IMO News Final
MEPC 81

The 81st session of Marine Environment Protection Committee (hereinafter referred to as MEPC) was convened as a hybrid meeting from 18th to 22nd March 2024 to discuss a wide range of issues under the purview of the Committee. This news final briefs on the outcomes of MEPC 81 on major technical issues.

1. Adoption of amendments to mandatory IMO instruments (Agenda 3)

1.1 Amendments to BWM Convention in relation to the use of electronic record book

MEPC 81 adopted Res.MEPC.383(81) containing draft amendments to BWM Convention in relation to the use of electronic record book. Given that regulation B-2.1 of the BWM Convention stipulates that ballast water record book may be of an electronic record system, while there is no associated guidance in relation to the use of its electronic record book, last MEPC 80 adopted Res.MEPC.372(80) on the *Guidance for the use of electronic record books under the BWM Convention* to ensure a harmonized approach with the relevant requirements of MARPOL and the NOx Technical Code allowing the use of electronic record book system. For providing a legal basis, the revised regulations A-1 and B-2 of the BWM Convention were introduced to provide a definition of electronic record book, approval requirements of electronic record book and a verification requirement by the ship's master. These amendments will enter into force on 1 October 2025.

1.2 Amendments to Article V of Protocol I of MARPOL Convention in relation to the revised reporting procedures for the loss of containers

MEPC 81 adopted Res.MEPC.384(81) containing draft amendments to Article V of protocol I of MARPOL Convention in relation to the revised reporting procedures for the loss of containers. These amendments were introduced to avoid duplication of the SOLAS reporting requirements, stipulating that reporting the loss of freight containers according to Article II(1)(b) shall be made in accordance with the provisions of SOLAS regulations V/31 and 32. But, considering that the amendments to regulations 31 and 32 of SOLAS Chater V in relation to the loss of freight container will enter into force on 1 January 2026, it was agreed that these amendments would also take effect on 1 January 2026 for aligning with SOLAS amendments.

1.3 Amendments to MARPOL Annex VI

MEPC 81 adopted Res.MEPC.385(81) containing draft amendments to MARPOL Annex VI in relation to the low-flashpoint fuels and other fuel oil related issues, marine diesel engine replacing a steam system, accessibility of the data in the IMO Ship Fuel Consumption Database (IMO DCS), and inclusion of data on transport work and enhanced level of granularity in the IMO DCS. These amendments will enter into force on 1 August 2025.

low-flashpoint fuels and other fuel oil related issues

While MEPC 79 adopted Res.MEPC.362(79) on the draft amendments to appendix V of MARPOL Annex VI on *Information to be included in the Bunker delivery Note* (regulation 18.5) to include "flashpoint" of fuels, concerns were raised that such amendments do not cover liquid low-flashpoint fuels such as methanol and ethanol due to the difference of fuel oil defined in between SOLAS II-2 as "oil fuel" based on liquid petroleum fuel and MARPOL Annex VI "fuel oil" containing gas and low-flashpoint fuels. Therefore, draft amendments to regulations 2, 14, 18 and appendix I of MARPOL Annex VI were introduced to reduce such a regulatory gap between those definitions, which include the following elements:

1. In defining "gas fuel" and "low-flashpoint fuels", it was agreed to add a new definition of "gas fuel" aligning with the definition of "gas" in IGF Code;

2. It was agreed that in-use/onboard sampling point requirements according to regulations 14.10 and 14.11 of MARPOL Annex VI and MARPOL representative sample requirements according to regulation 18.8 of MARPOL Annex VI should not apply to gas/low-flashpoint fuel;

3. Given that the minimum information such as sulphur content for low-flashpoint fuels still need to be documented by means of the bunker delivery note, it was agreed that the BDN requirements apply to low-flashpoint fuels for the purposes of MARPOL Annex VI; and

4. It was agreed to replace references to "for combustion purposes for propulsion" by "for use" in the definition of fuel oil to keep a technology neutral definition.

Marine diesel engine replacing a steam system

The draft amendments to regulation 13.2.2 of MARPOL Annex VI were introduced to clarify that a marine diesel engine replacing a steam system (main boiler and steam turbine) should be considered as a "replacement" of marine engine in terms of "major conversion" implying the applicable Tier standard at the time of the replacement or addition of the engine according to regulation 13.2.2.

As the consequential updates to the relevant Guidelines according to these amendments, MEPC 81 further adopted Res.MEPC.386(81) providing draft 2023 *Guidelines as required by regulation 13.2.2 in respect of non-identical replacement engines not required to meet the Tier III limit* in conjunction with the adoption of the above-mentioned amendments to regulation 13.2.2. The updated guidelines were to provide some points the Administrations should take into account in evaluating that engine should be Tier II compliant as opposed to Tier III in the case where a steam system is to be replaced by a marine diesel engine, as well as a template for Information to be provided to the Organization by the Administration which accepts that the installation of a Tier III non-identical replacement engine was not feasible and accordingly a Tier II engine has been installed.

