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Agenda item 12(b)
"Emissions from fuel used for international aviation and maritime transport"

UPDATE ON IMO'S WORK TO ADDRESS GHG EMISSIONS FROM INTERNATIONAL SHIPPING

SUMMARY

The International Maritime Organization (IMO) contributes to international action to address climate change by regulating GHG emissions from international shipping.

Five years after adoption of the 2018 *Initial IMO Strategy on reduction of GHG emissions from ships* (the Initial IMO Strategy), IMO is accelerating its efforts to decarbonize the shipping sector as soon as possible, through important parallel tracks, inter alia:

.1 finalization of a **revised Strategy with strengthened ambition** for adoption by MEPC 80 in July 2023;

.2 development of a **basket of mid-term GHG reduction measures**, including technical and economic elements, to pursue further GHG reduction whilst maintaining a level playing field and ensuring that no one is left behind;

.3 finalization of new guidelines on the **life cycle GHG intensity of marine fuels** to encourage the production, supply and use of sustainable low-carbon and zero-carbon marine fuels in the near future;

.4 development of the necessary **safety regulatory framework** allowing safe handling of the future marine fuels on board of ships; and

.5 scaling up of **technical cooperation and capacity-building initiatives** to support shipping decarbonization in developing countries, in particular SIDS and LDCs, ensure a just and equitable transition to low-carbon shipping and seize development opportunities arising from the decarbonization of the sector.

CONTEXT

1 Carrying more than 80% of the international trade of goods in volume, international shipping has increased fourfold over the past 50 years to a total of almost 11 billion tonnes[1]

[1] *Review of Maritime Transport 2022*. UNCTAD

which makes it a key enabler of global commerce. As such, most of the elements of the 2030 Agenda for Sustainable Development will only be realized with a sustainable maritime transport sector supporting world trade and facilitating global economy[2].

2 The International Maritime Organization (IMO) is a specialized United Nations agency and the global standard-setting authority for the safety, security and environmental performance of international shipping. This can be summed up by IMO's mission statement: *"Safe, secure and efficient shipping on clean oceans"*.

IMO'S REGULATORY WORK TO REDUCE GHG EMISSIONS FROM INTERNATIONAL SHIPPING

3 For over a decade now, IMO has been acting to reduce GHG emissions from international shipping. A timeline summing up these actions is provided in the Annex of this document.

4 Shipping is the most cost-effective and energy efficient mode of mass cargo transport, and since 2009 the increase of CO_2 emissions of international maritime transport has been effectively decoupled from the continuous growth of global seaborne trade volume (see Figure 1). International shipping is also the enabler of the world's energy transition facilitating global trade in the renewable energy commodities of the future. Today, GHG emissions from international shipping still account for about 2.5% of global anthropogenic GHG emissions[3].

