

**RESOLUTION MEPC.336(76)**  
**(adopted on 17 June 2021)**

**2021 GUIDELINES ON OPERATIONAL CARBON INTENSITY INDICATORS AND THE  
CALCULATION METHODS (CII GUIDELINES, G1)**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

NOTING that it adopted, by resolution MEPC.328(76), the 2021 revised MARPOL Annex VI, which is expected to enter into force on 1 November 2022 upon its deemed acceptance on 1 May 2022,

NOTING IN PARTICULAR that the 2021 revised MARPOL Annex VI contains amendments concerning mandatory goal-based technical and operational measures to reduce carbon intensity of international shipping,

NOTING FURTHER that regulation 28.1 of MARPOL Annex VI requires ships to which this regulation apply to calculate the attained annual operational CII taking into account the guidelines developed by the Organization,

RECOGNIZING that the aforementioned amendments to MARPOL Annex VI require relevant guidelines for uniform and effective implementation of the regulations and to provide sufficient lead time for industry to prepare,

HAVING CONSIDERED, at its seventy-sixth session, draft *2021 Guidelines on operational carbon intensity indicators and the calculation methods (CII Guidelines, G1)*,

1 ADOPTS the *2021 Guidelines on operational carbon intensity indicators and the calculation methods (CII Guidelines, G1)*, as set out in the annex to the present resolution;

2 INVITES Administrations to take the annexed Guidelines into account when developing and enacting national laws which give force to and implement requirements set forth in regulation 28.1 of MARPOL Annex VI;

3 REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the annexed Guidelines to the attention of masters, seafarers, shipowners, ship operators and any other interested parties;

4 AGREES to consider substantiated proposals for CII correction factors for certain ship types, operational profiles and/or voyages with a view to enhancing, as appropriate, the annexed Guidelines before entry into force of the aforementioned amendments to MARPOL Annex VI;

5 AGREES to keep the Guidelines under review in light of experience gained with their implementation and in light of the review of CII regulations to be completed by the Organization by 1 January 2026 as identified in regulation 28.11 of MARPOL Annex VI.

## ANNEX

### 2021 GUIDELINES ON OPERATIONAL CARBON INTENSITY INDICATORS AND THE CALCULATION METHODS (CII GUIDELINES, G1)

#### 1 Introduction

1.1 In the *Initial IMO Strategy on Reduction of GHG Emissions from Ships* (Resolution MEPC.304(72)), the level of ambition on carbon intensity of international shipping is quantified by the CO<sub>2</sub> emissions per transport work, as an average across international shipping.

1.2 These Guidelines address the calculation methods and the applicability of the operational carbon intensity indicator (CII) for individual ships to which chapter 4 of MARPOL Annex VI, as amended, applies.

#### 2 Definitions

2.1 *MARPOL* means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto, as amended.

2.2 *IMO DCS* means the data collection system for fuel oil consumption of ships referred to in regulation 27 and related provisions of MARPOL Annex VI.

2.3 For the purpose of these Guidelines, the definitions in MARPOL Annex VI, as amended, apply.

2.4 The metrics indicating the average CO<sub>2</sub> emissions per transport work of a ship are generally referred to as operational carbon intensity indicator (CII) in these Guidelines.

.1 A specific CII calculated based on the actual or estimated mass or volume of the shipment carried on board a ship is generally referred to as *demand-based CII*; and

.2 A specific CII, in which calculation the capacity of a ship is taken as proxy of the actual mass or volume of the shipment carried on board, is generally referred to as *supply-based CII*.

2.5 The supply-based CII which uses DWT as the capacity is referred to as *AER*, and the supply-based CII which uses GT as the capacity is referred to as *cgDIST*.

#### 3 Application

3.1 For all ships to which regulation 28 of MARPOL Annex VI applies, the operational carbon intensity indicators defined in section 4 should be applied.

3.2 The operational carbon intensity indicators defined in section 5 are encouraged to be additionally used by ships, where applicable, for trial purposes.

#### 4 Operational carbon intensity indicator (CII) of individual ships for use in implementing regulation 28 of MARPOL Annex VI

In its most simple form, the attained annual operational CII of individual ships is calculated as the ratio of the total mass of CO<sub>2</sub> ( $M$ ) emitted to the total transport work ( $W$ ) undertaken in a given calendar year, as follows:

$$\text{attained } CII_{\text{ship}} = M / W \quad (1)$$

##### 4.1 Mass of CO<sub>2</sub> emissions ( $M$ )

The total mass of CO<sub>2</sub> is the sum of CO<sub>2</sub> emissions (in grams) from all the fuel oil consumed on board a ship in a given calendar year, as follows:

$$M = FC_j \times C_{F_j} \quad (2)$$

where:

- $J$  is the fuel oil type;
- $FC_j$  is the total mass (in grams) of consumed fuel oil of type  $J$  in the calendar year, as reported under IMO DCS; and
- $C_{F_j}$  represents the fuel oil mass to CO<sub>2</sub> mass conversion factor for fuel oil type  $J$ , in line with those specified in the *2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships (resolution MEPC.308(73))*, as may be further amended. In case the type of the fuel oil is not covered by the guidelines, the conversion factor should be obtained from the fuel oil supplier supported by documentary evidence.

##### 4.2 Transport work ( $W$ )

In the absence of the data on actual transport work, the supply-based transport work ( $W_s$ ) can be taken as a proxy, which is defined as the product of a ship's capacity and the distance travelled in a given calendar year, as follows:

$$W_s = C \times D_t \quad (3)$$

where:

- $C$  represents the ship's capacity:
  - For bulk carriers, tankers, container ships, gas carriers, LNG carriers, ro-ro cargo ships, general cargo ships, refrigerated cargo carrier and combination carriers, deadweight tonnage (DWT)<sup>1</sup> should be used as Capacity;
  - For cruise passenger ships, ro-ro cargo ships (vehicle carriers) and ro-ro passenger ships, gross tonnage (GT)<sup>2</sup> should be used as Capacity; and
- $D_t$  represents the total distance travelled (in nautical miles), as reported under IMO DCS.

<sup>1</sup> Deadweight tonnage (DWT) means the difference in tonnes between the displacement of a ship in water of relative density of 1,025 kg/m<sup>3</sup> at the summer load draught and the lightweight of the ship. The summer load draught should be taken as the maximum summer draught as certified in the stability booklet approved by the Administration or any organization recognized by it.

<sup>2</sup> Gross tonnage (GT) should be calculated in accordance with the International Convention on Tonnage Measurement of Ships, 1969.

## 5 Operational carbon intensity indicator (CII) of individual ships for trial purpose

The following metrics are encouraged to be used for trial purposes, where applicable:

- .1 Energy Efficiency Performance Indicator (EEPI)

$$EEPI = \frac{M}{C \times D_t}$$

- .2 cbDIST

$$cbDIST = \frac{M}{ALB \times D_t}$$

- .3 clDIST

$$clDIST = \frac{M}{Lanemeter \times D_t}$$

- .4 EEOI, as defined in MEPC.1/Circ.684 on *Guidelines for voluntary use of the ship energy efficiency operational indicator (EEOI)*.

In the formulas above:

- the mass of CO<sub>2</sub> ( $M$ ), the ship's capacity ( $C$ ) and the total distance travelled ( $D_t$ ) are identical with those used to calculate the attained CII of individual ships, as specified in section 4.1 and 4.2;
- $D_t$  means the laden distance travelled (in nautical miles) when the ship is loaded;
- $ALB$  means the number of available lower berths of a cruise passenger ship; and
- $Lanemeter$  means the length (in metres) of the lanes of a ro-ro ship.