



SUSTAINABLE SHIPPING  
FOR A  
SUSTAINABLE PLANET

# Outcome of MEPC 75: GHG and energy efficiency

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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**

# Levels of ambitions set out in the Initial IMO GHG Strategy

## 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;

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;

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

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; and

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; and

- .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 CO<sub>2</sub> emissions reduction consistent with the Paris Agreement temperature goals.

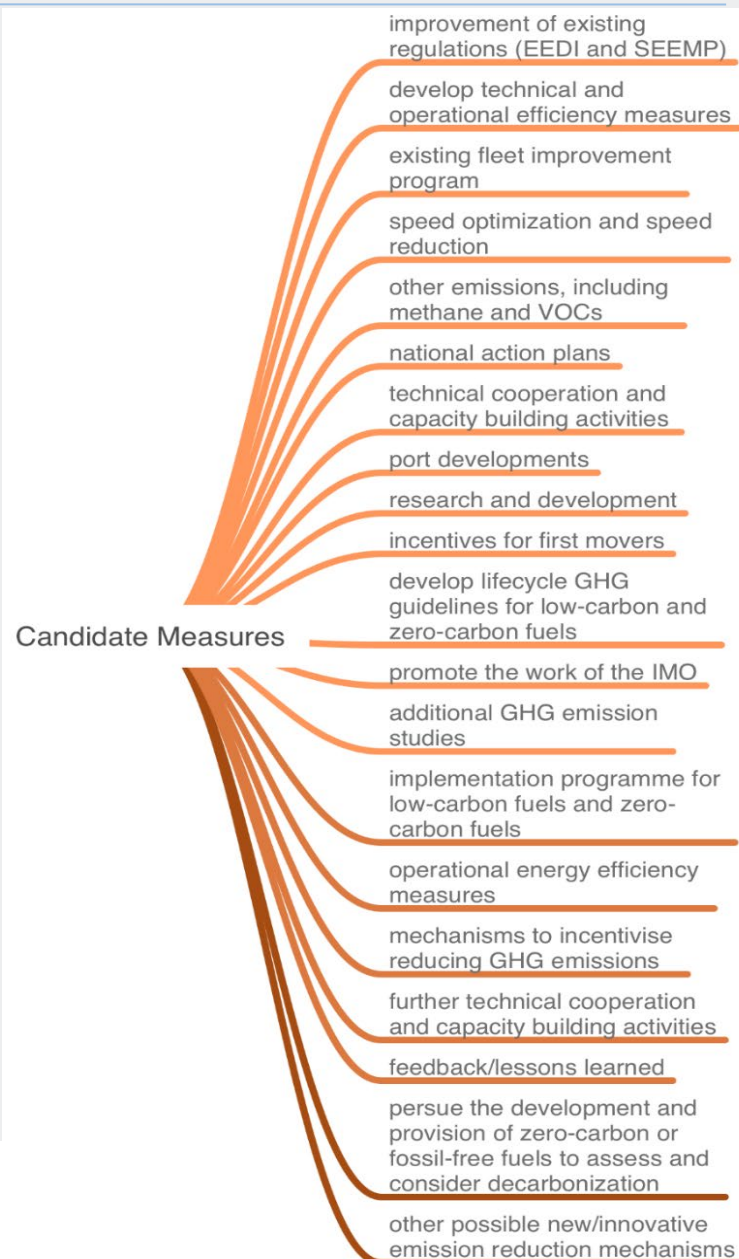
to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO<sub>2</sub> emissions reduction consistent with the Paris Agreement temperature goals.

**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 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)**



## Outcome of MEPC 75 on GHG and energy efficiency

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

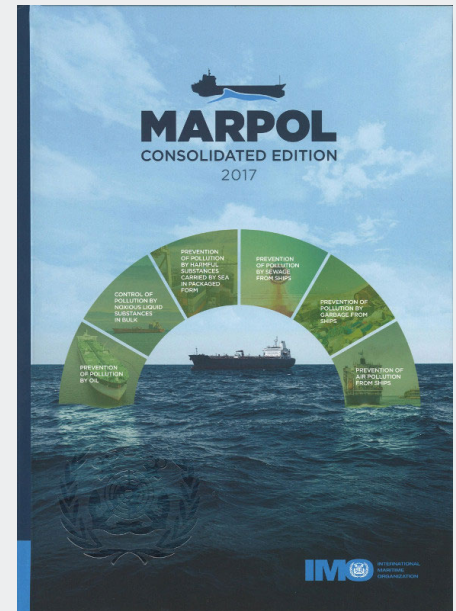
- 1. Adopted amendments to MARPOL Annex VI on early application of Phase 3 of the Energy Efficiency Design Index (EEDI)**
- 2. Approved a package on a goal-based short-term GHG reduction measure:** approval of amendments to MARPOL Annex VI + Terms of Reference for a comprehensive impact assessment of the draft measure
- 3. Approved 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**

### **MARPOL Annex VI on Air Pollution from Ships:**

- regulates atmospheric pollution and energy efficiency of ships
- ratified by **99** States, which represent around 97% of world tonnage
- contain 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 (I)

