

INTERSESSIONAL MEETING OF THE
WORKING GROUP ON REDUCTION OF
GHG EMISSIONS FROM SHIPS
12th session
Agenda item 3

ISWG-GHG 12/3/2
25 March 2022
ENGLISH ONLY
Pre-session public release:

**CONSIDERATION OF CONCRETE PROPOSALS FOR MID- AND LONG-TERM
MEASURES AND ASSOCIATED IMPACT ASSESSMENTS IN THE CONTEXT OF
PHASE I OF THE WORK PLAN AS WELL AS THE PROPOSAL TO ESTABLISH AN
INTERNATIONAL MARITIME RESEARCH BOARD**

**Establishment of an International Maritime Research and Development Board and an
IMO Maritime Research Fund**

**Submitted by Liberia, Nigeria, Palau, Singapore, ICS, BIMCO, INTERTANKO, CLIA,
INTERCARGO, IPTA, IMCA, INTERFERRY and WSC**

SUMMARY

Executive summary: To expedite approval of the necessary amendments to MARPOL Annex VI, the co-sponsors have suggested, in document MEPC 78/7/3 (Liberia et al.), some adjustments to the proposal to establish the IMRB and IMRF, as set out in document MEPC 76/7/7 (Denmark et al.). These seek, inter alia, to make the package more attractive to developing countries by making significant funds available (potentially some \$50 million annually) to the GHG TC-Trust Fund. These adjustments will also increase opportunities for companies and research institutes in any Member State to participate in the applied R&D programmes which the IMRB will commission and to benefit from the knowledge and insights which will be generated by these programmes in support of their own GHG reduction efforts.

Strategic direction, if applicable: 3

Output: 3.2

Action to be taken: Paragraph 42

Related documents: MEPC 78/7/3; MEPC 77/16, MEPC 77/7/1, MEPC 77/7/6, MEPC 77/7/21, MEPC 77/7/30, MEPC 77/7/31; MEPC 76/15, MEPC 76/7/7, MEPC 76/7/8; MEPC 75/18, MEPC 75/7/4, MEPC 75/INF.5; MEPC 74/18, MEPC 74/18/Add.1; ISWG-GHG 5/4/4; MEPC.1/Circ.885; MEPC 71/7/4 and resolution MEPC.304(72)

Introduction

1 This document, which contains a proposal that has been submitted to the Committee as document MEPC 78/7/3 (Liberia et al.), seeks to address issues raised by Member States about the establishment of the International Maritime Research and Development Board (IMRB) and IMO Maritime Research Fund (IMRF) by suggesting adjustments to the comprehensive proposal set out in document MEPC 76/7/7 (Denmark et al.). Although MEPC 77 instructed ISWG-GHG 12 to further consider the proposal, the time available during the intersessional meeting is likely to be limited. To expedite the urgent need for consideration and approval of the proposed amendments to MARPOL Annex VI at MEPC 78, the co-sponsors have also submitted this document to MEPC 78.

2 MEPC 77 resumed its consideration of the proposal for the establishment of the IMRB. The Committee (MEPC 77/16, paragraph 7.70):

- .1 thanked the co-sponsors of the IMRB proposal and associated fund for their updated proposal, which also addressed a number of the concerns expressed by delegations during earlier consideration of the proposal; and
- .2 noted the increased support for the proposal to establish an IMRB and associated fund, but also noted that, while many delegations saw merit in the establishment of an IMRB in principle, many other delegations opposed the approval of the proposal because of remaining concerns related to, inter alia, technology transfer, redistribution of funds, governance mechanism and access to R&D."

3 Notwithstanding the above, many delegations that had expressed initial views about the proposal at MEPC 76 were, due to lack of time, unable to express further views at MEPC 77 with the benefit of having considered the submissions made to MEPC 77. These submissions included documents:

- .1 MEPC 77/7/6 (Japan et al.) which sought to address issues raised at MEPC 76;
- .2 MEPC 77/7/1 (ICS et al.) which contained a comprehensive analysis, by the consultancy company Ricardo, of the technological challenges that need to be addressed and the R&D programmes that could be conducted by the IMRB to increase Technology Readiness Levels sufficiently by 2030 to make delivery of the 2050 level of ambition plausible;
- .3 MEPC 77/7/21 (ICS) which suggested how intellectual property issues might be addressed and that knowledge generated by IMRB programmes could be shared for the benefit of all Member States; and
- .4 MEPC 77/7/30 (Turkey) concerning intellectual property rights (IPR) and benefit sharing, and document MEPC 77/7/31 (Turkey) which proposed that the IMRB should oversee the implementation of the IPR procedures determined by the Committee.

