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REDUCTION OF GHG EMISSIONS FROM SHIPS

Proposed draft amendments to MARPOL Annex VI (Establishment of the International Maritime Research and Development Board and the IMO Maritime Research Fund)

**Submitted by Denmark, Georgia, Greece, Japan, Liberia, Malta, Nigeria, Palau,
Singapore, Switzerland, ICS, BIMCO, INTERTANKO, CLIA, INTERCARGO, IPTA, IMCA,
INTERFERRY and WSC**

SUMMARY

Executive summary: MEPC 75 considered the proposal in document MEPC 75/7/4 to accelerate R&D of low and zero-carbon technologies to help ensure delivery of the levels of ambition in the Initial IMO GHG Strategy. In response to the Committee's invitation for further commenting documents and other proposals, the co-sponsors communicate their support for establishing an International Maritime Research and Development Board and submit, inter alia, a comprehensive package of proposed draft amendments to MARPOL Annex VI to establish an International Maritime Research and Development Board and an IMO Maritime Research Fund. This document and proposal also include changes to address specific concerns and suggestions raised by some Member States at MEPC 75. An accompanying comprehensive impact assessment for the proposal is set out in document MEPC 76/7/8.

Strategic direction, if applicable: 3

Output: 3.2

Action to be taken: Paragraphs 43 and 44

Related documents: MEPC 76/7/8; resolution MEPC.304(72); MEPC 75/18, MEPC 75/7/4, MEPC 75/INF.5; ISWG-GHG 5/4/4; MEPC.1/Circ.885 and MEPC 71/7/4

INTRODUCTION

1 MEPC 75 considered a proposal co-sponsored by several industry associations for the development of a research and development (R&D) programme to accelerate the introduction of low-carbon and zero-carbon technologies and fuels, as set out in document MEPC 75/7/4 (ICS et al.).

2 The Committee noted that the proposed R&D programme would rely on the establishment by the Organization of an International Maritime Research and Development Board (IMRB) – which is already listed in the Initial IMO Strategy on the Reduction of GHG Emissions from Ships (Initial IMO Strategy) as a short-term candidate measure – with responsibility for commissioning, coordinating and administering specific R&D projects, to be financed by a fund (IMO Maritime Research Fund, IMRF) to be established by the Organization. This would be expected to raise approximately \$5 billion over the 10 to 15 year life of the programme via a proposed mandatory R&D contribution equivalent to \$2 per tonne of fuel oil consumed, using the mechanism already established by MARPOL Annex VI for the Fuel Oil Consumption Data Collection System.

3 The Committee also noted that document MEPC 75/INF.5 (ICS et al.) provided an analysis entitled Zero-carbon fuels acceleration carried out by Ricardo on what R&D activities could be undertaken with \$5 billion funding over the life of the IMRB, considering technical issues associated with zero-carbon technologies and the need to increase technology readiness levels (TRLs), providing example R&D case studies of projects which could be required, illustrating the breadth of projects which the IMRB and the fund could support to help achieve the levels of ambition agreed by the Organization in the Initial IMO GHG Strategy.

4 The Committee held an extensive discussion about the IMRB proposal in which considerable support was expressed by many delegations, with many noting the urgent need for R&D to support global efforts to decarbonize the international shipping sector.

5 Following the discussion, the Committee acknowledged the proposal by the industry organizations for the establishment of an IMRB and noted diverging views and concerns on the proposal contained in document MEPC 75/7/4, in particular with regard to various operational, administrative, legal and governance aspects.

6 The Committee also noted that the proposal to establish the IMRB would require more detailed consideration, taking into account documents submitted and comments made at MEPC 75, including consideration of its impacts on States, before taking any decisions on the proposal.

7 Subsequently, the Committee invited interested Member States and international organizations to submit further commenting documents and other proposals. In response to this request, the co-sponsors of this document submit the following comments and a comprehensive regulatory proposal.

DISCUSSION

8 The co-sponsors of this document:

- .1 support the assertion by the industry in document MEPC 75/7/4 that the absolute GHG reduction target for 2050, adopted as part of the Initial IMO Strategy, is unlikely to be achieved unless commercially viable zero-emission ships, including ships capable of trans-oceanic voyages, whether scheduled or non-scheduled, begin to appear on the market by 2030, which will require a collaborative effort involving all relevant parties including, in particular, the energy production and maritime industries;
- .2 agree that this can only happen, within the timeline required by the Initial IMO GHG Strategy, if there is a significant acceleration of R&D of zero-carbon technologies and – given that such technologies do not yet exist in a scale or form that can be readily applied to large ocean-going ships – that a suitably

funded R&D programme needs to commence more or less immediately under the supervision of the Organization;

- .3 further agree that a coordinated R&D programme and collaborative effort of the necessary scale can only be funded by the industry within a mandatory IMO framework, if the required funding is to be generated and to ensure that shipping companies worldwide will contribute on a fair and equal basis;
- .4 emphasize that the funding mechanism associated with the proposal to establish a coordinated international R&D programme is not a market-based measure (MBM) as it provides direct funding for research and development rather than seeking to change behaviour through a carbon pricing mechanism, and that any decision by the Committee to proceed with the development of an MBM is a separate issue;
- .5 stress that the underlying purpose of the proposal is to ensure, through the acceleration of R&D of low and zero-carbon technologies suitable for maritime application, that the world economy, including the economies of LDCs and SIDS, will continue to have access to efficient and economically sustainable maritime transport, notwithstanding the requirement of international shipping to meet the ambitious GHG reduction targets set by the Initial IMO GHG Strategy; and
- .6 highlight that the comprehensive impact assessment (set out in the annex to document MEPC 76/7/8) conclusively confirms that this proposal will have no disproportionately negative impact on States, including LDCs and SIDs.

9 While there are notable and impressive research efforts underway, there is a pressing need to expand the scope and scale of efforts to develop the specific marine technologies that will be needed to use zero-carbon fuels on a broad spectrum of ships including large transoceanic ships that must sail thousands of miles carrying large volumes of fuel. In the judgement of the co-sponsors, the need to expand and accelerate this technical work is critical if we are to be successful in introducing significant numbers of zero-carbon ships in the near future.

10 In light of the above considerations, the co-sponsors invite the Committee to consider the revised and detailed IMRB proposal outlined in this document and its annexes. This document includes a comprehensive package of draft amendments to MARPOL Annex VI (Establishment of the International Maritime Research and Development Board and IMO Maritime Research Fund) and a revised draft Charter which is amended to take into account the concerns and issues expressed by Member States at MEPC 75. The elements of this package included in the annexes to this document are summarized in paragraphs 33 to 38 below.

Concerns and issues raised at MEPC 75

11 During the extensive discussion that took place at MEPC 75 on the IMRB concept proposed in document MEPC 75/7/4, the main concerns and issues raised by some Member States included the need to consider whether:

- .1 a portion of the funds collected should be dedicated to SIDS and LDCs;
- .2 the governance structure should be further clarified, and the fund (IMRF) should be governed within IMO, not by a standalone NGO;

- .3 it might be practical for the industry to develop the IMRB outside the IMO regulatory framework;
- .4 the IMRB proposal should be linked to the broader discussion on the next possible package of measures;
- .5 the Organization should, in parallel with the establishment of the IMRB, initiate work towards developing an MBM;
- .6 a comprehensive impact assessment of the proposal needs to be conducted;
- .7 there might be legal questions associated with incorporating the IMRB and IMRF in MARPOL Annex VI;
- .8 the administrative burden on flag States to ensure compliance should be assessed and addressed; and
- .9 intellectual property concerns are addressed.

12 Each of these concerns and issues are addressed below.

Portion of funds collected should be dedicated to SIDS and LDCs

13 A number of Member States expressed the view at MEPC 75 that "a portion of the R&D contributions collected should be solely dedicated to SIDS and LDCs for some specific but connected matters" (MEPC 75/18, paragraph 7.71.31).

14 The co-sponsors agree with this view and have drafted a regulatory proposal to enable the IMRF to provide supplementary support, as may be determined by the Committee, to IMO's Integrated Technical Cooperation Programme and GHG TC-Trust Fund to assist maritime GHG reduction efforts of developing countries, in particular LDCs and SIDS.

The governance structure

15 Concerns were expressed by a number of Member States during MEPC 75 that in the proposal in document MEPC 75/7/4, the funding (IMRF) for the R&D projects would be under the auspices of the IMRB. It was suggested that there should be a more transparent and better separation of responsibilities between the IMRF and the IMRB and this could be done by placing the IMRF under the auspices of IMO which would provide the funding for the R&D programmes identified by the IMRB.

16 The co-sponsors agree with this suggestion and propose to include the establishment of an IMO Maritime Research Fund under the auspices of IMO, rather than a fund under the auspices of the IMRB as originally proposed in document MEPC 75/7/4.

Impracticality of establishing the IMRB outside the IMO regulatory framework

17 Comments were made during MEPC 75 that the industry might consider establishing the IMRB as a voluntary effort outside IMO.

18 The co-sponsors of this document assert that the R&D programmes required can only be created and succeed within the IMO framework. Establishing the IMRB outside of the IMO regulatory framework could only be voluntary, and the diversity and number of shipowners and their customers (who in many trades often pay for the cost of fuel oil) would make a voluntary programme infeasible and unable to generate the funds needed to support R&D programmes of the scale required. Under a non-mandatory mechanism outside of IMO there would be no mechanism to report and verify the necessary data for implementation of funding and enforcement of R&D contributions, and the "free-rider" problem would make participation competitively unattractive even for otherwise willing participants.

19 Finally, implementing the IMRB concept through the IMO regulatory framework would demonstrate to the world that IMO has put in place a comprehensive and realistic R&D programme to assist in achieving the levels of ambition in the Initial IMO GHG Strategy.

The IMRB concept is not an MBM and, being a candidate short-term measure, should be considered separately to mid- and long-term measures

20 During the discussion on the IMRB proposal at MEPC 75, some Member States suggested that the IMRB proposal should be linked to the broader discussion on the next possible package of measures. A few Member States further opined that, in their view, it had similarities to a market-based measure (MBM) and suggested that it should be addressed when mid- and long-term measures are considered.

21 The IMRB proposal is not an MBM. The IMRB is already listed in the Initial IMO GHG Strategy as a short-term measure and the need to accelerate R&D efforts is acknowledged to be an urgent priority. The proposal to establish the IMRB and IMRF simply provides a vehicle for establishing a coordinated international maritime R&D programme devoted to accelerating the introduction of maritime low-carbon and zero-carbon technologies, and the regulations proposed by the co-sponsors of this document make it clear that the R&D contribution should only be used for this specific purpose (as well as support for IMO's Integrated Technical Cooperation Programme and the IMO GHG TC Trust Fund). Measures to fund R&D efforts are also considered to play a distinct role as technology-push policies that would facilitate structural reform and transition towards decarbonization of international shipping.

22 With respect to considering the IMRB proposal when mid- and long-term measures are considered, the co-sponsors would point out that paragraph 4.7.9 of the Initial IMO Strategy clearly lists as a candidate short-term measure "research and development activities addressing marine propulsion, alternative low-carbon and zero-carbon fuels, and innovative technologies to further enhance the energy efficiency of ships and establish an International Maritime Research and Development Board to coordinate and oversee these R&D efforts." Unless such research and development activities are accelerated as a matter of urgency, there is a serious risk of failing to ensure the deployment of commercially viable zero-emissions ships by 2030, which is vital for achieving the levels of ambition in the Initial IMO GHG Strategy.

Comprehensive impact assessment of the IMRB concept needs to be conducted

23 A number of Member States indicated at MEPC 75 that a comprehensive assessment of the impact of the IMRB on States would need to be conducted before they could support the proposal.

24 The co-sponsors fully agree on the need for such an assessment in accordance with paragraphs 4.10 to 4.13 of the Initial IMO GHG Strategy and have conducted such an assessment which is set out in the annex to document MEPC 76/7/8, produced with the assistance of Clarksons Research, which conclusively confirms that this proposal will have no disproportionately negative impact on States, including LDCs and SIDS, and States that are geographically distant from their markets.

Establishing the IMRB and IMRF through MARPOL Annex VI

25 During MEPC 75 a view was expressed that "the proposal entailed significant legal challenges [...] and the choice of legal instrument and governance structure should be further considered" (MEPC 75/18, paragraph 7.71.16).

26 The co-sponsors are not aware of any legal reason why MARPOL Annex VI cannot be amended to include the IMRB/IMRF requirements if the Parties to MARPOL Annex VI wish to do so.

