

EU legislation on maritime greenhouse gas emissions

EU legislation on maritime greenhouse gas emissions is centered around three acts:

1. MRV: Monitoring, Reporting, Verification

The MRV Maritime Regulation (EU 2015/757) requires shipping companies to monitor and report greenhouse gas emissions of their ships on voyages to and/or from ports in the EU. A monitoring plan has to be made and emission data have to be collected and reported accordingly, through EU data collection system THETIS.

Ships of 5000 GT and over, that carry passengers or cargo, already have to comply with this regulation since 2018. Amendments to the MRV Maritime Regulation mean that as of 1-1-2025, two new categories of ships will be added:

- general cargo ships between 400 GT and 5000GT
- offshore ships of 400 GT and over

As these ships will have to start monitoring their emissions on January 1st, their monitoring plans will need to be ready before this date.

2. ETS: Emissions Trading System

The EU emissions trading system was established in 2003 (EU 2003/87). In 2023, it was amended to include maritime transport. To do so, it relies on MRV: the emission data that need to be presented when partaking in the ETS are the data that are collected under MRV. The ships that first started reporting under MRV in 2018 are partaking in the ETS for the first time in 2024. The ships that will start reporting under MRV in 2025 will start partaking in the ETS in subsequent years (see further).

3. FuelEU: Lowering maritime greenhouse gas emissions

The FuelEU Maritime Regulation (EU 2023/1805) has as its goal to 'decarbonize' shipping. It sets a threshold value for the greenhouse gas intensity of energy used by ships. This threshold value will be lowered every 5 years, starting with a 2% reduction per 2025 and ending (for now) with a reduction of 80% in 2050.

FuelEU uses MRV definitions. However, whereas MRV and ETS are only concerned with greenhouse gases emitted during voyages, FuelEU is also concerned with emissions within EU ports of call – requiring zero-emission energy use of ships while moored.

FuelEU enters into force on 1-1-2025 and will apply to ships of 5000GT and over that carry passengers or cargo to and/or from ports in the EU. These ships are required to have a FuelEU monitoring plan ready by 31 August 2024.

How does MRV/ETS/FuelEU relate to the Ship Energy Efficiency Monitoring Plan (SEEMP)?

Many ships that will now have to start complying with MRV will already have a SEEMP part I and maybe also a part II. SEEMP is part of Marpol Annex VI and as thus part of worldwide maritime legislation issued by the IMO, whereas the legislation around MRV, ETS and FuelEU is issued by the EU. Although more or less the same goals are pursued, these are separate legislations. A SEEMP II cannot be used as an MRV monitoring plan or vice versa. Ships may have to be compliant with both and report on their emissions both in THETIS under MRV as in the IMO Data Collection System (DCS) under SEEMP II.

New MRV ship categories

General cargo ships >400GT

'General cargo ship' means a ship with a multi-deck or single-deck hull designed primarily for the carriage of general cargo excluding specialised dry cargo ships, which are not included in the calculation of reference lines for general cargo ships, namely livestock carrier, barge carrier, heavy load carrier, yacht carrier, nuclear fuel carrier

The definition is given by EU Regulation 2016/1928 that lays down definitions for MRV

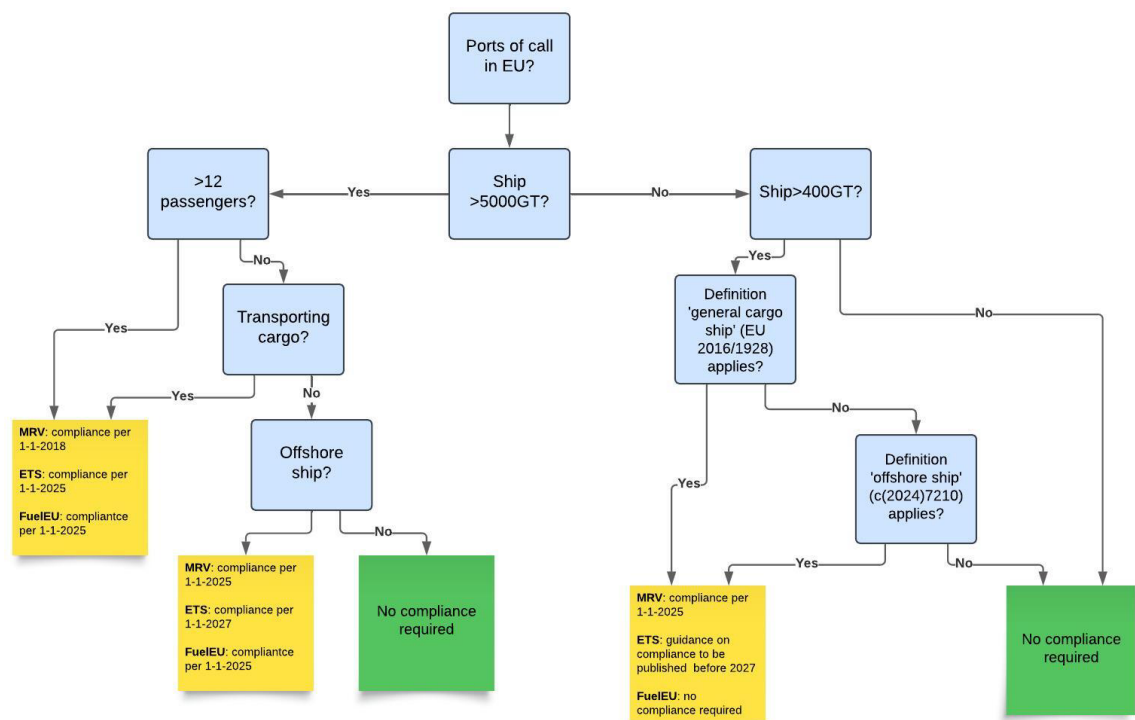
Offshore ships >400GT

'Offshore ships' are ships, other than icebreakers, designed or certified to perform service activities offshore or at offshore installations:

- (a) anchor handling tug supply vessel;
- (b) offshore supply ship;
- (c) crew/supply vessel;
- (d) pipe carrier;
- (e) platform supply ship;
- (f) drilling ship;
- (g) floating production storage and offloading (FPSO), oil;
- (h) gas processing vessel;
- (i) floating storage and offloading (FSO), gas;
- (j) FSO, oil;
- (k) accommodation ship;
- (l) diving support vessel;
- (m) offshore construction vessel;
- (n) offshore support vessel;
- (o) pipe burying vessel;
- (p) pipe layer;
- (q) pipe layer crane vessel;
- (r) production testing vessel;
- (s) standby safety vessel;
- (t) trenching support vessel;
- (u) well stimulation vessel;
- (v) cable layer;
- (w) cable repair ship;
- (x) mining vessel;
- (y) wind turbine installation vessel;
- (z) commissioning service operation vessel;
- (aa) service operation vessel;
- (ab) work/repair vessel;
- (ac) research survey vessel;
- (ad) dredger;
- (ae) hopper dredger.

This definition is given by delegated act c(2024)7210 which amends the MRV Regulation.

Flowcharts



ships >5000GT transporting cargo or passengers		2023	2024	2025	2026	2027	2028
		MRV	CO2	CO2, CH4, N2O	CO2, CH4, N2O	CO2, CH4, N2O	CO2, CH4, N2O
		ETS		CO2, 40%	CO2, CH4, N2O, 100%	CO2, CH4, N2O, 100%	CO2, CH4, N2O, 100%
		FuelEU		Monitoring plan per 31-08-2024	-2%	reduction in five year steps to -80% in 2050	

offshore ships >5000GT		2023	2024	2025	2026	2027	2028
		MRV		Monitoring plan per 1-1-2025	CO2, CH4, N2O	CO2, CH4, N2O	CO2, CH4, N2O
		ETS				CO2, CH4, N2O, 100%	CO2, CH4, N2O, 100%
		FuelEU		Monitoring plan per 31-08-2024	-2%	reduction in five year steps to -80% in 2050	

general cargo ships and offshore ships between 400GT and 5000GT		2023	2024	2025	2026	2027	2028
		MRV		Monitoring plan per 1-1-2025	CO2, CH4, N2O	CO2, CH4, N2O	CO2, CH4, N2O
		ETS			Guidance expected before 31st December	?	?

IMO DCS – Data Collection System

The IMO DCS is a global system for collecting fuel and emissions data from all ships of 5,000 GT or greater engaged in international voyages.

It has been mandatory since January 1, 2018, and is based on MARPOL Annex VI.

The following data is reported annually through the Ship Energy Efficiency Management Plan (SEEMP Part II):

Consumption by fuel type (HFO, MGO, LNG, Biofuel, etc.)

Distance traveled

Number of operating hours

Calculated Annual Efficiency Ratio (AER)

Technical data (gross tonnage, DWT, etc.)

How does the reporting work?

Continuous data collection throughout the year.

Annual reporting to the flag or Recognized Organization/Class state before March 31st.

The flag state or Recognized Organization/Class verifies the data.

The IMO receives all approved data in the IMO GISIS database.

The ship receives a renewed Statement of Compliance (SoC).

Goal of DCS

To create a reliable global emissions data platform.

To serve as a basis for policy development towards CO₂ reduction.

CII – Carbon Intensity Indicator

The CII is a performance indicator that measures a ship's CO₂ emissions efficiency per unit of transport work. CII has been mandatory since 2023 and is also part of MARPOL Annex VI.

How is CII calculated?

Usual for cargo ships:

$CII = \text{Annual Efficiency Ratio (AER)}$

$= \text{CO}_2 / (\text{DWT} \times \text{Distance})$

A lower value = better (more efficient).

Note: The formula depends on the type of ship (tankers, containers, ro-ro vessels, cruise ships, etc.).

Relationship between DCS and CII

CII stands for performance evaluation, DCS for data collection. The DCS data (fuel, distance, operating hours) are used to calculate a ship's CII rating.

DCS = raw data

CII = annual performance standard (rating A–E)

Without DCS data, a CII rating cannot be determined.

What should shipping companies do specifically?

For DCS:

Collect data annually according to SEEMP Part II

Submit to flag state or Recognized Organization/Class by March 31

Keep the Statement of Compliance on board

For CII:

Receive annual CII rating

If necessary, develop a Corrective Action Plan

Take measures such as:

Reduce speed (slow steaming)

Optimize trimming

Route optimization

Hull/propeller cleaning

Energy-efficient upgrades (VFDs, waste heat recovery, etc.)