

REGULATORY DEBRIEF  
ENERGY EFFICIENCY EXISTING  
SHIP INDEX (EEXI)

DECEMBER 2020





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## OVERVIEW

### INTRODUCTION

As a result of the IMO's continuous work to contribute to global efforts against climate change, the initial GHG Strategy was adopted by the organization in April 2018. Energy regulations and ongoing industry studies on emission reduction options are progressively stimulating innovation and targeting technology readiness. The initial IMO GHG Strategy has established levels of ambition that are subject to ongoing reviews by the organization (see Table 1). The ambition levels have considered potential improvements on vessel design and operational performance as well as the immediate need to introduce low/zero carbon fuels.

The initial GHG Strategy introduced a list of candidate short-term, mid-term and long-term measures to support the IMO's ambition levels (see Table 1). Short-term measures include the evaluation and improvement of vessel energy efficiency requirements (EEDI, SEEMP regulations), the application of technical efficiency measures for existing ships (EEXI regulations) and the introduction and regulation of carbon intensity (CII) for ships in operation. Mid-term and long-term measures include developing an implementation program for alternative low/zero carbon fuels, adoption of other possible innovative emission reduction mechanism(s) and market-based measures (MBMs) to incentivize GHG emissions reduction.

Table 1

Levels of Ambition Directing the IMO Initial GHG Strategy	Measures and Applicability
Carbon intensity of the ship to decline through further development of energy efficiency design index (EEDI) regulations for new ships	Review of EEDI regulations aims to improve the as-designed efficiency of new vessels.
Carbon intensity of international shipping to decline	<p>Measures aim to reduce CO<sub>2</sub> emissions per transport work, as an average across international shipping, by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008.</p> <p>Development of the EEXI regulatory framework aims to improve the energy efficiency of existing ships by implementation of technical measures.</p> <p>Scope of operational measures is currently under development. Requirements intend to cover individual vessels and/or fleet-wide assessment.</p>
GHG emissions from international shipping to peak and decline	<p>Measures aim to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 while pursuing efforts towards phasing them out.</p> <p>Scope is currently under review. Requirements under development intend to cover individual vessels and/or fleet-wide assessment.</p>

This white paper discusses the new EEXI regulations approved by MEPC 75 and corresponding amendments to MARPOL Annex VI, Chapter 4.

### ENERGY EFFICIENCY EXISTING SHIP INDEX (EEXI)

The seventh session of the Intersessional Meeting of the Working Group on Reduction of GHG Emissions from Ships (ISWG-GHG 7) has considered a number of concrete proposals to improve the energy efficiency of existing ships. The group agreed to introduce the necessary amendments to MARPOL Annex VI, Chapter 4 by application and enforcement of the EEXI regulations as a goal-based energy efficiency measure, together with CII regulations regarding operational carbon intensity.

The legal instruments developed to incorporate the EEXI measure into MARPOL Annex VI are shown in Table 2 together with their current status:

Table 2

IMO Instrument	Current Status
Amendments to MARPOL Annex VI	Approved at MEPC 75
Guidelines on method of calculation of the attained EEXI	Developed, subject to finalization and approval at MEPC 76
Guidelines on Survey and Certification of the attained EEXI	Developed, subject to finalization and approval at MEPC 76
Guidelines on the Shaft/Engine Power Limitation System to comply with the EEXI requirements and use of a power reserve (SHaPoLi/EPL Guidelines)	Developed, subject to finalization and approval at MEPC 76

**APPLICATION**

The EEXI regulations apply to all vessels falling under the ship type categories subject to compliance with EEDI regulations. EEXI does not apply to category A ships as defined in the Polar Code and ships having non-conventional propulsion except for cruise ships (non-conventional propulsion) and LNG carriers (conventional and non-conventional propulsion).

**ATTAINED EEXI – REGULATION 20A**

The attained EEXI will be ship-specific i.e., it will be calculated for each individual vessel and verified by the Flag Administration or any organization authorized by it (e.g. Classification Societies). The calculation will be included in each vessel’s EEXI technical file along with any supporting technical data and information used in the calculation process.

For all vessels that have been verified for EEDI and issued an International Energy Efficiency Certificate (IEEC), the attained EEDI will be equal to the attained EEXI, provided that the attained EEDI meets the regulatory limit established by the newly introduced required EEXI regulation 21A. When a ship’s Attained EEDI does not meet the EEXI threshold, technical modification options may be considered for compliance (e.g. engine power limitation, retrofit of energy saving technologies, alternative fuels). For such cases, the Attained EEXI calculation shall be calculated and verified based on the guidelines to be adopted by the IMO.

The EEXI calculation guidelines have been developed but so far remain in draft form. The calculation methodology is aligned with that used for EEDI. However, the determination of specific technical inputs such as the vessel’s reference speed (VREF) require further consideration. The supporting data and information that would normally be available during the EEDI verification process, may be difficult to obtain for EEXI. For such cases, an alternative calculation method was introduced based on statistical speed data of existing ships from the IHS Fairplay database also accounting for the correlation with the ship’s engine power.

The draft guidelines consider that the alternative calculation method for the ship speed (VREF) should by no means overestimate the vessel’s energy efficiency using the ship’s actual EEDI reference speed (VREF) once this has been determined.

