

**Note by the International Maritime Organization to the forty-seventh session of the
Subsidiary Body for Scientific and Technological Advice (SBSTA 47)
Bonn, Germany, 6 to 15 November 2017**

Agenda item 10(b)

Emissions from fuel used for international aviation and maritime transport

**UPDATE ON IMO'S WORK TO ADDRESS GHG EMISSIONS FROM FUEL USED FOR
INTERNATIONAL SHIPPING**

SUMMARY

IMO's Marine Environment Protection Committee (MEPC) has for some time now been considering, as an integral part of its agenda, actions to address greenhouse gas (GHG) emission from ships engaged in international trade. It met for its seventy-first session (MEPC 71) from 3 to 7 July 2017, at IMO Headquarters in London, with the participation of 99 Member States, two associate members, three United Nations bodies, seven intergovernmental organizations and 51 non-governmental organizations.

The Committee, at its seventieth session (MEPC 70) demonstrated the Organization's commitment to climate change mitigation by adopting amendments to chapter 4 of MARPOL Annex VI, requiring ships to record and report their fuel oil consumption and additional data on proxies for the "transport work" undertaken by the ship. This requirement will enter into force on 01 March 2018. The establishment of the IMO Ship Fuel Oil Consumption Database is the first in a three-step approach in which analysis of the data collected (second step) would provide the basis for an objective, transparent and inclusive policy debate in the MEPC (third step). MEPC 70 also approved a roadmap for developing a "Comprehensive IMO strategy on reduction of GHG emissions from ships".

MEPC 71 continued to work on track for the adoption of an initial IMO GHG Strategy in 2018, in accordance with the Roadmap approved at MEPC 70. The MEPC noted agreement within a working group on a draft outline for the structure of the initial IMO Strategy.

IMO is also continuing its efforts with regard to technical co-operation and capacity-building to ensure effective implementation and enforcement of the aforementioned regulations worldwide and, importantly, activities to support the implementation of resolution MEPC.229(65) on *Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships*.

Introduction

1 International shipping plays an essential role in the facilitation of world trade as the most cost-effective and energy-efficient mode of mass cargo transport, making a vital contribution to international trade and being a key pillar of the development of a sustainable global economy.

2 The International Maritime Organization (IMO) was established by Governments as a specialized agency under the United Nations to provide the machinery for intergovernmental cooperation in the field of regulation of ships engaged in international trade. IMO is responsible for the global regulation of all aspects of international shipping and has a key role in ensuring that lives at sea are not put at risk, including security of shipping, and that the environment is not polluted by ships' operations – as summed up in IMO's mission statement: **Safe, secure and efficient shipping on clean oceans.**

3 In 2011 the Committee has adopted amendments to MARPOL Annex VI introducing mandatory technical and operational measures for the energy efficiency of ships. For the first time in history, a global mandatory GHG emission reduction regime was established for an entire economic sector. These requirements have now been in force for over four years. EEDI and SEEMP are expected to generate annual reduction of about 703 to 1,325 million tonnes of CO₂ in 2050. This significant success story demonstrates the IMO's important role as the global standard setter for international shipping. However, the complexity of optimizing the energy efficiency of existing ships requires that any future action is taken so following the analysis of robust data.

4 This document provides an update of previous submissions by IMO to SBSTA, including document FCCC/SBSTA/2016/MISC.5.

Work on control of GHG emissions from international shipping

5 Measures to improve the energy efficiency of international shipping were adopted by Parties to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) at MEPC 62 in July 2011 and entered into force on 1 January 2013. The *Regulations for energy efficiency of ships* apply to internationally trading ships of 400 gross tonnage and above, and make mandatory the:

- .1 Energy Efficiency Design Index (EEDI) for new ships; and
- .2 Ship Energy Efficiency Management Plan (SEEMP) for all ships.

6 The EEDI is a non-prescriptive, performance-based mechanism that leaves the choice of technologies to use in a specific ship design to the industry. As long as the required energy-efficiency level is attained, ship designers and builders are free to use the most cost-efficient solutions for a ship to comply with the regulations.

7 All ships of 400 gross tonnage and above engaged in international trade are required to implement and maintain a SEEMP which establishes a mechanism for operators to improve the energy efficiency of ships. This should be achieved by monitoring the energy efficiency performance of a ship's transportation work and by considering new technologies and practices to improve energy efficiency at regular intervals.

