofuels and zero-rating

## Demonstrating compliance with sustainability criteria for biofuels

*Note: In order to make this guidance document a self-standing information source for shipping companies, section 8.1 contains a (slightly adjusted) copy of relevant parts of* [*MRR Guidance Document No.3*](https://climate.ec.europa.eu/document/download/2289952b-4d59-494c-8c49-c0a559c403d6_en?filename=gd3_biomass_issues_en.pdf) *(GD3, Biomass issues in the EU ETS)[[95]](#footnote-96). However, detailed information on the functioning of RED certification schemes are not repeated here. Therefore, the interested reader is invited to look up those details in GD3.*

### Alignment of EU ETS and RED

An important element of the MRR[[96]](#footnote-97) for phase 4 of the EU ETS is the alignment of requirements for biomass with those of the Renewable Energy Directive (RED).



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| The exact rules for the application of zero-rating rules are currently under review in the MRR, as rules for RFNBO/RCFs will be included. An update of this guidance will be provided when those rules have been become available. |



The relevant provisions for applying **sustainability and GHG savings criteria** ( this document refers to them as the “**RED criteria**”) are found in Article 38(5) of the MRR. That Article requires that the RED criteria have to be met in order to apply an (CO2) emission factor of zero to biomass. This is referred to as “zero-rating” the biomass in this document. Article 38(5) clarifies that **if those criteria are not met, the material must be treated like a fossil fuel**, i.e. in context of the MRV Maritime Regulation that the default emission factor as given in Annex I of that Regulation has to be used.

### Definitions

Article 3 of the MRR copies the biomass-related definitions[[97]](#footnote-98) from the RED as follows:

*'(21) ‘biomass’ means the biodegradable fraction of products, waste and residues from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of waste, including industrial and municipal waste of biological origin;*

*(21a) ‘biomass fuels’ means gaseous and solid fuels produced from biomass;*

*(21b) ‘biogas’ means gaseous fuels produced from biomass;*

*(22) ‘bioliquids’ means liquid fuel for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass;*

*(23) ‘biofuels’ means liquid fuels for transport produced from biomass;*

From these definitions, the following can be concluded:

* In the context of installations:
* Gaseous biomass is referred to as **biogas**, but it is also included in the term **biomass fuel** is used;
* Liquid biomass is referred to as **bioliquid**. The term “biofuel” is relevant only for transport purposes (in the EU ETS this is important for aviation).
* Solid biomass is included in the term **biomass fuel**.
* In the context of aircraft operators:
* Only liquid fuels are currently used for aviation. Liquid biomass is referred to as “**biofuel**”, as it is relevant for transport purposes.
* **For shipping companies, liquid biofuels as well as biogas[[98]](#footnote-99) (including in liquefied form, “bio-LNG”) will be relevant.**

### Implications of the RED criteria

A source stream[[99]](#footnote-100) *(for shipping companies, only fuels are relevant)* can be either fossil, biomass or a mixture of both. The application of RED criteria leads to the need to distinguish furthermore the following types of source streams (some may appear as theoretical cases):

1. Fossil source streams;
2. Biomass where sustainability and/or GHG savings criteria apply[[100]](#footnote-101):
* Criteria are satisfied: Biomass is zero-rated;
* Criteria are not satisfied: Biomass is treated like a fossil source stream, i.e. allowances must be surrendered for these emissions.
1. Biomass where RED criteria do not apply: Always zero-rated (case not relevant except for stationary installations).
2. Mixed source streams[[101]](#footnote-102):
3. Fossil / biomass mix, where either RED criteria do not apply, or where they apply and are satisfied: The emission factor is the preliminary emission factor[[102]](#footnote-103) multiplied by the fossil fraction.
4. Fossil / biomass mix, where RED criteria apply and are not satisfied: The whole source stream is treated as fossil.
5. Biomass mix or fossil / biomass mix, where RED criteria apply and only a part of the biomass satisfies the applicable RED criteria: These source streams are to be treated like those under point 4(a), with the non-sustainable part considered as part of the fossil fraction.



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| Examples of source streams:* Point (a): This could be fibre wood panels, where biomass (wood, for which the RED criteria are satisfied by certification under a voluntary scheme) is mixed with resins which are usually made from fossil raw materials.
* Point (b): This could be a liquid fuel where the supplier claims that x% biofuel has been added, but does not provide evidence for meeting the RED criteria for that amount.
* Point (c): An example would be rape seed methyl ester (“biodiesel”), where the rape seed oil satisfies the sustainability criteria and respective evidence is provided, while the methanol is either stemming from fossil sources, or where it is claimed to be biomass, but no evidence for meeting the RED criteria is available.
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Note that the above classification assumes that the whole source stream has the same composition, or is analysed using the same methodology where calculation factors are not based on default values[[103]](#footnote-104). However, the situation may occur that a certain biofuel, bioliquid or biomass fuel is used, where some batches delivered do satisfy the relevant RED criteria, while other batches do not (or where the operator, aircraft operator or shipping company does not hold the necessary proofs of sustainability). In such a case the operator or aircraft operator may in its monitoring plan and emissions report either consider this material as one source stream with different biomass fraction values, or as two distinct source streams, one being biomass without meeting RED criteria, and one biomass with RED criteria met. In case of MRV Maritime, the shipping company does not have that choice, but each fuel must be reported always separately.

The same approaches apply to mixed source streams where the biomass fraction only sometimes complies with the relevant sustainability criteria[[104]](#footnote-105).



The above considerations lead to practical **consequences when setting up the monitoring plan** in relation to biomass: The simplest way forward would be to establish a written procedure[[105]](#footnote-106) which requires the shipping company to attribute each batch of biofuel used for activities covered by the EU ETS to either a “RED compliant biofuel”[[106]](#footnote-107) or to a “non-RED complaint biofuel”, depending on whether a proof is available for meeting the applicable sustainability and/or GHG savings criteria or not. The ways of obtaining such proof are discussed in section 8.2 below.

## Practical approach for RED criteria



The Commission’s website dedicated to renewable energy is:
<https://energy.ec.europa.eu/topics/renewable-energy_en>

Information on voluntary schemes for certification of biofuels and biomass fuels can be found at <https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/voluntary-schemes_en>

These websites should be useful for looking for guidance on all issues regarding the assessment of RED criteria which is not covered by guidance on the EU ETS websites.

According to the RED, there are three ways in which economic operators can demonstrate compliance with the sustainability and GHG savings criteria for biofuels, bioliquids and biomass fuels:

* by means of a ‘national scheme’[[107]](#footnote-108);
* by using a ‘voluntary national or international scheme’ that the Member State accepts. If the Commission has formally recognised the scheme, the certificates and proofs of sustainability of the scheme must be accepted by all Member States. Therefore, using a recognised scheme gives legal certainty to economic operators, ensures harmonised implementation of the RED requirements and reduces the need for additional documentation;
* by providing all relevant evidence and GHG calculations themselves, having the information appropriately audited[[108]](#footnote-109) (if this approach is accepted by national authorities in the Member State).

