

Implementation of IMO's Initial GHG Strategy: *State-of-play*



SUSTAINABLE SHIPPING
FOR A
SUSTAINABLE PLANET

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The International Maritime Organization (IMO)



UN Specialized Agency mandated to set a **global regulatory framework** to ensure safe, secure and efficient shipping on cleaner oceans



IMO Convention was adopted in 1948. IMO has developed more than 50 international instruments, such as SOLAS and MARPOL



174 Member States & 3 associated members, 143 observer organizations (IGOs and NGOs), IMO HQ in London



IMO regulates the over 50,000 merchant ships trading worldwide



IMO stands for safe, secure and efficient shipping on cleaner oceans



Context: IMO's Initial Strategy on Reduction of GHG emissions from international shipping of April 2018 (Resolution MEPC.304(72))



MEPC 72/17/Add.1
Annex 11, page 1

ANNEX 11

RESOLUTION MEPC.304(72)
(adopted on 13 April 2018)

INITIAL IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS

THE MARINE ENVIRONMENT PROTECTION COMMITTEE

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

ACKNOWLEDGING that work to address greenhouse gas (GHG) emissions from ships has been undertaken by the Organization continuously since 1997, in particular, through adopting global mandatory technical and operational energy efficiency measures for ships under MARPOL Annex VI,

ACKNOWLEDGING ALSO the decision of the thirtieth session of the Assembly in December 2017 that adopted for the Organization a strategic direction entitled "Respond to Climate Change",

RECALLING the United Nations 2030 Agenda for Sustainable Development,

1. ADOPTS the Initial IMO Strategy on Reduction of GHG Emissions from Ships (hereinafter the Initial Strategy) as set out in the annex to the present resolution;
2. INVITES the Secretary-General of the Organization to make adequate provisions in the Integrated Technical Cooperation Programme (ITCP) to support relevant follow-up actions of the Initial Strategy that may be further decided by the Committee and undertaken by developing countries, particularly least developed countries (LDCs) and small island developing States (SIDS);
3. AGREES to keep the Initial Strategy under review, with a view to adoption of a Revised IMO Strategy on reduction of GHG emissions from ships in 2023.

adopted

IMO's Initial GHG Strategy: vision & levels of ambitions

Levels of ambition

3.1 Subject to amendment depending on review, the Initial Strategy identifies levels of ambition for technological innovation and the global introduction for international shipping will be integral to achieve the overall ambition. The reviews should take into account updated emission estimates, emissions reduction options for international shipping, and the reports of the Intergovernmental Panel on Climate Change (IPCC), as relevant. Levels of ambition directing the Initial Strategy are as follows:

- .1 **carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships**

to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type;

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- .2 **carbon intensity of international shipping to decline**

to reduce CO₂ 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; and

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- .3 **GHG emissions from international shipping to peak and then decline**

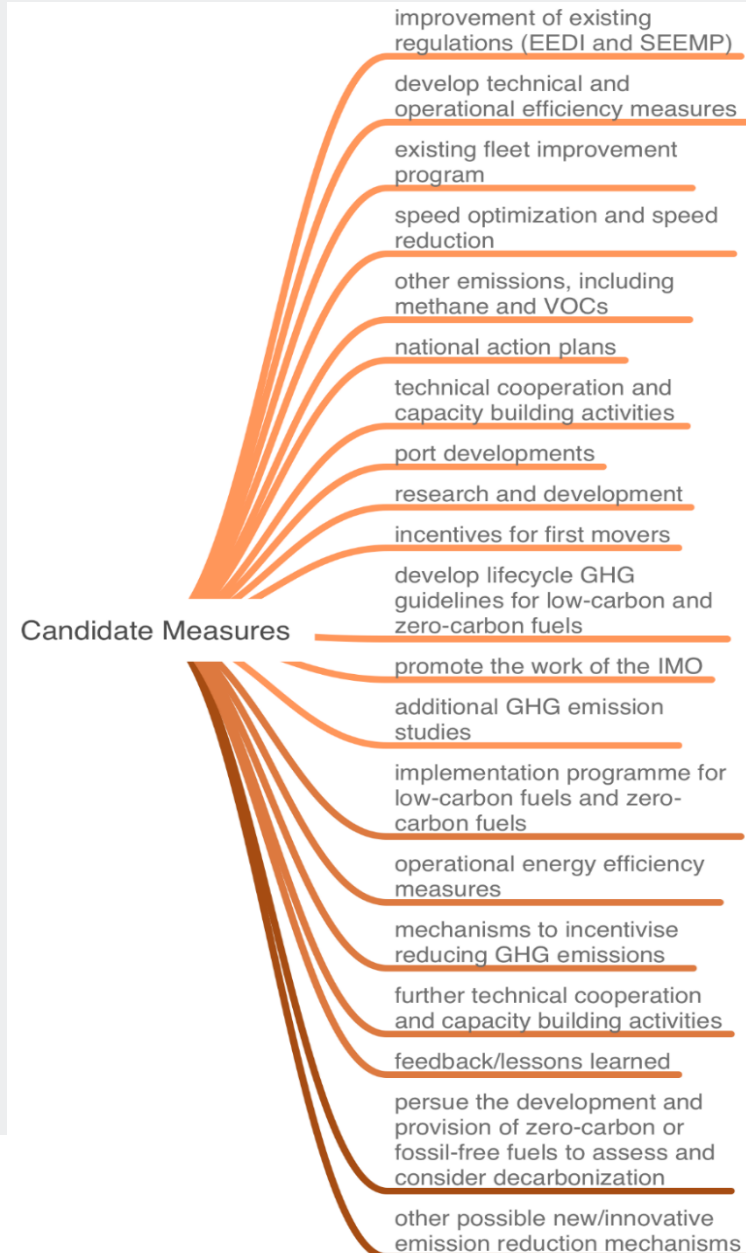
to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO₂ emissions reduction consistent with the Paris Agreement temperature goals.