4 The Group will recall that the IMRB was listed in the Initial IMO Strategy as a short-term candidate measure for adoption by 2023. The co-sponsors therefore recommend that the proposed amendments to MARPOL Annex VI, to catalyse and accelerate applied R&D of zero-carbon technologies and fuels, should, as matter of urgency, be considered and approved by the Committee as soon as possible. Following COP 26 in November 2021, with its emphasis

on collaborative action, and the 'Code Red' report issued by IPCC in August 2021, the IMRB/IMRF is the only comprehensive proposal ready for immediate approval which can meaningfully help to ensure the achievement of the current level of ambition for 2050 in the Initial Strategy (and any higher level of ambition agreed when this is revised in 2023).

5 Given the typical 25-year life of new ships, the co-sponsors stress that it is vital to ensure that zero-carbon ships and/or fuels can be delivered in large numbers/quantities from 2030 onwards if the current 2050 target in the Initial Strategy is to be achieved. If the IMRB is not taken forward this will make it far more difficult to achieve the current (and any revised) levels of ambition agreed by the Organization to meet the objectives established by UNFCCC. Unless zero-carbon technologies and fuels are available on a worldwide basis for the industry to transition to, which can be applied to all ship types and trades, any market-based measure that may be developed by the Organization would simply become a revenue raising exercise which, in itself, would fail to bring about the total decarbonization of international shipping.

6 The co-sponsors reiterate that approval of the proposal is a matter of political will, especially given that the establishment of the IMRB will have no cost implications for Member States or the Organization, with all administrative costs involved with establishing and operating the IMRF and the R&D contribution system being met by the IMRF itself. Moreover, as demonstrated by the comprehensive impact assessment contained in document MEPC 76/7/8 (Denmark et al.), the proposed R&D contribution of \$2 per tonne of fuel oil consumed will have no disproportionately negative impacts on the economies of Member States.

7 Apart from the need to drastically cut CO₂ emissions from international shipping within the timeframe agreed by the Committee – which can only be achieved by accelerating R&D to ensure the rapid development and introduction of zero-carbon technologies that can readily be applied to all types of ships, including large ships engaged in transoceanic voyages – it is also of the utmost importance that the Organization is able to demonstrate continuing leadership for decarbonization of international shipping in the face of initiatives which increasingly threaten the maintenance of the global regulatory framework provided by IMO. As the adoption by the Organization of the Ballast Water Management Convention demonstrated, establishing ambitious environmental targets without a solid technological foundation will cause significant problems at the implementation stage.

8 To address various issues raised by Member States, the co-sponsors suggest some adjustments to the draft texts set out in the annexes to document MEPC 76/7/7. It should be noted that these adjustments include just one (albeit important) change to the draft amendments to MARPOL Annex VI which require immediate approval by the Committee. The other adjustments relate to the accompanying guidelines which can be further fine-tuned before the amendments to MARPOL Annex VI are adopted. All these adjustments to the package proposed in document MEPC 76/7/7 are set out in the annex to this document, which document MEPC 78/7/3 has invited the Committee to consider prior to approval of the proposed amendments to MARPOL Annex VI.

Discussion

Provision of additional funds for GHG TC-Trust Fund activities to support developing countries, in particular LDCs and SIDS

9 The draft proposal set out in document MEPC 76/7/7 identifies that funds raised from R&D contributions by ships and placed in the IMRF shall primarily be utilized for funding research and development programmes to be administered by the IMRB (draft regulation 28.1

to MARPOL Annex VI).¹ But the updated proposed draft regulation 28.2.1 identifies that the IMRF can also be used to provide supplementary support to the GHG TC-Trust Fund. As set out in annex 17 to document MEPC 74/18 (Secretariat), the purpose of the GHG TC-Trust Fund is to provide a dedicated source of financial support for technical cooperation and capacity-building activities to support implementation of the Initial Strategy.

10 In document MEPC 78/7/3, the co-sponsors suggest that the proposed draft regulation 28 should be adjusted to provide a clear indication of the significant level of funding that the IMRF will provide for supplementary support to the GHG TC-Trust Fund to support maritime GHG reduction projects in developing countries, in particular, LDCs and SIDS. It is suggested that the regulation should specify that the amount to be provided annually from the IMRF to support the GHG TC-Trust Fund should be proportional to the level of funding for the IMO Technical Cooperation Fund compared to the overall IMO budget.