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| For shipping companies which plan to purchase biofuels outside the EU, **only the option using (international) voluntary schemes recognised by the Commission** is an available option. For biofuels purchased in a Member State, other national or voluntary schemes recognised by the Member State may also be used.  |

**For zero-rating biomass under the EU ETS MRV rules, the burden of proof concerning a biofuel, bioliquid or biomass fuel meeting the requisite sustainability and/or GHG savings criteria remains with the installation’s operator or aircraft operator, or shipping company.** Possible proof can be provided from applicable documentation ensuring compliance with a national system or the availability of certificates containing evidence of sustainability issued under a voluntary scheme recognised by the Commission or the installation’s (or aircraft operator’s administering) Member State under the RED (see sections 8.2.3 to 8.2.4).

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| The Member State relevant for the maritime sector in the EU ETS is the Member State of the administering authority (see section 2.4).  |

The evidence provided should furthermore indicate the amount of delivered biomass and identify the batch to which they relate. If the biomass has not already been certified (or where the certification does not cover all steps in the supply chain), the operators, aircraft operators or shipping companies would have to perform the necessary assessment themselves and have it audited accordingly by an auditor accepted by the Member State’s legislation. Note, however, that the national legislation of the Member State may contain other provisions. Some Member States may e.g. accept only biomass that has been certified by a scheme recognised by the Commission.

**Where compliance with the applicable RED criteria cannot be confirmed to the satisfaction of the administering authority[[109]](#footnote-110), the biofuel, bioliquid or biomass fuel will have to be treated like a fossil source stream and not zero-rated.**

### General responsibilities



The Member State where the installation is situated, the administering Member State in case of aircraft operators, or the Member State of the administering authority in case of shipping companies is responsible for defining the rules under which compliance with the RED criteria must be demonstrated for the biofuels, bioliquids and biomass fuels used within the Member State. Biomass certification schemes under the RED can cover different parts of the supply chain, and “economic operators” are often certified for only part of the supply chain. For the purpose of the EU ETS the burden of proof for compliance with the RED criteria is on the user of the biomass, i.e. the operator of the installation, the aircraft operator or the shipping company, as these are the persons who have the obligation of reporting emissions. However, for practical reasons, they will often have to rely on data and information provided by third parties, i.e. either the supplier or producer of the biomass or biofuel.

### Which criteria apply?



In most cases where “biomass” is mentioned in the MRR, it is added that “Article 38(5) applies”. That article[[110]](#footnote-111) clarifies the relationship between the MRR requirements and the RED, and in particular how the sustainability and GHG saving criteria of the RED are to be applied in order to allow the emissions from biomass to be zero-rated. The following points are worth noting:

* As the RED applies to renewable energy, the RED criteria apply only to energy uses of biomass in the EU ETS, i.e. to combustion emissions within the meaning of the MRR[[111]](#footnote-112). This is clarified in the MRR itself, as Article 38(5) states “… *biofuels, bioliquids and biomass fuels used for combustion shall fulfil the sustainability and the greenhouse gas emissions saving criteria*…”
* As the RED itself does not contain a definition of the term “installation”, the MRR clarifies that the definition of “installation” of the EU ETS Directive applies[[112]](#footnote-113).
* Not all the criteria given in Article 29 of the RED apply. the following elements should be taken into account:
	+ The “land related” sustainability criteria of Article 29(2) to (7) of the RED apply;
	+ The GHG saving criteria of Article 29(10) of the RED apply;
	+ The additional efficiency criteria for electricity production (Article 29(11) of the RED) do *not* apply;
	+ Some provisions contained in Article 29(1) of the RED are copied into the MRR in order to clarify their applicability. In particular, this includes the simplification that for municipal solid waste the GHG saving criteria do not apply.
	+ Furthermore, **the RED criteria apply irrespective of the geographical origin of the biomass**.

*Guidance document No.3 contains a “decision tree” in section 3.4.2, which describes in detail for which types of materials the sustainability criteria, the GHG savings criteria, both or none of the RED criteria apply. However, as for shipping companies it is assumed that they will rely on RED certification schemes, the details are not repeated here.*

### National systems in EU Member States

Member States’ implementations of the RED are currently partly still under development. They use diverse approaches. There is no complete overview available of Member States’ national systems on providing evidence of biomass sustainability and GHG savings. Operators, aircraft operators and shipping companies should obtain information on national systems from the relevant competent or administering authority.

The RED does not explicitly require a Member State to publish dedicated information. However, it is considered best practice to provide transparent information to operators. For the purpose of the EU ETS, Member States are therefore encouraged to consider practical ways of making information available to the public regarding the sustainability of biomass (by producer, brand, generic type or other suitable grouping), suppliers or producers thereof, or similar information, which allow the user of these biofuels, bioliquids or biomass fuels (and any EU ETS verifier) to gather assurance that a material complies with the applicable sustainability criteria.



Under the RED, Member States may use the possibility of Article 30(6) to notify a national scheme to the Commission for recognition. If such recognition is granted, the relevant information will be published on the Commission website[[113]](#footnote-114), and all other Member States are required to accept the resulting certificates, like it is the case of voluntary international schemes recognised by the Commission. However, the use of international voluntary systems may be desirable in many cases where the biofuel, bioliquid or biomass fuel is not used in the Member State where it is produced (e.g. in the aviation sector).

### Voluntary schemes

Details on all voluntary schemes recognised by the Commission can be found on the Commission’s website[[114]](#footnote-115). Regarding schemes not [yet] recognised by the Commission, Member States may accept those schemes, if they come to their own conclusion that the scheme ensures compliance of the biomass with RED criteria. Under the same conditions, the Member States may continue the acceptance of certificates issued by schemes approved under the RED I. However, Member States may have also other specific provisions in their legislation, e.g. allowing only schemes that have been recognised by the Commission. Hence, except when using schemes recognised by the Commission, shipping companies will always have to check with their competent authority or national legislation how to provide evidence that the biomass used complies with the RED criteria.

The most important aspect of the schemes recognised by the Commission is their applicability across the EU in a harmonised manner. This means that a biofuel, bioliquid or biomass fuel certified under such a recognised scheme will have to be recognised as sustainable in all Member States.