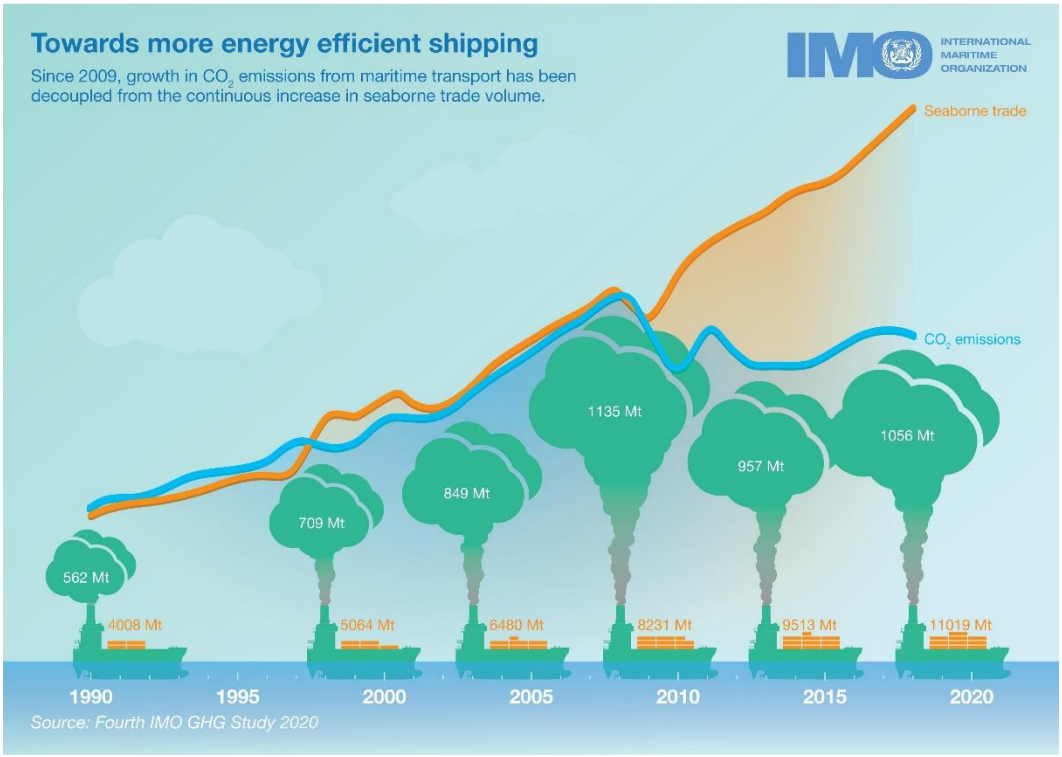

Figure 1: CO_2 emissions of global maritime transport and global seaborne trade

Initial IMO Strategy on reduction of GHG emissions from ships

5 In 2018, Member States adopted the *Initial IMO Strategy on reduction of GHG emissions from ships* (resolution MEPC.304(72)), setting out IMO's ambition to reduce carbon

2 https://www.imo.org/en/MediaCentre/HotTopics/Pages/SustainableDevelopmentGoals.aspx
3 *Fourth IMO GHG Study 2020*

intensity (emissions per transport work) by at least 40% by 2030, pursuing efforts towards 70% by 2050, and to reduce total annual GHG emissions from international shipping by at least 50% by 2050 compared to 2008, working towards phasing them out as soon as possible[4]. The Initial IMO Strategy envisages the 2050 level of ambition as "a point in a pathway of CO_2 emissions reduction consistent with the Paris Agreement temperature goals".

6 The Initial IMO GHG Strategy represents a global framework for Member States and the industry, setting out a vision for shipping decarbonization, levels of ambition to reduce GHG emissions and guiding principles; and includes candidate short-, mid- and long-term measures with possible timelines and an assessment of their impacts on States. The Initial GHG Strategy also foresees that a revised IMO GHG Strategy is to be adopted in 2023 (see section below).

7 Since the adoption of its Initial Strategy, IMO has been actively working on transposing the commitments into mandatory requirements that apply to individual ships from all flags to ensure that the levels of ambition are effectively achieved in line with the agreed timelines. As such, IMO's commitments do not just remain aspirational targets but lay down a binding regulatory framework that applies to the world fleet and is enforced globally, both the ship's flag State as well as any port State the ship visits.

8 IMO regulations apply worldwide without discrimination, thus providing a global equal level playing field, preventing distortion of specific trade flows and trade agreements, avoiding carbon leakage or sub-optimal shipping in certain parts of the world.

Revision of the *Initial IMO Strategy on reduction of GHG emissions from ships*

9 As presented in the IMO submission to SBSTA 56, MEPC 77 (November 2021) agreed to initiate the revision of the *Initial IMO Strategy on Reduction of GHG emissions from ships*, recognizing the need to strengthen the ambition during the revision process. The decision came in the wake of COP 26 and in view of the urgency for all sectors to accelerate their efforts to reduce GHG emissions.

10 MEPC 78 (6-10 June 2022) had for its consideration a number of documents submitted by Member States and observer organizations providing concrete proposals and comments related to the revision of the Initial IMO GHG Strategy, including, inter alia, the level of ambition for 2050, intermediate GHG reduction targets for 2030 and 2040, and how to ensure a "just and equitable" transition that addresses the interests of developing States, in particular SIDS and LDCs, often also the most climate vulnerable States.

11 MEPC 79 (12-16 December 2022) further discussed the proposals for the revision of the Initial GHG Strategy and reaffirmed its commitment to adopt a revised IMO GHG Strategy in all its elements, including with a strengthened level of ambition, by MEPC 80, and established two intersessional meetings to gather before MEPC 80 with a view to finalizing the draft text.

12 The 14th session of the Intersessional Working Group on GHG matters (ISWG-GHG14) (20-24 March 2023) considered a draft revised GHG strategy to be used as a basis for its continued negotiations at the next session (ISWG-GHG 15, 26-30 June) with a view to adoption of the 2023 IMO Strategy on Reduction of GHG Emissions from Ships during MEPC 80 (3-7 July 2023).

[4] The *Initial IMO Strategy on reduction of GHG emissions from ships* is available on the IMO website here

Mandatory short-term measures to reduce the carbon intensity of international shipping

13 As presented in previous IMO submissions to SBSTA, the short-term GHG reduction measure, composed of mandatory technical and operational requirements, has entered into force on 1 November 2022 and is aimed at reducing the carbon intensity of international shipping in 2030 by at least 40%, compared to 2008 levels.

14 The binding carbon intensity reduction targets are goal-based (i.e. technology and fuel agnostic), leaving the choice to comply with different technical and operational measures to the ship owner/operator.

15 IMO does actively support dissemination of recent information about the different technologies through its various projects. Under the Norway-funded project IMO GreenVoyage2050 a Practical Guide to the Selection of Energy Efficiency Technologies for Ships and an Energy Efficiency Technologies Portal have been developed. The GEF-UNDP-IMO GloFouling project analyses how advanced hull coatings can support fuel consumption reduction of ships.