11 For example, for 2021, the IMO Council at its 125th session² identified out of a total IMO budget of £52,855,000 that the IMO Technical Cooperation Fund budget is £5,206,000, which equates to just under 10% (9.85%) of the total IMO budget. Should, as anticipated, based on an R&D contribution from ships equivalent to \$2 per tonne of fuel oil consumed, the IMRF will receive funds of some \$500 million annually, then, using the same ratio, approximately \$50 million dollars would be provided annually for the GHG TC-Trust Fund by the IMRF. The resulting balance of funds, about 90% or possibly \$450 million per annum, would still be used for the primary purpose of supporting collaborative R&D programmes, although in practice the total amount of funds potentially available to support IMRB projects would be greater than this amount due to the co-funding that would be provided by some grantees in developed countries, as set out in paragraph 27 of this document.

12 The adjustment proposed to draft regulation 28.2.1 would demonstrate a clear commitment to support GHG reduction efforts by developing countries, in particular LDCs and SIDS, consistent with the Initial Strategy. The co-sponsors also note that there is clear support among IMO Member States for the proportion of funding of the Organization's annual budget which is currently provided for the IMO Technical Cooperation Fund.

13 In order that all supplementary funds from the IMRF (i.e. those not directed to the IMRB or for the administration of the IMRF) should be sent to the GHG TC-Trust Fund in an amount proportional to the level of funding for the IMO Technical Cooperation Fund compared to the overall IMO budget, the co-sponsors propose that paragraph 2.1 of draft regulation 28 be adjusted to read as follows (deleted text ~~struck through~~, additional text underlined):

".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. The percentage share of the IMRF's annual income to be used for this purpose, instead of that used for the principal purpose set out in paragraph 1, shall be equivalent to the budget for the IMO Technical Cooperation Fund calculated as a percentage of the Organization's budget as provided for in that year's annual budget of the Organization;"

14 Furthermore, the co-sponsors propose that the draft "*Guidelines for the establishment and governance of the International Maritime Research and Development Board and collection*

¹ Draft regulation numbers based on MARPOL Annex VI prior to adoption of resolution MEPC.328(76) on the 2021 Revised MARPOL Annex VI.

² IMO (2021) (e) *Budgetary matters for 2021*, Table 1: Approved budgets for the 2020 -2021 biennium, document C125/4(e).

of R&D contributions to the IMO Maritime Research Fund under chapter 6 of MARPOL Annex VI" (as set out in annex 2 to document MEPC 76/7/7) should include an additional paragraph to reflect the adjustment to draft regulation 28.2.1, as set out above as follows:

"5bis The principal purpose of the IMRF is to fund research and development programmes to be administered by the IMRB. The *Initial IMO Strategy on reduction of GHG emissions from ships* (MEPC.304(72)), identifies that the Organization recognizes that developing countries, in particular LDCs and SIDS, have special needs with regard to capacity-building and technical cooperation. In addition to its principal purpose, the IMRF is to provide supplementary support to assist maritime GHG reduction efforts of developing countries, in particular LDCs and SIDS."

Intellectual property rights and transfer of technology

15 At MEPC 76, a view was expressed that the provisions on Intellectual Property Rights (IPR) did not provide sufficient guarantees to ensure fair access to the results of R&D funded by the IMRB (MEPC 76/15, paragraph 7.71.14). MEPC 77 gave further consideration to IPR issues including document MEPC 77/7/21 (ICS) and document MEPC 77/7/30 (Turkey). Furthermore, document MEPC 77/7/31 (Turkey) proposed that the IMRB should oversee the implementation of the IPR procedures determined by the Committee.