8 MEPC 70 considered a report of its correspondence group reviewing the status of technological developments relevant to implementing Phase 2 of the EEDI regulations. MEPC 70 agreed to retain the EEDI requirements for Phase 2 and on the need for a thorough review of EEDI Phase 3 (1 January 2025 and onwards) requirements, including discussion on its earlier implementation and the possibility of establishing a Phase 4. Currently, Phase 3 requirements provide that new ships be built to be 30% more energy efficient compared to the baseline.

Third IMO GHG Study 2014

9 MEPC 67 (October 2014) approved the Third IMO GHG Study 2014, providing updated estimates for GHG emissions from ships¹. According to current estimates presented in this study, international shipping emitted 796 million tonnes of CO₂ in 2012, which accounts for no more than about 2.2% of the total emission volume for that year. By contrast, in 2007, before the global economic downturn, international shipping was estimated to have emitted 885 million tonnes of CO₂ which represented 2.8% of the global emissions of CO₂ for that year. These percentages are all the more significant when considering that shipping is the principal carrier of world trade, carrying as much as 90% by volume and therefore providing a vital service to global economic development and prosperity.

10 Updated emission estimates are considered necessary, in general, to provide a better foundation for future work by IMO to address GHG emissions from international shipping especially as the Business as Usual scenarios, depending on future economic and energy developments, forecast a growth in CO₂ emissions for international maritime transport of between 50% to 250% in the period up to 2050. Sea transport is fuel-efficient and without these updated figures it would be difficult to provide a meaningful baseline to illustrate the steadily on-going improvement in fuel efficiency due to improved hull design, more effective diesel engines and propulsion systems and more effective utilization of individual ships resulting from the introduction of mandatory technical and operational measures.

Further technical and operational measures to enhance the energy efficiency of ships

11 MEPC 68 (May 2015) agreed that the development of a data collection system for ships should follow a three-step approach: data collection, data analysis, followed by decision-making on what further measures, if any, are required. This approach was re-affirmed by MEPC 69 (April 2016).

12 MEPC 68 noted that one purpose of the data collection system was to analyze energy efficiency and that for this analysis to be effective some transport work data needs to be included. In this regard, MEPC 68 agreed that data collected by the IMO, particularly that related to transport work, needs to be confidential and not publicly available, and that there is a need to address resulting administrative burdens, impact on industry and the variables that influence energy efficiency. MEPC 69 further agreed that confidentiality of data is crucial and no third-party access to the data should be permitted.

13 MEPC 70 adopted mandatory MARPOL Annex VI requirements for ships to record and report their fuel oil consumption. Under the amendments, ships of 5,000 gross tonnage and above (representing approximately 85% of the total CO₂ emissions from international shipping) will be required to collect consumption data for each type of fuel oil they use, as well as other, additional, specified data including proxies for "transport work". The aggregated data will be reported to the flag State after the end of each calendar year and the flag State, having determined that the data has been reported in accordance with the requirements, will issue a Statement of Compliance to the ship. Flag States will be required to subsequently transfer this data to an IMO Ship Fuel Oil Consumption Database. IMO will be required to produce an annual report to the MEPC, summarizing the data collected.

14 MEPC 71 adopted *2017 Guidelines for Administration verification of ship fuel oil consumption data*, to support the implementation of the mandatory MARPOL requirements

¹ The executive summary and the full report of the Third IMO GHG Study 2014 in English, as well as the executive summary translated into French and Spanish, have been published and are available on the IMO website at:
<http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Greenhouse-Gas-Studies-2014.aspx>

from calendar year 2019, *2017 Guidelines for the development and management of the IMO Ship Fuel Oil Consumption Database* and approved an MEPC circular on *Submission of data to the IMO data collection system for fuel oil consumption of ships from a State not Party to MARPOL Annex VI* to facilitate a broad coverage of the data collection system. The Committee also approved draft amendments to regulation 21 of MARPOL Annex VI regarding EEDI requirements for ro-ro cargo and ro-ro passenger ships, with a view to adoption at MEPC 72 and established a correspondence group on review of the Energy Efficiency Design Index (EEDI) beyond phase 2, to report on progress by MEPC 72 and make a recommendation to MEPC 73 on the time period and reduction rates for EEDI phase 3 requirements.

Reduction of GHG emissions from ships

15 MEPC 69 welcomed the Paris Climate Agreement and acknowledged the major achievement of the international community in concluding the agreement. It also unanimously recognized IMO's own role in mitigating the impact of GHG emissions from international shipping and acknowledged the current efforts and the measures already introduced by IMO to enhance the energy efficiency of ships.