16 MEPC 79 adopted amendments to MARPOL Annex VI to require additional reporting by flag States to the IMO Ship Fuel Oil Consumption Database (DCS) on the ship's carbon intensity performance values (EEXI and CII rating), which provide a building block for further carbon intensity reduction measures.

17 The Committee further agreed to include a new workstream on further revision of the IMO DCS in the agenda of ISWG-GHG 13 (5-9 December 2022), which will largely focus on possible reporting of cargo-related information to reflect the carbon intensity of a ship more accurately.

18 The IMO carbon intensity rating system provides a valuable tool to enhance the involvement of the private sector and other actors in the maritime value chain in promoting low-carbon shipping. It will allow the financial sector, e.g. banks and insurance companies, but also ports, charterers and cargo owners to use the mandatory ratings of these ships in a way to steer investment and equity to the most efficient ships.

19 The new regulations also enhance cooperation between shipowners and charterers regarding energy efficiency management on board and may also constitute building blocks for future GHG reduction measures to be developed in the mid- and long-term.

Comprehensive impact assessment of the short-term measure and its lessons-learned exercise

20 According to the Initial IMO Strategy, the adoption of emissions reduction measures should be supported by an evidence-based impact assessment taking into account, as appropriate, analysis tools and models. MEPC 74 approved a *Procedure for assessing impacts on States of candidate measures*, as was reported in IMO's submission to SBSTA 50. In line with the Initial IMO Strategy, particular attention is paid to the needs of developing countries, in particular SIDS and LDCs.

21 IMO conducted in spring 2021 a comprehensive impact assessment of the short-term measure, with the contribution of external stakeholders, including UNCTAD. The outcome of this impact assessment was approved by MEPC 76.

22 MEPC 76 agreed to keep under review the impacts on States of the aforesaid amendments to MARPOL Annex VI so that any necessary adjustments can be made, and to initiate a lessons-learned exercise of the comprehensive impact assessment.

23 Based on recommendations of an Ad-hoc Expert Workshop on Impact Assessments which identified concrete proposals for improving the impact assessment procedure, ISWG-GHG 13 completed the lessons-learned exercise, and, in particular, finalized the review of the *Procedure for assessing impacts on States of candidate measures*, which was approved by MEPC 79 and issued as MEPC.1/Circ.885/Rev.1.

Development of mid- and long-term measures

24 As presented in the IMO submission to SBSTA 56, MEPC 76 approved a Work plan for development of mid- and long-term measures aiming at supporting the achievement of the vision and the levels of ambition agreed in the Initial IMO Strategy. The Work plan consists of three main phases:

.1 Phase I – Collation and initial consideration of proposals for measures;

.2 Phase II – Assessment and selection of measure(s) to further develop; and

.3 Phase III – Development of (a) measure(s) to be finalized within (an) agreed target date(s).

25 MEPC 78 supported, in general, the further development under Phase II of the Work plan of a basket of candidate mid-term GHG reduction measures, integrating both various technical and carbon pricing elements while recognizing the necessary flexibility.

26 In accordance with Phase II of the Work plan, the Committee agreed to continue its work by means of assessing the various proposed measures, in particular, their (1) feasibility, (2) effectiveness to deliver the long-term levels of ambition and (3) potential impacts on States, with a view to further developing the basket of candidate mid-term measures.

27 MEPC 79 further considered proposed measures along with initial impact assessments with a view to identifying a basket of IMO's next set of measures to reduce GHG emissions from shipping. Current proposals contain GHG fuel standards, fuel levies, emissions cap-and-trade system, feebate system, and combinations of concepts.

28 MEPC 79 noted the increased convergence on the development of a basket of measures consisting of both technical and economic elements to promote the energy transition of shipping and provide the world fleet the needed incentive while contributing and ensuring a level playing field and a just and equitable transition.

29 MEPC 80 will identify which mid-term measure(s) to develop further in priority.

Expert workshop on mid-term measures

30 ISWG-GHG 14 requested the IMO Secretariat to organize a dedicated ad-hoc expert workshop on comparative analysis of candidate mid-term measures ahead of ISWG-GHG 15. Mid-term measures might include technical elements such as a GHG intensity standard, as well as an economic element such as a fuel levy, reward, feebate or flat rate contribution incentivizing the global availability and uptake of low and zero carbon fuels.

31 The two-day workshop was instructed to:

.1 carry out an expert review of the technical and economic elements, and their possible combinations, of the proposals for candidate mid-term measures, in

particular their feasibility, effectiveness to deliver the levels of ambition and their potential impacts on States; and

.2 provide relevant information to facilitate the identification of possible technical and economic elements, as well as other commonalities in the proposed measures, which may serve as building blocks for the basket of candidate mid-term measures - to be developed further as a priority under Phase III of the Work Plan.

32 Proponents of candidate measures as well as relevant organizations, including UNCTAD, were invited to submit and present their views and share updated information on the technical and economic elements of the proposals for candidate mid-term measures, and their possible combinations.