16 Member States have identified that transparency and the sharing of knowledge and lessons learned from R&D projects to be commissioned and administered by the IMRB, using IMRF funding, are critical to success. To address concerns about the treatment of IPR, while also ensuring the sharing of knowledge derived from the projects undertaken to the maximum extent practicable, the co-sponsors suggest several adjustments to the texts set out in the annexes to document MEPC 76/7/7. These are derived, in part, from the IP policies of a number of grant programmes, operated by a variety of regional and international organizations, which have been reviewed by Ricardo as set out in document MEPC 77/7/21.³

17 Noting the importance of the transfer of technology, the co-sponsors suggest that the draft resolutions to adopt the proposed draft *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*" and the proposed draft Charter (as set out in annex 2 and annex 4 to document MEPC 76/7/7, respectively) be adjusted to include preambular paragraphs as follows:

"RECALLING FURTHER that it adopted, by resolution MEPC.229(65) *Promotion of technical cooperation and transfer of technology relating to improvement of energy efficiency of ships*,

RECALLING FURTHER the Organization's Strategic Plan 2018 to 2023 adopted, by resolution A30/Res.1110, that identifies that to achieve the goal of uniform implementation, the Organization will continue to develop and execute projects to provide targeted capacity building and technical cooperation that fosters, promotes and supports implementation efforts, especially those of developing countries, and will continue to pay particular attention to the needs of small island developing States and least developed countries,".

³ For the Ricardo report including a list of programmes examined and references, see: <https://rsc.ricardo.com/insights/research-development-requirements-for-zero-carbon-shipping-en->

18 With regard to the proposed draft "*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*" (as set out in annex 2 to document MEPC 76/7/7), it is suggested that paragraph 3 be adjusted as follows (additional text underlined):

"IMRB Charter

- 3 The IMRB Charter should set out, inter alia, the primary research and development objectives of the IMRB, critical principles and operating parameters including, without prejudice to existing national laws and regulations, 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."

19 Under "Oversight of the IMRB by the Marine Environment Protection Committee", with regard to paragraph 5 setting out some of the specific responsibilities of MEPC, it is suggested to add an additional responsibility and that a sub-paragraph 6 be added as follows:

- ".6 Overseeing the implementation of procedures for the treatment of intellectual property rights as determined by the Committee, including approval of a model grant agreement and code of practice to be developed by the IMRB."

20 With regard to the proposed draft Charter set out in annex 4 to document MEPC 76/7/7, it is suggested that article 7, which contains provisions for IPR, should be adjusted as follows (additional text underlined):

- ".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:
- .1 The intellectual property policy for all grants and contracts shall be as follows: All research and development grants and contracts shall, without prejudice to existing national laws and regulations, 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 in discussion with the grantee(s) or contractor on a case-by-case basis, 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."

21 It is further suggested that additional sub-clauses are added to paragraph 7 of article 7 of the draft Charter as follows:

- "7.1 The IMRB should prepare a "model grant agreement" document that offers a framework for the project partners (grantees) in the management of IPR. This document should include:
- .1 policy recommendations for project partners (grantees) on identification, exploitation, protection and dissemination of IP;
 - .2 a "Code of Practice" that contains guidance on implementation; and
 - .3 a detailed annex on example cases, specific rules, consequences of non-compliance, etc.
- 7.2 The IMRB should allocate a professional officer (IP officer) responsible for supporting project partners (grantees) in establishing agreements on IPR and monitoring the implementation of the recommendations.
- 7.3 The "model grant agreement" should cover, inter alia, the following issues:
- .1 designation by the project partners (grantees) of a contact point responsible for IPR management who will liaise with the IP officer throughout the project to ensure that the IP is appropriately disseminated;
 - .2 clarification and identification of IP related topics including: identification of IP owned by grantees beforehand (Background IP); ownership of results (Foreground IP) and its protection; and access rights and any licence fees with respect to Background and Foreground IP;
 - .3 arrangements with regard to any non-disclosure agreement (NDA) that might cover a period of time after completion of the project to protect any existing IP or any IP generated prior to decisions on IP dissemination or patent filing; and
 - .4 arrangements with regard to any retention of Background IP created or developed before the date of the agreement and access to Background IP.
- 7.4 The IMRB should develop a policy to promote easy dissemination of the results from all R&D projects, including publication of findings in open access databases and the establishment of a repository accessible to all Member States and other relevant stakeholders. The repository should contain both existing public domain information and IMRB project reports.
- 7.5 To support knowledge sharing among all Member States, the IMRB should promote and support grant applications that include collaboration with organizations from multiple Member States, including those located in different regions and in both developed and developing countries."