Accessibility of the data in the IMO Ship Fuel Consumption Database (IMO DCS) and inclusion of data on transport work and enhanced level of granularity in the IMO DCS

The draft amendments to regulation 27 and appendix IX of MARPOL Annex VI were introduced concerning the granularity of reporting fuel consumption and additional data, with the following outstanding elements:

1. On an ad-hoc basis and under strict confidentiality rules, IMO DCS data may be shared for the analysis and research purposes. On the request of a company, the fuel oil consumption reports of the company's owned ships can be shared to the public in a non-anonymized form; and

2. It was further agreed to invite the early application of these amendments from 1 January 2025 to avoid double collecting and reporting of the data, and to facilitate the review of short-term measures with the data collected according to the revised format.

Implication Analysis

- Regarding the **electronic ballast water record book** referred in paragraph 2.9 above, electronic record book manufacturers are invited to ensure that the requirements provided in the guidelines are satisfied when developing electronic ballast water record book, and to note that it should be certified by the Administration or Recognized Organization. With respect to the relevant procedures on the **approval of electronic record book and the issue of Declaration**, please refer to the previous Technical Information **titled "Procedures for the use of electronic record book under the MARPOL Convention(2021-IMO-01 click to link)"** published in accordance with Res.MEPC.312(74) on Guidelines for the use of electronic record book under MARPOL.

- For the ships using low-flashpoint fuel or gas fuel as an alternative fuel, a bunker delivery note shall contain at least the information specified in **items 1 to 6 of appendix V of MARPOL Annex VI** as referred to in paragraph 1.2 above. In particular, it should be noted that the **density** of the fuel shall be declared by the fuel oil supplier's representative that **the fuel oil is in conformity with regulation 18.3 of MARPOL Annex VI**, **sulphur content** of the fuel shall be documented on the bunker delivery note by the supplier with the **actual value** as determined by a test method appropriate to the fuel type or, **a statement that the sulphur content is less than 0.001% m/m** when tested by such a method.

- **Administrations** are invited to **note** their rights and obligations arising from the amendments; and **consider** establishing their own national legislation to properly implement them, including necessary actions against confirmed non-compliant cases.

2. Ballast Water Management Convention (Agenda 4)

2.1 Basic Approval was granted

- ERMA FIRST FLOW BWMS (Denmark)

2.2 Type approved BWMSs reported to MEPC 81 (total 4 units)

- RADClean® BWMS (Islamic Republic of Iran), Semb-Eco BWMS (Singapore), Cyeco BWMS (Norway) and BalClor® Smart BWMS (Denmark), they were type approved in accordance with BWMS Code adopted by resolution MEPC.300(72).

2.3 Interim guidance on the application of the BWM Convention to ships operating in challenging water quality

MEPC 81 adopted Res.MEPC.387(81) providing an *Interim guidance on the application of the BWM Convention to ships operating in challenging water quality* containing the following outstanding elements:

1. The Guidelines provide recommended steps that can be taken to restore or maintain effective operation of a BWMS when operating in challenging water quality. These include steps to identify when a system is inoperable owing to challenging water quality; actions to avoid bypass of the system; steps to recover from bypass to ensure compliance with the D-2 standard; and planning, record keeping, and communication principles;

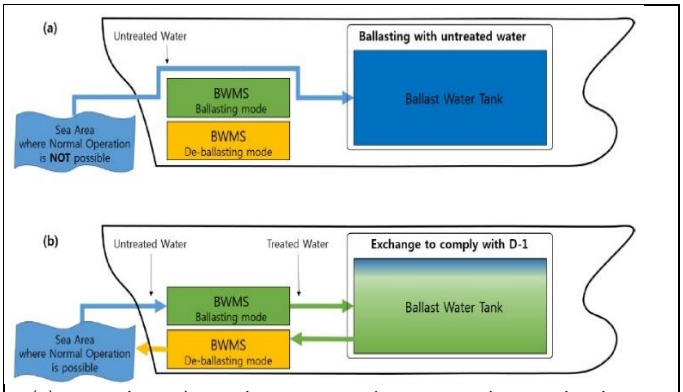
2. The guidelines do not address situations in which a BWMS is inoperable for reasons unrelated to challenging water quality, or in which inadequate performance is due to improper installation, operation or maintenance. Such situations should be addressed on a case-by-case basis in consultation with the Administration of the ship and implicated port States (See also BWM.2/Circ.62);

3. Triggers for implementing challenging water quality procedures should be included in the BWMP and should be based on the performance and self-monitoring of the BWMS. The list of triggers should be developed in conjunction with the BWMS manufacturer, based on BWMS design and operational limitation(s);