Correction factors that account for specific structural elements and powering needs, such as those used in the EEDI calculation for chemical tankers, ice-strengthened ships, shuttle tankers, ro-ro cargo, and ro-ro passenger ships, are pending agreement.

The auxiliary power component (PAE) is expected to follow the estimation process by the current EEDI calculation guidelines. However, when engine power limitation is installed, clarifications may be necessary on if and how the SHaPoLi/EPL installation will affect the calculation.

**REQUIRED EEXI - REGULATION 21A**

Regulation 21A will provide the requirement and guidelines for calculating the required EEXI and verifying that a vessel's attained EEXI is lower than the required EEXI. The Required EEXI would be the regulatory limit for EEXI and its calculation will be in line with the EEDI reference line values using reduction factors specific to EEXI, as shown in Table 3.

Table 3

Ship Type	Size	Reduction Factor
<b>Bulk Carrier</b>	200,000 DWT and above	15
	20,000 and above but less than 200,000 DWT	20
	10,000 and above but less than 20,000 DWT	0-20*
<b>Gas Carrier</b>	15,000 DWT and above	30
	10,000 and above but less than 15,000 DWT	20
	2,000 and above but less than 15,000 DWT	0-20*
<b>Tanker</b>	200,000 DWT and above	15
	20,000 and above but less than 200,000 DWT	20
	4,000 and above but less than 20,000 DWT	0-20*
<b>Containership</b>	200,000 DWT and above	50
	120,000 and above but less than 200,000 DWT	45
	80,000 and above but less than 120,000 DWT	35
	40,000 and above but less than 80,000 DWT	30
	15,000 and above but less than 40,000 DWT	20
	10,000 and above but less than 15,000 DWT	0-20*
<b>General Cargo Ship</b>	15,000 DWT and above	30
	3,000 and above but less than 15,000 DWT	0-30*
<b>Refrigerated Cargo Carrier</b>	5,000 DWT and above	15
	3,000 and above but less than 5,000 DWT	0-15*
<b>Combination Carrier</b>	20,000 DWT and above	20
	4,000 and above but less than 20,000 DWT	0-20*
<b>LNG Carrier</b>	10,000 and above	30
<b>Ro-ro Vehicle Carrier</b>	10,000 and above	15
<b>Ro-ro Cargo Ship</b>	2,000 and above	5
	1,000 and above but less than 2,000 DWT	0-5*
<b>Ro-ro Passenger Ship</b>	1,000 DWT and above	5
	250 and above but less than 1,000 DWT	0-5*
<b>Cruise Passenger Ship with Non-conventional Propulsion</b>	85,000 GT and above	30
	25,000 GT and above but less than 85,000 GT	0-30*

(\*) Reduction factor to be linearly interpolated between the two values dependent upon ship size. The lower value of the reduction factor is to be applied to the smaller ship size.



## REGULATORY DEBRIEF

Special consideration was taken by the members of the ISWG-GHG during the determination of the EEXI reduction factors to address the compliance challenges that some older vessels may face while keeping in line with the IMO Strategy's level of ambition for 2030.

Furthermore, a review clause was introduced stating that by January 1, 2026, the Organization shall assess the effectiveness of Regulation 21A to determine the need to adopt potential future amendments.

## EEXI SURVEY AND CERTIFICATION

For the verification of a vessel's attained EEXI, an application for a survey would be submitted to the verifier together with an EEXI Technical File containing the necessary information for the verification and supporting background documents.

The verification scope is generally expected to align with the one applied for EEDI. However, specific requirements will be introduced on the method to obtain the ship speed (VREF), for situations where SHaPoLi/EPL is installed and for ships having undergone a major conversion.

Upon final verification, each vessel's attained EEXI and required EEXI values will be indicated on the vessel's IEEC issued by the Flag Administration.

For cases where the attained EEDI of the ship satisfies the required EEXI, a confirmation of compliance with EEXI regulations and subsequent update of the IEEC would be sufficient.







### TIMELINE TO ENFORCEMENT

The draft amendments to MARPOL Annex VI introducing the EEXI regulations, have been approved by MEPC 75 (Nov 2020). The draft amendments will now be put forward for adoption at the subsequent MEPC 76 session, to be held in June 2021. The MARPOL treaty requires draft amendments to be circulated for a minimum of six months before adoption, and they can enter into force after a minimum of 16 months following adoption. Enforcement of EEXI regulations will begin on January 1, 2023. *Note: the verification that the ship's attained EEXI is in accordance with the regulations shall take place at the first annual, intermediate or renewal survey for the IAPP Certificate, whichever is the first, on or after January 1, 2023.*

### ABS SUPPORT

ABS' thorough knowledge of international regulations coupled with industry-recognized leadership on sustainability can assist ship owners, builders and designers to address compliance requirements while examining different technology alternatives. Comprehensive project assessments can include sensitivity studies to support the client's investment strategy and decision-making process.

In order to address the emerging EEXI regulations, ABS offers the service of EEXI Benchmarking and Improvement Options. This enables the ship owners and operators to assess their fleets and understand the range of available options they have for achieving the required EEXI levels for each vessel segment.

For more information on the available services please visit [www.eagle.org/sustainability](http://www.eagle.org/sustainability).

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