Administrative burden on flag States to ensure compliance

27 A number of Member States raised concerns about potential administrative burdens. The co-sponsors have sought to minimize the administrative burden on flag States as far as possible in the proposed amendments to MARPOL Annex VI by linking the R&D contribution to be made to the IMRF to the fuel oil data which ships are already required to submit to Administrations for the IMO Fuel Oil Consumption Data Collection System, and by placing most of the tasks necessary to ensure compliance with the IMRF rather than with flag States.

28 Each ship (not the flag State) will be required to provide the IMRF with fuel oil consumption data as already reported to the Administration, or any organization duly authorized by it, in accordance with regulation 22A.3 of MARPOL Annex VI.

29 The co-sponsors propose that the IMRF will be responsible, inter alia, for determining the R&D contribution to be made by each ship, the collection and processing of the R&D contribution, and the issuance of an IMRF Annual Account Statement to confirm that the total R&D contribution to be made to the IMRF for that ship for the previous calendar year has been made.

30 The responsibility of the flag State (or other organization to which this responsibility has been delegated) will be to confirm that the information provided in the IMRF Annual Account Statement is consistent with the ship's fuel consumption data as reported to the Administration (or any organization duly authorized by it) in accordance with regulation 22A.3 of MARPOL Annex VI.

Intellectual property

31 The co-sponsors acknowledge the importance of this issue with respect to programmes and projects which might be supported by the IMRB, and this issue is addressed in the revised draft Charter for the establishment and governance of the International Maritime Research and Development Board, as set out in annex 4 to this document. However, it is recognized that further consideration on how intellectual property concerns may be addressed for work undertaken through the IMRB may need to be finalized in the proposed IMRB Charter.

Other modifications made to the IMRB proposal to improve and clarify the proposal

32 In the package which includes amendments to MARPOL Annex VI proposed by the co-sponsors, a number of modifications have been made to the original IMRB proposal contained in document MEPC 75/7/4 to address issues raised by Member States at MEPC 75 and to improve and clarify how the concept would be implemented. These include:

- .1 providing regulatory clarity regarding the purposes and roles of the IMRB and IMRF;
- .2 adding draft guidelines for the establishment and governance of the IMRB and collection of R&D contributions by the IMRF, to supplement the IMRB and IMRF regulatory requirements;
- .3 making MEPC responsible, inter alia, for oversight authority of the activities, governance and annual budget of the IMRB;
- .4 providing regulatory clarity regarding the process for a ship to obtain an IMRF Statement of Compliance, built upon the IMO Fuel Oil Data Collection System framework, minimizing administrative burdens for Administrations as much as possible;
- .5 providing a draft form for an IMRF Statement of Compliance as a new appendix to MARPOL Annex VI;
- .6 providing regulatory clarity regarding flag State and port State control requirements to ensure consistent implementation and enforcement;
- .7 providing a draft MEPC resolution to establish a fixed value of the R&D contribution based on each tonne of CO₂ emissions and calculated using tonnes of fuel consumed;
- .8 utilizing the conversion factor between fuel consumption and CO₂ emission, as set out in the *Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI)*, to allow for a reduced R&D contribution for fuels with a lower carbon content;
- .9 making appropriate changes to the draft Charter for the establishment and governance of the IMRB included with document MEPC 75/7/4 to be consistent with the proposed amendments to MARPOL Annex VI, summarized in paragraph 34 and 35 below, and revisions and clarifications as noted above; and
- .10 providing regulatory clarity regarding when the IMRB and IMRF will commence and cease operations.

COMPREHENSIVE REGULATORY PACKAGE INCLUDING PROPOSED DRAFT AMENDMENTS TO MARPOL ANNEX VI

33 As indicated above, the co-sponsors have taken into account the discussion at MEPC 75, in particular with regard to the issues raised relating to the operational, administrative, legal and governance aspects of the original proposal and, in response to the Committee's invitation for further proposals, have prepared a comprehensive regulatory proposal as follows:

- .1 annex 1 – draft amendments to MARPOL Annex VI to add, inter alia, a new chapter 6 "Research and Development of Low-Carbon and Zero-Carbon Technologies for Maritime Application";
- .2 annex 2 – draft MEPC resolution and "Guidelines for the establishment and governance of the International Maritime Research and Development Board and Collection of R&D Contributions made to the IMO Maritime Research Fund under chapter 6 of MARPOL Annex VI";
- .3 annex 3 – draft MEPC resolution and annex "R&D Contribution to the IMO Maritime Research Fund"; and
- .4 annex 4 – draft MEPC resolution and Charter for the establishment and governance of the International Maritime Research and Development Board.

34 The proposed draft amendments set out in annex 1 to this document include provisions for the new chapter 6 to MARPOL Annex VI as follows:

- .1 Application;
- .2 International Maritime Research and Development Board (IMRB);
- .3 IMO Maritime Research Fund (IMRF);
- .4 R&D Contributions made to the IMRF;
- .5 Dates for implementation;
- .6 Review and termination of this chapter; and
- .7 Form of the Statement of Compliance with the IMRF.

35 In addition, consequential draft amendments to the following regulations of MARPOL Annex VI are proposed to include the Statement of Compliance with the IMRF:

- .1 Regulation 6 – Issue or endorsement of Certificates and Statements of Compliance;
- .2 Regulation 8 – Form of Certificates and Statements of Compliance;
- .3 Regulation 9 – Duration and validity of Certificates and Statements of Compliance; and
- .4 Regulation 10 – Port State control on operational requirements.

36 The draft "guidelines for the establishment and governance of the International Maritime Research and Development Board and Collection of R&D Contributions made to the IMRF under chapter 6 of MARPOL Annex VI" with accompanying draft MEPC resolution, which are set out in annex 2 to this document, provide guidelines for the elements of the governance structure of the IMRB and the process for collection of R&D contributions as follows:

- .1 Management of IMRB;
- .2 IMRB Charter;

- .3 Oversight of the IMRB by the MEPC; and
- .4 Guidance for the collection of the R&D contributions.

37 The draft MEPC resolution and accompanying annex set out in annex 3 to this document contain, inter alia, the requirements, pursuant to draft regulation 29.1, for calculating the R&D contribution and indicate who should be responsible for the cost associated with the R&D contribution.

38 The proposed draft regulation 27 set out in annex 1 to this document requires the Organization to establish a Charter for the IMRB. A preliminary draft Charter was included in annex 1 to document MEPC 75/7/4. The co-sponsors have revised and updated that draft Charter to reflect all the applicable changes made to the IMRB concept that have been mentioned in the above paragraphs. In annex 4 to this document, the co-sponsors have included that revised draft Charter and accompanying MEPC resolution draft Charter for the establishment and governance of the IMRB. MEPC may wish to utilize this revised draft charter as a basis for the Charter required under draft proposed regulation 27.

39 Pursuant to MEPC.1/Circ.885, an initial impact assessment on States was set out in annex 2 to document MEPC 75/7/4. A comprehensive impact assessment on States is set out in the annex to document MEPC 76/7/8 for the proposed draft amendments to MARPOL Annex VI that are set out in annex 1 to this document to implement this revised IMRB proposal.

CONCLUSIONS

40 A comprehensive, well-funded R&D programme is essential to identify and develop the low and zero-carbon technologies needed for maritime application, including the development of working prototypes that will be critical for the shipping industry to meet the levels of ambition in the Initial IMO GHG Strategy.

41 MEPC acknowledged that such an R&D programme was needed by including paragraph 4.7.9 as a candidate short-term measure in the Initial IMO GHG Strategy – "to initiate research and development activities addressing marine propulsion, alternative low-carbon and zero-carbon fuels, and innovative technologies to further enhance the energy efficiency of ships and establish an International Maritime Research and Development Board to coordinate and oversee these R&D efforts".

42 The comprehensive regulatory proposal included with this document, which takes into account the concerns expressed by some Member States at MEPC 75, would meet the intent of the candidate short-term measure in paragraph 4.7.9 of the Initial IMO GHG Strategy and would be a significant positive step forward in ensuring that the levels of ambition in the Initial IMO GHG Strategy can be achieved.

ACTION REQUESTED OF THE COMMITTEE

- 43 The Committee is invited to consider this document, in particular:
- .1 that additional research and development efforts focused on developing the technologies necessary to use low and zero-carbon fuels in the commercial maritime fleet are urgently needed. These efforts are critically needed to enable commercial deployment of zero-emission ships across a wide variety of ship types, including large ships engaged in transoceanic trades;

- .2 the comprehensive regulatory proposal as set out in annex 1 to this document, including the proposed draft amendments to MARPOL Annex VI (Establishment of the International Maritime Research and Development Board and the IMO Maritime Research Fund);
- .3 the comprehensive impact assessment on States as set out in the annex to document MEPC 76/7/8;
- .4 the clarifications and explanations by the co-sponsors in response to the concerns and issues raised by Member States at MEPC 75; and
- .5 the suggested modifications to the proposal contained in document MEPC 75/7/4 to address the concerns and issues raised by Member States at MEPC 75 and to improve and clarify the proposal.

44 The Committee is invited to agree that the proposed draft amendments to MARPOL Annex VI as set out in annex 1 to this document, and the other annexes included with this document, should be used as the basis for further consideration by the Committee with a view to approval at MEPC 77.

ANNEX 1

PROPOSED DRAFT AMENDMENTS TO MARPOL ANNEX VI (Establishment of the International Maritime Research and Development Board and IMO Maritime Research Fund)

Regulation 6

The title of the regulation is amended (addition shown underlined) as follows:

Issue or endorsement of Certificates and Statements of Compliance related to fuel oil consumption reporting, operational carbon intensity rating and the IMO Maritime Research Fund

A new title and paragraphs 9 and 10 are added as follows:

Statement of Compliance – IMO Maritime Research Fund (IMRF)

9 Upon receipt of the IMRF Annual Account Statement pursuant to regulation 29.5 of this Annex, the Administration, or any organization duly authorized by it, shall determine whether the R&D contribution has been made to the IMRF in accordance with regulation 29.1 of this Annex by checking whether the information provided in the IMRF Annual Account Statement is consistent with the ship's fuel oil consumption data pursuant to regulation 22A.3 of this Annex and, if so, issue a Statement of Compliance related to the IMRF no later than six months from the beginning of the calendar year. In every case, the Administration assumes full responsibility for this Statement of Compliance.

10 With respect to a ship not registered in a Party to this Annex, the Statement of Compliance related to the IMRF may be issued by the appropriate Administration of any Party to this Annex, if satisfied that the contribution required under regulation 29.1 of this Annex has been made to the IMRF for the previous calendar year for that ship. A Statement of Compliance so issued shall have the same force and receive the same recognition as a Statement of Compliance issued under paragraph 9 of this regulation.

Regulation 8

The title of the regulation is amended (addition shown underlined) as follows:

Form of Certificates and Statements of Compliance related to fuel oil consumption reporting, operational carbon intensity rating and the IMO Maritime Research Fund

A new title and paragraph 5 are added as follows:

Statement of Compliance – IMO Maritime Research Fund

5 The Statement of Compliance pursuant to regulations 6.9 and 6.10 of this Annex shall be drawn up in a form corresponding to the model given in appendix [XII] to this Annex and shall at least be written in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy.

Regulation 9

The title of the regulation is amended (addition shown underlined) as follows:

Duration and validity of Certificates and Statements of Compliance related to fuel oil consumption reporting, operational carbon intensity rating and the IMO Maritime Research Fund

A new title and paragraph 13 are added as follows:

Statement of Compliance – IMO Maritime Research Fund

13 The Statement of Compliance pursuant to regulations 6.9 and 6.10 of this Annex shall be valid for the calendar year in which it is issued and for the first six months of the following calendar year.

Regulation 10

Port State control on operational requirements

A new paragraph 7 is added as follows:

7 In relation to chapter 6 of this Annex, any port State inspection shall be limited to verifying, when appropriate, that there is a valid Statement of Compliance related to the IMRF on board, in accordance with article 5 of the Convention.

A new chapter 6 is added as follows:

Chapter 6 – Research and Development of Low-Carbon and Zero-Carbon Technologies for Maritime Application

Regulation 26

Application

- 1 This chapter shall apply to all ships of 5,000 gross tonnage and above.
- 2 The provisions of this chapter shall not apply to:
 - .1 ships solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly; and
 - .2 ships not propelled by mechanical means, and platforms including FPSOs and FSUs and drilling rigs, regardless of their propulsion.