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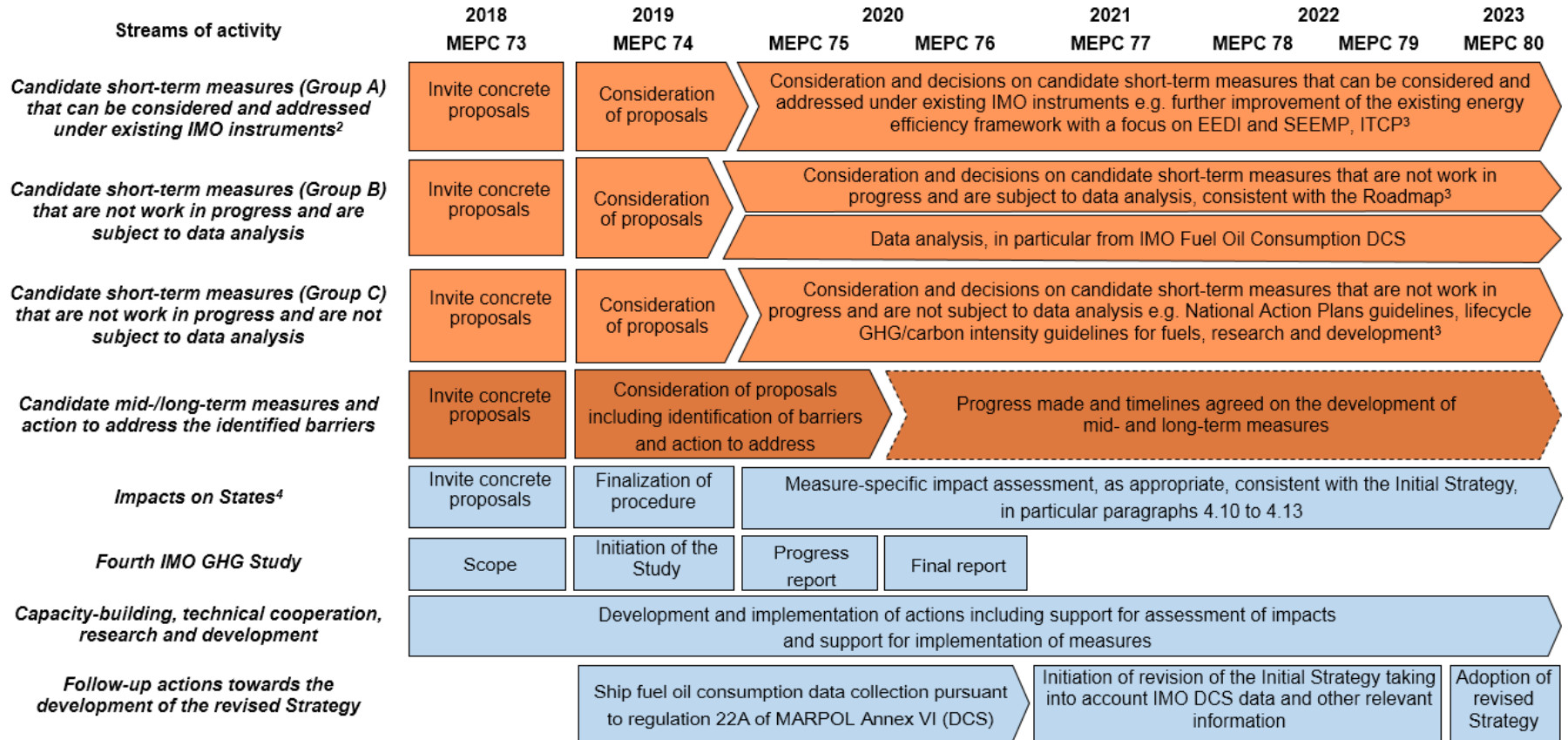
Vision: “IMO is committed to reducing GHG emissions from international shipping and, as a matter of urgency, aims to phase them out as soon as possible in this century”