4. Challenging water quality triggers should be assessed on a voyage-by-voyage basis because water quality challenges may vary. Following a bypass even in a location with challenging water quality, decontamination to ensure that subsequent discharges meet the D-2 performance standard may include ballast water exchange through a BWMS (BWE+BWT). However, BWE+BWT alone may not be sufficient to meet the standard, the risks associated with BWE+BWT alone may be mitigated by conducting ballast water flushing;

5. Any pre-emptive bypass to manage challenging water quality should be agreed in advance by the Administration of the ship and the port State receiving the ballast water to ensure that the bypassed water is returned to D-2 compliance prior to discharge. Bypass should always be considered as the last resort and the BWMS should be used as much as possible to treat ballast water with challenging water quality; and

6. Example decontamination procedure intended to promote a return to compliance with D-2 performance standard after a BWMS has been bypassed as per a ship using the sequential method or flow-through/dilution method and sample procedure diagram for ships ballasting in areas with challenging water quality as per assessment of BWMS operations, challenging water quality process, alternatives to bypass, and decontamination for managing ballast water following a BWMS bypass were also provided in the appendix of the guidelines to assist ships in planning for compliance with the BWM Convention and the D-2 performance standard when a type-approved BWMS has difficulty in meeting operational demand in challenging water quality.



(a) operation scheme in sea area where normal operation is not possible and (b) operation scheme in sea area where normal operational is possible

2.4 Temporary storage of treated sewage and grey water in the ballast water tanks under BWM Convention

MEPC 81 approved BWM.2/Circ.82 providing a *guidance for the temporary storage of treated sewage and/or grey water in ballast water tanks*, with the following outstanding elements:

1. For ships with limited spaces to provide adequate tank arrangements for holding treated sewage and grey water generated onboard, the ballast tanks may be temporarily used as treated sewage and/or grey water holding tanks. In doing so, the technical and operational measures should be conducted to avoid the contamination of ballast tanks. Such operational and management method of the temporary storage of the treated sewage and/or grey water in the ballast tanks should be described in the Ballast Water Management Plan (BWMP) of the ship;

2. To avoid possible spread of live organisms, prior to the transfer of treated sewage/grey water into the ballast water, the ballast tank should be properly emptied using BWMS to remove any residual ballast water and sediments as far as practicable. The ballast tank should be fully emptied to remove any residual treated sewage or grey water before being used as a ballast tank again;

3. In case a ship changes the use of a ballast water tank from treated sewage/grey water storage back to ballast water discharge, the contents of the ballast water tanks should be discharged by flushing the ballast water tank, pipes, and dual-purpose pumps with at least the same volume of the temporary stored treated sewage/grey water; and

4. During the period in which the ballast tank is holding treated sewage/grey water. The Ballast Water Record Book (BWRB) should have an entry with the type of water being stored as well as date, time and location of change of the use of a ballast tank.

2.5 Modifications to BWMS after type approval

MEPC 81 considered a proposal on development of a guidance for approval after initial type approval of BWMS due to necessary modifications to the system. While approval of modifications to an already type approved BWMS due to changes or upgrades is not clearly defined in the BWMS Code, it is noted that such modifications to existing BWMS are sometimes carried out for system's upgrade purposes (e.g. a robust BWMS suitable for challenging water quality, or alternative filters), and thus it should be clarified whether the current procedures for type approval in accordance with BWMS Code should be carried out without simplified process (e.g. reduced test scope from BWMS Code such as omissions of land-based and/or shipboard testing, if necessary) or not.

During consideration, MEPC 81 particularly noted that while this issue would ultimately be addressed under the Convention review stage, in the interim it should be addressed with guidance to facilitate a consistent process for approval of modifications to BWMS by different Administrations. Moreover, given the various views on detailed technical aspects including testing such as numbers and types of tests, the Committee invited interested Member States and international organizations to submit further concrete proposals to the next session with a view to finalization of guidance on modifications to ballast water management systems with existing type approval.

2.6 Experience Building Phase (EBP) and Convention Review Plan (CRP) under the BWM Convention

Experience Building Phase (EBP) which is constructed as three stages: a data gathering stage, a data analysis stage, and a Convention review stage has been carried out to monitor the overall implementation of the BWM Convention. In addition, MEPC 80 approved BWM.2/Circ.79 on the *Convention Review Plan under the experience -building phase associated with the BWM Convention*, and further agreed to establish a correspondence group

to define objectives for changes to specific Convention provisions and/or instruments, or the need for new provisions and/or instruments. MEPC 81 considered the report of the correspondence group on Review of BWM Convention, and finalized the list of the BWM Convention provisions proposed for revision and/or development as follows:

BWM Convention provisions	Revision and/or development
Regulation A-3 (Exceptions)	Amendments to regulation A-3.4 for allowing circumstances when the ship will discharge unmanaged or partially managed ballast water and sediments on the high seas (challenging water quality, contingency measures and/or PSC requirement on BWE+BWT)
Regulation B-1 (BWMP)	Amendments to identify ships with BWMS that are type approved in accordance with the BWMS Code as opposed to older version of the G8 guidelines, create a standardized BWMP template and add a new requirement that ships plan for contingency measures, etc.
Regulation B-2 (BWRB)	Amendments to add a new requirement that a BWMS maintenance log be added to the BWRB, reflecting the OEM manual and maintenance schedule and be kept updated and signed by crew involved in each action
Regulation B-6 (Duties)	Amendments to add a new requirement for crew familiarization of BWMS
Regulation D-2 (Ballast performance standard)	Amendments to establish a maximum allowable discharge concentration (MADC) for BWMS that use active substances, to ensure that in-service ships regularly discharge effectively neutralized ballast water, for BWMS utilizing active substances
Regulation D-3 (Approval of BWMS)	Amendments to create a new requirement that any type approved BWMS installed on a ship to meet the D-2 standard shall be maintained in good working order
Regulation E-1 (Surveys)	Amendments to include a requirement that annual surveys confirm required maintenance has been undertaken by verifying the BWRB, including the ballast water maintenance log

In addition, MEPC 81 further identified the associated instruments proposed for revision and/or development such as possible amendments as follows:

1. BWMS Code (Res.MEPC.300(72)) for including some requirements on a mandatory maintenance schedule in Operational, Maintenance and Safety Manual (OMSM) and contemporaneous instructions for the proper operation of BWMS as a basis for the development of approved BWMPs;
2. Guidelines G2 (Res.MEPC.173(58)) for creating a new requirement that CMDs be verified in accordance with BWM.2/Circ.78, and once CMDs are verified, unverified devices should not be supported for commissioning testing;
3. Guidelines G4 (Res.MEPC.127(53) as amended by Res.MEPC.306(73) and 370(80)) for creating a new requirement to update a BWMP when a BWMS is upgraded or retrofitted, and creating ship-specific guidance for conducting onboard sampling which is sufficiently detailed to prevent improper sampling collection (i.e. ship and BWMS particulars that can impact the quality of discharge samples collected);
4. Guidelines (G9) for including the maximum holding time for samples to be analyzed, and creating a new requirement to calibrate sensors in situ to ensure complete TRO sensing is completed as per their design; and
5. Guidelines for PSC under the BWM Convention (Res.MEPC.252(67)) for creating a new requirement for indicative monitoring and sampling to ensure effective operation of BWMS, and creating a new requirement to confirm adequate maintenance and record keeping has been undertaken, etc.

MEPC 81 further agreed to establish a correspondence group to prepare draft text for amendments to provisions of the BWM Convention and to associated instruments, and for new provisions and/or instruments, based on the list of provisions and instruments for revision and/or development as referred above.

Implication Analysis

- Regarding the guidance for the application of the BWM Convention to ships operating at ports with challenging water quality referred in paragraph 2.3 above, it is noted that **a ship specific procedure for challenging water quality should be reflected in the BWMP**, while re-approval of the updated BWMP by the Administration and/or Recognized Organization. However, it is further noted that re-approval of the updated BWMP may be required according to the revisions to regulation B-1 and G4 guidelines as part of the "Experience Building Phase" as referred in paragraph 2.6 above. For more details, please refer to the technical information to be published in near future.

- Regarding the temporary storage of treated sewage and grey water in the ballast water tanks referred in paragraph 2.4 above, it is noted that **a ship specific procedure for challenging water quality should be reflected in the BWMP**, while re-approval of the updated BWMP by the Administration and/or Recognized Organization. However, it is further noted that re-approval of the updated BWMP may be required according to the revisions to regulation B-1 and G4 guidelines as part of the "Experience Building Phase" as referred in paragraph 2.6 above. For more details, please refer to the previous Technical Information titled **"Guidance regarding the temporary storage of treated sewage and/or grey water in ballast water tanks(2024-IMO-04 click to link)"**.

- Regarding modifications to BWMS after type approval, given that **the modifications to the existing type approved BWMSs which were already installed onboard ships are being frequently carried out for the purpose of system upgrades (due to challenging water quality, etc)**, the system manufacturers are invited to particularly note the future discussion progress on the scope of the approval of BWMS modifications and its details.