Regulation 27

International Maritime Research and Development Board

1 The Organization shall establish an International Maritime Research and Development Board (IMRB) to commission, coordinate and administer programmes for the applied research and development of low-carbon and zero-carbon emission technologies that are specifically tailored for maritime application, including development of working prototypes, in accordance with the Charter established by the Organization as required in paragraph 2.

2 The Organization shall establish a Charter¹ for the establishment and governance of the IMRB, taking into account Guidelines adopted by the Organization.²

3 The Marine Environment Protection Committee shall oversee the activities and governance of the IMRB in accordance with the IMRB Charter, taking into account Guidelines adopted by the Organization.³

Regulation 28

IMO Maritime Research Fund

1 The Organization shall establish an IMO Maritime Research Fund (IMRF) for the principal purpose of funding the research and development programmes to be administered by the IMRB in accordance with regulation 27 of this Annex, taking into account Guidelines adopted by the Organization.⁴

2 In addition, the IMRF shall:

- .1 provide supplementary support, as may be decided by the Marine Environment Protection Committee, to the Organization's Integrated Technical Cooperation Programme and GHG TC-Trust Fund to assist maritime GHG reduction efforts of developing countries, in particular LDCs and SIDS; and
- .2 meet the costs to the Organization incurred exclusively for providing administrative support to the IMRF and to the IMRB to be established under regulation 27 of this Annex.

3 The R&D contributions made to the IMRF shall only be used for the purposes specified in paragraphs 1 and 2 of this regulation.

Regulation 29

R&D contribution made to the IMO Maritime Research Fund

1 Subject to regulation 30 of this Annex, within four months after the end of each calendar year, each ship of 5,000 gross tonnage and above to which this Chapter applies shall make an R&D contribution to the IMO Maritime Research Fund (IMRF). The R&D contribution for each ship to which this regulation applies shall be fixed at a rate and value to be determined by the Organization.⁵

2 For ships using alternative low-carbon fuels and energy sources, or fuels with lower GHG emissions than conventional fuel oil, a lower R&D contribution than required under

¹ A draft Charter for the establishment and governance of the IMRB is set out in annex 4 to this document.

² By MEPC resolution at the time of adoption of these amendments. Draft resolution set out in annex 2 to this document.

³ By MEPC resolution at the time of adoption of these amendments. Draft resolution set out in annex 2 to this document.

⁴ By MEPC resolution at the time of adoption of these amendments. Draft resolution set out in annex 2 to this document.

⁵ By MEPC resolution at the time of adoption of these amendments. Draft resolution set out in annex 3 to this document.

paragraph 1 of this regulation shall apply, as may be determined by the Organization, taking into account Guidelines adopted by the Organization.

3 Within three months after the end of each calendar year, each ship shall provide the IMRF with fuel oil consumption data as reported to the Administration, or any organization duly authorized by it, in accordance with regulations 22A.3, 22A.4 or 22A.5 of this Annex.

4 No later than one month after receiving the R&D contribution from each ship, as required under paragraph 1 of this regulation, the IMRF shall provide an IMRF Annual Account Statement to each ship confirming that the total R&D contribution to be made to the IMRF for that ship for the previous calendar year, including the portion thereof as provided for in paragraphs 6 and 7 of this regulation, has been made.

5 Following receipt of the IMRF Annual Account Statement, the ship shall promptly provide the Administration, or any organization duly authorized by it, with the IMRF Annual Account Statement.

6 In the event of the transfer of a ship from one Administration to another, the R&D contribution made by the ship in accordance with paragraph 1 of this regulation shall cover the period of the calendar year corresponding to the losing Administration.

7 In the event of a change from one Company to another, the R&D contribution made by the ship in accordance with paragraph 1 of this regulation shall cover the portion of the calendar year corresponding to the previous Company.

8 In the event of change from one Administration to another and from one Company to another concurrently, paragraph 6 of this regulation shall apply.

Regulation 30

Dates for implementation

1 Implementation of the requirements stipulated under regulation 29 of this Annex shall commence on a date after the IMRF and the IMRB Charter have been established in accordance with the requirements of regulations 27 and 28 of this Annex, and that the IMRB is ready to commence operations in accordance with the IMRB Charter.

2 The Organization shall review and confirm that the requirements under regulations 27 and 28 have been met no later than 12 months after entry into force of chapter 6 of this Annex. The Parties, based on the review undertaken by the Organization, shall decide whether the IMRB is ready to commence operations, in accordance with the IMRB Charter. If the IMRB is not ready to commence operations then a further review should be undertaken within six months.

Regulation 31

Review of this chapter

1 After an operational period of 10 years, beginning on the date that this chapter enters into force, the Organization shall review the status of this chapter and amend the relevant provisions if necessary.

2 Upon completion of the IMRB's work programme, and with the approval of the Organization, the IMRF and the IMRB shall cease operations. Upon such a determination, chapter 6 of this Annex and its requirements shall be dissolved, unless the Parties determine otherwise.

APPENDIX [XII]

Form of the Statement of Compliance – IMO Maritime Research Fund

STATEMENT OF COMPLIANCE – IMO MARITIME RESEARCH FUND

Issued under the provisions of the Protocol of 1997, as amended, to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 related thereto (hereinafter referred to as "the Convention") under the authority of the Government of:

.....
(full designation of the Party)

by
(full designation of the competent person or organization authorized under the provisions of the Convention)

Particulars of ship¹

Name of ship

Distinctive number or letters.

IMO Number²

Port of registry

Gross tonnage.

THIS IS TO DECLARE:

1. That the ship has submitted to this Administration an IMRF Annual Account Statement required by regulation 29.4 of Annex VI of the Convention, which is consistent with the ship's fuel consumption data pursuant to regulation 22A.3 of Annex VI of the Convention, covering ship operations from (01/01/yyyy) through (31/12/yyyy).

This Statement of Compliance is valid until (dd/mm/yyyy)

Issued at:
(place of issue of Statement)

Date (dd/mm/yyyy)
(date of issue) (signature of duly authorized official issuing the Statement)

(seal or stamp of the authority, as appropriate)

¹ Alternatively, the particulars of the ship may be placed horizontally in boxes.

² In accordance with IMO ship identification number scheme (resolution A.1078(28)).

ANNEX 2

RESOLUTION MEPC.XXX(7X)

(Adopted on [same date as adoption of the draft amendments for establishment of the International Maritime Research and Development Board and IMO Maritime Research Fund])

[20XX] GUIDELINES FOR THE ESTABLISHMENT AND GOVERNANCE OF THE INTERNATIONAL MARITIME RESEARCH AND DEVELOPMENT BOARD AND COLLECTION OF R&D CONTRIBUTIONS TO THE IMO MARITIME RESEARCH FUND UNDER CHAPTER 6 OF MARPOL ANNEX VI

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING article 38(a) of the Convention on the International Maritime 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,

RECALLING ALSO that it adopted, by resolution MEPC.XXX(X), *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 (Establishment of the International Maritime Research and Development Board and IMO Maritime Research Fund)*,

NOTING that the aforementioned amendments to MARPOL Annex VI, which included a new chapter 6 on Research and Development of Low-Carbon and Zero-Carbon Technologies for Maritime Application, entered into force on [XXX],

NOTING ALSO that regulation 27 of MARPOL Annex VI, as amended, requires the establishment of a Charter for the governance of an International Maritime Research and Development Board (IMRB) and its relationship with the Organization,

NOTING FURTHER that regulation 28 of MARPOL Annex VI, as amended, requires the Organization to establish an IMO Maritime Research Fund (IMRF) for the principal purpose of providing support to the research and development programmes to be administered by the IMRB,

RECOGNIZING that the aforementioned amendments to MARPOL Annex VI require the adoption of relevant guidelines for uniform and effective implementation of the regulations and to provide sufficient lead time for the Organization and Administrations to prepare,

HAVING CONSIDERED, at its [seventy-XXX] session, draft [20XX] guidelines for the establishment and governance of the International Maritime Research and Development Board and collection of R&D contributions to the IMO Maritime Research Fund under chapter 6 of MARPOL Annex VI,

1 ADOPTS the [20XX] Guidelines for the establishment and governance of the International Maritime Research and Development Board and collection of R&D contributions to the IMO Maritime Research Fund under chapter 6 of MARPOL Annex VI (the [20XX] Guidelines), as set out in the annex to the present resolution;

2 INVITES the Organization to take the annexed [20XX] Guidelines into account when developing and implementing the requirements set forth in chapter 6 of MARPOL Annex VI, as amended;

3 AGREES to keep the [20XX] Guidelines under review in light of the experience gained with their implementation.

ANNEX

[20XX] Guidelines for the establishment and governance of the International Maritime Research and Development Board and collection of R&D contributions to the IMO Maritime Research Fund under chapter 6 of MARPOL Annex VI

Introduction

1 The purpose of these guidelines is to direct the Organization's governance and the operation of the International Maritime Research and Development Board (IMRB) and IMO Maritime Research Fund (IMRF) to be established under chapter 6 of MARPOL Annex VI.

International Maritime Research and Development Board

Management of IMRB

2 The IMRB should be established, managed and operated without cost to the Organization, and once the IMO Maritime Research Fund (IMRF) is operational, costs can be recovered from the IMRF.

IMRB Charter¹

3 The IMRB Charter should set out, inter alia, the primary research and development objectives of the IMRB, critical principles and operating parameters including treatment of intellectual property rights, collaboration with related R&D initiatives, selection procedures for the IMRB Board of Directors, conflict of interest provisions, criteria and procedures for eligibility and review of R&D proposals made to the IMRB including technology readiness levels (TRLs); and other criteria as may be necessary.

Oversight of the IMRB by the Marine Environment Protection Committee

4 The Marine Environment Protection Committee (MEPC) should establish arrangements, inter alia, for the approval of the annual budget and expenditure of the IMRB, oversight of the IMRB's management functions and work in accordance with the IMRB Charter, and approval of the appointment of the IMRB's senior officers.

5 The specific responsibilities of MEPC should include, but not be limited, to:

- .1 providing general oversight and advice to the IMRB and its Board of Directors on the strategic direction and annual budget of the IMRB;
- .2 ensuring that the IMRB performs its duties and responsibilities consistent with the objectives set forth in the IMRB Charter;
- .3 approving the overall annual operating budget for the IMRB after considering recommendations and other relevant information provided by the IMRB and its Board of Directors;

¹ Paragraph 3 may be deleted if the IMRB Charter is adopted on the same date as the draft amendments for establishment of the IMRB and IMRF.

- .4 undertaking independent financial audits of the IMRB concerning the management and administration of its funds and related investments to ensure that the IMRB fully meets its fiduciary responsibilities, including the accounting of funds expended for specific research and development programmes, grants, and other funding provided by the IMRB using IMRF funds; and
- .5 advising upon recommendations made by the IMRB to modify and adjust the IMRB research strategy and budget, as appropriate, in light of technological, scientific and research developments.

IMO Maritime Research Fund

Collection of R&D contributions to the IMRF

6 The IMRF should establish an IMRF account for each ship to which chapter 6 of MARPOL Annex VI applies, in accordance with the IMO ship identification scheme (resolution A.1078(28)) to which R&D contributions can be submitted by the Company responsible for that ship as defined by paragraph 49 of regulation 2 of MARPOL Annex VI.

7 No later than one month after receiving the data specified in regulation 29.3 of MARPOL Annex VI, the IMRF should provide a provisional statement for each ship which sets out the total R&D contribution to be made to the IMRF for the previous calendar year, as required under regulation 29.1 of MARPOL Annex VI.

8 No later than one month after receiving the R&D contribution from each ship, as required under regulation 29.1, the IMRF shall provide an IMRF Annual Account Statement to each ship confirming that the total R&D contribution to be made to the IMRF for that ship for the previous calendar year has been made, in accordance with regulation 29.4 of MARPOL Annex VI.

9 The mechanism for the IMRF to collect R&D contributions should allow the Company, as defined by paragraph 49 of regulation 2 of MARPOL Annex VI, responsible for making R&D contributions on behalf of the ship, to make a single annual R&D Contribution calculated from the data reported to the IMRF in accordance with regulation 29.3 of MARPOL Annex VI. In addition, the mechanism should allow the Company the option to make R&D contributions in advance, on a quarterly basis or as frequently as may be required, based on fuel oil purchased for consumption.