Candidate measures contained in Initial IMO GHG Strategy

- The Initial GHG Strategy contains a list of “**candidate GHG reduction measures**” with the following timelines for finalization and agreement:
 - **Short-term measures** - between 2018 and 2023
 - Mid-term measures - between 2023 and 2030
 - Long-term measures - beyond 2030
- Zoom in on examples of **short-term measures**:
 - Improvement of existing **EEDI** regulations
 - Development of short-term GHG reduction measures aimed at **reducing carbon intensity** (transport work) of international shipping
 - Establishment of an **International Maritime Research and Development Board (IMRB)**



Programme of follow-up actions of the Initial Strategy up to 2023



² Includes ongoing work pursuant to regulation 21.6 of MARPOL Annex VI.

³ "In aiming for early action, the timeline for short-term measures should prioritize potential early measures that the Organization could develop, while recognizing those already adopted, including MARPOL Annex VI requirements relevant for climate change, with a view to achieve further reduction of GHG emissions from international shipping before 2023" (paragraph 4.2 of the Initial Strategy).

⁴ Assessment of impacts on States to be undertaken in accordance with the procedure to be developed by the Organization.

Outcome of MEPC 75 on GHG and energy efficiency

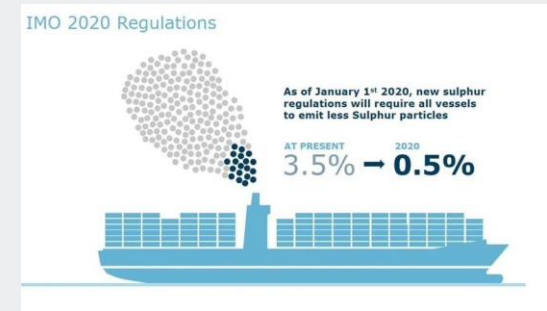
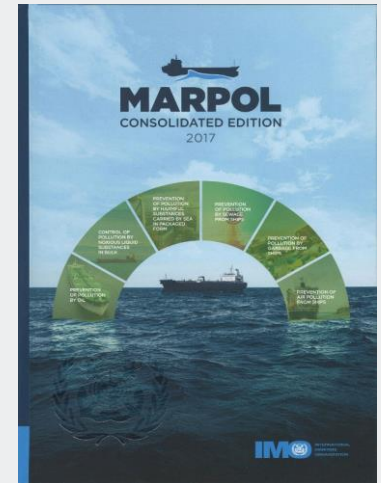
The 75th session of IMO's Marine Environment Protection Committee (virtual session - 16-20 November 2020):

- 1. Adopted amendments to MARPOL Annex VI on early application of Phase 3 of the Energy Efficiency Design Index (EEDI)**
- 2. Approved a package on a goal-based short-term GHG reduction measure:** approval of amendments to MARPOL Annex VI + Terms of Reference for a comprehensive impact assessment of the draft measure
- 3. Approved the Fourth IMO GHG Study 2020**
- 4. Had an initial consideration of the proposal for an International Maritime Research and Development Board (IMRB)**
- 5. Adopted a resolution on voluntary National Action Plans to reduce GHG emissions from international shipping**

Context: MARPOL Annex VI

IMO's International Convention for the Prevention of Pollution from Ships (MARPOL) regulates various sources of operational pollution

