



Republic of the Philippines
DEPARTMENT OF TRANSPORTATION

MARITIME INDUSTRY AUTHORITY



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TO : ALL SHIPOWNERS, SHIP OPERATORS, MASTERS AND OFFICERS OF PHILIPPINE REGISTERED SHIPS ENGAGED IN THE OVERSEAS TRADE, RECOGNIZED ORGANIZATIONS, SHIPBUILDERS, SHIP DESIGNERS, AS WELL AS OTHER RELATED MARITIME ENTITIES.

SUBJECT: REGULATIONS ON ENERGY EFFICIENCY FOR SHIPS (ENERGY EFFICIENCY EXISTING SHIP INDEX (EEXI) AND CARBON INTENSITY INDICATOR (CII)) AND IMO'S STRATEGY IN REDUCING GREENHOUSE GASES (GHG) EMISSION

This information is hereby given to all concerned that the amendments to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) introducing the **mandatory measures to reduce emissions of greenhouse gases (GHGs) from international shipping** was adopted by the IMO Marine Environment Protection Committee 76th session (MEPC 76).

I. INTRODUCTION

These are two new measures: the technical requirement to reduce carbon intensity, based on a new **Energy Efficiency Existing Ship Index (EEXI)**; and the operational carbon intensity reduction requirements, based on a new operational **Carbon Intensity Indicator (CII)**.

The EEXI is a framework for determining the energy efficiency and CO₂ emissions of in-service vessels over 400 GT. Adapted from the Energy Efficiency Design Index (EEDI) for newbuilds, the EEXI requires ship owners to assess and measure their ships' CO₂ emissions by design against specific emission reduction factors for each vessel type. Owners can then implement technical measures to adjust their vessels' emissions to the required level.

The CII requires in-service ships of over 5,000 GT to quantify and report on carbon emissions from ongoing operations. The CII provides ship operators with the factor by which they must reduce carbon emissions annually to comply with regulations and ensure continuous improvement. Vessels will be rated on a five-tiered scale (from A to E) for performance. For ships that achieve a D rating for three consecutive years or an E rating in a single year, a corrective action plan needs to be developed as part of the SEEMP and approved.



II. COMPLIANCE

	EEXI	CII
Coverage	All Philippine Registered Ships 400 GT and above plying international voyages	All Philippine Registered Ships 5000 GT and above plying international voyages
Entry into force	01 January 2023	01 January 2023
Type Compliance	Technical Measure To achieve EEXI compliance, vessels can undergo a preliminary assessment, then gain approval for preliminary technical files and earn a statement of compliance. Verification of the ship's EEXI takes place after January 1, 2023, at the vessel's first annual, intermediate or renewal survey for its International Energy Efficiency Certificate (IEEC).	Operational Measure For CII, managers/ superintendent/ supervisors must determine ships' carbon intensity profiles and develop an optimized Ship Energy Efficiency Management Plan (SEEMP) by the end of 2022. This mandatory document is a ship-specific plan that provides a mechanism to help improve the energy efficiency of a ship in a cost-effective manner.
Possible Improvement measures	<ul style="list-style-type: none">• Engine power limitation• Shaft power limitation• Engine derating• Propulsion optimization• Installation of Energy-saving devices• Use of alternative fuels (e.g., methanol, renewable)	<ul style="list-style-type: none">• Efficient voyage plan• Use of alternative fuels (e.g., methanol, renewable)• Hull and propeller optimization• Installation of Energy-saving devices• Improvement of the overall condition of the ship (e.g. antifouling)

III. CALCULATION

EEXI calculations are based on the methodology developed for the Energy Efficiency Design Index (EEDI) for newbuilds. The EEXI describes a vessel's CO₂ emissions, determining standardized CO₂ emissions related to installed engine power, transport capacity and ship speed. Emissions are calculated based on the installed power of the main engine, fuel oil consumption, and a conversion factor between fuel and the corresponding CO₂ mass.