33 A report containing a summary of the discussion will be submitted to MEPC 80 as document MEPC 80/INF.39, to be considered prior by ISWG-GHG 15.

Revised resolutions adopted on voluntary measures

34 MEPC 74 adopted resolution MEPC.323(74), which encourages voluntary cooperation between shipping and port sectors to contribute to reducing GHG emissions from ships. The resolution highlights several areas in which action should be encouraged which include, but are not limited to, the provision of: (1) Onshore Power Supply (preferably from renewable sources); (2) safe and efficient bunkering of alternative low-carbon and zero-carbon fuels; (3) incentives promoting sustainable low-carbon and zero-carbon shipping; and (4) improving quality and availability of data for optimizing voyages and port calls and facilitating Just In Time Arrivals of ships.

35 A resolution on National Action Plans (NAP) MEPC.327(75) was adopted in November 2020 at MEPC 75 urging Member States to develop and update a voluntary NAP with a view to contributing to reducing GHG emissions from international shipping by supporting actions at national level, such as cooperation between the ports and shipping industry as well as along the maritime value chain.[5]

36 MEPC 79 adopted revised resolutions on both voluntary cooperation with ports and on national action plans (resolutions MEPC.366(79) and MEPC.367(79), respectively). The amendments to both resolutions notably include references to ‘shipping routes’ and ‘maritime hubs’ to support shipping decarbonization.

37 Through the project GreenVoyage2050, IMO also developed useful Portal and Guide for Member States to embark on the development of such a National Action Plan involving all stakeholders.[6]

IMO action to promote the uptake of alternative low-carbon and zero-carbon maritime fuels

Lifecycle GHG/carbon intensity assessment for marine fuels

38 Lifecycle GHG/carbon intensity assessment (LCA) of marine fuels is a key element supporting the uptake of alternative marine fuels for international shipping by adequately calculating the overall GHG/carbon footprint of those fuels.

[5] The submitted national action plans and strategies are available on the IMO website here
[6] The guidance is available here

39 MEPC 78 established a correspondence group to further develop draft guidelines on lifecycle GHG intensity of marine fuels (LCA Guidelines), covering various issues such as various fuel production pathways, sustainability criteria issues, Well-to-Tank, Tank-to-Wake and entire Well-to-Wake emission calculation methodologies, third-party verification, etc. MEPC 79 considered an interim report of the correspondence group. ISWG-GHG 15 will consider the final report of the Correspondence Group on Marine Fuel Life Cycle GHG Analysis with a view to finalization of the draft LCA Guidelines and adoption at MEPC 80.

40 Further information on marine fuels life cycle may be found from a report on sustainability criteria and life cycle GHG emission assessment methods and standards for alternative marine fuels, developed by the Global Industry Alliance to Support Low Carbon Shipping (Low Carbon GIA), a partnership under the IMO-Norway GreenVoyage2050 Project.

Safety considerations

41 In parallel, since 2018, IMO's Maritime Safety Committee (MSC) has been working on the development of the appropriate regulatory framework to ensure a safe use of low- and zero-carbon marine fuels, e.g. hydrogen, methanol, fuel cells, ammonia, etc. MSC approved the *Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel* (MSC.1/Circ.1621) and the *Interim guidelines for the safety of ships using fuel cell power installations* (MSC.1/Circ.1647) in 2020 and 2022, respectively. Moreover, a circular on *Interim Guidelines for the safety of ships using LPG fuels* is foreseen to be approved in 2023.

42 MSC also developed a work plan for the development of new guidelines for other alternative fuels; namely, Guidelines for ships using hydrogen and ammonia are planned to be finalized by 2024. Development of mandatory instruments regarding methyl/ethyl alcohols (methanol) will be finalized by 2025 while consideration on the development of mandatory instruments regarding fuel cells will commence by 2025. The safe use of other candidate low-carbon fuels such as ammonia is also under consideration.

Proposals related to onboard CO_2 capture

43 MEPC 79 considered proposals related to onboard CO_2 capture and agreed to further consider these proposals at MEPC 80. MEPC invited interested Member States and international organizations to submit further information, comments and proposals on onboard CO_2 capture to that session.

CAPACITY-BUILDING, TECHNICAL COOPERATION AND OTHER SUPPORTING ACTIVITIES

Multi-donor trust fund to support implementation of the Initial IMO Strategy

44 In May 2019, IMO established a voluntary multi-donor trust fund (GHG TC-Trust Fund), to provide a dedicated source of financial support for technical cooperation and capacity-building activities to support the implementation of the Initial IMO Strategy. The IMO GHG TC Trust Fund has funded a number of initiatives aimed at enhancing IMO's informed and inclusive decision-making, such as the Fourth IMO GHG Study 2020, the comprehensive impact assessment of the short-term GHG reduction measure, a project on improving the availability of maritime transport cost data in the Pacific region and the recently published Study on the readiness and availability of low- and zero-carbon ship technology and marine fuels.