- regulates atmospheric pollution and energy efficiency of ships
- ratified by **99** States, which represent around 97% of world tonnage
- contains binding requirements, with differentiation in applicability depending on ship type and ship size
- Chapter 3 regulates **air pollution**: the global sulphur cap – “IMO2020” and NOx emissions
- Chapter 4 regulates **energy efficiency**: EEDI, SEEMP, data collection system



Outcome of MEPC 75: Early application of Phase 3 of the EEDI

Application of the **EEDI Phase 3** reduction factors **brought forward from 2025 to 2022** for selected ship types: container, large gas carriers, general cargo, LNG carriers, cruise ships non-conventional propulsion

- The Energy Efficiency Design Index (EEDI) foresees gradual improvement in energy efficient ship design and building
- Applies to **new build** ships only
- Adopted amendments to Chapter 4 of MARPOL Annex VI will enter into force on 1 April 2022 (16 months after adoption)

Regulation 21 Required EEDI

6 The existing table 1 (Reduction factors (in percentage) for the EEDI relative to the EEDI reference line) and the associated footnotes are replaced by the following:

Ship Type	Size	Phase 0 1 Jan 2013 – 31 Dec 2014	Phase 1 1 Jan 2015 – 31 Dec 2019	Phase 2 1 Jan 2020 – 31 Mar 2022	Phase 2 1 Jan 2020 – 31 Dec 2024	Phase 3 1 Apr 2022 and onwards	Phase 3 1 Jan 2025 and onwards
Bulk carrier	20,000 DWT and above	0	10		20		30
	10,000 and above but less than 20,000 DWT	n/a	0-10*		0-20*		0-30*
Gas carrier	15,000 DWT and above	0	10	20		30	
	10,000 and above but less than 15,000 DWT	0	10		20		30
	2,000 and above but less than 10,000 DWT	n/a	0-10*		0-20*		0-30*
Tanker	20,000 DWT and above	0	10		20		30
	4,000 and above but less than 20,000 DWT	n/a	0-10*		0-20*		0-30*
Containership	200,000 DWT and above	0	10	20		50	
	120,000 and above but less than 200,000 DWT	0	10	20		45	
	80,000 and above but less than 120,000 DWT	0	10	20		40	
	40,000 and above but less than 80,000 DWT	0	10	20		35	
	15,000 and above but less than 40,000 DWT	0	10	20		30	

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (I)

The goal-based short-term GHG reduction measure is designed to achieve the 2030 level of ambition set out in the Initial Strategy: reducing carbon intensity of international shipping by 40% compared to 2008

- MEPC 75 **approved draft amendments** to Chapter 4 of MARPOL Annex VI, to be adopted by MEPC 76 (June 2021) - entry into force in 2023
- The draft amendments were approved as a **package** with the Terms of Reference for a **comprehensive assessment of possible impacts** on States of the draft measure, to be considered by MEPC 76
- The short-term measure sets requirements aimed at reducing the **'carbon intensity'** (transport work) of ships (NOT a target on absolute GHG emission reduction)
- The short-term measure is **goal-based**: combining a **technical** and **operational** approach to achieve carbon intensity reduction target

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (II)

The goal-based short-term GHG reduction measure is designed to achieve the 2030 level of ambition set out in the Initial Strategy: reducing carbon intensity of international shipping by 40% compared to 2008

- Baseline year in the Initial IMO GHG Strategy is 2008
- Carbon intensity reduction since 2008:
 - AER (Annual efficiency ration): between 21-22%
 - EEOI (Energy efficiency operational indicator): between 29.4-31.8%

EEOI: gCO ₂ /t/nm AER: gCO ₂ /dwt/nm		2008	2012	2018	Percentage changes	
					2018 vs. 2008	2018 vs. 2012
Option 1 (vessel-based)	EEOI	17.10	13.16	11.67	-31.8%	-11.3%
	AER	8.08	7.06	6.31	-22.0%	-10.6%
Option 2 (voyage-based)	EEOI	15.16	12.19	10.70	-29.4%	-12.3%
	AER	7.40	6.61	5.84	-21.0%	-11.5%

Source: *Fourth IMO GHG Study 2020*

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (III)

Combination of a technical and operational approach to achieve carbon the intensity reduction target:

- Applies to **existing** ships, with differentiation depending on ship type and ship size
- The goal-based approach leaves **flexibility** for ship owners/operators to achieve the **annual carbon intensity reduction factor**
- Requires a combination of:
 1. **Ex-ante certification of the technical approach**, i.e. the Energy Efficiency Existing Ship Index (EEXI)
 2. **Mandatory reduction of operational emissions**: operational carbon intensity performance to be annually verified (CII)
 3. **Enhanced use and auditing** of the *Ship Energy Efficiency Management Plan* (SEEMP)