ANNEX 3

RESOLUTION MEPC.XXX(7X)

(Adopted on [same date as adoption of draft amendments for Establishment of the International Maritime Research and Development Board and IMO Maritime Research Fund])

R&D CONTRIBUTION TO THE IMO MARITIME RESEARCH FUND

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING article 38(a) of the Convention on the International Maritime 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,

RECALLING ALSO that it adopted, by resolution MEPC.XXX(X), *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 (Establishment of the International Maritime Research and Development Board and IMO Maritime Research Fund)*,

NOTING that the aforementioned amendments to MARPOL Annex VI, which included a new regulation 28 of MARPOL Annex VI establishing an IMO Maritime Research Fund (IMRF), entered into force on [XXX],

NOTING ALSO that regulation 29.1 of MARPOL Annex VI, as amended, requires each ship to make an R&D contribution to the IMRF,

RECOGNIZING that the aforementioned amendments to MARPOL Annex VI require the Organization to determine a fixed rate and value for the R&D contribution,

ACKNOWLEDGING that the R&D contribution to the IMRF is not a market-based measure and will only be used to provide funding required for the purposes specified under regulation 28 of MARPOL Annex VI,

HAVING CONSIDERED, at its [seventy-XXX] session, a draft R&D contribution to the IMO Maritime Research Fund,

1 ADOPTS the R&D contribution to the IMO Maritime Research Fund, as set out in the annex to the present resolution;

2 REQUESTS the Parties to MARPOL Annex VI and other Member Governments to bring the R&D contribution to the attention of shipowners, ship operators, charterers, port State Authorities and any other interested parties.

ANNEX

R&D CONTRIBUTION TO THE IMO MARITIME RESEARCH FUND

1 Pursuant to regulation 29.1 of MARPOL Annex VI, the R&D contribution made to the IMO Maritime Research Fund for each ship shall be calculated as follows:

Rate of R&D contribution: Tonne of fuel oil * C_F^1 = CO₂ emissions

Value of R&D contribution: For liquid fuel oil including Diesel/Gas Oil, Light Fuel Oil (LFO) and Heavy Fuel Oil (HFO):²
\$0.624 per tonne of CO₂ emissions
(equivalent to \$2 per tonne of liquid fuel oil consumed by the ship)

For LPG:³
\$0.624 per tonne of CO₂ emissions
(equivalent to US\$1.89 per tonne of LPG consumed by the ship)

For LNG:
\$0.624 per tonne of CO₂ emissions
(equivalent to \$1.72 per tonne of LNG consumed by the ship)

Methanol:
\$0.624 per tonne of CO₂ emissions
(equivalent to US\$0.86 per tonne of methanol consumed by the ship)

Ethanol:
\$0.624 per tonne of CO₂ emissions
(equivalent to \$1.19 per tonne of ethanol consumed by the ship)

2 In the case of a ship equipped with a dual-fuel main or auxiliary engine, the ship shall provide the IMRF with fuel oil consumption data for both types of fuel, as provided to the Administration in accordance with regulation 22A.3 of MARPOL Annex VI.

3 Notwithstanding the requirement under regulation 29.1 of MARPOL Annex VI for a ship to make an R&D contribution to the IMRF, the entity ultimately responsible for paying for the cost of the fuel oil should ultimately be responsible for meeting the cost of the R&D contribution. When a ship is operating under a charter party clause which requires the charterer to pay for the fuel oil purchased for consumption on that ship, the cost of the associated R&D contribution to the IMRF for that ship should be the responsibility of the charterer.

¹ C_F : Conversion factor between fuel consumption and CO₂ emissions, as set out in paragraph 2.2.1 of annex to resolution MEPC.308(73) 2018 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships, as amended.

² For the purpose of calculating the R&D contribution to the IMRF, the CO₂ emissions of all types of liquid fuel oil are treated as being equal to Diesel/Gas Oil.

³ The CO₂ emissions of butane LPG are regarded as equal to propane.

4 The mandatory R&D contribution by a ship to the funding mechanism established for international shipping should not be duplicative, and emissions or fuel oil consumption for the basis of such a contribution should be accounted for only once.

ANNEX 4

**DRAFT RESOLUTION AND CHARTER FOR THE ESTABLISHMENT AND GOVERNANCE
OF THE INTERNATIONAL MARITIME RESEARCH AND DEVELOPMENT BOARD (IMRB)**

**RESOLUTION MEPC.XXX(7X)
(Adopted on [XXXX])**

**CHARTER FOR THE ESTABLISHMENT AND GOVERNANCE OF THE
INTERNATIONAL MARITIME RESEARCH AND DEVELOPMENT BOARD**

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING article 38(a) of the Convention on the International Maritime 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,

RECALLING ALSO that it adopted, by resolution MEPC.XXX(X), *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 (Establishment of the International Maritime Research and Development Board and IMO Maritime Research Fund)*,

RECALLING FURTHER that the Initial IMO GHG Strategy explicitly recognizes the need for technological innovation and that the global introduction of alternative fuels and/or energy sources for international shipping will be critical to achieving the overall ambition,

NOTING that the goals of the Initial IMO GHG Strategy require the accelerated development and deployment of low-carbon and zero-carbon fuels, propulsion systems, and related technologies needed to meet the unique power demands that make up the broad spectrum of shipping activity in the commercial maritime sector,

NOTING ALSO the urgent need for new research and development activities addressing marine propulsion, alternative low-carbon and zero-carbon fuels, and innovative technologies to further enhance the energy efficiency of ships,

NOTING FURTHER that regulation 27.1 of MARPOL Annex VI, as amended, requires the Organization to establish an International Maritime Research and Development Board (IMRB) to commission, coordinate and administer programmes for the applied research and development of low carbon and zero-carbon emission technologies that are specifically tailored for maritime application, including development of working prototypes, in accordance with the Charter to be established by the Organization pursuant to regulation 27.2 of MARPOL Annex VI,

NOTING FURTHER that regulation 27 of MARPOL Annex VI, as amended, requires the establishment of a Charter for the governance of an International Maritime Research and Development Board (IMRB) and its relationship with the Organization, taking into account guidelines developed by the Organization,

RECOGNIZING that the aforementioned amendments to MARPOL Annex VI require the adoption of relevant guidelines for uniform and effective implementation of the regulations and to provide sufficient lead time for the Organization and Administrations to prepare,

HAVING CONSIDERED, at its [seventy-XXX] session, the draft Charter for the establishment and governance of the International Maritime Research and Development Board under chapter 6 of MARPOL Annex VI,

ADOPTS the Charter for the establishment and governance of the International Maritime Research and Development Board (IMRB) under chapter 6 of MARPOL Annex VI as set out in the annex to the present resolution.

ANNEX

**CHARTER FOR THE ESTABLISHMENT AND GOVERNANCE OF THE
INTERNATIONAL MARITIME RESEARCH AND DEVELOPMENT BOARD (IMRB)**

Article 1
Establishment

1. The International Maritime Research and Development Board (IMRB) is established by the Organization pursuant to regulation 27.1 of MARPOL Annex VI, in accordance with Guidelines adopted by the Organization. [, in [insert relevant geographic location] and is registered as ... consistent with the [insert relevant legal authorities governing the establishment of a non-profit organization in the relevant jurisdiction].]
2. The IMRB shall be established, managed and operated without cost to the Organization. Once the IMO Maritime Research Fund (IMRF) is operational, costs can be recovered from the IMRF. Start-up funds required to establish the IMRB shall also be repaid from the IMRF.

Article 2
Mandate

1. The mandate and purpose of the International Maritime Research and Development Board (IMRB) is to commission, co-ordinate and administer programmes for the applied research and development of low-carbon and zero-carbon emission technologies that are specifically tailored for maritime application, including development of working prototypes, with an emphasis on projects which increase the technology readiness levels (TRLs) of such technologies.
2. The IMRB shall be funded using funds provided by the IMO Maritime Research Fund (IMRF) and other supplementary sources of funding including co-funding of specific programmes and projects undertaken through the IMRB.
3. The IMRB and its programmes shall support research and development projects that accelerate the development and deployment of low-carbon and zero-carbon fuels, marine propulsion systems, and related technology and design advancements. Low-carbon and zero carbon fuels and technologies are fuels and technologies that produce near zero or zero-carbon emissions when evaluating the full life cycle production of a given fuel or technology.
4. The IMRB and its programmes shall develop a portfolio of research and development projects that pursue low-carbon and zero-carbon fuels and technologies that reflect the differing demands that are inherent to a broad spectrum of shipping activity including large transoceanic ships, smaller short-sea ships, passenger ships, and the major ship types that constitute commercial maritime trades. This portfolio shall include research, development and demonstration projects that seek to identify and develop low-carbon and zero-carbon fuels and technologies which are not yet available for commercial deployment on most ship types.
5. While the primary mandate of the IMRB is focused on identifying low-carbon and zero-carbon fuels and technologies, the IMRB shall also consider important environmental co-benefits. Consequently, the IMRB will consider and encourage development of fuels and technologies that also minimize harmful emissions such as oxides of nitrogen, SO_x, particulate matter, black carbon, and other emissions and discharges considered harmful to the environment.

6. The IMRB may exercise its discretion to also pursue mixed-fuel (e.g. hybrid fossil and non-fossil fuel) projects if such projects are considered to be important pathways in facilitating the transition to low-carbon and zero-carbon fuels and technologies.

7. The IMRB's research and development efforts may include field demonstrations of promising technologies, fuels and marine propulsion systems with the aim of catalysing the conditions that will lead to low-carbon and zero-carbon systems that are commercially available and economically and technically viable for use across a wide range of ship types used in the commercial maritime sector.

8. When the IMRB determines, and IMO agrees, that low-carbon and zero-carbon fuels, propulsion systems and technologies can be made available across the maritime sector, the mandate shall be considered to have been met.

Article 3 **Objectives**

1. The primary objective of the IMRB is to meet the above mandate through the funding and management of applied research and development projects that support development of low-carbon and zero-carbon fuels, marine propulsion systems, and related technologies for use in the commercial maritime sector.

2. The IMRB shall pursue the most cost-effective low-carbon and zero-carbon fuels and technologies, noting that costs of new technologies and fuels usually decline as deployment is scaled-up and applied research leads to breakthroughs that may significantly reduce overall system cost.

3. The IMRB shall also seek to foster international cooperation and collaboration among the recipients of its grants and contracts and other interested parties to maximize the productivity and progress of research and development projects. In this context, the IMRB shall work to disseminate knowledge gained from funded projects to assist global efforts to decarbonize shipping and help support the transition from fossil fuel use in shipping in both developed and developing countries, particularly SIDS and LDCs.

4. The IMRB shall promote, fund and evaluate low-carbon and zero-carbon fuels and technologies that can be applied in different ship types to ensure that research and development investments are made in those areas of commercial maritime shipping that are critical to achieving the objectives outlined in the IMO GHG Strategy. In this context, the IMRB work programme needs to give appropriate priority to identifying low-carbon and zero-carbon fuels and technologies that are workable for transoceanic ships.

5. The IMRB shall include a research work stream that will explore technical and operational innovations that could contribute to reducing transport costs to small island developing States and other remote locations.

6. Among its research and development initiatives, the IMRB shall include funding to develop and construct fully functioning prototypes. The IMRB may also fund projects to develop prototype ship-to-shore infrastructure designs to facilitate practical and economical fuelling of ships. Such projects will be limited to prototype development and shall not be expanded to include commercial infrastructure construction and shipbuilding.

7. The IMRB shall take into consideration related R&D efforts underway by national governments, regional bodies, and other institutions. The IMRB shall expand the range and level of investment of applied R&D efforts devoted to the introduction of low-carbon and zero-

carbon technologies in the commercial maritime sector while seeking to avoid duplication of efforts undertaken outside the framework of the IMRB.

8. The IMRB shall achieve these objectives in a manner that is transparent, credible and trusted, while remaining aligned with the Objectives of the IMO GHG Strategy.

Article 4
Management and Organization of the IMRB

1. The IMRB shall be composed of the IMRB Board of Directors, an Executive Director, Chief Financial Officer, Technical Research Officer, General Counsel, and other professional and administrative staff to perform the managerial functions and responsibilities necessary to the successful operation of the IMRB (see figure 1 set out in appendix 1 to this document).

2. The IMRF will provide the financial resources necessary to support the programmatic work of the IMRB that will include grants and contracts to qualified research and development institutions and other qualified parties performing work as directed and authorized by the IMRB. The IMRF will also provide the necessary financial resources to support the IMRB Secretariat including salaries, office space, and all other related expenses.