The Integrated Technical Cooperation Programme (ITCP)

45 To help developing countries improve their ability to comply with international rules and standards relating to maritime safety and the prevention and control of maritime pollution, IMO has developed an Integrated Technical Cooperation Programme (ITCP), which is designed to assist governments which lack the technical knowledge and resources that are needed to operate a shipping industry safely and efficiently.

46 The effects of the COVID-19 pandemic have continued to have an impact on the work of IMO in the implementation of capacity-building activities delivered through the Organization's ITCP. Consequently, the Secretariat has continued to adapt its working practices to meet the challenges and to develop new implementation methodologies, taking into account the lessons learned and experience gained, with a strong focus on online training in lieu of "traditional" in-person training.

47 Support to IMO's GHG-related activities under the ITCP is a clear priority for the Organization. For 2022-2023, a dedicated global programme "Reducing atmospheric emissions from ships and in ports and effective implementation of MARPOL Annex VI and the Initial IMO GHG Strategy", was designed to assist Member States with the implementation of the Initial IMO Strategy, thereby increasing energy efficiency measures for ships, as well as reducing atmospheric pollution from ships, including when in ports. In addition, national and regional training and capacity-building activities support Member States for following up the outcomes of impact assessments of candidate measures and to better understand IMO's Data Collection System (DCS).

48 During the 72nd session of the Technical Cooperation Committee (TC 72), held from 17 to 20 October 2022, the Committee was informed on the technical cooperation work undertaken by the Secretariat so far to support implementation of the energy efficiency requirements in MARPOL Annex VI and the Initial IMO Strategy on the reduction of GHG emissions from ships.

49 In 2023, through IMO's ITCP, the following activities were delivered aimed at enhancing awareness, knowledge, and skills of participants on relevant aspects of MARPOL Annex VI:

.1 A regional conference on Seizing opportunities for green shipping in Asia and the Pacific was organized in Manila, Philippines (16-17 May). The two-day conference explored the challenges and opportunities that lie within the green transition of the shipping sector, and provided a venue to discuss regional perspectives and priorities in the current negotiations of the IMO Strategy on the reduction of greenhouse gas emissions from ships and its regulatory framework. The conference participants were apprised of the ongoing IMO-World Bank Study on Energy Efficiency of Domestic Ferries to enhance safety and energy efficiency of domestic passenger ships in the Philippines. The conference further provided opportunities to discuss how to promote green shipping in Southeast Asia and the Pacific. It explored concrete solutions and shared knowledge from different regional experiences where concrete steps have been taken towards the green transition of the shipping sector. The conference was co-organized by the Philippines through the Maritime Industry Authority (MARINA), the Danish Maritime Authority of Denmark, and IMO;

.2 A Green Shipping conference in Accra, Ghana (15-16 February), provided a forum to discuss opportunities and challenges for African countries in the decarbonization of international shipping. Key drivers of change include an

ambitious and global regulatory framework put in place by IMO addressing energy efficiency; development of new technologies; and investments in renewable energy and infrastructure. The conference – the first of its kind on the continent - was co-organized and co-sponsored by IMO, in collaboration with the Maritime Authorities of Ghana and Denmark. Participants came from 15 African countries. Through a programme of high-level in-person panels and interactive sessions, attendees identified expectations with regard to the revision of the Initial IMO GHG Strategy and the development of economic measures. New ways of working together, especially between the public-private sector and between developed and developing countries, are crucial for the green transition. The panel sessions addressed opportunities and challenges in terms of unlocking finance for port infrastructure, renewable energy production, training and skill development of seafarers as well as job generation and attracting young generations to a low-carbon African shipping industry;

.3 Held back-to-back with the 6th Association of African Maritime Administrations (AAMA) Conference and General Assembly in Mombasa, Kenya (5 May 2023**)** the IMO conference on Low-Carbon Shipping in Africa had as its theme 'Overcoming challenges by unlocking opportunities and investments'. The conference covered different subjects including as IMO's contribution to global climate action; shipping as enabler of climate action and energy transition; and capacity building, partnerships and technology cooperation. The Low-Carbon Shipping in Africa conference explored the challenges and opportunities of shipping decarbonization for African countries. It also provided an opportunity to discuss differing perspectives and priorities amongst developing countries in ongoing IMO negotiations on the adoption of an ambitious revision of the Initial IMO GHG strategy, and the development of mid-term greenhouse gas reduction measures;

.4 A project on "Improving access to maritime transport costs in the Pacific region" is currently underway. This project, funded by IMO's GHG Trust Fund and implemented by the Pacific Community (SPC) and the Maritime Technology Cooperation Center in the Pacific (MTCC Pacific), aims to improve the availability of relevant maritime transport costs data in the Pacific region with a view to facilitating future assessments of impacts of candidate IMO mid- and long-term GHG reduction measures in that region. It has involved a number of field missions in participating countries to improve the access to transport cost data. Stakeholders from national statistics offices, port authorities, customs and maritime administrations are taking part in the project;