Reflecting CBDR-RC in the funding of R&D projects, and encouraging collaboration between developed and developing countries

22 Consistent with the Initial Strategy and MARPOL, which both refer to the principles of non-discrimination and no more favourable treatment, all ships to which the regulations apply should make the required R&D contributions at the same rate and value, regardless of the flag State. Nevertheless, to be consistent with the Initial Strategy, the way in which R&D contributions are utilized to fund R&D projects needs to be cognizant of the principle of common but differentiated responsibilities and respective capabilities in the light of different national circumstances (CBDR-RC), as enshrined in the UNFCCC, its Kyoto Protocol and the Paris Agreement.

23 During previous discussions within the Committee, Member States have identified the need to ensure collaborative participation in IMRB programmes by companies and research institutions in as many Member States as possible. Some Member States have also expressed concerns about the ability of developing countries to participate in IMRB programmes, and the possibility that IMRF funds might be utilized predominantly by companies and research institutes in developed countries.

24 It will therefore be important to encourage participation in IMRB projects by companies and research institutions in developing countries, including via grant applications made jointly in cooperation with entities based in developed countries.

25 Being cognizant of the CBDR-RC principle, it is suggested that companies and research institutes (grantees) in developing countries should have access to IMRB grants on differential terms. Grantees in developing countries should not be required to provide any co-funding, whereas grantees in developed countries may normally be required to contribute an appropriate amount of co-funding to any grants which they receive, as may be agreed between the IMRB and the grantee.

26 However, to provide a strong incentive to encourage companies and institutions in developed countries to undertake projects jointly with entities in developing countries, it is suggested that no co-funding should be required from entities in developed countries for any joint projects conducted in collaboration with partners from developing countries.

27 The co-sponsors therefore propose that a new paragraph be added to the current draft "*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*" (as set out in annex 2 to document MEPC 76/7/7) as follows:

"Funding of IMRB projects

10bis Funding of R&D projects by the IMRF and administered by the IMRB should be as follows:

- .1 for projects to be undertaken solely or jointly by grantees in developed countries only, the grantee(s) may be required to provide an appropriate level of co-funding as may be agreed between the IMRB and the grantee(s);
- .2 for projects to be undertaken solely or jointly by grantees in developing countries, no co-funding will be required; and

- .3 for projects to be undertaken jointly by grantees in one or more developed countries plus one or more developing countries, no co-funding will be required."

28 The adjustments to the draft guidelines suggested above will thus enable companies and institutions in developing countries to apply for grants for R&D projects commissioned by the IMRB without any need to provide co-funding. These adjustments will also increase the ability of entities in developing countries, including LDCs and SIDS, to participate in IMRB projects via collaborative projects conducted jointly with entities in developed countries which will have a strong financial incentive to undertake joint projects with companies and research institutes in developing countries. This will include joint projects with entities from developing countries whose primary interest in the successful delivery of the Initial Strategy may be in their capacity as port States, for example with respect to the development of the new bunker delivery systems which may be required in ports worldwide.

Governance arrangements for equitable representation on the IMRB

29 IMO Member States have indicated a wish to see the Board of Directors of the IMRB have balanced geographic representation.

30 To address the issue of appropriate geographic representation, the co-sponsors suggest using the approach adopted by the Committee for the 2013 and 2020 IMO GHG studies and the 2016 Fuel Oil Availability Review under MARPOL Annex VI. For example, the terms of reference for the *Fourth IMO GHG Study*, set out in annex 18 to document MEPC 74/18/Add.1, identify the need for balanced geographic representation on the Steering Committee for the study and read as follows:

"Steering Committee

A Steering Committee should be established by the Committee at its seventy fourth session. The Steering Committee should be geographically balanced (e.g. with reference to the five United Nations regions), and equitably represent developing and developed countries. Relevant stakeholders should also be represented. The Steering Committee established should be of a manageable size and therefore should be as small as possible."

31 It is therefore suggested to address the concerns raised that an additional provision be added in article 4 of the draft Charter (concerning Management and Organization of the IMRB, as set out in annex 4 of document MEPC 76/7/7) to read as follows:

"3bis The IMRB Board of Directors shall be geographically balanced (e.g. with reference to the five United Nations regions), and equitably represent developing and developed countries.

32 Furthermore, to ensure a wider representation from Member Governments on the IMRB Nominating Committee it is suggested to amend paragraph 6 of article 4 of the draft Charter to read as follows:

"6 The IMRB Nominating Committee shall be composed of [21] members. Of these [21] members, [8] shall be from the shipping industry, [10] 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."