3. The IMRB Board of Directors shall consist of [11] individuals, including a Chairperson, who are non-governmental professionals with extensive experience and recognized expertise in one or more of the following fields: research and development, shipping, shipbuilding, low and zero-carbon fuels and technologies, environmental policy, energy policy and other expertise relevant to the mandate of the IMRB.

4. The term lengths for the Board of Directors shall be initially staggered, with four members serving one-year terms, four members serving two-year terms, and three members serving three-year terms. The standard term length after each initial term shall be three years, and Board Members will be able to serve a maximum of two terms. To serve a second term a Board Member must again be nominated and selected via the same process that a new nominee would face. Using this process, each year, approximately one-third of the Board's seats shall rotate to new nominees, or in some cases, will be retained for a Board Member's second term. Consequently, the Board of Directors will always have members with sufficient IMRB-specific experience.

5. The initial Chairperson of the Board will be selected by the IMO Secretary-General from a list of candidates provided by the IMRB Nominating Committee. The remaining [10] initial IMRB Board Members will then be selected by the Chairperson from a list of candidates named by the IMRB Nominating Committee.

6. The IMRB Nominating Committee shall be composed of [13] members. Of these [13] members, [7] shall be from the shipping industry, [3] shall be government representatives, and [3] shall be from academia and environmental NGOs. The IMRB Nominating Committee may utilize professional assistance for nominating prospective Board Members consistent with paragraph 7 below. Once the IMRB Board of Directors has been established, subsequent nominations to ensure continuity of the Board (consistent with the term lengths outlined in paragraph 4) shall be made by the IMRB Nominating Committee with the approval of the IMRB Board of Directors. Interviews and other evaluations may be performed as the IMRB Nominating Committee, Executive Director and IMRB Board of Directors deem appropriate.

7. The IMRB Nominating Committee shall ensure that nominees for the IMRB Board of Directors are non-governmental professionals with experience, inter alia, in: research and development, shipping, shipbuilding, low-carbon and zero-carbon fuels and technologies,

environmental policy, energy policy and other expertise relevant to the mandate of the IMRB. Specific criteria and guidance outlining expertise and experience are set out in appendix 2 of this document.

8. The IMRB Board of Directors shall be responsible for making high-level decisions concerning strategy and management of the IMRB. These responsibilities shall include: development of specific R&D needs, providing guidance to the Executive Director, and identification, definition and ongoing refinement of the specific research priorities consistent with the mandate of the IMRB.

9. The IMRB Board of Directors shall have the authority to set its own processes and procedures for reviewing and evaluating proposals on an individual and/or group basis, and shall have the final say on approval of grants and contracts that have been recommended to it by the IMRB staff.

10. The IMRB Board of Directors may, if appropriate, recommend an increase or decrease in the funding of the IMRB should the IMRB Board of Directors conclude that the amount of funding currently authorized warrants adjustment.

11. The Chairperson of the Board shall rotate every [two to four] years. The initial term of the inaugural Chairperson should be [...] years.

12. The Chairperson of the Board's responsibilities shall include convening and leading meetings of the IMRB Board of Directors and assisting the Executive Director in communications with the Organization and other parties as appropriate.

13. With respect to the initial establishment of the IMRB, the IMRB Board of Directors shall select an IMRB Executive Director and Chief Financial Officer from a list of candidates provided by the IMRB Nominating Committee. Following a rigorous interview process, the Board of Directors shall select the most qualified person for the respective positions. Subsequent IMRB Executive Directors and Chief Financial Officers will be chosen by the IMRB Board of Directors.

14. The responsibilities of the IMRB Executive Director shall include overall management and direction of the IMRB. The IMRB Executive Director and Chairperson of the Board of Directors shall be responsible for presenting the annual operating budget to MEPC and reporting on the IMRB's work and progress to MEPC, and other bodies, as appropriate.

15. The Chief Financial Officer (CFO) of the IMRB shall oversee the operating budget of the IMRB, and financial management of the programmatic contracts and grants, and all related fiduciary obligations consistent with the budget approved by the IMRB Board of Directors and MEPC. The CFO shall report to the IMRB Executive Director and shall regularly liaise with the Organization on the management of the IMRF, contributions to the IMRF, and other aspects of the IMRF, as the IMRB sees fit.

16. The IMRB Executive Director shall hire a Technical Research Director to administer and oversee the strategic research initiatives of the IMRB and provide technical advice to the Executive Director and the IMRB Board of Directors. The Technical Research Director shall report to the Executive Director.

17. The IMRB Executive Director, with the approval of the IMRB Board of Directors, shall consider qualified candidates and make a selection for the position of General Counsel. The General Counsel will provide legal counsel to the Executive Director, Technical Research Director and the IMRB Board of Directors. In addition, the General Counsel will be responsible

and have authority to oversee all matters where a conflict of interest may arise. In this context, the General Counsel shall review and have access to all the Organization's administrative and managerial reports regarding the IMRF, funding awards, hiring procedures, hiring decisions, nominations and appointments to the IMRB Board of Directors, and other areas of the IMRB as necessary to ensure that there are no conflicts of interest. Any conflicts of interest identified shall be reported to the IMRB Board of Directors by the General Counsel in a timely manner.

18. The Chairperson of the IMRB Board of Directors, IMRB Executive Director, Technical Research Director and Chief Financial Officer, as appropriate, shall present regular reports on the management and status of the research and development programme, and related matters to MEPC.

19. The IMRB Executive Director [with the approval of the IMRB Board of Directors] shall have the authority to hire professional and administrative staff as is necessary to ensure the smooth and efficient operation of the IMRB. The IMRB Executive Director shall also have the authority to delegate specific managerial authorities as he or she deems necessary.

Article 5 **Conflict of Interest Provisions**

1. The selection of the IMRB Board of Directors, IMRB Executive Director, Chief Financial Officer, the Technical Research Director and the General Counsel (hereafter referred to as the IMRB Officers) shall be subject to strict conflict of interest provisions to ensure that the management, direction and decision-making within the IMRB are undertaken in a manner that is free of political and commercial conflicts of interest or the appearance of such conflicts. It is critical that nominees for IMRB Officers are free from notable conflicts of interest, both commercial and political. Therefore, any nominee should be vetted in light of specific criteria identified in appendix 2 to this document, and subject to review and approval of the IMRB General Counsel.

2. The IMRB Officers and the performance of their responsibilities shall be subject to a defined set of conflict of interest provisions as set out in appendix 2 to this document.

Article 6 **Acquisition and Management of Resources**

1. Pursuant to regulation 28.1 of MARPOL Annex VI, the IMO Maritime Research Fund (IMRF) shall provide the financial support for the administration, management and operation of the IMRB and the monies necessary to fund the specific programmes and projects approved and funded by the IMRB. The IMRB may also accept and utilize financial contributions provided to the IMRB on a voluntary basis by governments, institutions, and other entities.

2. Consistent with the budget approved by the IMRB Board of Directors and MEPC, the IMRB Executive Director shall possess the authority to approve contracts, purchases, and other actions necessary for the effective operation of the IMRB. Contracts and grants relating to specific research and development projects require approval of the IMRB Board of Directors and are subject to the provisions specified under article 7.

Article 7 **Administration of Grants and Contracts**

1. A system shall be established and put in place by the IMRB, in which qualified applicants may submit proposals for research and development projects as requested by the IMRB through a "Request for Proposal" (RFP), solicitation of contract proposals, or through

other mechanisms as deemed appropriate by the IMRB Executive Director. The IMRB will also develop a process and criteria for reviewing unsolicited proposals consistent with article 3 of this document.

2. Qualified applicants may include any government, public, private, or non-profit institution or consortium with the experience and expertise necessary to undertake the work and provisions called for in a given grant or contract supported by the IMRB.

3. The IMRB professional staff shall review proposals based on their merit, feasibility, proposed cost, and scientific and technical potential.

4. In reviewing proposals, as well as research and development work performed or currently in progress, the IMRB staff may utilize appropriate peer review measures and engage external consultants with appropriate technical expertise to determine the scientific merit and feasibility of proposals, and to assess progress made in the case of existing work projects.

5. Those proposals considered to have the most merit shall be recommended to the IMRB Board of Directors for final review and determination of whether to approve the work, the duration of the work project, and the specific level of funding to be approved. Decisions concerning grants and contracts made by the IMRB Board of Directors shall require the affirmative support of a majority of the IMRB Board Members that are eligible and participating when voting on a given motion. If a given IMRB Board Member or Members have been determined to have a potential conflict of interest on a specific proposal, that/those IMRB Board Member(s) will be excluded from voting or otherwise participating in the Board's discussion of the specific proposal under consideration.

6. The IMRB and its Board of Directors shall consider, inter alia, the following criteria during its evaluation and assessment of specific project proposals:

- a. potential to meet the low-carbon and zero-carbon objectives identified in article 3 of this Charter;
- b. potential to increase the technology readiness levels (TRLs) of low-carbon and zero-carbon technologies suitable for maritime application;
- c. energy density, feasibility, and potential to be applied in specific maritime ship types and trades, including the spatial and energy demands of transoceanic voyages;
- d. safety considerations that examine risks to the ships' crew, shore-side personnel, and relevant risks to the general public;
- e. co-benefits with respect to the control of other important air emissions such as NO_x, SO_x, PM, BC, VOCs, etc.;
- f. whether the specific fuel or technology can be used with existing internal combustion two-stroke, slow speed engines and, if not, whether the project proposal provides an appropriate evaluation of the relevant considerations for ship design, materials science, and the overall engineering of relevant systems as applicable to one or more ship types;
- g. potential to be used in conjunction with existing bunkering infrastructure;

- h. impacts on competition and maintenance of a level playing field, in particular, avoidance of grants being made directly to shipowners, shipyards, energy producers, or other parties that might cause market distortion; and
 - i. specific project proposal criteria as specified by the IMRB.
- 7. All research and development grants and contracts shall be subject to the grantee's acceptance of specific terms to be established by the IMRB, including, but not limited to:
 - a. The intellectual property policy for all grants and contracts shall be as follows: All research and development grants and contracts shall be subject to the grantee's acceptance of specific terms concerning intellectual property rights associated with inventions arising from the grant or contract. These terms, which shall be determined by the IMRB, shall be designed to further two equally important purposes:
 - i) to encourage broad participation in the work funded and directed by the IMRB by providing grantees an opportunity to obtain intellectual property rights in the results of work funded by the IMRB; and
 - ii) to ensure that the intellectual property associated with discoveries and knowledge created by work funded by the IMRB is available for incorporation into inventions and derivative works created by parties other than the grantees performing the work leading to such discoveries and knowledge.
 - b. The objectives specified in 6a shall be fulfilled by the IMRB through grant conditions that may include, inter alia, a requirement that all utility patents and utility patent applications claiming inventions made pursuant to an IMRB grant or contract shall be licensable to anyone in the world on fair, reasonable and non-discriminatory (FRAND) terms, so that such inventions can be widely adopted by the international community.
 - c. Grantees or contractors shall provide regular updates on substantive progress made and use of funds provided to date.
 - d. Grantees or contractors shall return unused funds (if any remain) at the completion of the proposed project to the IMRB, which shall then deposit such remaining funds back into the IMRF.
 - e. The IMRB shall be authorized to terminate a given work project and its funding if in the judgement of the IMRB Board of Directors the recipient has failed to satisfactorily perform the stipulated work in a timely manner or has failed to properly account for or manage IMRB funds. The IMRB will hold the sole authority to terminate funding of a given work project.
- 8. Contracts and other payments (e.g. salaries, office space and other expenses) that are primarily related to internal management and administrative responsibilities of the IMRB may be approved by the IMRB Executive Director. The IMRB Executive Director may also delegate such approvals to the Chief Financial Officer.

Article 9
Coordination

1. Taking into consideration paragraph 7 of article 3, the IMRB shall work as practical, to coordinate its research programmes and specific projects with other institutions working on related efforts.

Article 10
Supervision and Oversight by MEPC

1. The IMRB shall be subject to the oversight of MEPC shall have oversight authority over the IMRB in accordance with MARPOL Annex VI, chapter 6, regulation 27.