3. Air Pollution and Energy Efficiency (Agenda 5 and 6)

3.1 NOx Tier III compliance strategy in low load point of the SCR operation

Last MEPC 80 considered a proposal encouraging the international cooperation to address a concern that the actual NOx emission levels may be exceeding the Tier III standards when ships with IMO NOx Tier III propulsion engine are operating within ECAs at low loads (below 25% Maximum Continuous Rating (MCR)), such as in port, coastal, and inland areas, ship speed reduction zones. It was based on that a Selective Catalytic Reduction (SCR) system does not work properly below 250°C of exhaust gas from marine diesel engines. In this respect, a potential modification to the certification scheme was also addressed such as an additional point corresponding to a low-load condition to be tested along with the standard E3(or E2) cycle, and the low-load point (10% or 15% of engine power) could be defined for different types of engines.

In this regard, MEPC 81 further considered a proposal, given the concerns that the NOx and ECA requirements in accordance with regulation 13 of MAPROL Annex VI are not achieving the anticipated reductions in air pollution from marine diesel engines, suggesting various ways to address this issue including additional test cycles or modification to the existing test cycles as follows:

1. The combination of the marine engine test cycle and the MARPOL Annex VI and NTC (NOx Technical Code) auxiliary control device (ACD) could resulting in disabling Tier III NOx technology at low engine loads, leading to little or no NOx reductions in an ECA;
2. The keel laying dates incentivize behavior (early keel-laying) to avoid compliance with the Tier III NOx limits;
3. There are challenges in linking compliance procedures to be real-world operational load-behavior of marine diesel engines; and
4. Remote measurements to be conducted by service suppliers on a regular basis need to be introduced to provide indicative information on in-use emissions and ensure that the engines are compliant with Tier III NOx limits for their whole lifetime.

After consideration, given the views that further research and data collection were needed in terms of identifying the technical feasibility for the NOx engine performance at low loads, and concerns expressed regarding the effectiveness of regulation 13 of MARPOL Annex VI in relation to the compliance with NOx Tier III standards in NOx ECAs, MEPC 81 invited interested Member States and international organizations to continue conducting research on the matter and to consider submitting proposals for a new output on the review of the effectiveness of regulation 13 of MARPOL Annex VI, including the NOx Tier III standard, to a future session of the Committee.

3.2 Engine International Air Pollution Prevention (EIAPP) certificate for marine diesel engines

MEPC 81 considered proposals seeking clarification regarding re-issuance of Engine International Air Pollution Prevention (EIAPP) certificate at the time of change of flag of a ship as follows:

1. As it has been observed that in recent times there have been instances where port State authorities have asked for EIAPP Certificate to be re-issued by or on behalf of the gaining flag whenever there is change of flag of a ship, the guidelines for port State control under MARPOL Annex VI need to be amended to ensure that the initial EIAPP Certificate should be considered as valid and re-issuance of the certificate is not required at the time of change of flag; and
2. The gaining flag is responsible for surveying and ensuring the validity of the EIAPP Certificate for the engines onboard the ship, and thus, re-issuing the EIAPP Certificate or a statement that recognizes the EIAPP Certificates issued by the previous Administration should be maintained.

After consideration, given that the receiving Administration was responsible for surveying and ensuring the validity of the EIAPP certificates for the engines onboard the ship and there was no sufficient support for the proposed interpretation regarding re-issuance of EIAPP Certificate at the time of change of flag of a ship, MEPC 81 invited interested member states and international organizations to submit proposals with appropriate justifications to a future session.

3.3 Implementation and review of the short-term measure

MEPC 81 considered following issues and subsequently made decisions as follows:

1. Considering that CII and its rating system is currently within de facto experience building phase and, a review of the system is currently under way that will be completed by 1 January 2026, a draft MEPC resolution urging member States to advise wider stakeholders (e.g. financiers, insurers, charters, brokers and port State control) not to utilize CII or its metric (AER or cgDIST) for assessment of energy efficiency or regulatory compliance risk was proposed. After consideration, given the views that the review process of short-term measures is now ongoing, and thus, it should not be prejudged until review process of

short-term measures is completed by 1 January 2026 in accordance with its work plan agreed at MEPC 80, MEPC 81 could not reach a consensus on this proposal and then invited interested Member States and international organizations to collect data and submit information, recommendations and proposals for improving the CII framework to MEPC 82.

2. In calculating the attained CII, a discrepancy in the definition of "Capacity" for CII calculations between the *2022 Guidelines on operational carbon intensity indicators and the calculation methods* (CII Guidelines, G1) and the *2022 Interim Guidelines on correction factors and voyage adjustments for CII calculations* (CII Guidelines, G5) was identified. The definition of "Capacity" in G1 guidelines is the actual ship's DWT or GT, while the definition in G5 guidelines[1] is DWT or GT as defined for each specific ship type in the *2022 Guidelines on the reference lines for use with operational carbon intensity indicator* (CII reference lines guidelines, G2). This means that the capacity used in calculating the attained CII values will change solely due to the application of these correction factors or voyage adjustments. Thus, amendments to G5 guidelines were proposed to ensure that individual ship's actual DWT or GT should be used in calculating the attained CII value regardless voyage adjustments or correction factors are applied. After consideration, MEPC 81 agreed to issue a corrigendum to the guidelines to correct the editorial error identified in this proposal.