16 MEPC 70, having considered several submissions and established the Working Group on the Reduction of GHG emissions from international shipping, approved a Roadmap for developing a Comprehensive IMO strategy on reduction of GHG emissions from ships, which foresees an initial GHG reduction strategy to be adopted in 2018. The Roadmap contains a list of activities, including further IMO GHG studies and significant intersessional work, with relevant timelines and provides for alignment of those new activities with the ongoing work on the aforementioned three-step approach to ship energy efficiency improvements. This alignment provides a way forward to the adoption of a revised strategy in 2023 to include short-, mid-, and long-term further measures, as required, including implementation schedules.

17 MEPC 71 noted agreement within a working group on a draft outline for the structure of the initial IMO GHG Strategy. The group met following a week-long meeting of the Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG-GHG 1, 26-30 June 2017), which reported on its detailed discussions. The initial strategy is set to include:

- 1 Preamble/introduction/context including emission scenarios
- 2 Vision
- 3 Levels of ambition
Guiding principles
- 4 List of candidate short-, mid- and long-term further measures with possible timelines and their impacts on States
- 5 Barriers and supportive measures; capacity building and technical cooperation; R&D
- 6 Follow-up actions towards the development of the revised Strategy
- 7 Periodic review of the Strategy

18 The Committee approved terms of reference for the second and third meetings of the Intersessional Working Group. In addition to further considering how to progress the matter of reduction of GHG emissions from ships and advise the Committee as appropriate, the second intersessional meeting (ISWG-GHG 2, 23-27 October 2017) had been instructed to further develop the structure and identify core elements of the draft initial IMO Strategy on reduction of GHG emissions from ships and develop draft text for inclusion in the initial Strategy.

19 The second meeting of the ISWG-GHG has made progress in starting to shape a draft initial IMO GHG Strategy including refining the vision for IMO, which will express IMO's

further commitment to reducing GHG emissions from international shipping. While the structure of the Strategy has been largely agreed, the detailed text to be included is still under discussion.

20 A wide range of detailed proposals were put forward for inclusion in the draft initial Strategy. These included those relating to the vision, levels of ambition, guiding principles, candidate measures, barriers and supportive measures and follow up actions. The group agreed that the draft Strategy should incorporate a process for its periodic review. The group agreed that candidate short-term measures could be measures finalized and agreed by the Marine Environment Protection Committee (MEPC) between 2018 and 2023; candidate mid-term measures could be measures finalized and agreed by the MEPC between 2023 and 2030; and candidate long-term measures could be measures finalized and agreed by the MEPC beyond 2030. Dates of entry into force and when the measure can effectively start to reduce GHG emissions would be defined for each measure individually. The group supported the need for early action.

21 The group highlighted the need to consider carefully the potential impact of measures on States, particularly the Least Developed Countries (LDCs) and Small Island Developing States (SIDS). The group also recognised the need to address barriers and provide supportive measures, including capacity building and technical cooperation; and research and development especially into alternative fuels.

22 The Working Group's report, along with other submissions, will go forward to the third Intersessional Working Group session, scheduled to meet 3-6 April 2018. The third session is expected to finalize a draft initial IMO GHG Strategy, to be put forward for adoption by MEPC 72 (9-13 April 2018).

Technical co-operation and transfer of technology

23 Regulation 23 (Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships) of chapter 4 of MARPOL Annex VI requires Administrations, in co-operation with the IMO and other international bodies, to promote and provide, as appropriate, support directly or through IMO to Member States, especially developing States that request technical assistance. It also requires the Administration of a Party to MARPOL Annex VI to co-operate actively with other Parties, subject to its national laws, regulations and policies, to promote the development and transfer of technology and the exchange of information to States which request technical assistance, particularly developing States.

24 Linked to the implementation of energy efficiency measures, MEPC 65 (May 2013) adopted resolution MEPC.229(65) on *Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships*, which, among other things, requests the IMO, through its various programmes, to provide technical assistance to Member States to enable cooperation in the transfer of energy efficient technologies to developing countries in particular; and further assist in the sourcing of funding for capacity building and support to States, in particular developing States, which have requested technology transfer.

25 MEPC 69 noted that a comprehensive update of the Train the Trainer package on "Energy Efficient Ship Operation" had been undertaken to include a new module on the regulatory framework related to the energy efficiency of ships, an EEDI Calculator for training purposes, and other related updated information, such as the findings from the Third IMO GHG Study 2014. Member Governments and other interested delegations were encouraged to make use of it².