**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 carries, 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: package on a goal-based short-term GHG reduction measure (I)

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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: 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 <sub>2</sub> /t/nm AER: gCO <sub>2</sub> /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: package on a goal-based short-term GHG reduction measure (III)

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

- The 'goal' and 'functional requirements' are provided for in a new regulations 19A and 19B
- 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 carbon intensity reduction factor
- Requires:
  - **Ex-ante certification of the technical approach**, i.e. the Energy Efficiency Existing Ship Index (EEXI)
  - **Mandatory reduction of operational emissions** operational carbon intensity performance to be annually verified
  - Enhanced use of **Ship Energy Efficiency Management Plan (SEEMP)**



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

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**Technical approach: Energy Efficiency Existing Ship Index (EEXI) is set out in the new regulations 20A and 21A**

- ***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 Phase 2/3)
- ***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 1/1/2023, on the basis of the '***EEXI Technical File***'
- Most likely 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: package on a goal-based short-term GHG reduction measure (V)

**Technical approach: Energy Efficiency Existing Ship Index (EEXI) is set out in the new regulations 20A and 21A**

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

<u>Ship type</u>	<u>Size</u>	<u>Reduction factor</u>
<u>Bulk carrier</u>	<u>200,000 DWT and Above</u>	<u>15</u>
	<u>20,000 and above but less than 200,000 DWT</u>	<u>20</u>
	<u>10,000 and above but less than 20,000 DWT</u>	<u>0-20*</u>
<u>Gas carrier</u>	<u>15,000 DWT and above</u>	<u>30</u>
	<u>10,000 and above but less than 15,000 DWT</u>	<u>20</u>
	<u>2,000 and above but less than 10,000 DWT</u>	<u>0-20*</u>
<u>Tanker</u>	<u>200,000 DWT and Above</u>	<u>15</u>
	<u>20,000 and above but less than 200,000 DWT</u>	<u>20</u>
	<u>4,000 and above but less than 20,000 DWT</u>	<u>0-20*</u>
<u>Containership</u>	<u>200,000 DWT and above</u>	<u>50</u>

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

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### The operational approach: set out in the new Regulation 22B

- 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 CII(s) to be used, e.g. AER, EEOI, ..., still need(s) to be defined
- 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 Fuel 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: package on a goal-based short-term GHG reduction measure (VII)

## The rating system is set out in the new Regulation 22B.6

- 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**”
- **SEEMP** shall include the required annual CII for next 3 years, implementation plan, procedure for self-evaluation and improvement, (plan of corrective actions)
- Regulation 22B.10: Administrations, port authorities and other stakeholders as appropriate, are encouraged to provide **incentives to ships rated as A or B**

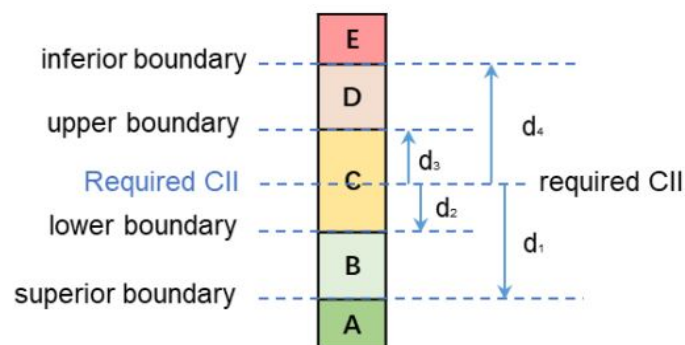


Figure 2: *dd* vectors and rating bands

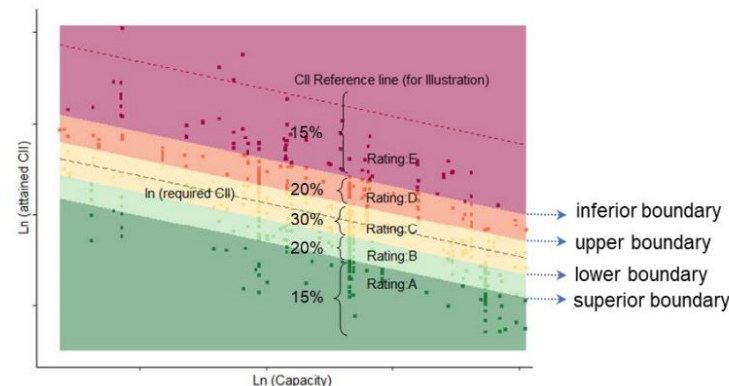


Figure 1: Operational energy efficiency performance rating scale

# Outcome of MEPC 75: 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
- A **review** of the goal-based short-term measure is to be completed by 1 January 2026