2. Oversight responsibilities of MEPC shall include:

- a. providing general oversight and advice to the IMRB and its Board of Directors on the strategic direction and budget of the IMRB;
- b. ensuring that the IMRB performs its duties and responsibilities consistent with the objectives and mandate set forth in this Charter;
- c. advising upon recommendations made by the IMRB to modify and adjust the IMRB research strategy and budget as appropriate in light of technological, scientific and research developments;
- d. reviewing and approving the IMRB's annual operating budget after considering recommendations and other relevant reports and information provided by the IMRB and its Board of Directors. In the event that MEPC does not approve the proposed annual operating budget, the IMRB shall prepare a modified budget within 45 days of the initial decision; and
- e. reviewing and, if necessary, undertaking independent financial audits of the IMRB to ensure that the IMRB fully meets its fiduciary duties, including the accounting of funds expended for specific research and development programmes, grants, contracts and other funding provided by the IMRB using IMRF funds.

3. The IMRB shall provide regular reports to MEPC on the progress of IMRB programmes, and other matters and updates as appropriate.

4. Consistent with regulation 27, MEPC shall review and approve the IMRB annual budget. Decisions on the funding of individual R&D projects will be the sole responsibility of the IMRB and its Board of Directors.

Article 11
Dissolution

1. Pursuant to regulation 31.1 of MARPOL Annex VI, and after an operational period of 10 years, beginning on the date that chapter 6 of MARPOL Annex VI enters into force, the Organization shall review the status of chapter 6 of MARPOL Annex VI and amend the relevant provisions if necessary.

2. Pursuant to regulation 31.2 of MARPOL Annex VI, upon completion of the IMRB's work programme, and with the approval of the Organization, the IMRB shall cease operations. Upon such a determination, chapter 6 of MARPOL Annex VI and its requirements shall be dissolved, unless the Parties determine otherwise.

APPENDIX 1

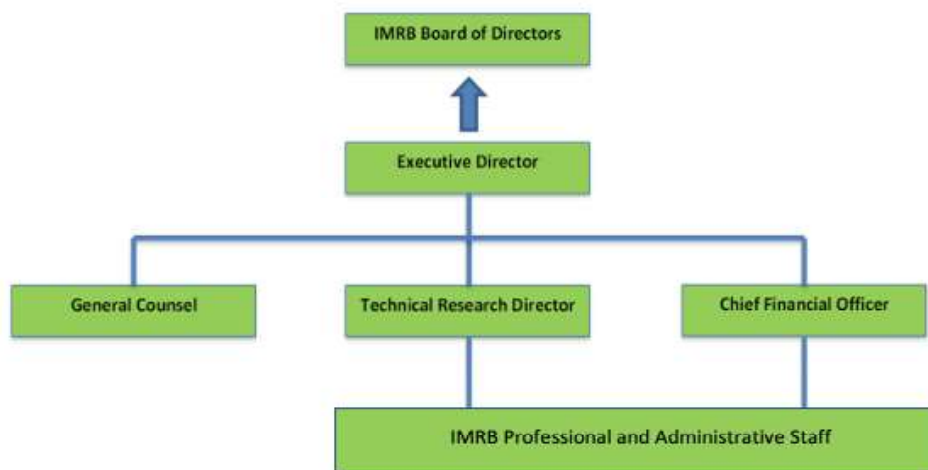


Figure 1 Management and Organization of the IMRB

APPENDIX 2

Vetting criteria and conflict of interest provisions for IMRB officers

[to be developed at a later stage]



WORLD SHIPPING COUNCIL
PARTNERS IN TRADE

EU ETS DISCUSSION PAPER

10 September 2020

Abstract

A brief examination of a potential EU Emissions Trading System (ETS) applied to maritime shipping should the EU elect to use the Monitoring, Reporting and Verification (MRV) Regulation scope of application that includes extraterritorial voyages. The paper also discusses the potential impacts if one or more systems of a similar nature are adopted by different governments.

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Executive Summary

The European Commission has stated that it plans to bring international shipping into the EU Emissions Trading System (ETS). This paper examines the effect of introducing an EU carbon pricing mechanism for shipping that is applied not only to intra-EU voyages, but also to extraterritorial voyages outside of the European Economic Area (EEA). **The World Shipping Council asks EU decision-makers to consider the points in this paper as they discuss bringing shipping into the EU ETS and to limit the proposed ETS to intra-EU shipping.**

I. Material Impacts of an ETS Based on the EU MRV Scope

The geographic scope of an EU ETS using the voyage parameters used in the EU MRV regulation is extensive and would establish an unprecedented degree of control over extraterritorial voyages. A large portion of the voyages and emissions covered by the system would occur outside EU waters and in many cases extend thousands of miles across the globe. While CO₂ allocations for shipping are as yet unknown, if one uses a carbon price of €25 per tonne of CO₂ generated in 2018, the ETS would impose trade costs of roughly 3.45 billion euros in a single year. Put differently, one sector would account for up to 25% of the total 2018 ETS revenues. Given the sizeable revenue generated and the fact that these revenues are generated as ships sail far from the EU, the application of emission pricing to extraterritorial voyages is likely to create significant trade tensions and raise legal and diplomatic concerns about the geographic reach of unilaterally imposed emission charges and operational regulations.

II. Retaliatory Measures & Effect on LDCs and other States

Maritime transport is the backbone of global trade. It is also a highly competitive industry with relatively low margins. Should the EU proceed with a system with a broad geographic scope, other countries or regions may adopt similar regulations with extraterritorial reach. Under such a scenario, overlapping voyage segments could be subject to double charges or require bilateral or multilateral agreements with a multitude of States across the world.

Significant cargo volumes are trans-shipped through EU ports to and from Africa, Russia, and other non-EU locations including numerous less-developed countries (LDCs). This means that significant cargo volumes arrive in Europe that are not destined for European customers. For such cargoes, the application of ETS would have a direct impact on the cost of delivering goods to non-EU states and not least LDCs. Lengthy voyages would see their imports and exports first subject to emission charges as they sail across the ocean to an EU port for trans-shipment and then again as the same cargo leaves the EU for its ultimate destination.

III. Impact on IMO Progress and Global Reductions of GHG Emissions

The geographic reach of an ETS based on the MRV scope is substantial, but it nevertheless falls far short of the effectiveness of mandatory global CO₂ reductions. The IMO has progressed on both technical and operational measures. The EU and other IMO Member States have had a fundamental role in securing a high degree of ambition and concrete absolute reduction goals. Adopting an ETS with a large extraterritorial impact is likely to present a significant impediment to the development of a global solution because once in place, national or regional initiatives – particularly where revenue is concerned – are unlikely to be unwound or modified. Thus, instead of catalyzing global action, adoption of a regional regime with extraterritorial effect may preclude global action in the IMO.

Shipping in the EU Emissions Trading System: An Evaluation of Regional Regulations Applied on an Extraterritorial Basis

10 September 2020

Background: The European Commission has stated that it plans to bring international shipping into the EU Emissions Trading System (ETS). This is part of the broader Green Deal discussions within the EU about what regulatory and financial mechanisms will be used to address greenhouse gas (GHG) emissions from maritime shipping. This paper presents a brief examination of the effect of introducing an EU carbon pricing mechanism for shipping that is applied not only to intra-EU voyages, but also to extraterritorial voyages outside of the European Economic Area (EEA). This paper considers what impacts could be anticipated if one or more non-EEA countries were to adopt similar measures. In addition, the paper draws attention to the issue of cargoes trans-shipped through the EU to and from non-EU countries and especially cargoes trans-shipped to and from Less Developed Countries (LDCs). Finally, the paper examines what effect these actions may have on efforts to adopt GHG reduction measures for shipping at the global level.

What Does Extraterritorial Application Mean in this Context? When considering a given national or regional measure applicable to maritime shipping, the government or governments involved must consider the geographic coverage of the respective measures and obligations. Depending on the system in question, this may apply to activities while at berth or anchor, to voyages within a given jurisdiction, to all voyages within the 12-mile territorial sea, or some other formula that extends obligations beyond the territorial sea or Exclusive Economic Zone (EEZ).

In enacting the Monitoring, Reporting and Verification (MRV) Regulation adopted in 2015, the EU chose to apply reporting obligations to all voyages within the EU as well as the last leg of an incoming voyage and the first leg of a voyage departing the EU. Those incoming and outgoing voyage legs represent a large proportion of the sailings covered by the reporting obligations. Furthermore, in many cases those voyage segments involve voyages measured in thousands of miles, extending half-way around the world, and whose duration may be measured in weeks.

This paper examines what scenarios and impacts can reasonably be anticipated if the EU were to adopt a regulatory measure with financial obligations applicable to extraterritorial voyages (same scope as in the current MRV regulations) and what scenarios could unfold if other governments were to establish similar regulatory programmes. This paper also addresses how these actions may impact the probability of a more comprehensive global agreement at the IMO.

Study Assumptions: The paper examines three different scenarios where the responsible regulatory authority applies obligations to extraterritorial voyages based on last voyage segment entering the relevant territory and the first voyage segment following departure. In the first part of the paper, we examine a scenario where the EU applies a fee applicable to emissions via an ETS or via a fund using the scope of application as featured in the current MRV rules. In the second part of the paper we examine hypothetical scenarios in which Brazil, China, and the United States¹ apply similar systems with

¹ The authors do not wish to predict or otherwise suggest that Brazil, China, or the United States would choose to adopt similar regulations with extraterritorial effect. Rather, the scenarios are constructed as a 'test of concept' to illustrate what trade challenges and complications arise if one or more countries with significant maritime trade activity decide to adopt similar regulations with extraterritorial effect.

overlapping effect due to extraterritorial application. In the third part of the paper, we consider the aggregate impacts if the IMO were to establish similar rules applicable to all international voyages on a global basis. In the fourth part of the paper we briefly consider cargoes trans-shipped through EU ports, potential EU charges on voyages into and out of the EU carrying these non-EU cargoes, and the implications for imports and exports from less developed countries (LDCs) that are trans-shipped through EU ports. Finally, we examine how adoption of national and regional systems that impose costs on extraterritorial voyages connected to a given country or region may touch upon sensitive trade interests and how one or more regional actions may impact the probability of action at the global level.

Part One: What Does Inclusion of Shipping in the EU ETS Look Like Using the MRV Extraterritorial Scope of Application?

The European Commission is expected to make a formal proposal in 2021 outlining how commercial shipping calling EU ports could be included in the EU Emissions Trading System or ETS. Preliminary discussions suggest that one of the principal options to consider is whether the emissions trading system should apply to the same voyages currently covered by the EU MRV regulations. The European Parliament Environment Committee has also proposed a modified scope of application that would extend the system to voyage segments beyond the first and last non-EU port of call if the ship is determined to have not discharged a 'substantial' portion of its cargo at the port in question.

To fully understand the geographic reach of such a system, we briefly examine two ship voyages for illustrative purposes. In the first voyage, a ship travels from Shanghai to Rotterdam (non-stop), traveling roughly **10,500 nautical miles** (one way), consuming 3,220 tonnes of conventional fuel oil and generating roughly 10,027 tonnes of CO₂ (using a conversion factor of 3.114). This voyage takes roughly 26 days (one way). The ship sails over 21,000 nautical miles (round trip) with less than 14% of the voyage occurring within EU territorial waters. Using a carbon price of 25 euros per tonne of CO₂,² a single round trip voyage of a single ship would incur costs resulting in approximately **€501350 in EU revenue**. Moreover, EU regulations would be applied and emission charges calculated as the ship sails through the Gulf of Suez and the Red Sea, across the Indian Ocean, through the Strait of Malacca, and across the South and East China Seas.

In the second voyage, a ship departs Portugal and sails non-stop to Rio de Janeiro. This voyage covers roughly 4,200 miles one way and is subject to EU emission charges as well as potential operational efficiency regulations for the full duration of the voyage even though the ship spends less than 1% of its voyage in EU territorial waters.³

The European Commission's 2019 Annual Report on CO₂ Emissions from Maritime Transport reports that maritime voyages covered by the EU MRV regulations generated 138 million tonnes of CO₂ in 2018 in total.⁴ If each tonne of CO₂ emitted was subject to a €25 carbon price, revenues received by the European Union would total approximately 3.45 billion euros. The 2019 Report also states that ***"around two-thirds of the CO₂ emissions reported by the monitored fleet comes from voyages to or from a port outside the European Economic Area. These incoming and outgoing voyages are therefore***

² 25 euros per tonne of CO₂ is selected as a representative carbon price based on EU carbon prices in early 2020 before COVID 19 significantly affected EU carbon prices. As a market driven pricing mechanism, the EU carbon price is subject to significant market variability.