² Details of the course, including training materials such as presentations, can be downloaded from the following website:

26 In line with the IMO's High-level Action Plan and Strategic Direction 9 which identifies that "IMO will pay special attention to the shipping needs of Small Island Developing States (SIDS) and the least developed countries (LDCs)", the MEPC has noted the need for timely scheduled voyages, in particular to SIDS dependent upon maritime transport, and that such a special need should be carefully considered to ensure SIDS are not penalized by any measures developed and adopted in respect of operational energy efficiency. In this regard, MEPC has also noted that the Organization's technical cooperation activities would seek to address specific needs of LDCs and SIDS with regard to implementation of ship energy efficiency requirements. MEPC reaffirmed its view at MEPC 70 that SIDS and LDCs have special needs.

27 MEPC 70 was informed of the establishment of an information portal for energy efficiency technologies for ships which provides users with information on existing energy efficiency technologies and highlights the wide spectrum of ways to potentially reduce ship fuel oil consumption³.

Technical cooperation activities

28 To ensure effective implementation and enforcement of the new energy efficiency regulations worldwide, IMO has also been focusing its efforts on technical co-operation and capacity building, and has been undertaking a series of regional and national workshops on implementation of the measures to address emissions from international shipping. Under the Integrated Technical Co-operation Programme (ITCP) of IMO, further capacity-building activities are currently planned, in order to sustain the level of technical cooperation interventions in various regions for the effective implementation and enforcement of energy efficiency measures for ships.

29 Furthermore, with financial support from the Global Environment Facility (GEF), UNDP and IMO are cooperating in a global effort to transform the shipping industry towards a lower carbon future, through the Global Maritime Energy Efficiency Partnerships Project a project entitled "Transforming the global maritime transport industry towards a low carbon future through improved energy efficiency" (GloMEEP Project). This project was officially launched in September 2015 at the IMO-Singapore Future Ready Shipping 2015 Conference. Although originally established for a two-year time period, due to the successful mobilization of additional funds from IMO's ITCP and external donors during GloMEEP's first year of implementation, the project has officially been extended to 31 December 2018.

30 The overall goal of GloMEEP is to strengthen the national capabilities for countries to become party to and effectively implement MARPOL Annex VI. The project aims to contribute to a significant reduction of GHG emissions from international shipping via supporting ten Lead Pilot Countries (LPCs) in taking a fast-track approach to pursuing relevant legal, policy and institutional reforms, driving national government action and industry innovation to support the effective implementation of IMO's energy efficiency requirements. The GloMEEP LPCs are: Argentina, China, Georgia, India, Jamaica, Malaysia, Morocco, Panama, the Philippines and South Africa. The project includes three main components as follows:

31 Project component 1 - Legal, policy and institutional reforms (LPIR): this component supports LPCs in undertaking national LPIR activities for the effective implementation of IMO's energy efficiency regulations, as well as acting as catalysts for increased ratification of

<http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Pages/IMO-Train-the-Trainer-Course.aspx>

³ The portal can be accessed through the following link: <http://glomeep.imo.org/resources/energy-efficiency-techologies-information-portal/>

these regulations by other developing countries at a global scale. In collaboration with IMarEST, a strategic partner to the project, the development of three guide documents is currently being finalized as follows: .1 Rapid Assessment Guide for determining the country maritime energy efficiency and emissions status; .2 Guide for maritime energy efficiency strategy development; and .3 Guide for incorporation of MARPOL Annex VI into national law. These guides are a core element of the LPIR component of the project and aim to assist LPCs in developing their own national status assessment reports, maritime energy efficiency policies and strategies, and national legislations.

32 Project component 2 - Maritime sector energy efficiency capacity building, awareness raising, knowledge creation and dissemination: this component aims to enhance awareness and capacity to ratify, implement and enforce IMO's energy efficiency regulations, as well as foster the uptake of ship operational and design energy efficiency measures in the LPCs. Based on the scoping document developed by the Ad Hoc Expert Working Group on Facilitation of Transfer of Technology for Ships (MEPC 69/5), the technical content for an Energy Efficiency Technologies Information Portal was developed by DNV GL. The Portal aims to: provide users with access to energy efficiency technology information in a user-friendly format; serve as a positive signal to industry and policy-makers about the wide spectrum of ways to reduce ship energy consumption; and support the GloMEEP Project in its objective to increase knowledge sharing among stakeholders and catalyse the uptake of ship operational and design energy efficiency measures. The web-based Portal is accessible to the public on the GloMEEP Project website. Other activities which have been delivered under this component include the development of several training packages, aimed at administrations, maritime training institutions, port State control officers, and ports personnel. So far, over 500 participants have been trained at 19 workshops implemented under the GloMEEP Project.