An operator or shipping company who purchases a biofuel, bioliquid or biomass fuel which has received a proof of sustainability from a recognised voluntary scheme (i.e. a certificate of compliance with that scheme’s rules), may in any case assume that it can be considered sustainable under the RED, and can be used with an emission factor of zero in the EU ETS[[115]](#footnote-116). However, there are important limitations:

* The operator or shipping company has to be aware that some voluntary schemes are approved only for some fuel types, some of the required criteria (e.g. only the sustainability criteria or only the GHG savings criteria), or only regarding some steps of the value chain (e.g. only collecting and trading, or only the actual biofuel production or processing stage, etc.). If applicable, another proof must be obtained for the remaining criteria or missing parts of the value chain.
* In particular the GHG savings criteria are highly dependent on the distance of transport to the EU ETS installation, aerodrome or port (see default values in Annex VI of RED). Hence, if the economic operator under the certification scheme does not carry out the verification of the GHG savings criterion specifically for each site where the biomass is used, the operator or shipping company will have to provide its own evidence for this purpose and ensure appropriate verification, or request an economic operator under the certification scheme (e.g. the fuel supplier) to provide the missing certification. The latter may often be preferred by operators due to its simplicity, and may be required by the installation’s Member State or aircraft operator’s administering Member State, or the shipping company’s administering authority.
* Some sustainability schemes cover a wider scope than just RED criteria. Many have an international background. Some have set up a specific version of the same overarching scheme for the purpose of demonstrating RED compliance. Only the latter is recognised by the Commission. operators, shipping companies, verifiers and competent authorities should be aware of these differences (where applicable), and use only certificates which explicitly refer to those “RED compliant versions” of the voluntary schemes as eligible for zero-rating in the EU ETS.
* Some schemes are recognised with limited geographical scope (e.g. if auditing services are available only in specific countries).
* The Commission’s recognition of voluntary schemes are usually valid for five years. Furthermore, economic operators’ certification can be suspended by the certification scheme. Only biofuels, bioliquids or biomass fuels covered by a valid recognition are eligible for zero-rating in the EU ETS.

Since all voluntary schemes are required to publish their rules, their certification bodies and the certificates issued on their website, operators of EU ETS installations, aircraft operators and shipping companies can obtain all the required information. In case of doubt, direct contact to the certification scheme operator should be sought.

### How do RED certification schemes work?

Note: This section may apply to both, national or international schemes, which may be voluntary or required by Member States.

*Guidance document No.3 contains details on this topic in section 3.4.5. It is assumed that shipping companies will rely on such RED schemes, but the level of detail in GD3 exceeds their needs. In short, the certifications schemes under the RED must comply with the Implementing* *Act[[116]](#footnote-117) pursuant to Article 30(8) of the RED.*

**RED “Certificate” vs. “Proof of Sustainability”**



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| A *certificate*[[117]](#footnote-118) is what certifies that an economic operator complies with the rules of the certification scheme. The *Proof of Sustainability*[[118]](#footnote-119) *(PoS)* is issued by the certified economic operator for confirming that a certain consignment of biomass material, biofuel, biogas, or biomass fuel fulfils the sustainability or GHG savings criteria. |

The role of a certification body is different from the EU ETS verifier in that not specific environmental data are verified, but the certification means that the **economic operator is** **certified as being capable** of managing the sustainability information, GHG savings data or the relevant mass balance system, depending on the certification scope. Depending on the certification scheme’s rules, such certificate is valid for one year from the certification[[119]](#footnote-120) (i.e. forward-looking, while EU ETS verification confirms data from the past). This does not mean that the auditor will not check data from specific consignments (batches) of biomass, but still the certificate proves that the economic operator is capable of issuing “proofs of sustainability” for the biomass material, biofuel, biogas or biomass fuel.



For the EU ETS shipping companies this means that **the evidence required is the “proof of sustainability”** for each of the consignments (batches) of biofuel used so that CO2 emissions from biomass can be zero-rated in the annual emissions report. The evidence can be obtained by one of the following methods:

* The supplier[[120]](#footnote-121) of the biofuel provides a proof of sustainability for the biofuel purchased by the shipping company. The shipping company (and EU ETS verifier) would only have to check if the full value chain[[121]](#footnote-122) and all required RED criteria are covered. For the GHG savings criteria, emissions from transport to point of bunkering need to be included.
* For installations, other options exist, which are less likely to be applicable to aircraft operators and shipping companies, but theoretically possible:
* If the operator of the EU ETS installation, aircraft operator or shipping company has obtained a certificate from a certification scheme, the operator can apply the processes it has established for obtaining the certification, and issue proofs of sustainability for the biomass in question, and manage its own mass balance system for this purpose.
* Alternatively, and if applicable, the operator, aircraft operator or shipping company can apply other processes or certification rules, e.g. rules provided by a national scheme or directly by the Member State’s legislation, taking into account any specific rules for auditing provided by the Member State.

# Annex IV

## Acronyms

AA Administering Authority

AER Annual Emissions Report

AVR Accreditation and Verification Regulation (A&V Regulation)

BDN Bunker Delivery Note

CA Competent Authority

CCS Carbon Capture and [geological] Storage

CEMS Continuous Emission Measurement System

EU ETS EU Emission Trading System

MP Monitoring Plan

MPE Maximum Permissible Error (term usually used in national legal metrological control)

MRR Monitoring and Reporting Regulation (M&R Regulation)

MRV Monitoring, Reporting and Verification

MS Member State(s)

*[to be completed in next Version]*

## Legislative texts

**EU ETS Directive**: Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, amended several times. Download of the consolidated version:
<http://data.europa.eu/eli/dir/2003/87/2023-03-01>

**MRV Maritime Regulation**: Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC, <http://data.europa.eu/eli/reg/2015/757/2024-01-01>

**Relevant implementing and delegated acts:**

**Administration of shipping companies:** Commission Implementing Regulation (EU) **2023/2599** of 22 November 2023 laying down rules for the application of Directive 2003/87/EC of the European Parliament and of the Council as regards the administration of shipping companies by administering authorities in respect of a shipping company; <http://data.europa.eu/eli/reg_impl/2023/2599/oj>

**Templates**: Commission Implementing Regulation (EU) **2023/2449** of 6 November 2023 laying down rules for the application of Regulation (EU) 2015/757 of the European Parliament and of the Council as regards templates for monitoring plans, emissions reports, partial emissions reports, documents of compliance, and reports at company level, and repealing Commission Implementing Regulation (EU) 2016/1927; <http://data.europa.eu/eli/reg_impl/2023/2449/oj>

**Transhipment ports:** Commission Implementing Regulation (EU) **2023/2297** of 26 October 2023 identifying neighbouring container transhipment ports pursuant to Directive 2003/87/EC of the European Parliament and of the Council
<http://data.europa.eu/eli/reg_impl/2023/2297/oj>