R&D contribution to the IMRF

33 When reviewing the proposed R&D contribution to the IMRF provided in paragraph 1 in the annex to the draft resolution (MEPC 76/7/7, annex 3) it was identified that additional decimal places need to be added to the values of the R&D contribution per tonne of CO₂ emitted to ensure that these correctly correspond to the value expressed per tonne of fuel oil. Minor editorial corrections are therefore suggested to annex 3 to document MEPC 76/7/7.

Conclusion

34 Document MEPC 78/7/3 seeks to address the issues raised by Member States with regard to the establishment of the IMRB by suggesting further adjustments to the package set out in document MEPC 76/7/7. In particular, these seek to make the proposal more attractive to developing countries by making significant funds available (some \$50 million annually) to the GHG TC-Trust Fund, while increasing the opportunities for companies and research institutions in any Member State to participate in the applied R&D programmes which the IMRB will commission and to benefit from the knowledge and insights that will be generated by these programmes in support of their own GHG reduction efforts.

35 The Initial Strategy sets out, in its paragraph 4.7.9, a short-term measure to "initiate research and development activities addressing marine propulsion, alternative low-carbon and zero-carbon fuels [...] and establish an International Maritime Research Board to coordinate and oversee these R&D efforts". Establishment of the IMRB, funded by the IMRF, as set out in document MEPC 76/7/7, at no cost to Member States or to the Organization, clearly meets the intent of the candidate short-term measure identified in the Initial Strategy. All that is required is political will.

36 The need for the Committee to approve the amendments to MARPOL Annex VI at its seventy-eighth session, which are required to establish the IMRB as soon as possible, has been given additional urgency by the 'Code Red' Report published by IPCC in August 2021. The world is closely watching the decisions being taken by the Committee and the industry was disappointed by the lack of progress made at MEPC 77 given that the IMRB is a short-term candidate measure and is the only proposal ready for immediate adoption which can help ensure that international shipping decarbonizes within the timelines agreed by the Committee.

37 Achievement of the current 2050 level of ambition requires thousands of zero-carbon ships and/or large quantities of fuels to be delivered from 2030, but current Technology Readiness Levels (TRLs) are insufficient to achieve this. Regardless of any other mid- and long-term measures which the Organization might decide to adopt, without a massive and immediate acceleration of R&D there will be few, if any, proven zero-carbon technologies that are appropriate for use across the entire commercial fleet. The comprehensive analysis set out in document MEPC 77/7/1 identifies 120 distinct challenges for increasing TRLs and more than 260 separate R&D projects which will need to be conducted urgently.

38 There is also serious uncertainty about the pathways to decarbonization which present huge barriers to the investment decisions needed for the transition. Existing funds dedicated to applied R&D of zero-technologies that can be utilized by ships are woefully inadequate. The establishment by the Organization of an extensive, coordinated R&D programme, with guaranteed funding of some \$5 billion – which will collaborate with and complement other R&D programmes – is therefore essential if the Initial Strategy is to succeed.

39 It is emphasized that voluntary contributions alone will not provide the large amount of guaranteed funding necessary to adequately support the comprehensive R&D programme required to increase TRLs. Shipping companies have to contribute on an equal basis, in order to maintain the global level playing field. Voluntary R&D contributions would provide no certainty regarding the amount of funds or timing when funds would be collected, making it impossible to properly manage the IMRB's R&D programmes.

40 The comprehensive regulatory proposal contained in document MEPC 76/7/7 takes into account the concerns expressed by Member States at MEPC 75, and document MEPC 77/7/6 addressed comments made during MEPC 76. With the adjustments suggested by the co-sponsors in document MEPC 78/7/3, the proposed amendments to MARPOL Annex VI, as set out in the annexes to document MEPC 76/7/7, are mature, complete and ready for approval at MEPC 78.

41 If an extensive R&D programme is not established as soon as possible, by approval of the MARPOL Annex VI amendments at the seventy-eighth session of the Committee, the levels of ambition identified in the Initial Strategy are unlikely to be achieved. Moreover, the Committee will miss the opportunity, before other bodies fill any vacuum, to demonstrate its commitment to the implementation of its Initial Strategy and its leadership role as the global regulator in reducing GHG emissions from shipping.