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EEXI [g/ton·mile]=

$$\frac{\left(\prod_{j=1}^M f_j \right) \left(\sum_{i=1}^{nME} P_{ME(i)} \cdot C_{FME(i)} \cdot SFC_{ME(i)} \right) + (P_{AE} \cdot C_{FAE} \cdot SFC_{AE}) + \left\{ \left(\prod_{j=1}^M f_j \cdot \sum_{i=1}^{nPTI} P_{PTI(i)} - \sum_{i=1}^{neff} f_{eff(i)} \cdot P_{AEPTI(i)} \right) \cdot C_{FAE} \cdot SFC_{AE} \right\} - \left(\sum_{i=1}^{neff} f_{eff(i)} \cdot P_{eff(i)} \cdot C_{FAE} \cdot SFC_{AE} \right)}{f_1 \cdot f_2 \cdot f_3 \cdot Capacity \cdot V_{ref}}$$

A ship's CII is calculated as the ratio of the total mass of CO₂ emitted to the total transport work undertaken in a given calendar year. A vessel's performance rating is determined by comparing a ship's operational carbon intensity performance with the average performance of others ships of the same type. Required reductions for each ship type are expected to either increase or remain stable over time, ensuring that international shipping achieves the IMO's intended targets.

Ship owners and managers shall determine the ships' carbon intensity profiles and develop an optimized Ship Energy Efficiency Management Plan (SEEMP) prior to the entry into force.

IV. SPECIFIC GUIDELINES

For specific guidelines, please refer to MARPOL Annex VI and the IMO Circulars and the following MEPC Resolutions that were developed and adopted by the 76th Session of the MEPC of the IMO:

- **MEPC.1/Circ.850/Rev.3** – GUIDELINES FOR DETERMINING MINIMUM PROPULSION POWER TO MAINTAIN THE MANOEUVRABILITY OF SHIPS IN ADVERSE CONDITIONS
- **MEPC.1/Circ.795/Rev.5** – UNIFIED INTERPRETATIONS TO MARPOL ANNEX VI
- **MEPC.1/Circ.895** – UNIFIED INTERPRETATIONS TO THE NOX TECHNICAL CODE 2008, AS AMENDED
- **Resolution MEPC.328(76)** – AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1997 TO AMEND THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973, AS MODIFIED BY THE PROTOCOL OF 1978 RELATING THERETO 2021 Revised MARPOL Annex VI
- **Resolution MEPC.332(76)** – AMMENDMENTS TO THE 2018 GUIDELINES ON THE METHOD OF CALCULATION OF THA ATTAINED EEDI
- **Resolution MEPC.333(76)** – 2021 GUIDELINES THE METHOD OF CALCULATION OF THE ATTAINED ENERGY EFFICIENCY EXISITING SHIP INDEX (EEXI)
- **Resolution MEPC.334(76)** – 2021 GUIDELINES ON SURVEY AND CERTIFICATION OF THE ATTAINED ENERGY EFFICIENCY EXISTING SHIPS (EEXI)



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- **Resolution MEPC.335(76)** – 2021 GUIDELINES ON THE SHAFT/ENGINE POWER LIMITATION TO COMPLY WITH THE EEXI REQUIREMENTS AND USE OF POWER RESERVE
- **Resolution MEPC.336(76)** – 2021 GUIDELINES ON OPERATIONAL CARBON INTENSITY INDICATORS AND THE CALCULATION METHODS (CII GUIDELINES, G1)
- **Resolution MEPC.337(76)** – 2021 GUIDELINES ON THE REFERENCE LINES FOR USE WITH OPERATIONAL CARBON INTENSITY INDICATORS (CII REFERENCE LINES GUIDELINES, G2)
- **Resolution MEPC.338(76)** – 2021 GUIDELINES ON THE OPERATIONAL CARBON INTENSITY REDUCTION FACTORS RELATIVE TO REFERENCE LINES (CII REDUCTION FACTOR GUIDELINES, G3)
- **Resolution MEPC.339(76)** – 2021 GUIDELINES ON THE OPERATIONAL CARBON INTENSITY RATING OF SHIPS (CII RATING GUIDELINES, G4)

V. WAYFORWARD: DOMESTIC SHIPPING

The Maritime Industry Authority (MARINA) through the Shipyards Regulation Service is currently conducting study on the technical and economical aspect of the new decarbonization initiative by the IMO.

All Philippine registered ships plying in domestic trade is hereby advised to study and start developing energy efficient systems and practices that will support reduction GHG emission in the Philippine maritime industry.

VI. REFERENCES

Copies of the IMO Circulars/Resolutions and other references may be downloaded from www.imo.org.

For information and guidance of all concerned.

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