**Islands and PSOs** (Public Service obligations): Commission Implementing Decision (EU) **2023/2895** of 19 December 2023 laying down the list of islands and ports referred to in Article 12(3-d) of Directive 2003/87/EC of the European Parliament and of the Council and the list of transnational public service contracts or transnational public service obligations referred to in Article 12(3-c) of that Directive; <http://data.europa.eu/eli/dec_impl/2023/2895/oj>

**Update of MRV Annexes** – Commission Delegated Regulation (EU) **2023/2776** of 12 October 2023 amending Regulation (EU) 2015/757 of the European Parliament and of the Council as regards the rules for monitoring greenhouse gas emissions and other relevant information from maritime transport; ELI: <http://data.europa.eu/eli/reg_del/2023/2776/oj>

**A & V Rules**: Commission Delegated Regulation (EU) **2023/2917** of 20 October 2023 on the verification activities, accreditation of verifiers and approval of monitoring plans by administering authorities pursuant to Regulation (EU) 2015/757 of the European Parliament and of the Council on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport, and repealing Commission Delegated Regulation (EU) 2016/2072;
<http://data.europa.eu/eli/reg_del/2023/2917/oj>

**Aggregated** Company-level reporting: Commission Delegated Regulation (EU) **2023/2849** of 12 October 2023 supplementing Regulation (EU) 2015/757 of the European Parliament and of the Council as regards the rules for reporting and submission of the aggregated emissions data at company level;
<http://data.europa.eu/eli/reg_del/2023/2849/oj>

**RED**: Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast). <http://data.europa.eu/eli/dir/2018/2001/2023-11-20>

1. Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of greenhouse gas emissions from maritime transport, and amending Directive 2009/16/EC (Text with EEA relevance); Consolidated version: <http://data.europa.eu/eli/reg/2015/757/2024-01-01> [↑](#footnote-ref-2)
2. Established by the “EU ETS Directive”: 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. Consolidated version: <http://data.europa.eu/eli/dir/2003/87/2024-03-01> [↑](#footnote-ref-3)
3. Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC, <http://data.europa.eu/eli/reg/2023/1805/oj> [↑](#footnote-ref-4)
4. Irrespective of the ship type, naval auxiliary activities by the ship will be considered out of MRV scope, as long as the ship can prove, to the satisfaction of Member State authorities, that the relevant activities qualify as naval auxiliary services to the State, for instance by providing a statement released by the authorities they are assisting certifying the nature of such activities as non-commercial ones. During the reporting period, the same ship may indeed carry out also commercial activities not qualifying as naval auxiliary services to a country, in which case those would fall under MRV scope. [↑](#footnote-ref-5)
5. <https://climate.ec.europa.eu/document/download/edc93136-82a0-482c-bf47-39ecaf13b318_en?filename=GD0%20-%20Annex%20I%20to%20EU-ETS%20Directive.2024.pdf> [↑](#footnote-ref-6)
6. EU ETS MRVA Website: <https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/monitoring-reporting-and-verification-eu-ets-emissions_en#documentation>

 The following information sources are most important: [Quick Guide for operators](https://climate.ec.europa.eu/document/download/535fc76c-4466-4568-a88a-e205a5ee0d6f_en?filename=quick_guide_operators_en.pdf); GD1 ([General guidance for installations](https://climate.ec.europa.eu/document/download/d4f11230-9126-41a8-8c42-6131cd4e742e_en?filename=gd1_guidance_installations_en.pdf)) and the [Monitoring Plan template](https://climate.ec.europa.eu/document/28e0bd9c-a805-4cc2-b3a9-efee00107f78_en). [↑](#footnote-ref-7)
7. <http://data.europa.eu/eli/reg_impl/2023/2297/oj> [↑](#footnote-ref-8)
8. This act (Commission Implementing Decision (EU) 2023/2895) covers both the list of islands relevant under Article 12(3-d) and the routes of public service obligations required by Article 12(3-c). <http://data.europa.eu/eli/dec_impl/2023/2895/oj>. [↑](#footnote-ref-9)
9. All the emissions associated to a voyage benefitting from one of the derogations mentioned in this section 2.3.3 will benefit from the derogation to surrender allowances, even those taking place within port. As an example, for a voyage Lisbon/Funchal (where Madeira is the Outermost Region of the same Member State – Portugal)/Porto, both the emissions from the leg Lisbon/Funchal and Funchal/Porto will benefit from the derogation, as well as the emissions taking place within the port of call in Funchal. The same applies to cases of derogations granted under Article 12(3-d) and 12(3-c) of the EU ETS Directive. [↑](#footnote-ref-10)
10. Commission Implementing Decision (EU) 2024/411 of 30 January 2024 on the list of shipping companies specifying the administering authority in respect of a shipping company in accordance with Directive 2003/87/EC of the European Parliament and of the Council, <http://data.europa.eu/eli/dec_impl/2024/411/oj> [↑](#footnote-ref-11)
11. <https://mrv.emsa.europa.eu/#public/eumrv>. You should perform the following steps:

	* Create a user account in the THETIS-MRV system (if not already existing);
	* Add the new company to the user account;
	* If established in an EEA country, according to the information recorded in THETIS-MRV, the company may already send a request to the THETIS-MRV Helpdesk to be assigned to the administering authority of that EEA country.
	* If established in a non-EEA country, first, ensure that all the ships under the company’s responsibility falling within EU ETS scope are assigned to the company account in THETIS-MRV, and thereafter, send a request to the THETIS-MRV Helpdesk to be assigned to the administering authority of the EU Member State where the first port of call took place.
	* The helpdesk can be contacted under thetis@emsa.europa.eu. [↑](#footnote-ref-12)
12. ISM: International Safety Management Code. The ISM Company is the company which manages the ship’s affairs under the ISM. [↑](#footnote-ref-13)
13. A bareboat charterer cannot be considered as the shipowner within the meaning of the EU ETS Directive. This consideration also applies in the case where the ship is subject to a ‘parallel registration’ in the registry of two administrations. However, a bareboat charterer can be responsible for compliance with EU ETS and MRV in respect of a given ship if that bareboat charterer has accepted to assume ISM Code responsibilities in respect of that ship, and the conditions for ISM ´Companies’ responsibility for EU ETS and MRV are fulfilled. [↑](#footnote-ref-14)
14. Commission Implementing Regulation (EU) 2023/2599 of 22 November 2023 laying down rules for the application of Directive 2003/87/EC of the Europe-an Parliament and of the Council as regards the administration of shipping companies by administering authorities in respect of a shipping company; <http://data.europa.eu/eli/reg_impl/2023/2599/oj> [↑](#footnote-ref-15)
15. Article 11(2): “*Where there is a change of company, the previous company shall submit to the administering authority responsible, to the authorities of the flag States concerned for ships flying the flag of a Member State, to the new company and to the Commission, as close as practicable to the day of the completion of the change and no later than three months thereafter, a verified report covering the same elements as the emissions report referred to in paragraph 1, but limited to the period corresponding to the activities carried out under its responsibility.*” [↑](#footnote-ref-16)
16. Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No 601/2012, consolidated version: <http://data.europa.eu/eli/reg_impl/2018/2066/2024-01-01> [↑](#footnote-ref-17)
17. The MRV Maritime Regulation does not specify a specific period for storage. For orientation, the MRR for the EU ETS requires data storage for 10 years. [↑](#footnote-ref-18)
18. Through Regulation (EU) 2023/957 of 10 May 2023. [↑](#footnote-ref-19)
19. According to national legislation, this deadline may be earlier, but not before 28 February. Note that before the introduction into the EU ETS, this deadline was 30 April under the MRV Maritime Regulation. The first year in which the new deadline applies is 2025, covering the emissions of 2024. [↑](#footnote-ref-20)
20. For the purpose of simplification, the surrender of allowances has not been included in the picture. Similarly, the picture also ignores the processes of allocation and trading of allowances. [↑](#footnote-ref-21)
21. A non-significant change would be e.g. only the change of the shipping company without other change to the MP. [↑](#footnote-ref-22)
22. The Member State of the administering authority may require earlier submission, but not earlier than 28 February. [↑](#footnote-ref-23)
23. Article 11(2) of the MRV Maritime Regulation: “*Where there is a change of company, the previous company shall submit to the administering authority responsible, to the authorities of the flag States concerned for ships flying the flag of a Member State, to the new company and to the Commission, as close as practicable to the day of the completion of the change and no later than three months thereafter, a verified report covering the same elements as the emissions report referred to in paragraph 1, but limited to the period corresponding to the activities carried out under its responsibility.*” [↑](#footnote-ref-24)
24. As in point 2.1 and point 2.2, Part C of Annex II to the Maritime MRV Regulation. [↑](#footnote-ref-25)
25. Article 12(3-b), 12(3-c) or 12(3-d) of the ETS Directive provide for specific derogations related to, respectively, outermost regions, certain transnational public service contracts or obligations, and specific small islands with no road or rail link with the mainland and with a population of fewer than 200 000 permanent residents. See section 5.2 of this guidance document for details. [↑](#footnote-ref-26)
26. This exceptional obligation to monitor on a per-voyage basis only affects the voyages and corresponding emissions falling under the scope of the said derogations, and does not require additional per-voyage monitoring on routes where the shipping company had no per-voyage monitoring obligations prior to the inclusion in the EU ETS. [↑](#footnote-ref-27)
27. That is the case of slippage coefficients for LNG and nitrous oxide emissions factors for hydrogen. [↑](#footnote-ref-28)
28. The application of method C may not be necessary if that emissions source is fed through a dedicated separate tank or if the same dedicated tank feeds a set of emissions sources of the same emissions source type. In such cases, the same result can be attained through application of method A or method B. [↑](#footnote-ref-29)
29. Annex I Part B point 1 specifies: “*The fuel contained in tanks at the beginning of the period, plus fuel deliveries during the period, minus fuel available (i.e. contained in tanks) at the end of the period and de-bunkered fuel between the beginning of the period and the end of the period together constitute the fuel consumed over the period.*” [↑](#footnote-ref-30)
30. Not all fuel types as in point 2, Part A of Annex I to the EU MRV Regulation are assigned an emissions factor value. In some cases, a value may not be available yet, and the symbols TBM (to be measured), N/A (not applicable), or a dash are shown. As specified in Annex I to the MRV Maritime Regulation, where a cell in the table indicates either TBM or N/A, the highest default value of the fuel class in the same column of the table as shown under point 2 shall be used. Where, for a particular fuel class, all cells in the same column indicate either TBM or N/A, the default value of the least favourable fossil fuel type shall be used. This rule does not apply to slippage coefficients, for which the symbol TBM or N/A refers to non-available values for the emissions source, in which cases a certified value in accordance with Article 10(6) of Regulation (EU) 2023/1805 shall be used. [↑](#footnote-ref-31)
31. Accordingly, the table under point 2, Part A of Annex I to the EU MRV Regulation indicates the value ‘not applicable’ for the slippage coefficient for MDO. [↑](#footnote-ref-32)
32. Annex I Part B point 4 specifies: “*The direct greenhouse gas emissions measurements may be used for voyages and for greenhouse gas emissions occurring within ports located in a Member State’s jurisdiction. For ships for which CO2 reporting is based on this method applied to all emissions sources on board the ship, the fuel consumption shall be calculated using the measured CO2 emissions and the applicable emission factors of the relevant fuels and emission sources. This method is based on the determination of greenhouse gas emissions flows in exhaust gas stacks (funnels) by multiplying the greenhouse gas concentrations of the exhaust gas with the exhaust gas flow. The application of this method to determine emissions of a greenhouse gas shall not prevent companies from applying any other of the methods described under this Part to any other greenhouse gas. The calibration methods applied and the uncertainty associated with the devices used shall be specified in the monitoring plan.*” [↑](#footnote-ref-33)
33. <https://climate.ec.europa.eu/document/download/d4f11230-9126-41a8-8c42-6131cd4e742e_en?filename=gd1_guidance_installations_en.pdf> [↑](#footnote-ref-34)
34. <https://climate.ec.europa.eu/document/download/923025bb-76c8-4382-af9e-7db6f5eedb4c_en?filename=policy_ets_monitoring_gd7_cems_en.pdf> [↑](#footnote-ref-35)
35. Also a standard material, such as e.g. a copy of the kilogram prototype, disposes of an uncertainty due to the production process. Usually this uncertainty will be small compared to the uncertainties later down in its use. [↑](#footnote-ref-36)
