

# Energy efficiency and carbon intensity reduction

An overview of the new short-term emission reduction measures

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In June 2021, the IMO Marine Environment Protection Committee (MEPC) adopted a number of amendments to the MARPOL convention. The additions include two new energy efficiency measures – the Energy Efficiency Existing Ship Index (EEXI) and Carbon Intensity Indicator (CII). These are part of a series of short term global measures to reduce greenhouse gas (GHG) emissions from shipping. They are intended to provide shipowners with a reference point to reduce their emission levels and get on course to meet IMO targets for GHG reduction of 50% reduction by 2050.

Starting as early as 1 January 2023, depending on the schedule of their first survey, vessels over 400GT failing to meet the requirements set out in the EEXI and CII risk being detained in port and other penalties.

## EEXI

The marine industry is already familiar with the requirements of the Energy Efficiency Design Index (EEDI), which foresees gradual improvements in energy efficient ship design and construction. The EEDI applies to ships built post-2013, and to date has considered only the design parameters of the vessels and not operational factors. This principle has been extended to cover existing ships through the Energy Efficiency Existing Ship Index (EEXI).

The EEXI describes a vessel's CO<sub>2</sub> emissions, determining standardised CO<sub>2</sub> 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 CO<sub>2</sub> mass.

Attained EEXI is the measure of ships' energy efficiency and is measured in gm CO<sub>2</sub>/t.nm. If attained EEXI is above required EEXI, the ship should implement countermeasures such as shaft/engine power limitation, retrofitting energy saving devices, etc.

EEXI certification will take place:

- At the first annual, intermediate or renewal survey of the International Air Pollution Prevention (IAPP) Certificate on or after 1 January 2023 for ships delivered before 1st January 2023, or
- At the initial International Energy Efficiency Certificate (IEEC) survey for ships delivered on or after 1 January 2023.
- The verification of EEXI shall be completed by the date of the survey.

EEXI is a mandatory requirement applying to ships above 400 GRT trading in international waters that fall under the existing survey and certification scheme as per MARPOL Annex VI regulation 19, like EEDI, except for the following:

- Ships operating only in national waters.
- Ships not propelled by mechanical means.
- Platforms, including FPSOs and FSUs and drilling rigs.
- Ships with non-conventional propulsion apart from cruise passenger ships with electric propulsion and LNG carriers.

As of 1 January 2023, vessels subject to the EEXI will need technical files in place, including the EEXI calculation with supporting documentation. These must be submitted to a class society for verification prior to the International Energy Efficiency (IEE) survey. The IEE certificate is issued on the verification of the EEXI during the next scheduled annual, intermediate or renewal survey in the year 2023.

Ships with an attained EEDI that meets the current required EEXI do not need to prepare an EEXI technical file.

## CII

The CII will take effect in January 2023 alongside the EEXI and will apply to ships above 5,000 gross tonnage trading internationally. The CII is an annual indicator of the ship's transport efficiency rated from A (best performance) to E (worst performance) and expressed in grammes of CO<sub>2</sub> emitted per transport capacity and distance. While the EEXI is a one-time certification covering design parameters, the CII is based on the actual emissions of the vessel during operation and is to be revised yearly. The CII requires ships 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.

A ship's CII is calculated as the ratio of the total mass of CO<sub>2</sub> 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 other ships of the same type. Required reductions for each ship type may increase over time to ensure that international shipping achieves the IMO's intended targets.

Vessels rated D for three consecutive years or E in any year will have to present an approved action plan to be in compliance.

## Compliance

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).

For CII, managers must determine ships' carbon intensity profiles and develop an optimised 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.

The milestone dates leading to EEXI and CII Compliance:

- June 2021 MEPC vote on EEXI and CII.
- September 2022 Completion of EEXI assessment and adoption.
- December 2022 Development of carbon intensity profile and enhanced SEEMP.
- 1 January 2023 EEXI and CII come into force.