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (IV)

Technical approach: Energy Efficiency Existing Ship Index (EEXI)

- **EEXI reduction factors** (in percentage) are relative to the EEDI reference line per ship type and size, and largely mirror EEDI values for 2022 (EEDI Phases 2 or 3)
- **Attained EEXI** shall be specific to each ship and shall indicate the estimated performance of the ship in terms of energy efficiency
- **Required EEXI** is maximum value of attained EEXI that is allowed
- One-off **EEXI certification** shall take place at the first annual, intermediate or renewal IAPP survey after 1 January 2023, based on the '**EEXI Technical File**'
- Most likely (most cost efficient) means to achieve EEXI reduction values is **Engine/Shaft Power Limitation**, other technical means are, for instance, bow or propeller improvements

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (V)

Technical approach: Energy Efficiency Existing Ship Index (EEXI)

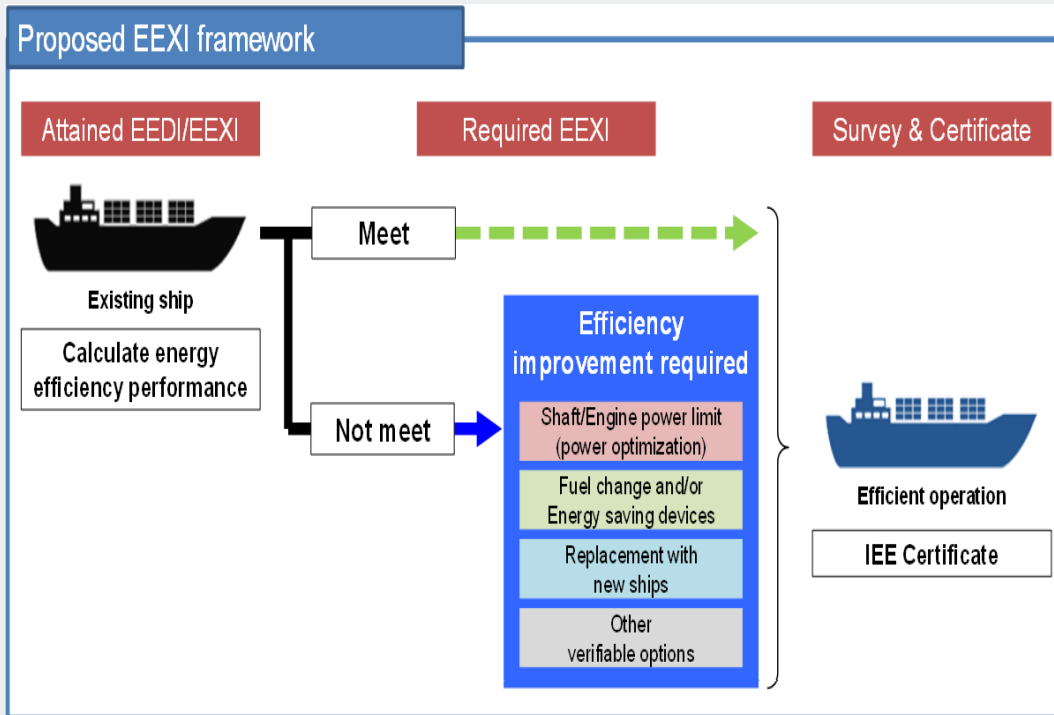


Table 3. Reduction factors (in percentage) for the EEXI relative to the EEDI reference line

Ship type	Size	Reduction factor
Bulk carrier	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*
Gas carrier	15,000 DWT and above	30
	10,000 and above but less than 15,000 DWT	20
	2,000 and above but less than 10,000 DWT	0-20*
Tanker	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*
Containership	200,000 DWT and above	50

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (VI)

The operational approach

- Applicable to all ships above 5,000 GT
- Ships to achieve a required operational energy efficiency (**'required CII'**) in accordance with the carbon intensity indicator (CII) reduction factor
- The metric to be used, e.g. AER, EEOI, ..., still need(s) to be defined in technical guidelines
- Carbon intensity calculation is largely based on total amount of fuel consumed, as already reported by ships over 5,000 GT and collected in IMO's Ship Fuel Oil Consumption Database
- Annual energy efficiency performance will be **'rated'** against reference lines defining the required carbon intensity reduction for each rating
- The annual carbon intensity calculation and associated rating is to be verified by Administration, which will issue a **"Statement of Compliance"**