36. The MRV Maritime Regulation defines in Article 3(k): ‘uncertainty’ means a parameter, associated with the result of the determination of a quantity, that characterises the dispersion of the values that could reasonably be attributed to the particular quantity, including the effects of systematic as well as of random factors, expressed in per cent, and describes a confidence interval around the mean value comprising 95% of inferred values taking into account any asymmetry of the distribution of values. [↑](#footnote-ref-37)
37. Operators of stationary installations must furthermore demonstrate compliance with specific tiers, which are related to permissible uncertainty levels. [↑](#footnote-ref-38)
38. <https://climate.ec.europa.eu/document/download/873cfdb7-4039-4170-b3bb-49e1800ac320_en?filename=policy_ets_monitoring_gd4_guidance_uncertainty_en.pdf> [↑](#footnote-ref-39)
39. In case of transfer of ownership of a ship, the shipping company responsible for the ship before the transfer has to compile a similar report for the time period before the transfer, in accordance with Article 11(2) of the MRV Maritime Regulation. [↑](#footnote-ref-40)
40. Through the reporting on a per voyage basis function in THETIS MRV users can upload voyage data separately, which the system will then automatically aggregate to give annual emissions data for the purpose of the emissions report, also taking into account the segregation by geographical scope. [↑](#footnote-ref-41)
41. For the purposes of the MRV Maritime Regulation, ‘ro-ro ship’ means a ship designed for the carriage of roll-on-roll-off cargo transportation units or with roll-on-roll-off cargo spaces. [↑](#footnote-ref-42)
42. For the purposes of the MRV Maritime Regulation, ‘container ship’ means a ship designed exclusively for the carriage of containers in holds and on deck. [↑](#footnote-ref-43)
43. E.g. tankers, bulk carriers, general cargo ships, refrigerated cargo ships, vehicle carriers and combination carriers. [↑](#footnote-ref-44)
44. “Year” is to be read as “part of the year until the transfer of responsibility for the ship” in case of “partial emissions reports” in accordance with Article 11(2) of the MRV Maritime Regulation. [↑](#footnote-ref-45)
45. For definition of relevant ports please see section 2.2.4, and for definition of relevant voyages see section 2.2.3. [↑](#footnote-ref-46)
46. Point (k) of Article 10 of the MRV Maritime Regulation specifies this more precisely as “*total aggregated emissions of greenhouse gases covered by Directive 2003/87/EC in relation to maritime transport activities in accordance with Annex I to that Directive and to be reported under that Directive, together with the necessary information to justify the application of any relevant derogation from Article 12(3) of that Directive provided for in Article 12(3-e) to (3-b) thereof.*” [↑](#footnote-ref-47)
47. The unit for reporting depends on the type of cargo, see Table 5. [↑](#footnote-ref-48)
48. Commission Delegated Regulation (EU) 2023/2849,
<http://data.europa.eu/eli/reg_del/2023/2849/oj> [↑](#footnote-ref-49)
49. Step 1 in this guidance document relates to point 1.1 of Part C of Annex II of the MRV Maritime Regulation. Similarly, Step 2 relates to point 1.2 of that Part C, etc. Therefore the legal references are not repeated for each step. [↑](#footnote-ref-50)
50. In the MRV Maritime Regulation this step is termed “*Derogation from the general principle and use of emission factors pursuant to Article 14 of [the EU ETS Directive]”*. [↑](#footnote-ref-51)
51. Directive (EU) 2018/2001, consolidated version: <http://data.europa.eu/eli/dir/2018/2001/2023-11-20> [↑](#footnote-ref-52)
52. Monitoring and Reporting Regulation (pursuant to Article 14 of the EU ETS Directive): Commission Implementing Regulation (EU) 2018/2066, <http://data.europa.eu/eli/reg_impl/2018/2066/2024-01-01> [↑](#footnote-ref-53)
53. Defined as “*liquid and gaseous fuels the energy content of which is derived from renewable sources other than biomass*”. Hydrogen or ammonia produced from water hydrolysis using renewable (not nuclear) energy qualify as RFNBO. [↑](#footnote-ref-54)
54. Defined as “*liquid and gaseous fuels that are produced from liquid or solid waste streams of non-renewable origin which are not suitable for material recovery in accordance with Article 4 of Directive 2008/98/EC* [the Waste Framework Directive]*, or from waste processing gas and exhaust gas of non-renewable origin which are produced as an unavoidable and unintentional consequence of the production process in industrial installations.*” Such fuels are result of a CCU (Carbon capture and Utilisation) process. [↑](#footnote-ref-55)
55. For guidance on the term “EEA port” used in this guidance, please see section 2.2.4. [↑](#footnote-ref-56)
56. This derogation is found in the MRV Maritime Regulation as “*Derogation from the general principle in the case of CO2 emissions referred to in Article 12(3a) and (3b) of [the EU ETS Directive]*”. Article 12(3a) refers to CCS, and 12(3b) to permanent CCU, see footnote 66. [↑](#footnote-ref-57)
57. The MRV Maritime Regulation refers to this step as “Derogation from the general principle in the case of greenhouse gas emissions from a voyage or activities referred to in Article 12(3-d), (3-c) or (3-b) of Directive 2003/87/EC”. [↑](#footnote-ref-58)
58. The MRV Maritime Regulation refers to this step as “*Calculation of the ship’s total aggregated emissions of greenhouse gases to be reported under Directive 2003/87/EC in the case that the company wants to benefit from the derogation provided for in Article 12(3-e) of that Directive.*” [↑](#footnote-ref-59)
59. “*Calculation of the ship’s total aggregated emissions of greenhouse gases to be reported under Directive 2003/87/EC, taking into account Article 3gb of that Directive*”. [↑](#footnote-ref-60)
60. This is reflected in the emissions report templates as per Annex II and IV to Implementing Regulation (EU) 2023/2449. The partial emissions report and the full-year emissions report share the same template and structure. The emissions within MRV scope to be reported at the end of the reporting period in the full-year emissions report will include the sum of all emissions within MRV scope associated to the ship, including those from partial emissions report. The emissions reported in the company level emissions report (Annex IV) will only include those emitted during the periods in which the relevant ship(s) was under their responsibility. [↑](#footnote-ref-61)
61. Note that the rule for using actual emission factors is possible only for fossil fuels. [↑](#footnote-ref-62)
62. See footnote 16 [↑](#footnote-ref-63)
63. The EU ETS Directive has no rules for the capture of non-CO2 gases. [↑](#footnote-ref-64)
64. I.e. scrubbing of flue gas and subsequent release of the scrubbing water to the environment does not qualify as CO2 capture. [↑](#footnote-ref-65)
65. Directive 2009/31/EC; <http://data.europa.eu/eli/dir/2009/31/oj> [↑](#footnote-ref-66)
66. Regarding the principle of permanence, the EU ETS Directive Article 12(b) states: “*An obligation to surrender allowances shall not arise in respect of emissions of greenhouse gases which are considered to have been captured and utilised in such a way that they have become* ***permanently chemically bound in a product so that they do not enter the atmosphere under normal use, including any normal activity taking place after the end of the life of the product****.*” [↑](#footnote-ref-67)
67. THETIS MRV offers a dedicated ‘Cloning’ functionality, which allows the user to extract and reuse company-specific parts from other monitoring plans. The procedure is described in the online tutorial video ‘C15 Cloning of a Monitoring Plan’ available at <https://emsa.europa.eu/thetis-mrv/thetis-mrv-videos/>. [↑](#footnote-ref-68)
68. Regulation (EU) 2023/1805, OJ L 234, 22.9.2023, p. 48,
<http://data.europa.eu/eli/reg/2023/1805/oj> [↑](#footnote-ref-69)
69. In particular the procedures and methods to monitor fuel consumption and associated control activities, including the list of emission sources/fuel consumers, fuel tanks and measurement equipment should be the same in MRV Monitoring Plan and FuelEU Monitoring Plan. [↑](#footnote-ref-70)
70. To be meant as change of ‘company’ as entity responsible for obligations under the MRV Maritime Regulation. A change of company may be triggered by a change of ownership (sale/purchase of the ship) but also by a change in the delegated entity to assume responsibility for MRV compliance (i.e. modifications concerning the document referred to in Implementing Regulation (EU) 2023/2599). [↑](#footnote-ref-71)
71. The amendment of the MRV Maritime Regulation in 2023 introduces new GHGs for all ships, establishing new monitoring obligations starting the reporting year 2024. Therefore an update of all monitoring plans submitted before 2024 is necessary.  [↑](#footnote-ref-72)
72. E.g. as per the assessment carried out by an accredited verifier [↑](#footnote-ref-73)