3.4 Matters related to the IMO DCS, EEDI, EEXI and SEEMP

MEPC 81 considered following issues and subsequently made decisions as follows:

1. Given that the current IMO DCS data as a basis for present and future regulatory GHG measures may present some risks and vulnerabilities associated with legal and cyber security issues, MEPC 81 agreed to instructed IMO Secretariat to conduct a review of the suitability of the IMO DCS for the implementation of current and future regulatory GHG measures, in terms of enhancing data quality and integrity.

2. When developed EEDI reference lines, LNG carriers having conventional propulsion built to Phase 0 were categorized as gas carriers in their IEE Certificate, and LNG carriers with non-conventional propulsion (DFDE, turbine, etc) that were contracted within Phase 0 were also categorized as gas carriers. As a result, fuel oil consumption data from LNG carriers which were categorized as gas carriers were reported to IMO DCS database and used in developing the CII reference lines for LNG carriers and gas carriers. This means that the current CII reference lines for LNG and gas carriers do not clearly distinguish these ship types in terms of implementing CII requirements. Given this historical background for the development of reference lines for gas carrier and LNG carrier, MEPC 81 agreed that all LNG carriers currently categorized as gas carriers be recategorized as LNG carrier for the purposes of IMO DCS reporting and implementation of CII and, the IMO Secretariat recalculate the AER[2] of the LNG and gas carrier fleet for 2021 and 2022 once the recategorization is completed.

3. Recalling that MEPC 81 adopted the draft amendments to appendix IX of MARPOL Annex VI for expanding the range and granularity of data to be reported to the IMO Data Collection System (DCS), MEPC 81 adopted Res.MEPC.388(81) and Res.MEPC.389(81) providing consequential amendments to Part II of the *2022 Guidelines for the development of a Ship Energy Efficiency Management Plan* (SEEMP Guidelines) (Res.MEPC.346(78)) and *2022 Guidelines for Administration Verification of Ship Fuel Oil Consumption Data and Operational Carbon Intensity* (Res.MEPC.348(78)). These updated guidelines provide clarifications as to how to calculate total annual fuel oil consumption and fuel oil consumption

[1] For example, in accordance with G5 guidelines, for LNG carrier of less than 65,000 DWT, a default value 65,000 is used as the capacity value in calculating the attained CII when voyage adjustments and/or correction factors are applied. This causes distortion in the carbon intensity and its rating.
[2] The metric calculated as 'CO_2 emission / (DWT x Distance Travelled' is referred to as AER (Annual Efficiency Ratio)

per consumer type (through the method using bunker delivery note, flow meters, bunker fuel oil tank monitoring, LNG cargo monitoring and cargo tank monitoring for ships using cargo other than LNG as a fuel), conversion factor, distance travelled, hours underway, total amount of onshore power supplied and total transport work.

4. MEPC.1/Circ.795/Rev.9 providing the modifications to the unified interpretation was approved to explicitly specify the applicable required EEDI of each Phase for the ship types, LNG carrier, cruise passenger ship, ro-ro passenger ship, ro-ro cargo ship (vehicle carrier) and ro-ro cargo ship, delivered on or after 1 September 2019. It is because MEPC 66 in 2014 adopted the amendments to MARPOL Annex VI by Res.MEPC.251(66) extending the application of the required EEDI to additional five ship types as referred above, while MEPC.1/Circ.795 does not provide any interpretations as to which EEDI Phases should be applied for those ship types as per when the ship was building contracted, keel laid (constructed) and delivered.

5. Regulation 2.2.15 of MARPOL Annex VI provides a definition of "general cargo ship". This definition does not include specialized dry cargo ships, which are not included in the calculation of reference lines for general cargo ships, namely livestock carrier, barge carrier, heavy load carrier, yacht carrier, nuclear fuel carrier. In this regard, MEPC 81 approved MEPC.1/Circ.795/Rev.9, as well as the amendments to unified interpretation referred to in paragraph 4 above, providing the modifications to the unified interpretation to MARPOL Annex VI to incorporate IACS Recommendation 170 into the MARPOL unified interpretation.

6. MEPC 81 adopted Res.MEPC.390(81) providing modifications to *2021 Guidelines on the shaft/engine power limitation system to comply with the EEXI requirements and use of a power reserve* (Res.MEPC.335(76), as amended by Res.MEPC.375(80)) to require ships to have all shaft or engine power, including power reserve, available for immediate use while in pilotage water for the purpose of ensuring the safe navigation in pilotage water. These guidelines further clarify that the shaft or engine power limitation system is not capable of being immediately overridden, the system should be overridden before a pilot's embarkation and remain overridden until the ship departs pilotage water.