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (VII)

The rating system

- 5 ratings: A, B, C, D and E (major superior, minor superior, moderate, minor inferior, or inferior performance)
- A ship rated D for 3 consecutive years or rated as E, shall develop a “**Plan of corrective actions**”
- The **SEEMP** shall include the **required annual CII** for the next 3 years, an implementation plan, a procedure for self-evaluation and improvement, (and if required a plan of corrective actions)

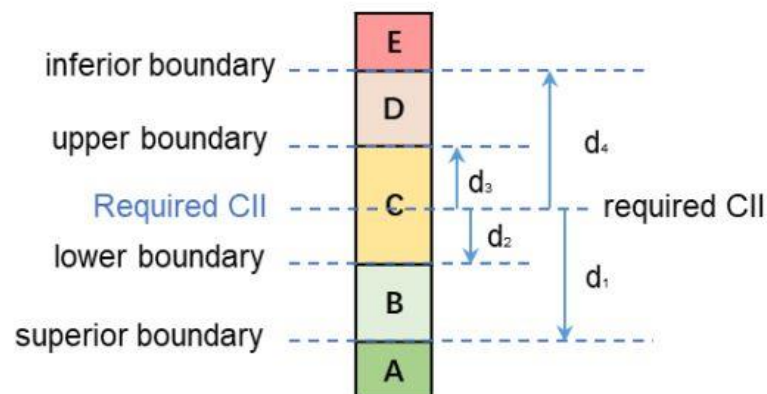
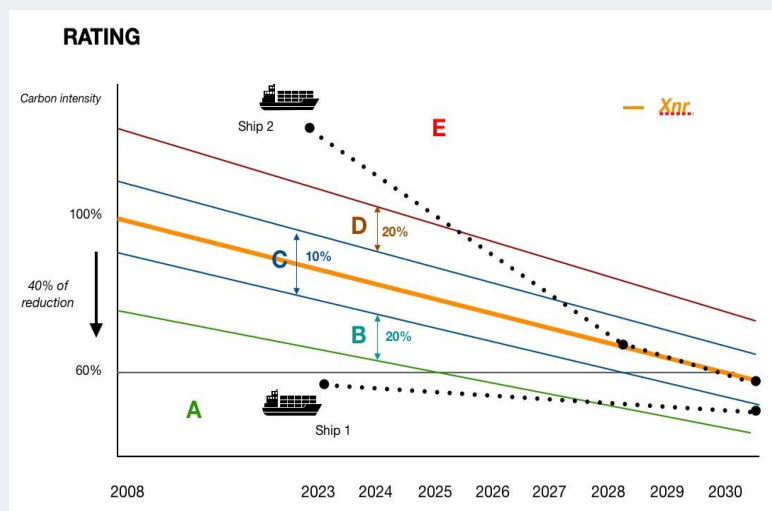


Figure 2: *dd* vectors and rating bands

Outcome of MEPC 75: agreement on a package on a goal-based short-term GHG reduction measure (VIII)

Combined approach of the short-term measure:

- The ex-post annual carbon intensity verification will allow for monitoring the effectiveness of the EEXI in achieving the required CII
- In case the required CII is not achieved, additional operational measures need to be implemented by the ship
- Administrations, port authorities and other stakeholders (**insurers?**) as appropriate, are encouraged to provide **incentives to ships rated as A or B**
- A **review** of the short-term measure is to be completed by 1 January 2026



The outcome of MEPC 75 ensures progress with implementation of the candidate measures in line with the timelines foreseen in the Initial IMO GHG Strategy