³ The Environment Committee of the EU Parliament has recently proposed that operational efficiency standards be imposed on ships calling EU ports.

⁴ 2019 Annual Report on CO₂ Emissions from Maritime Transport SWD (2020) 82 final, Brussels, 19.5.2020

responsible for the majority of CO₂ emissions.” It is likely therefore that at least 50% of the emissions covered under the regulations **do not occur** within EU territorial waters.

The MRV database demonstrates that a very substantial portion of voyages covered involve operations that occur well outside the European Union. As illustrated in Figure 1, an ETS regime applied to shipping using the same scope of application as the MRV would reach thousands of miles around the globe, and would apply carbon charges to emissions generated by ships sailing along the coasts of multiple non-EU nations that are located adjacent to other oceans and separated from Europe by sailing times measured in weeks.

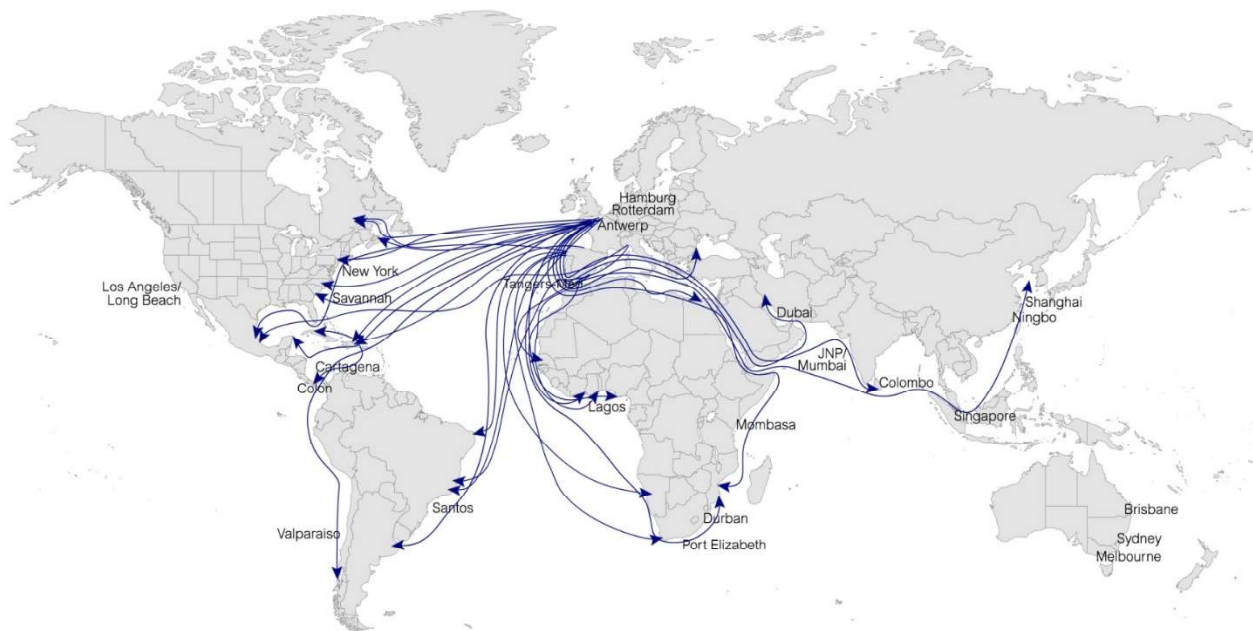


Figure 1: Geographic reach of international container shipping routes covered by the current EU MRV regulations⁵

Sample nautical distance to/from EU (nautical miles)			
Hamburg-London Gateway	411	Antwerp-Savannah	3857
Hamburg-Casablanca	1682	Rotterdam-Dubai	6257
Rotterdam-Shanghai	10467	Rotterdam-Colombo	6813
Le Havre-New York	3134	Rotterdam-Valparaiso	7456
Hamburg-Montreal	3203	Hamburg-Singapore	8633
Hamburg-Lagos	4423	Yantian-Rotterdam	9763

Considering the geographic reach of the MRV regulations, it is misleading to think of the regulations as merely regional in scope. The MRV regulations and those applicable in an EU ETS or in ‘EU operational efficiency standards,’ if applied to extraterritorial voyages, would be quasi-global in their reach and would impose emission charges on voyages that extend thousands of miles across the globe and within the jurisdiction of multiple States that are far removed from the EU. In many cases, operational

⁵ The route lines reflect incoming and outgoing voyages (first / last voyage segments only) of international container services that are part of a larger international rotation. Source: Drewry Maritime Research, July 2020. The depicted route lines do NOT include domestic or intra-regional container services, dry bulk, tanker, general cargo, or other ship voyages.

regulations and emission charges would be applied to voyages that are separated from Europe by one or more oceans. Such an outcome might be viewed favorably by some politicians and some stakeholders, but it would lack legitimacy internationally and would most likely generate significant tensions with trade partners.

The emissions generated by these voyages are related to imports and exports of the EU, but these same emissions are also related to the imports and exports of numerous nations that are the providers or recipients of cargo transported on these voyages.

A national or regional regulatory system that imposes emission charges and operational efficiency rules with quasi-global reach raises a number of questions with important political, economic, legal, and diplomatic dimensions. The full range of questions that may arise is extensive, but for purposes of brevity we include a few of the more significant questions that require attention:

- Is it appropriate that a voyage extending hundreds or thousands of miles across the globe and largely outside the territorial waters and Exclusive Economic Zone of the regulating party should be subject to operational regulations and financial obligations that are calculated on the basis of miles sailed and emissions generated?
- Is it appropriate that a ship sailing in the territorial waters of a State far removed from the regulating State be subject to operational regulations that carry financial obligations absent a formal agreement between the parties?
- What trade issues and diplomatic tensions can be expected to arise with the application of unilateral operational rules and financial obligations on ship emissions while in transit across the globe absent agreement in an international body such as the IMO?
- How confident can we be that the ETS will be effective in actually reducing emissions (versus a situation where one is simply paying to pollute) when the IMO is poised to adopt operational efficiency standards to significantly lower emissions across the fleet and the availability of zero-carbon fuels and technologies will likely be constrained over the next decade?

Part Two: What happens if One or More Governments Adopt Similar Regimes?

Should the EU choose to establish regulations that impose financial obligations and operational efficiency rules on voyages extending across the globe, we examine below what may be expected if one or more governments outside of Europe choose to adopt similar regimes. In short, a test of concept should examine how a system unfolds not only if one actor adopts such a regime, but also what potential scenarios unfold if additional governments adopt similar rules either as a retaliatory response to a perceived unilateral imposition by a trading partner or independently.

Important Note: *We stress that this discussion paper does not assume or predict that any given country would choose to adopt similar regulations with extraterritorial application. What the paper seeks to do is to briefly outline the overlapping coverage of multiple systems and the consequent questions that arise in a scenario where one or more governments choose to adopt similar regimes. For discussion purposes, we briefly examine what the spatial coverage would look like if Brazil, China, and the United States were to choose to adopt similar regulations applicable to voyages arriving in or departing from their respective ports. The primary criteria in selecting these three countries is that they are all significant trading nations located on three different continents.*

Figures 2 - 4 illustrate the geographic reach of a number of international container shipping routes and the distances covered if these countries were to apply regulations to incoming and outgoing voyages in a manner similar to that used in the EU MRV regime. It should also be emphasized that the examples and the associated graphics reflect only a portion of the more significant international container shipping routes arriving in and departing from these countries. The maps do not reflect intra-regional container routes, bulk shipping routes, or the numerous regional and global voyages undertaken by the full range of ship types serving international commerce. Maps reflecting the full range of voyages undertaken by all ships entering or departing these countries would produce a map overwhelmed by route lines.



Figure 2: Container shipping routes to/from Brazil that are part of larger international vessel rotations⁶

Sample nautical distance to/from Brazil (nautical miles)			
Valencia-Suape	3550	Port Klang-Sepetiba	8694
Sines-Rio de Janeiro	4189	Singapore-Santos	8967
Livorno-Salvador	4393	Rio de Janeiro-Cap Town	3280
Pecem-New York	3297	Santos-Coega (Ngqura)	3808
Port Everglades-Suape	3434	Pointe Noire-Navegantes	3699

⁶ The route lines reflect incoming and outgoing voyages (first/last voyage segments only) of international container services that are part of a larger international rotation. Source: Drewry Maritime Research, July 2020. The depicted route lines do NOT include domestic or intra-regional container services, dry bulk, tanker, general cargo, or other ship voyages.

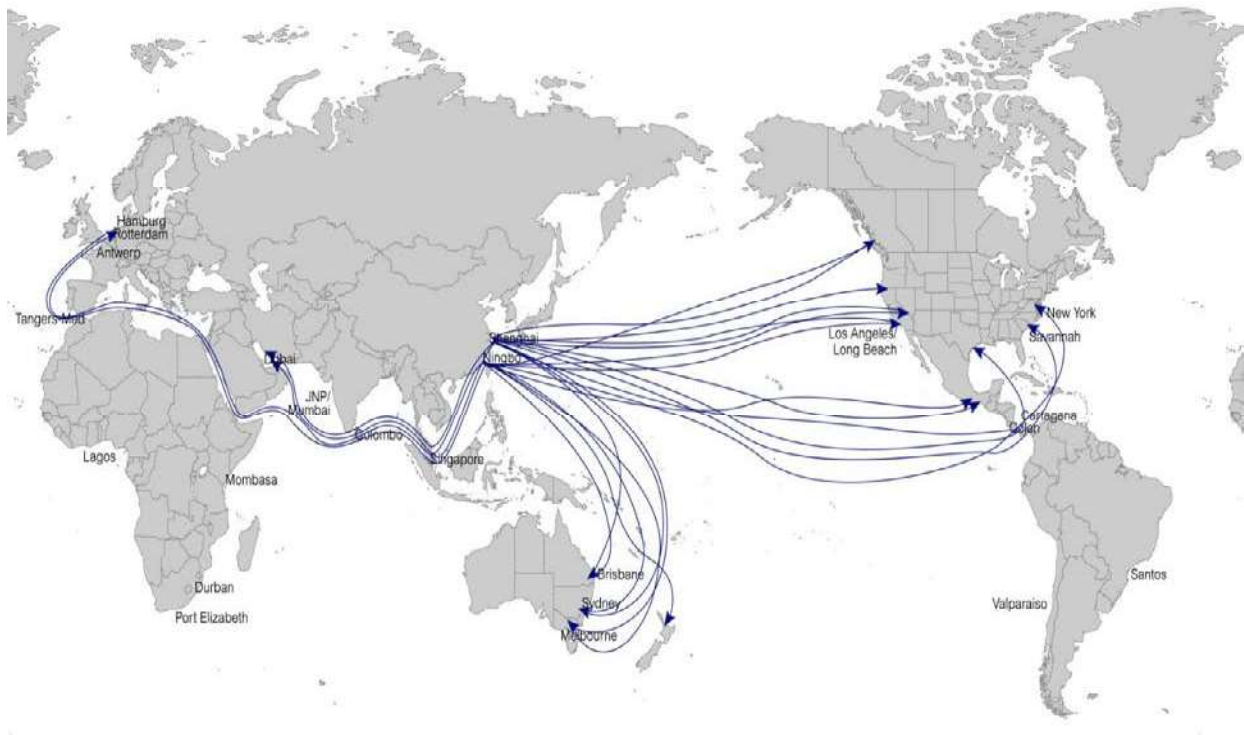


Figure 3: Container shipping routes to/from China that are part of larger international vessel rotations⁷

Sample nautical distance to/from China (nautical miles)					
Shanghai-Rotterdam	10521	Yantian-Long Beach	6358	Shanghai-Manzanillo ME	6857
Yantian-Rotterdam	9763	Ningbo-Los Angeles	5729	Shanghai-Colon	8630
Hong Kong-Jebel Ali	4923	Ningbo-Tacoma	5109	Charleston-Hong Kong	10834
Ningbo-Sydney	4500	Shanghai-New York	10609	Seattle-Dalian	5159
Hong Kong-Brisbane	3961	Shanghai-Savannah	10200	Norfolk-Xiamen	10791
Hong Kong-Tauranga	5130	Shanghai-Prince Rupert	4630		

⁷ The route lines reflect incoming and outgoing voyages (first/last voyage segments only) of international container services that are part of a larger international rotation. Source: Drewry Maritime Research, July 2020. The depicted route lines do NOT include domestic or intra-regional container services, dry bulk, tanker, general cargo, or other ship voyages.