From 15 to 16 February 2023, IMO, UNCTAD, SPC and MTCC-Pacific held in Suva (Fiji) a regional roundtable with 31 participants from 9 countries in the Pacific region to discuss the collection of maritime transport costs data at the national level and the sharing of lessons learned from the project so far. Recommendations and best practices for maritime transport costs data collection will be widely disseminated; and

.5 A short-term measure to achieve the objectives of the initial strategy for In support of the implementation of the short-term GHG reduction measure, a pilot project is being delivered by SPC in collaboration with Fiji Government Shipping Services to retrofit a Fijian government ship with new technology systems to increase energy efficiency and reduce carbon emissions. Funded

by IMO's GHG TC Trust Fund, it is envisaged that this pilot project will be rolled out to other Pacific Islands countries and territories, including dissemination of the results and lessons-learned.

Voluntary Multi-Donor Trust Fund (VMDTF) for financial support to attend IMO GHG meetings

50 The IMO Council at its 128th session (28 November-2 December 2022) endorsed the establishment of the Voluntary Multi-Donor Trust Fund (VMDTF) providing financial assistance to representatives of developing countries, in particular SIDS and LDCs, which are IMO Member States, in attending the meetings of MEPC and ISWG-GHG.

Future fuels and technology for low- and zero-carbon shipping project (FFT project)

51 In September 2022, the IMO Secretariat launched the Future Fuels and Technology for low- and zero-carbon shipping project (the FFT project).

52 The FFT project is a partnership project between the Government of the Republic of Korea and the International Maritime Organization (IMO), funded through the Voyage Together Trust Fund and implemented by the Marine Environment Division (MED).

53 This project is designed to support GHG reduction from international shipping by providing technical analysis to the Organization in support of policy discussions held in the Marine Environment Protection Committee.

54 In this regard, the FFT Project carried out a *Study on the readiness and availability of low- and zero-carbon technology and marine fuels*, contributing to the identification of the state-of-play and projections regarding the global uptake and dissemination of low- and zero-carbon marine technology and fuels.

55 The main findings of the study conducted by Ricardo and DNV were presented during ISWG-GHG 14 and submitted to MEPC 80 as document MEPC 80/INF.10. The key findings of this study are:

.1 Achieving a more ambitious decarbonization pathway than business as usual is not seen as being limited by the technical and commercial readiness of candidate fuels and technologies, nor infrastructure and shipyard readiness;

.2 While candidate fuels are and will be more expensive than currently used fuels, this is not a barrier to their uptake for the shipping industry if the demand signal is clear;

.3 A clear signal of demand is needed to enable sufficient availability of candidate fuels. That signal of demand could come from the forthcoming Revised IMO GHG Strategy setting revised levels of ambition in combination with the policies needed to drive the transition to the revised ambition;

.4 All three decarbonization scenarios (50%, 80%, and 100% GHG reduction by 2050) considered in this study are expected to be feasible in 2040 and in 2050 if policies to deliver an increased level of ambition are implemented in the short term; and

.5 Considering that the planned investments and announced projects on candidate fuel production towards 2030 are still conservative, achieving a

possible 2030 target of 45% GHG reduction in the 100% reduction scenario could be challenging. Hence, a clear demand signal and more ambitious policies are needed very soon to come into effect by 2025 in order to meet the 2030 target of this scenario.

56 Other workstreams of the project include:

.1 identifying and supporting possible incentives/regulatory methods to promote the uptake of low- and zero-carbon fuels and technology; and

.2 promoting pilot projects to analyse and demonstrate the feasibility and effectiveness of the IMO GHG strategy and relevant GHG reduction pathways.

57 The IMO GHG TC Trust Fund will complement the project, as appropriate.

IMO GHG related Partnerships and Projects Portfolio

58 IMO has signed memorandum of understanding (MoU) with the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), the Commonwealth, and the Central American Bank for Economic Integration (CABEI) respectively. The scopes of potential activities/projects to be implemented out of these MoUs include the area of marine environment protection and climate change which GHG emission should fall under. Additionally, under the SMART-C Programme funded by the Republic of Korea, a new long-term project that aims to reduce GHG emission is now at the development stage with the implementation period is estimated to be 5 years starting from 2023 until 2027.

GreenVoyage2050

59 IMO-Norway GreenVoyage2050, funded by Norway Ministry of Climate and Environment ($7.5 million), has accelerated its work on several new pilot project proposals in:

.1 Georgia: Establishment of a new green domestic passenger ferry route;

.2 India: Exploring low and zero carbon alternatives for the ferry sector in the State of Assam;

.3 Malaysia: Exploring Malaysia's potential as a producer of alternative, low and zero marine fuels; and greening of harbor crafts in the Port of Tanjung Pelepas;

.4 South Africa: Development of sustainable biofuels from macro algae; and greening South Africa's government fleet (Emergency Towing Vessels and harbor crafts) to demonstrate new technologies and supporting countries in their efforts to reduce emissions from ships and in ports. The project also continued its support to countries in the development of National Action Plans (NAPs) and the drafting of legislation to incorporate MARPOL Annex VI into national law. Through its Low Carbon Global Industry Alliance (Low Carbon GIA) the project has developed several new online resources addressing topics such as Just-In-Time arrivals, alternative marine fuels regulations, and confidence grading for energy efficiency technologies, as well as launching a second E-Learning course in collaboration with UN CC:Learn.