Action requested of the Working Group

42 The Group is invited to consider the information contained in this document and its annexes and, in particular to:

- .1 note that the IMRB is not a market-based measure (MBM);
- .2 recall that as a short-term measure, a delay in the establishment of the IMRB/IMRF due to the proposal being further considered alongside proposals for mid-term measures such as an MBM for international shipping, would be inconsistent with the Initial Strategy adopted in 2018; and
- .3 consider the suggested adjustments to the proposal set out in document MEPC 76/7/7, as set out in the annex to this document, in particular to the adjustment proposed to draft regulation 28.2.1 of MARPOL Annex VI concerning the supplementary funding to be provided from the IMRF to the GHG TC-Trust Fund.

ANNEX

PROPOSED ADJUSTMENTS TO DRAFT TEXTS SET OUT IN ANNEXES TO DOCUMENT MEPC 76/7/7

1 Proposed adjustments to draft regulation 28 of MARPOL Annex VI set out in annex 1 to document MEPC 76/7/7

1.1 Paragraph 2.1 is amended as follows (deleted text ~~striketrough~~, additional text underlined):

~~".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. The percentage share of the IMRF's annual income to be used for this purpose, instead of that used for the principal purpose set out in paragraph 1, shall be equivalent to the budget for the IMO Technical Cooperation Fund calculated as a percentage of the Organization's budget as provided for in that year's annual budget of the Organization;"~~

2 Proposed adjustments to the draft 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 set out in annex 2 to document MEPC 76/7/7

2.1 Additional preambular paragraphs (*2bis* and *2ter*) are added to the draft resolution as follows:

"RECALLING FURTHER that it adopted, by resolution MEPC.229(65) *Promotion of technical cooperation and transfer of technology relating to improvement of energy efficiency of ships,*

RECALLING FURTHER the Organization's Strategic Plan 2018 to 2023 adopted, by resolution A30/Res.1110, that identifies that to achieve the goal of uniform implementation, the Organization will continue to develop and execute projects to provide targeted capacity building and technical cooperation that fosters, promotes and supports implementation efforts, especially those of developing countries, and will continue to pay particular attention to the needs of Small Island Developing States (SIDS) and Least Developed Countries (LDCs),"

2.2 Paragraph 3 on the IMRB Charter is amended as follows (additional text underlined):

"IMRB Charter

3 The IMRB Charter should set out, inter alia, the primary research and development objectives of the IMRB, critical principles and operating parameters including, without prejudice to existing national laws and regulations, 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."

2.3 A sub-paragraph 6 is added under paragraph 5 as follows:

"6 Overseeing the implementation of procedures for the treatment of intellectual property rights as determined by the Committee, including approval of a model grant agreement and code of practice to be developed by the IMRB."

2.4 A paragraph *5bis* is added under the section on IMO Maritime Research Fund as follows:

"*5bis* The principal purpose of the IMRF is to fund research and development programmes to be administered by the IMRB. The *Initial IMO Strategy on Reduction of GHG emissions from ships* (MEPC.304(72)), identifies that the Organization recognizes that developing countries, in particular LDCs and SIDS, have special needs with regard to capacity-building and technical cooperation. In addition to its principal purpose, the IMRF is to provide supplementary support to assist maritime GHG reduction efforts of developing countries, in particular LDCs and SIDS."

2.5 A paragraph *10bis* and subheading is added as follows:

"Funding of IMRB projects"

10bis Funding of R&D projects by the IMRF and administered by the IMRB should be as follows:

- .1 for projects to be undertaken solely or jointly by grantees in developed countries only, the grantee(s) may be required to provide an appropriate level of co-funding as may be agreed between the IMRB and the grantee(s);
- .2 for projects to be undertaken solely or jointly by grantees in developing countries, no co-funding will be required; and
- .3 for projects to be undertaken jointly by grantees in one or more developed countries plus one or more developing countries, no co-funding will be required."

3 Proposed adjustments to R&D contribution to the IMO Maritime Research Fund set out in annex 3 to document MEPC 76/7/7

3.1 Paragraph 1 of the annex to the draft resolution is amended as follows (deleted text ~~struck through~~, additional text underlined):

Value of R&D contribution: For liquid fuel oil including Diesel/Gas Oil, Light Fuel Oil (LFO) and Heavy Fuel Oil (HFO)¹:
\$0.62438 per tonne of CO₂ emissions
(equivalent to \$2 per tonne of liquid fuel oil consumed by the ship)

For LPG:²

¹ 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.

² The CO₂ emissions of butane LPG are regarded as equal to propane.