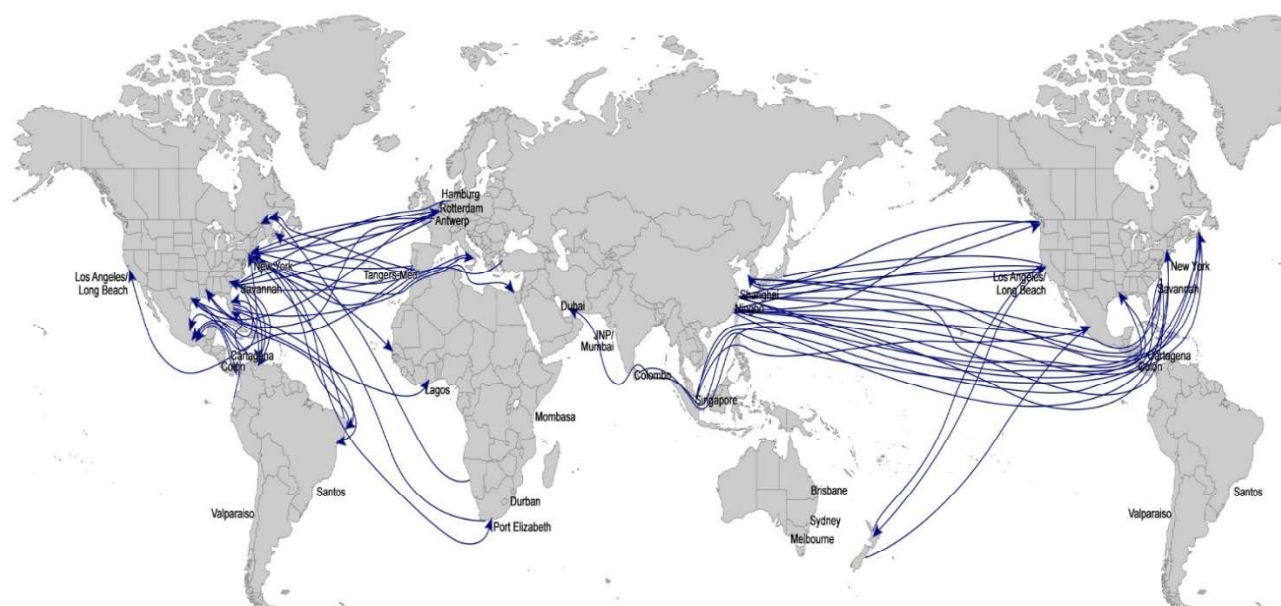


Figure 4: Container shipping routes to/from North America that are part of larger international vessel rotations⁸

Sample nautical distance to/from North America (nautical miles)							
Shanghai-Los Angeles	5705	Tauranga-Los Angeles	5652	Damietta-New York	5074	Houston-Kingston (Jamaica)	1274
Ningbo-Long Beach	5729	Le Havre-New York	3134	Valencia-Montreal	3601	Vancouver-Busan	4619
Busan-Los Angeles	5250	Bremerhaven-New York	3457	New York-Bremerhaven	3488	Charleston-Singapore	10572
Busan-New York	10139	Hamburg-Montreal	3203	Norfolk-Xiamen	10791	New York-Dakar	3343
Colombo-Halifax	8075	Liverpool-Montreal	2776	Savannah-Busan	9716	Port Everglades-Suape	3434

With the introduction of two or more carbon pricing schemes by trading partners we begin to observe voyages that are subject to regulation by two or more parties. These overlapping regimes grow in scope and complexity depending on the nature of the specific voyage and the number of countries adopting such rules. By way of example, the two voyages highlighted earlier (Rotterdam to Shanghai and Lisbon to Rio de Janeiro) would be subject to dual charges that may double the relevant payments⁹ or require the negotiation of a bilateral agreement between the respective trading partners.

Depending upon the number of countries adopting similar regimes, numerous voyage rotations would become subject to a matrix of regulations requiring payment to multiple governments. It is not difficult to imagine the complexity of rules, bilateral agreements and consequent trade sensitivities that can be expected to arise in a maritime landscape that is regulated and subjected to charges by multiple maritime trading nations. Indeed, such a system would be completely contrary to the longstanding

⁸ The route lines reflect incoming and outgoing voyages (first/last voyage segments only) of international container services that are part of a larger international rotation. Source: Drewry Maritime Research, July 2020. The depicted route lines do NOT include domestic or intra-regional container services, dry bulk, tanker, general cargo, or other ship voyages.

⁹ The relevant payments could be doubled if both parties applied the same carbon charge. The additional payment could be higher or lower because the carbon price is being applied through the unilateral action of two parties.

international consensus that international ocean transportation should be free from multiple taxation regimes and from restrictions on free access to all trading nations.

Part Three: What are the Prospects for Global Rules if One or More National or Regional Regimes are Established?

Multiple Member State Regimes Plus Global IMO Regulation

In this section we examine the question of whether action by the EU to establish binding operational efficiency standards and to impose related financial obligations on international shipping calling EU ports is likely to lead to adoption of a global operational efficiency standard, a market-based measure or another GHG policy instrument at the IMO.

We have already described a hypothetical situation in which one or more regional or national regulations have been established that impose operational requirements and/or financial obligations that apply to extraterritorial voyages extending across the globe. It is also clear that the revenues generated under such a system would be measured in billions of euros. At first glance one may be inclined to argue that national or regional regimes would be terminated should IMO Member States act to create a global regime with similar obligations and policy objectives. A more detailed consideration of this scenario, however, suggests a very different outcome.

First, we already have experience in which domestic legislation impacting international shipping has not been phased out or even harmonized following adoption of similar, but not identical global standards.¹⁰ Equally important, the regulations in question here involve the collection of significant monies that would likely become part of the government's general revenue. It would be understandable that governments that had undergone an extensive legislative and regulatory effort to establish such requirements might be reluctant to terminate a regulatory programme that is uniquely tailored to the political demands that shaped its creation. It is even more likely that a government becomes highly reluctant to terminate a regulatory programme that generates significant revenue. Moreover, some governments can be expected to argue that the proposed IMO regime is materially different and that the specific national or regional requirements need to remain in place for one or more reasons. Thus, it is entirely possible, even probable, that IMO Member States would be reluctant to reach agreement on a global regime knowing that one or more national or regional schemes would likely remain in place.

Should agreement on a global regime still prove possible despite these concerns, the total cost of multiple overlapping systems would raise the financial costs to international trade to a level that would likely be significant for many countries – both developing and developed. It would be reasonable to estimate that the combined revenues generated under specific Member State regimes would amount to tens of billions per annum (working from the base estimate that the EU regime alone would generate 3.4 billion euros). An estimate of the cost of a global regime established through the IMO (again assuming a €25 carbon price and using 250 million tonnes as a gross estimate of fuel consumed by international shipping), would generate additional costs of approximately €19.5 billion per annum. If nations that have already established regimes with extraterritorial effect choose to maintain the requirements outlined earlier, total costs imposed on international trade would increase significantly and subject trade to multiple overlapping regulatory systems with administrative burdens that grow with each system

¹⁰ For example, despite adoption of global Data Collection System (DCS) regulations by the IMO, the European Union still maintains unique requirements with extraterritorial application as adopted in EU regulations for monitoring, reporting and verification of CO₂ emissions from maritime transport (Regulation (EU) 2015/757).

adopted. Of course, higher per-unit costs of carbon (exceeding the €25 figure used in this paper, as has been argued for in the EU) would result in much greater annual costs.

Part Four: Trans-Shipment of Cargoes and Charges on Voyages Carrying Non-EU Cargoes

A significant volume of cargoes destined for countries outside the EU are first shipped to the EU and then shipped to a destination outside the EU. Some of the most common areas with cargoes trans-shipped through the EU are Africa, Asia, South and North America, and the Russian Federation. This situation arises for broad spectrum of imports and exports originating from or destined to many non-EU locations. To put this in context, in 2014, *MDS Transmodal* performed some analyses for WSC of various liner shipping activities within the EU. Their analyses utilized a combination of their own proprietary *World Cargo Database* and 2012 data published by Eurostat. At that time, *MDS Transmodal* concluded that:

- 1) Total Containerized Cargo Moving between EU Countries and non-EU Countries:
 - Exports: 264 million UNITISED tonnes (29.3 million TEU)¹¹
 - Imports: 192 million UNITISED tonnes (21.4 million TEU)
- 2) Total Cargo In-Transit via Ports in the European Union: 57.6 million UNITISED tonnes (6.4 million TEU) -- defined as container traffic transiting through EU ports but neither originating from EU countries nor destined for EU countries.

The 6.4 million TEU “in-transit” then represented about 12% of the total containerized cargo moving between EU countries and non-EU countries. These shipments face potential emission charges applied to incoming voyages to ports in the EU and then a second layer of charges as the same cargoes are shipped out to Africa, Russia, and many other destinations. Trans-shipment of cargoes is significantly higher in some EU ports, and these ports may encounter a notable change in activity if shippers seek to avoid charges on trans-shipped cargoes.

Impacts on LDCs and other Non-EU States: Incoming and outgoing voyages are often long voyage segments as goods from South Africa, West Africa, Asia, South America, North America, Australia, New Zealand, and other distant locations are often trans-shipped through Europe. A significant portion of these shipments would originate from or be destined for LDCs that would bear significant additional trade costs that apply not only to imports and exports destined for the EU, but on cargoes originating from or destined for various non-EU locations around the world. In the case of trans-shipment cargoes, the additional trade costs are imposed by and collected by a third party (the EU) while adding substantial additional trading costs to many less developed economies.

Conclusions

An EU decision to subject extraterritorial voyages extending thousands of miles across the globe to unilateral regulations – either through an ETS or by imposing operational efficiency standards to ships while operating in waters far removed from the EU – would constitute a major and unprecedented exercise of unilateral authority over international trade and the operation of commercial shipping.

¹¹ MDS Transmodal analyses estimated TEU using a conversion factor of 9 tonnes per TEU.

If the proposed scope of application for including shipping within the EU ETS followed the same definition of voyage and “port of call” as used in the EU MRV regulations, some of the most serious implications of such a decision would include the following:

Geographic Reach of a System that Regulates Extraterritorial Voyages

- The geographic scope of an EU ETS using the voyage parameters used in the EU MRV database is quasi-global in its application;
- A majority of the emissions covered and charges imposed by the system would be generated by voyage segments occurring outside EU waters, in many cases thousands of miles distant from the EU;
- Based on a carbon price of €25 per tonne of CO₂ and the reported 2018 CO₂ emissions covered by the EU MRV rules, the ETS would impose costs of 3.45 billion euros per year;
- The application of emission pricing to extraterritorial voyages is likely to create significant trade tensions and raise legal and diplomatic concerns about the geographic reach of unilaterally imposed emission charges and operational regulations.

Impacts on Trans-shipped Cargoes from Non-EU States and LDCs

- Significant cargo volumes are trans-shipped through EU ports to and from Africa, Russia, and other non-EU locations. These cargo volumes would face the potential of double charges – first on the inbound voyage as the ship sails to an EU port and then again on the outbound voyage as the same cargo leaves the EU enroute to its ultimate destination;
- Trans-shipment is a central aspect of the shipment of goods to and from LDCs because these nations in some cases do not generate sufficient cargo volumes to support many direct shipment options. These voyages are often measured in thousands of miles as many LDCs face long distances to market. As a result, LDCs would be disproportionately affected by an EU ETS that applies to extraterritorial voyages.

Global Impacts and the Prospects for Reaching a Comprehensive GHG Agreement in the IMO

- Should other countries elect to adopt similar regulations with extraterritorial reach, there would be multiple overlapping charges in the absence of bilateral or multilateral agreements;
- The geographic reach and complexity of multiple national or regional regimes would be significant;
- The significant revenues generated by national and regional systems would make it very difficult to retire national rules should a global regime be proposed;
- Adoption of an EU ETS regime applying emission pricing to extraterritorial emissions is likely to present a considerable impediment to development of a global market-based mechanism; and therefore
- Instead of catalyzing global action, development of one or more regional systems would impede or even preclude global action.

In light of the above considerations, in a scenario in which the EU decides to include shipping within the EU Emissions Trading System or decides to impose operational efficiency standards, the regulations should be limited to intra-EU voyages only.

###