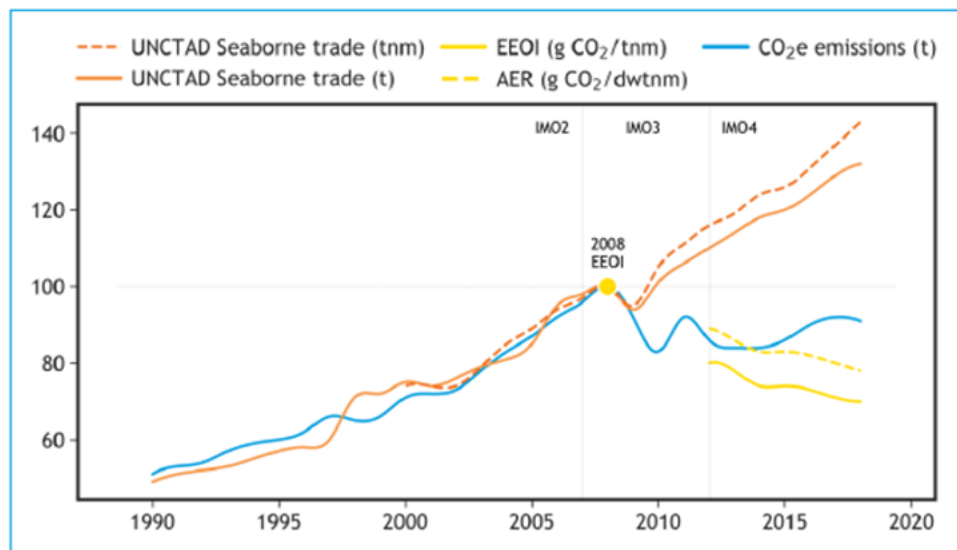


Outcome of MEPC 75: Approval of the *Fourth IMO GHG Study 2020*

The Fourth IMO GHG Study 2020:

- GHG emission inventories for the period 2012-2018
- Total emissions in 2018: 1,056 MT CO₂e (up 9.6% from 2012)
- Shipping's share of global emissions in 2018: 2.89% (up from 2.76% in 2012)

Figure 2 - international shipping emissions and trade metrics, indexed in 2008, for the period 1990-2018, according to the voyage-based allocation² of international emissions³.

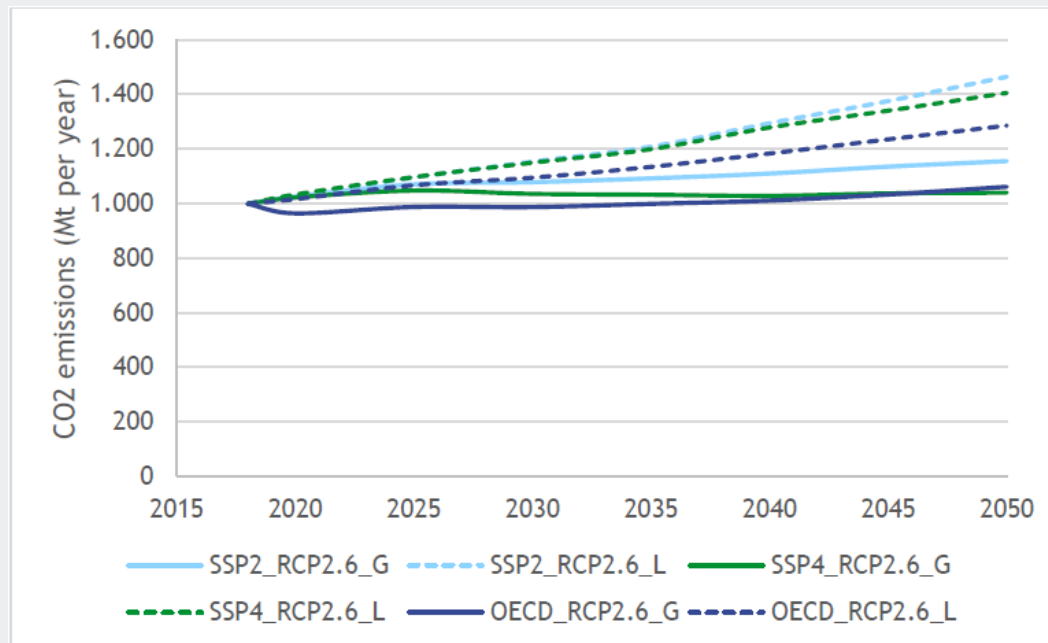


Source: 4th IMO GHG study

Year	GHG emissions (CO ₂ e) international shipping (mt) voyage based	GHG emissions (CO ₂ e) international shipping (mt) vessel based
2008	794	940
2012	713	862
2018	755	937

Outcome of MEPC 75: Approval of the *Fourth IMO GHG Study 2020*

- **Carbon intensity** calculations: 2008 (base year of the Initial Strategy) - 2018 **overall** carbon intensity improvement: 21 - 32%
- **Emission projections:** under Business-as-usual scenarios, 2050 emissions from shipping are expected to **represent between 90% and 130% of 2008 emissions**