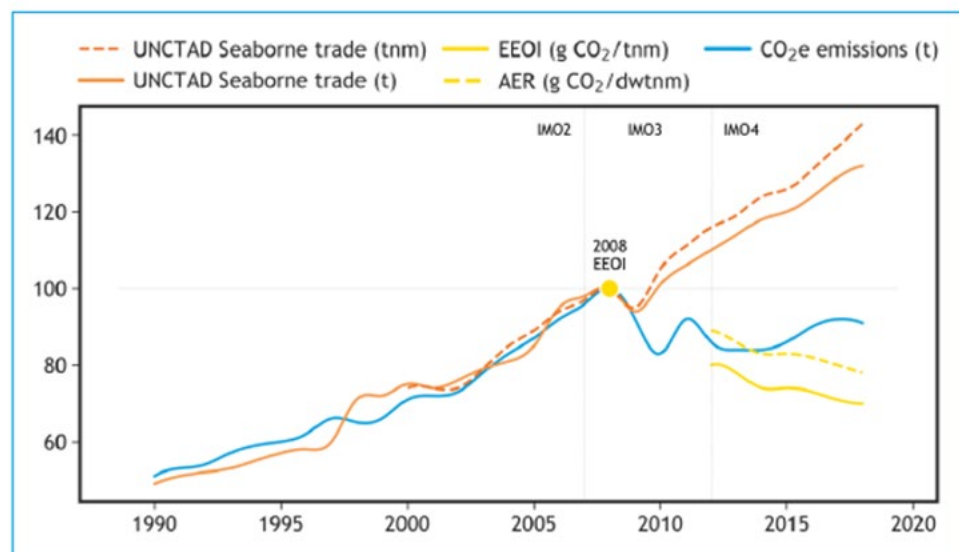
The outcome of MEPC 75 ensures progress with implementation of the candidate measures in line with the timelines foreseen in the Initial IMO GHG Strategy

# Outcome of MEPC 75: Approval of the 4<sup>th</sup> IMO GHG Study 2020

## The Fourth IMO GHG Study 2020:

- GHG emission inventories for the period 2012-2018
- Total emissions in 2018: 1056 MT CO<sub>2</sub>e (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 allocation<sup>2</sup> of international emissions<sup>3</sup>.



Source: 4<sup>th</sup> IMO GHG study

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



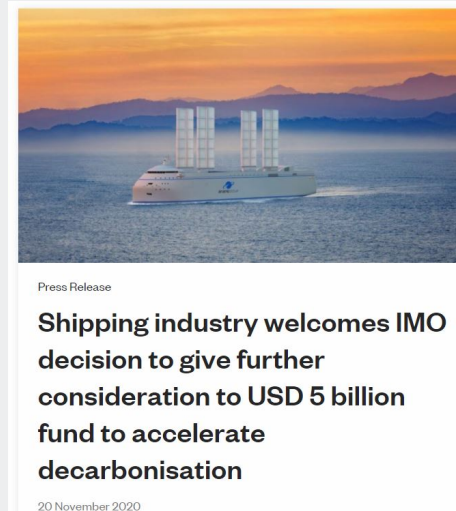
## Outcome of MEPC 75: Approval of the 4<sup>th</sup> IMO GHG Study 2020

- Carbon intensity calculations: 2008 (base year of the Initial Strategy) - 2018 **overall** carbon intensity improvement: 21 - 32%
- Emission projections: emissions projected to increase under BAU scenario by about 90 to 130% of 2008 emissions by 2050

Percentage changes 2018 vs.2008		Bulk carriers		Container ships		Oil tankers	
		overall	individual	overall	individual	overall	individual
Option 1 (vessel-based)	EEOI	-39.96%	-31.73%	-26.18%	-21.34%	-28.95%	-17.64%
	AER	-31.19%	-20.24%	-26.71%	-15.00%	-12.59%	+3.29%
Option 2 (voyage-based)	EEOI	-37.68%	-28.36%	-25.64%	-20.07%	-25.96%	-8.23%
	AER	-31.01%	-20.49%	-26.84%	-14.14%	-9.96%	+5.91%

## Outcome of MEPC 75: consideration of 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 p/t 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)



## IMO's regulatory outlook: short-term

### ■ Finalization of the short-term goal-based measure

- Development of a set of broad set of **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

#### Meeting calendar 2021

ISWG-GHG 8	May 2021
MEPC 76	June 2021
MEPC 77	November 2021

### ■ Consideration of proposals to encourage uptake of alternative low/zero carbon fuels, incl. the development of life cycle GHG/carbon intensity guidelines

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

- During MEPC 75 many Member States emphasized the importance of initiating discussions asap on: (1) mid-and long-term GHG reduction measures (2) revision of the Initial IMO Strategy and (3) working arrangements on GHG
  - Possible mid- and long-term measures can include proposals for global Market Based Measures (MBM)
  - Concrete proposals can be submitted to future sessions of MEPC





# 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**
- Provide the international forum to promote coordinated large-scale demonstration, testing and piloting of promising low-carbon fuels: **IMO-UNEP R&D Forum** (2021)
- Ensure no country is left behind in the transition to carbon-neutral shipping: **enhance our technical cooperation efforts** (e.g. **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.

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News 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**

# Thank you for your attention

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