33 Project component 3 - Public-private partnerships to catalyse maritime sector energy efficiency innovation, R&D and technology deployment: this component primarily aims to catalyse the involvement of private sector in maritime sector energy efficiency activities in developing countries through knowledge-sharing, international forums and collaborative pilot efforts in technology assessment and deployment. Within this project component, in June 2017, the "Global Industry Alliance to Support Low Carbon Shipping" (GIA) was launched, connecting the GloMEEP Project and the maritime industry. Under the GIA, 16 leading maritime companies have committed both technical expertise and financial capital, to collectively identify and develop innovative solutions to address common barriers to the uptake and implementation of energy efficiency technologies and operational measures.

34 More detailed information on the number of activities undertaken at global, regional and national levels within the framework of the three GloMEEP Project components, are set out in document MEPC 71/11/1.

35 Also, the second joint IMO-Singapore International Conference on Maritime Technology Transfer and Capacity Building ("Future-Ready Shipping Conference 2017") was co-organized by the Maritime and Port Authority of Singapore (MPA) and IMO. This two-day event, held on 25 and 26 September 2017 in Singapore, provided a dedicated forum for maritime leaders and professionals to review the latest technologies available for improved energy efficiency of ships and discuss how to facilitate successful technology transfers between countries and increase the take-up of maritime technologies worldwide. The forum also considered ongoing and future collaborations that can drive discussions towards identifying opportunities that can have a transformational impact on the shipping industry as it moves towards decarbonization.

36 The Global MTCC Network Project (GMN⁴) funded by the European Union and implemented by IMO has established Maritime Technology Cooperation Centres (MTCCs) in five regions of the world, namely Asia, Africa, Caribbean, Pacific, and Latin America, that together form a global network of MTCCs. Through 2019 this Network will promote the uptake of low-carbon technologies and operations in maritime transport. It will help developing countries and, in particular, Least Developed Countries and Small Islands Developing States limit GHG emissions from their shipping sectors through technical assistance and capacity building, while encouraging the uptake of innovative energy-efficiency technologies.

Summary

37 International maritime transport is the most energy efficient mode of mass cargo transport and indispensable to the world. A global approach to further improvements in energy efficiency and work to address GHG emissions from ships is considered necessary as sea transport is predicted to grow significantly in the coming years in line with expected future growth in world trade.

38 MEPC 69 welcomed the Paris Agreement on Climate Change and recognized it as a major achievement by the international community. It also unanimously recognized IMO's own role in mitigating the impact of GHG emissions from international shipping and acknowledged the current efforts and the measures already introduced by IMO to enhance the energy efficiency of ships.

39 MEPC 70 continued the Organization's commitment to climate change mitigation by adopting amendments to chapter 4 of MARPOL Annex VI, requiring ships to record and report their fuel consumption, which is expected to come into force in early 2018. The establishment of the IMO Ship Fuel Oil Consumption Database is the first in a three-step approach in which analysis of the data collected (second step) would provide the basis for an objective, transparent and inclusive policy debate by the MEPC (third step).

40 MEPC 70, having established the Working Group on the Reduction of GHG emissions from international shipping to hold an in-depth discussion and recommend an appropriate way forward, approved a roadmap for developing a Comprehensive IMO strategy on reduction of GHG emissions from ships.

41 MEPC 71 noted agreement within a working group on a draft outline for the structure of the initial IMO GHG Strategy and approved terms of reference for the following intersessional meetings. The roadmap foresees the adoption of the initial IMO GHG Strategy at MEPC 72 in spring 2018. A key element of the initial strategy will be a vision for the shipping industry and it has been proposed that this should focus on decarbonization of the sector in the second half of this century. Under the roadmap, and to provide a long-term vision for the shipping sector, the MEPC has to address a number of important questions, such as what role the international shipping sector should have in supporting the goals of the Paris Agreement.

42 IMO continues to develop its adopted framework of technical and operational measures that now serves as a mandatory performance standard for increased energy efficiency in international shipping. The framework builds on IMO's enforcement and control provisions (flag State implementation and port State control), and provides a suite of comprehensive technical guidelines for their effective implementation.

43 IMO is advancing its technical cooperation activities to stimulate the uptake of innovative energy-efficiency and low-carbon technologies for international shipping through the widespread dissemination of information and technology transfer.

⁴ Project website: <http://gmn.imo.org/>

44 IMO, as the global regulator of international shipping, will continue its endeavours to reduce environmental impacts from international maritime transport, a vital industry to world trade and sustainable development, and keep relevant bodies of the UNFCCC informed of its progress.