73. <https://climate.ec.europa.eu/document/download/44dec508-ad8f-4a38-a284-1b809985d6c9_en?filename=policy_ets_monitoring_gd6_dataflow_en.pdf&prefLang=en> [↑](#footnote-ref-74)
74. <https://climate.ec.europa.eu/document/download/44dec508-ad8f-4a38-a284-1b809985d6c9_en?filename=policy_ets_monitoring_gd6_dataflow_en.pdf&prefLang=en> [↑](#footnote-ref-75)
75. <https://emsa.europa.eu/thetis-mrv/thetis-mrv-videos/>. [↑](#footnote-ref-76)
76. Such templates are defined in Annex I to Implementing Regulation (EU) 2023/2449, <http://data.europa.eu/eli/reg_impl/2023/2449/oj>. [↑](#footnote-ref-77)
77. <https://mrv.emsa.europa.eu/#public/eumrv> [↑](#footnote-ref-78)
78. As in the case of fields explicitly labelled as ‘voluntary’ or which apply only to certain ship types and/or are dependent on other selections. [↑](#footnote-ref-79)
79. This notably includes assessing whether fields have been correctly marked as ‘Not Applicable/N/A’ by the shipping company. [↑](#footnote-ref-80)
80. Commission Delegated Regulation (EU) 2023/2917 of 20 October 2023 on the verification activities, accreditation of verifiers and approval of monitoring plans by administering authorities pursuant to Regulation (EU) 2015/757 and repealing Commission Delegated Regulation (EU) 2016/2072. <http://data.europa.eu/eli/reg_del/2023/2917/oj>. [↑](#footnote-ref-81)
81. Documents can be uploaded in THETIS MRV either as attachments to the Monitoring Plan or directly in the ship’s page editable by the user. Once uploaded, the attachments will be visible to all users having access to the ship’s page. [↑](#footnote-ref-82)
82. Please note that companies with ships falling only under the scope of the MRV Maritime Regulation, but not under the scope of the EU ETS Directive, would not be attributed to any administering authority. [↑](#footnote-ref-83)
83. A reference could be made to procedures or systems effectively implemented as part of their existing management systems, such as the International Safety Management Code (ISM Code), the Ship Energy Efficiency Management Plan (the SEEMP), Systems and controls covered by harmonised quality, environmental or energy management standards, such as EN ISO 9001:2015, EN ISO 14001:2015 or EN ISO 50001:2011, or any other relevant internal procedures established by the company. [↑](#footnote-ref-84)
84. The indication of data source is required in the tables referring to description of methods. [↑](#footnote-ref-85)
85. As per Article 3(e) of the MRV Maritime Regulation. Reductions on the gross tonnage of a ship granted on the basis of any other instrument or regulation shall not be considered within the MRV Maritime Regulation. [↑](#footnote-ref-86)
86. As defined in Article 3, point (w), of Directive 2003/87/EC. [↑](#footnote-ref-87)
87. In the case of waste incinerators only the emissions from the combustion of pilot fuels shall be considered, thus excluding emissions from waste combustion itself. [↑](#footnote-ref-88)
88. When such a further segregation is not needed (i.e. because the same emission factors apply within a certain emissions source type), the value ‘class’ may be left empty. [↑](#footnote-ref-89)
89. The list of fuel types has been expanded following the adoption of Commission Implementing Regulation (EU) 2023/2449, and now also includes: ‘H2 (Fossil)’, ‘NH3 (Fossil), ‘Methanol (Fossil)’, ‘Ethanol’, ‘Bio-diesel’, ‘Hydrotreated Vegetable Oil (HVO)’, ‘Liquified bio-methane as transport fuel (Bio-LNG)’, ‘Bio-methanol’, ‘Other Biofuel’, ‘Bio-H2’, ‘e-diesel’, ‘e-methanol’, ‘e-LNG’, ‘e-H2’, ‘e-NH3’, ‘e-LPG’, ‘e-DME’, and ‘Non-fossil Other fuel’. [↑](#footnote-ref-90)
90. According to which the monitoring on a per-voyage basis of certain information may still be required to benefit from the derogation provided for in Articles 12(3-d) to 12(3-b) of the EU ETS Directive (Directive 2003/87/EC). [↑](#footnote-ref-91)
91. A description of a detailed procedure for fuel related procedures can be found in section 5.1 of the best practices document on monitoring and reporting of fuel consumption. [↑](#footnote-ref-92)
92. Annex I of the MRV Maritime Regulation, Part C, point 1.4: “… *the company shall ensure that all relevant measuring equipment is calibrated, adjusted and checked at regular intervals including prior to use, and checked against measurement standards traceable to international measurement standards, where available, and proportionate to the risks identified.
Where components of the measuring systems cannot be calibrated, the company shall identify those components in the monitoring plan and propose alternative control activities.
When the equipment is found not to comply with the performance requirements, the company shall promptly take necessary corrective action.*” [↑](#footnote-ref-93)
93. As detailed in Part C to Annex II of the Maritime MRV Regulation. [↑](#footnote-ref-94)
94. Companies are required to regularly update the risk assessment, submit it to the verifier and make it available to the Administering Authority upon request. Since the obligation to establish the risk assessment in full may be complied with outside of the monitoring plan, this table may contain a brief description of the procedure together with the reference to the full procedure. [↑](#footnote-ref-95)
95. <https://climate.ec.europa.eu/document/download/2289952b-4d59-494c-8c49-c0a559c403d6_en?filename=gd3_biomass_issues_en.pdf> [↑](#footnote-ref-96)
96. EU ETS Monitoring and Reporting Regulation, full information given in footnote 16. [↑](#footnote-ref-97)
97. Definitions here are not mutually exclusive. For example, wastes and residues can be at the same time biomass fuels or bioliquids, if they are used as fuels without further processing. [↑](#footnote-ref-98)
98. Note that zero-rating applies only to CO2 emissions. Therefore, CH4 emissions including slippage will have to be reported as if the gas were fossil natural gas. [↑](#footnote-ref-99)
99. Source stream means either fuel or process material leading to emissions. For details see Guidance document No. 1 (general guidance for installations). [↑](#footnote-ref-100)
100. Cases where the RED II criteria do not apply exist only in stationary installations. [↑](#footnote-ref-101)
101. Note that the concept of “biomass fraction” does not exist in context of MRV Maritime, as all components of blended fuels have to be reported separately, i.e. a maritime fuel can be only 100% fossil or 100% biofuel. [↑](#footnote-ref-102)
102. Article 3(36) of the MRR defines: “*‘preliminary emission factor’ means the assumed total emission factor of a fuel or material based on the carbon content of its biomass fraction and its fossil fraction before multiplying it by the fossil fraction to produce the emission factor*”. In context of MRV Maritime, all the tank-to-wake emissions factors would be considered in this way. [↑](#footnote-ref-103)
103. Similar to e.g. different batches of coal which are analysed separately, but all reported under the same source stream “coal”. [↑](#footnote-ref-104)
104. Note, however, that in case of stationary installations, the selection of either approach has implications on the selection of appropriate tiers. If separate source streams are chosen, the sustainable biomass source stream is always a *de-minimis* source stream, while a source stream with fossil or non-sustainable biomass fractions may have to comply with higher tiers, depending on its associated emissions (see section 5.2 of GD 1). In case of MRV Maritime, no tier concept is applicable. Fuels always have to be reported separately. [↑](#footnote-ref-105)
105. See sections 6.1.3 and 7.3 on the topic of “written procedures” supplementing the monitoring plan. Such a written procedure should be described and referenced to in Table B.9 of the monitoring plan. [↑](#footnote-ref-106)
106. Note that the MP and AER templates use also the simpler terminology “sustainable biomass” and “non-sustainable biomass”, where “RED II compliant / non compliant” is more precise. [↑](#footnote-ref-107)
107. The term refers to a certification scheme established in a Member State. National schemes can be recognised by the Commission. If the national scheme is recognised, it is valid in all Member States, otherwise only in the Member State that put it in place. [↑](#footnote-ref-108)
108. Such audit is mandatory according to Article 30(3) of the RED II: “*[…] Member States shall require economic operators to arrange for an adequate standard of independent auditing of the information submitted, and to provide evidence that this has been done. […]*”. This audit can be performed by an EU ETS verifier only if the latter has the proven competence (i.e. accreditation) for that task (see section 3.4.6.5 of GD3). [↑](#footnote-ref-109)
109. Not only the competent authority, but also the verifier during verification will assess if the evidence for meeting the sustainability criteria is sufficient. [↑](#footnote-ref-110)
110. Article 38(5) of the MRR:

“*Where reference is made to this paragraph, biofuels, bioliquids and biomass fuels used for combustion shall fulfil the sustainability and the greenhouse gas emissions saving criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001.*

*However, biofuels, bioliquids and biomass fuels produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues are required to fulfil only the criteria laid down in Article 29(10) of Directive (EU) 2018/2001. This subparagraph shall also apply to waste and residues that are first processed into a product before being further processed into biofuels, bioliquids and biomass fuels.*

*Electricity, heating and cooling produced from municipal solid waste shall not be subject to the criteria laid down in Article 29(10) of Directive (EU) 2018/2001.*

*The criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001 shall apply irrespective of the geographical origin of the biomass.*

*Article 29(10) of Directive (EU) 2018/2001 shall apply to an installation as defined in Article 3(e) of Directive 2003/87/EC.*

*The compliance with the criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001 shall be assessed in accordance with Articles 30 and 31(1) of that Directive.*

*Where the biomass used for combustion does not comply with this paragraph, its carbon content shall be considered as fossil carbon.*” [↑](#footnote-ref-111)
111. Some borderline cases exist where it may not be clear if a material is a fuel or a process input, such as pore-forming agents in the ceramic industry. In this case, may be used as guidance: “*Where the CO2 emissions stem from a process which has a primary purpose other than the generation of heat, the competent authority may agree that the source stream is not acting as a fuel. Hence, such source streams serve non-energetic purposes and the sustainability criteria do therefore not apply.*” (see also section 3.5 of GD2 on free allocation rules for installations). [↑](#footnote-ref-112)
112. In context of maritime transport, this is only relevant in relation to the installation that produces the biofuel. Article 3(e) of the EU ETS Directive: *‘installation’ means a stationary technical unit where one or more activities listed in Annex I are carried out and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution;* [↑](#footnote-ref-113)
113. See footnote 113. [↑](#footnote-ref-114)
114. <https://energy.ec.europa.eu/topics/renewable-energy/biofuels/voluntary-schemes_en> .
Approvals are valid for 5 years. It is therefore necessary to check the validity period of the approval in the relevant Commission Decision. [↑](#footnote-ref-115)
115. In case of mixed materials or fuels, obviously the zero-rating applies only to the biomass fraction. [↑](#footnote-ref-116)
116. Commission Implementing Regulation (EU) 2022/996 of 14 June 2022 on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria, available from <http://data.europa.eu/eli/reg_impl/2022/996/oj> [↑](#footnote-ref-117)
117. Article 2(4) of the implementing act defines “*‘certificate’ means a conformity statement by a certification body within the framework of a voluntary scheme, certifying that an economic operator complies with the requirements of Directive (EU) 2018/2001 [the RED II]*”; [↑](#footnote-ref-118)
118. Article 2(23) of the implementing act defines “*‘proof of sustainability’ means a declaration by an economic operator, made on the basis of a certificate issued by a certification body within the framework of a voluntary scheme certifying the compliance of a specific quantity of feedstock or fuels with the sustainability and greenhouse gas emissions savings criteria set out in Articles 25(2) and 29 of Directive (EU) 2018/2001* [the RED II]”. [↑](#footnote-ref-119)
119. The certificate has to give the validity period. [↑](#footnote-ref-120)
120. As only certified operators can issue proofs of sustainability under the RED, the fuel supplier needs such certification. [↑](#footnote-ref-121)
121. “Full value chain” means from cultivation/first gathering point to the gate of the installation, including applicable processing steps (e.g. production of a biofuel). The steps covered should be indicated on the proofs of sustainability provided by the fuel supplier in this case. [↑](#footnote-ref-122)