\$0.62438 per tonne of CO₂ emissions
(equivalent to \$1.89 per tonne of LPG consumed by the ship)

For LNG:
\$0.62438 per tonne of CO₂ emissions
(equivalent to \$1.72 per tonne of LNG consumed by the ship)

Methanol:
\$0.62438 per tonne of CO₂ emissions
(equivalent to \$0.86 per tonne of methanol consumed by the ship)

Ethanol:
\$0.62438 per tonne of CO₂ emissions
(equivalent to \$1.19 per tonne of ethanol consumed by the ship)

4 Proposed adjustments to the draft Charter for the establishment and governance of the International Maritime Research and Development Board (IMRB) set out in annex 4 to document MEPC 76/7/7

4.1 Additional preambular paragraphs (*2bis* and *2ter*) are added to the draft resolution, as follows:

"RECALLING FURTHER that it adopted, by resolution MEPC.229(65) on the *Promotion of technical cooperation and transfer of technology relating to improvement of energy efficiency of ships*,

RECALLING FURTHER the Organization's Strategic Plan 2018 to 2023 adopted, by resolution A30/Res.1110, that identifies that to achieve the goal of uniform implementation, IMO will continue to develop and execute projects to provide targeted capacity building and technical cooperation that fosters, promotes and supports implementation efforts, especially those of developing countries, and will continue to pay particular attention to the needs of small island developing States and least developed countries,"

4.2 Paragraph *3bis* is added to Article 4 Management and Organization of the IMRB, as follows:

"*3bis* The IMRB Board of Directors shall be geographically balanced (e.g. with reference to the five United Nations regions), and equitably represent developing and developed countries. The IMRB Board of Directors shall endeavour to make all reasonable efforts to ensure gender balance in all appointments including to the IMRB Board of Directors."

4.3 Paragraph 6 of article 4 of the draft Charter is amended as follows (deleted text ~~striketrough~~, added text underlined):

"6 The IMRB Nominating Committee shall be composed of [~~13~~21] members. Of these [~~13~~21] members, [~~7~~8] shall be from the shipping industry, [~~3~~10] 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."

4.4 Paragraph 7 of article 7 Administration of Grants and Contracts is amended, as follows (additional text underlined):

"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:

.1 The intellectual property policy for all grants and contracts shall be as follows: All research and development grants and contracts shall, without prejudice to existing national laws and regulations, 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 in discussion with the grantee or contractor on a case by case basis, shall be designed to further two equally important purposes:

iii) 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

iv) 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.

7.1 The IMRB should prepare a "model grant agreement" document that offers a framework for the project partners (grantees) in the management of IPR. This document should include:

.1 policy recommendations for project partners (grantees) on identification, exploitation, protection and dissemination of IP;

.2 a "Code of Practice" that contains guidance on implementation; and

.3 a detailed annex on example cases, specific rules, consequences of non-compliance, etc.

7.2 The IMRB should allocate a professional officer (IP officer) responsible for supporting project partners (grantees) in establishing agreements on IPR and monitoring the implementation of the recommendations.

7.3 The "model grant agreement" should cover, inter alia, the following issues:

- .1 designation by the project partners (grantees) of a contact point responsible for IPR management who will liaise with the IP officer throughout the project to ensure that the IP is appropriately disseminated;
 - .2 clarification and identification of IP related topics including: identification of IP owned by grantees beforehand (Background IP); ownership of results (Foreground IP) and its protection; and access rights and any licence fees with respect to Background and Foreground IP;
 - .3 arrangements with regard to any non-disclosure agreement (NDA) that might cover a period of time after completion of the project to protect any existing IP or any IP generated prior to decisions on IP dissemination or patent filing; and
 - .4 arrangements with regard to any retention of Background IP created or developed before the date of the agreement and access to Background IP [and the extent to which, if any, this may be considered as match-funding].
- 7.4 The IMRB should develop a policy to promote easy dissemination of the results from all R&D projects, including publication of findings in open access databases and the establishment of a repository accessible to all Member States and other relevant stakeholders. The repository should contain both existing public domain information and IMRB project reports.
- 7.5 The IMRB should establish a database for IP, including patents and licence status, from IMRB projects [and, as may be appropriate, prior technologies related to potential IMRB projects]. IP should be included within the database, regardless of whether patents have or will be applied for.
- 7.6 To support knowledge sharing among all Member States, the IMRB should promote and support grant applications that include collaboration with organizations from multiple Member States, including those located in different regions and in both developed and developing countries."
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