GHG-SMART training programme

60 The IMO-Republic of Korea Sustainable Maritime Transport Training Programme (GHG—SMART), funded by the Republic of Korea ($2.5 million), supports small islands developing states (SIDS) and least developed countries (LDCs) with the implementation of the IMO GHG Strategy via building sufficient human capacity in these countries. It includes the development of an annual programme of a comprehensive training online, followed by individual training plans, a Practical Training and Study visit, combined with an opportunity of 2 trainees (1 woman and 1 man) to further benefit from a World Maritime University (WMU) scholarship. The 2022 GHG SMART Practical Training and Study Visit was held from 19 to 23 September 2022 in Busan, Republic of Korea. The GHG-SMART Project represents an innovative way of delivering IMO's training activities since it provides a continued long-term programme:. participants undergo classroom training as well as field training. The field training l includes visits to the technology development and demonstration sites and major infrastructure facilities that support GHG reduction and energy efficiency. The ongoing 2023 programme supports 22 participants from 14 SIDS and LDCs, with a concluded online training in February 2023 and an in person Practical Training planned for September 2023.

Global Maritime Technology Cooperation Centres Network (GMN)

61 The Global Maritime Technology Cooperation Centres (MTCC) Network funded by the European Union (EU) ($11 million) successfully completed its Phase I, which aimed at reducing international shipping's GHG emissions. Over the course of 6 years, the GMN established five MTCCs in Africa, Asia, the Caribbean, Latin America and the Pacific with a primary goal of enhancing the human and institutional capacities in maritime administrations and port authorities. The Network has conducted over 90 workshops and conferences and delivered ten pilot demonstration projects. To build on this success, the European Commission has pledged further Euro 10 million to support GMN Phase II from 2023 to 2027. The focus of phase 2, which is envisioned to be launched July 2023 will be scaling up the work of the regional centres, with emphasis on facilitating the introduction of portside energy efficiency measures and technologies, as well as retrofitting domestic vessels through pilot demonstrations.

GloFouling Partnerships

62 "Building Partnerships to Assist Developing Countries to Minimize the Impacts from Aquatic Biofouling" (GEF-UNDP-IMO GloFouling Partnerships project) is part of a wider IMO effort, in collaboration with the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF), to protect marine ecosystems from the negative effects of invasive aquatic species. The seed funding is provided by GEF ($6.9 million). The Project fosters an intervention in 12 beneficiary countries and 14 partnering countries in 6 regions at multiple levels: driving legal, policy and institutional reforms in countries to implement the IMO Biofouling Guidelines; developing capacity to enact a national policy; and bringing in active private sector participation to identify effective solutions and technologies to deal with biofouling. The project also looks at GHG emissions resulting from biofouling on ships. During the period under review, the project has finalized the development and published 3 global Guides for governments and 2 Technical reports on best management practices in the recreational boating and aquaculture sectors. The project also organized the second GloFouling Partnerships Forum and Exhibition on Biofouling Prevention and Management for Maritime Industries from 11-14 October 2022 at IMO headquarters with 180 in-person attendees. The E-learning training course "Introduction to biofouling: impacts and

management of risks" is now open to the public and available in the IMO Learning Management System (LMS). The Global Industry Alliance (GIA) for Marine Biosafety has commissioned 2 reports (one on biofouling management regulations and the other one on GHG aspects related to biofouling management) and has released a short animation showcasing the findings of its published study "Analysing the Impact of Marine Biofouling on the Energy Efficiency of Ships and the GHG Abatement Potential of Biofouling Management Measures". As a result of its Mid-Term Review, the project was extended to 31 May 2025.

TEST Biofouling

63 The "Accelerating Transfer of Environmentally sound Technologies through demonstration pilots to reduce biofouling and related emissions" (TEST Biofouling) Project is funded by Norad ($4 million) with the aim to assist developing countries to build their knowledge on control and management of biofouling and showcase effective approaches to biofouling management and the mitigation of environmental risks associated with the transfer of Invasive Aquatic Species (IAS) through biofouling by means of demonstration projects at both regional and country level. The project has a duration of 4 years (January 2022 –to December 2025) and a contribution of approximately USD 4 million.

64 TEST Biofouling project focusing on testing novel technologies and new sustainable methods of biofouling management through demonstration projects, which can be effective ways to showcase to developing countries the availability and possibilities of new technologies and the environmental and energy efficiency benefits their use could help achieve. The TEST Biofouling project aims at achieving this through 12 national demonstration projects, as well as undertake three regional demonstration pilots on the most cutting-edge technologies and on their use.