7. MEPC 81 approved MEPC.1/Circ.908 providing a procedure for reporting to the organization uses of power reserve. Recalling that the Administration should report to the IMO Secretariat uses of a power reserve over a 12-month period from 1 January to 31 December for the preceding calendar year with the information recorded in accordance with Res.MEPC.375(80), the Administrations are invited to report uses of a power reserve using the format set out in the procedure.

8. Fuel oil consumption data is currently reported to the IMO DCS according to fuel categories defined in the 2022 Guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships (Res.MEPC.346(79)), but the guidelines do not consider various new type of fuel oils such as VLSFO, ULSFO, Biofuels and e-fuels, and no suitable fuel categories are provided in IMO DCS Database for these fuel types. Thus, development of guidance for uniform reporting of VLSFO, ULSFO, Biofuels and e-fuels to the IMO DCS and unified interpretation to MARPOL Annex VI for reflecting this understanding were proposed. After consideration, given the various views as to whether a guidance for uniform report of those fuels to the IMO DCS should be provided in the unified interpretation to MARPOL Annex VI or in the SEEMP guidelines, and whether the biofuels suitable for MEPC.1/Circ.905 should be reported with on the mass of bio component or whole amount of biofuel blends with fossil fuel, MEPC 81 invited interested Member States and international organizations to submit proposals for unified interpretation for the consistent reporting of fuel oils a future session.

3.5 Guidance for marine bunkering vessels on carriage requirements for biofuels intended for use as marine fuels

MEPC 81 considered a proposal discussing the issues on the use of biofuels to reduce GHG emissions from international shipping and proposing a draft MEPC circular providing guidance on the carriage requirements of biofuels for marine bunkering vessels certified for the carriage of MAPROL Annex I cargoes.

The use of biofuels as a drop-in fuel solution in IMO's carbon intensity and reduction of GHG emissions is recognized by the LCA guidelines and, therefore, industry is moving towards wider availability and uptake of biofuels. However, it was identified that convention bunkering vessels certified for the carriage of oil, marine residual or distillate fuels oil and MARPOL Annex I cargoes cannot carry biofuels and its blends of more than 25% by volume of biofuels since those bunkering vessels should be certified to comply with the carriage requirements in accordance with the IBC Code and the 2019 *Guidelines for the carriage of MARPOL Annex I cargoes and biofuels* (MSC-MEPC.2/Circ.17) as a chemical tanker. This means that conventional bunkering vessels cannot carry biofuels and its blends from B30 to B100 which are being introduced into the shipping industry for reducing GHG emissions and complying with CII requirements.

After consideration, given that this issue was not directly an issue related to air pollution but rather to carriage requirements, MEPC 81 instructed PPR Sub-Committee and 30th ESPH Working Group to proceed further discussion on the development of carriage requirement on biofuels for conventional bunkering vessels certified for carriage of oil fuels under MAPROL Annex I or the revision of current carriage requirements as provided in the IBC Code and MSC-MEPC.2/Circ.17.

3.6 MSC-MEPC.1/Circular on Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI and SOLAS Chapter II-2

MEPC 81 approved, subject to concurrent approval by the MSC 108, MSC-MEPC.1/Circular on the *Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL Annex VI and SOLAS chapter II-2*. The circular, which is based on the existing *2009 Guidelines for the sampling of fuel oil for determination of compliance with the revised MARPOL ANNEX VI* (Res.MEPC.182(59)), is intended to establish an agreed method to obtain a representative sample of the fuel oil for combustion purposes delivered for use on board ships in relation to the application of both regulation of SOLAS Chapter II-2 and regulation 18 of MARPOL Annex VI. In addition, it was agreed to revoke Res.MEPC.182(59) on the *2009 Guidelines for the Sampling of Fuel Oil for Determination of Compliance with the Revised MARPOL Annex VI* as soon as the joint MSC-MEPC circular enters into effect.

Implication Analysis

- Regarding the NOx Tier III compliance strategy in low load point of the SCR operation as referred in paragraph 3.1 above, SCR and marine diesel engine manufacturers are invited to recognize that the relevant **test procedures in NOx Code may be amended to ensure the compliance with Tier III NOx standard** when the ships installed with SCR are operating in an emission control area at a low load, and particularly note the discussion progress in the future for the purpose of developing the relevant technologies.