Consideration of the proposal for an IMRB

- Shipping industry proposed the establishment of an **International Maritime Research and Development Board (IMRB) and associated Fund**
 - based on a **mandatory 2 USD\$ fuel levy per tonne of fuel**
 - To create a fund of **5 billion USD** over a 10-year period to finance R&D projects, including special focus on developing States
 - The initial consideration during MEPC 75 did not conclude anything yet; **further discussion foreseen during MEPC 76** (June 2021)



Adoption of an MEPC resolution on National Action Plans

- Adoption of resolution MEPC.327(75) on **Encouragement of Member States to develop and submit voluntary National Action Plans to address GHG emissions from ships**
- Exemples of national action plans on the IMO website:
<https://www.imo.org/en/OurWork/Environment/Pages/RELEVANT-NATIONAL-ACTION-PLANS-AND-STRATEGIES.aspx>



Etc...

IMO's regulatory outlook: short-term

- **Finalization of the short-term goal-based measure**
 - Development of a set of broad set of **technical guidelines**: Correspondence Group established by MEPC 75 to present its outcomes to MEPC 76
 - Draft guidelines to be discussed by **ISWG-GHG 8** (May 2021)
 - Establishment of a **Steering Committee** to oversee the development of a **comprehensive assessment of possible impacts** of the short-term measure on States: outcomes to be considered by MEPC 76 in view of adoption of the amendments to MARPOL Annex VI
- **Consideration of proposals to encourage uptake of alternative low/zero carbon fuels, incl. the development of life cycle GHG/carbon intensity guidelines**



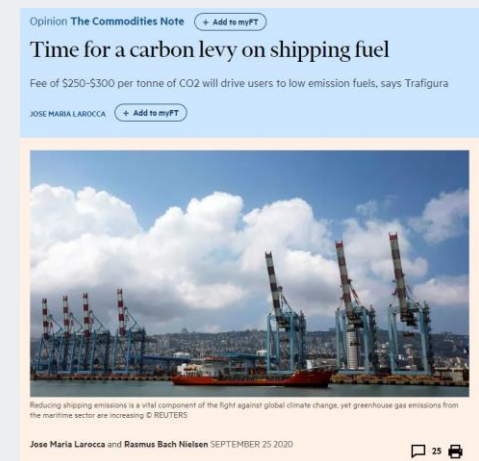
IMO symposium on alternative low-carbon and zero-carbon fuels - 9 and 10 February 2021

IMO official meeting calendar for 2021

ISWG-GHG 8	24-28 May 2021
MEPC 76	10-17 June 2021
ISWG-GHG 9	18-22 October 2021
MEPC 77	8-12 November 2021

IMO's regulatory outlook: mid- to long-term

- During MEPC 75 many Member States emphasized the importance of initiating discussions as soon as possible on:
 1. mid-and long-term GHG reduction measures
 2. revision of the Initial IMO Strategy
 3. IMO working arrangements on GHG reduction
- Possible mid- and long-term measures may include proposals for global Market Based Measures (MBM)
- Certain mid- and long-term measures will require work to commence prior to 2023
- Concrete proposals can be submitted to future sessions of MEPC
- Reduction of GHG emissions from ships remain high on the IMO regulatory agenda



Decarbonization of international shipping: IMO's additional actions

IMO's additional actions:

- Bring together **private and development banks** to establish strategic partnerships and innovative financial instruments to bridge the existing investment gap: **FIN-SMART roundtables**
- Provide the international forum to promote coordinated large-scale demonstration, testing and piloting of promising low-carbon fuels: **IMO-UNEP 2021 Maritime Zero-Low Carbon Innovation Forum** (September 2021)
- Ensure no country is left behind in the transition to carbon-neutral shipping: **enhance our technical cooperation efforts: GreenVoyage2050, MTCCs, GHG-Smart)**

BUSINESS / ECONOMIC / POLITICS

First FIN-SMART roundtable on financing sustainable maritime transport

More than 50 senior officials from the financial, public and private sectors participated in the first "Financing Sustainable Maritime Transport (FIN-SMART) Roundtable" today, a high-level virtual forum hosted by the International Maritime Organization (IMO), the European Bank for Reconstruction and Development (EBRD) and the World Bank Group.

AS BY AMERICAN STOCK NEWS EDITOR OCTOBER 27, 2020 22 VIEWS



IMO, MPA Singapore introduce NextGen initiative

The International Maritime Organization (IMO) and the Maritime and Port Authority Singapore (MPA) jointly introduced "NextGEN", a concept for a collaborative global ecosystem of maritime decarbonization initiatives.

["NextGEN" shipping decarbonization concept mooted for green and efficient navigation](#)

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