IMO CARES

65 IMO Coordinated Actions to Reduce Emissions from Shipping (IMO CARES) is a project aimed at reducing shipping emissions through coordinated actions worldwide. Funded by the Kingdom of Saudi Arabia with a contribution of $1,185,000, this project strives to connect the global north and south by providing a global cooperation and collaboration platform that supports innovation whilst stimulating the development and uptake of energy efficiency technologies. The project is 1 year in duration, with the intention of bridging to a longer term-frame (additional 3 years).

66 The IMO CARES project will deliver a Marine Technology Global Challenge to identify technology solutions, focused on portside energy efficiency technologies and the retrofitting of domestic vessels. These solutions will be demonstrated in Africa and the Caribbean. The Global Challenge will be supplemented by a matchmaking event that will encourage investment by connecting technology providers with interested companies. The project will also develop – in collaboration with the Innovation Forum – an in-depth report of the innovation landscape of the maritime sector, with specific focus on developing countries.

Blue Solutions

67 The preparatory phase of the Blue Solutions project, an ambitious Asia maritime transport emissions project that aims to support East and Southeast Asian countries in identifying opportunities to prevent and reduce transport emissions, was submitted for approval to the International Climate Initiative (IKI) of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of Germany (BMU). The full-size project, once approved, will target the reduction of GHG and other pollutant emissions from ships within ports, and from

hinterland transport through energy efficiency improvements, optimized processes and innovative technologies (blue solutions) in the ASEAN region, in cooperation with the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA)

FIN-SMART

68 The IMO-EBRD-World Bank co-lead Financing Sustainable Maritime Transport (FIN-SMART) Roundtable has been providing a platform among Member State representatives, International Financial Institutions, representatives of private banks and other key maritime stakeholders to identify maritime decarbonization investment risks, opportunities and potential financial solutions, with a special emphasis on financing needs and options in developing countries, particularly SIDS and LDCs.

69 The third FIN-SMART roundtable in June 2023 is, through concrete examples of maritime decarbonization projects in developing countries, to highlight concrete success factors and the role of the various actors in these projects. It is also showcase to the financial community the investment opportunity in more concrete terms, as developing countries may have large unused sustainable resources (for example, wind or solar energy) that could be used for the production of green fuels that the maritime industry requires to accelerate decarbonization.

Innovation Forum

70 The IMO-UNEP-Norway Innovation Forum is a global platform aimed at championing innovation to accelerate the transition of the marine sector towards a zero- and low-emission future. Its aim is to promote innovation by providing a global platform to exchange best practices and fill necessary gaps by gathering ideas and latest developments from all competent international policy makers. The second Innovation Forum, funded by the Government of Norway ($105,000) was held in a hybrid format on 28 and 29 September 2022 and was linked to the IMO World Maritime Day (WMD) theme 2022 “New Technologies for Greener Shipping”. It was attended by a total of 1,900 in person and virtual participants.. Norway has pledged a contribution of $334,505 to fund a third and fourth Innovation Forum, in2023 and 2024, respectively. The 2023 session will be held in conjunction with the WMD, under the theme “MARPOL at 50 — Our commitment goes on”, celebrating the 50th anniversary of the MARPOL Convention, continuing to support the global South and the green transition of the maritime sector into a sustainable future.

NextGEN and NextGEN Connect

71 IMO and the Maritime and Port Authority of Singapore (MPA) have jointly launched NextGEN Connect (“GEN” stands for “Green and Efficient Navigation”), which aims to bring industry stakeholders, academia and global research centres together to offer inclusive solutions for maritime decarbonization for trials along specific shipping routes. The launch was made during the IMO-Singapore Future of Shipping Conference: Decarbonization (6 April 2022). Under NextGEN Connect, diverse stakeholders were invited to propose robust methodologies to jointly develop, on a pilot basis, route-based action plans to reduce greenhouse gas (GHG) emissions between specific points along a shipping route in the Asia-Pacific region. Consequently, the NextGEN Connect challenge received a number of exciting proposals, which were carefully considered by a panel of judges. The winner was announced during the Singapore Maritime Week (24 to 28 April 2023).

72 Jointly introduced by IMO and MPA, the NextGEN Connect Challenge is the next phase of the NextGEN initiative. Launched in September 2021, the continuously updated

NextGEN database (nextgen.imo.org/) currently lists more than 150 decarbonization projects with more than 500 stakeholders worldwide, including IMO Member States, shipowners, technology developers, classification societies and non-governmental organizations.

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ANNEX 1


IMO
INTERNATIONAL MARITIME ORGANIZATION
ACTING TO DECARBONIZE INTERNATIONAL SHIPPING
SHIPPING:
Indispensable to global trade and sustainable development
Serving the world's energy transition
IMO'S WORK TO CUT GHG EMISSIONS FROM SHIPPING

ANNEX 2 – ADDRESSING CLIMATE CHANGE: A DECADE OF IMO ACTION TO CUT GHG EMISSIONS FROM SHIPPING