- Regarding the amendments to appendix IX of MARPOL Annex VI for expanding the range and granularity of data to be reported to the IMO DCS database as referred in paragraphs 1.3 and 3.3.3 above, it should be noted that **"early application of these amendments from 1 January 2025"** means that:
  - The methodologies for collecting fuel oil consumption data with granularity should be reflected in the SEEMP Part II and re-approved by the end of 2024.
  - The fuel oil consumption data according to the revised appendix IX should be collected by individual ships as of 1 January 2025.
  - Fuel oil consumption data with granularity collected from 1 January 2025 to 31 December 2025 should be reported to the Administrations and/or ROs for verification by 31 March 2026.
    - For the details on the re-approval of SEEMP Part II, implementation of revised IMO DCS framework and timeline, please refer to the Technical Information to be published in near future.

- Regarding the format for reporting of EPL/Shapoli override engine power limitation as referred in paragraph 3.3.6 and 3.3.7 above, given that the ship should without delay notify its Administration or RO and the competent authority of the relevant port of destination with the information on the **use of power reserve**, **ship owners and stakeholders who wish to report that information to this classification society** are invited to note a Technical Information titled **"Procedural manual for override and use of power reserve on ships installed with Shapoli/EPL(2024-IMO-01 click to link)"** providing reporting procedures and methods. In addition, for the details on the shaft/engine power limitations and use of a power reserve according to the revised guidelines, please refer to the Technical Information to be published in near future.

- Regarding the requirements for bunkering vessels carrying biofuels and its blends as referred in paragraph 3.5 above, it is not clear as to whether conventional bunkering vessels certified for carriage of MARPOL Annex I cargoes can also carry biofuel blends of more than 25% by volume of biofuels, while **the national legislation would apply in this case since most bunkering vessels operate in national waters**, ship owners and operators are invited to consult with fuel oil suppliers, port Authorities and relevant stakeholders in advance about the availability of such fuel oils in their port limits.

4. Reduction of GHG emissions from ships (Agenda 7)

4.1 Basket of candidate mid-term measures to further reduce GHG emission from international shipping

ISWG-GHG 16 and MEPC 81 has continued the discussions to develop a basket of candidate measures that designating Goal-Based Marine Fuel Standard with a phased reduction of GHG Fuel Intensity (CO_{2eq}/MJ) per energy of marine fuels over time as a technical measure and GHG Pricing Mechanism for the purpose of collecting revenues to support the implementation of the technical measure as an economic measure. In particular, it focused on setting a pathway that can meet the intermediate goals of the 2023 revised strategy containing the overarching elements such as 5~10% uptake of zero or near-zero GHG emission fuels, technologies and/or energy sources to increase by 2023, reducing total annual GHG emissions from international shipping by 20~30% by 2030 and 70~80% by 2040, and ultimately reaching net-zero GHG emissions by or around 2050.

In this regard, ISWG-GHG 16 and MEPC 81 continued to discuss the outstanding elements contained in the proposed basket of candidate mid-term measures as follows:

1. **GHG Fuel Standard with a voluntary flexible mechanism, in combination with a Greenhouse Gas Pricing Mechanism covering all GHG emissions**
   - Applying the GHG reduction targets and checkpoints (for 2030, 2040 and 2050) from the 2023

revised Strategy to the 2008 WtW GHG emissions to establish a GHG emissions pathway in absolute terms. The attained GFI (GHG Fuel Intensity) will be calculated based on the WtW GHG emissions, as defined in the LCA Guidelines. It also includes a remedial action that allows ships that cannot operate on low-GHG fuels to continue to operate, by using the Flexible Compliance Units (FCU)[3] or GHG Remedial Units (GRU)[4]. Pooling compliance[5] is also allowed for non-compliant ships by teaming up with over-compliant ships.

- The purchase of GRU creates revenue, though it will be much lower, as the price of the GRUs should be set never to make them the preferred solution over other compliance methods (use of compliant fuels or purchases of FCUs). The amounts of levies are proposed to range from 2 USD per tonnes of CO2e to 300 USD, subject to the results of the Comprehensive Impact Assessment.

2. International Maritime Sustainiable Fuels and Fund (IMSF&F) mechanism
   - IMSF&F is to set up a required limit to the TtW[6] GHG intensity indicator of fuels/energy used onboard ships (required GFI, in gCO_{2eq}/MJ) and WtT[7] value will not be considered in setting the reference GFI value. The actual GHG emissions of a ship can be calculated by multiplying the actual GFI with the actual annual fuels/energy consumption. It also provides a flexible mechanism allowing over-compliant ships to earn rewards by selling Surplus Units to non-complaint ships. Non-compliant ships can obtain Remedial Units through monetary contributions to the Sustainable Shipping Fund (SSF). Pooling compliance is also allowed for non-complaint ships to receive Surplus Units from over-compliant ships.
   - Under this framework, the application of an independent levy is not required to avoid double taxation. WtT GHG emissions are also addressed to provide the ships using sustainable fuels/energy in terms of lifecycle approach with the incentives and to adjust the attained TtW GFI values based on the WtW GHG emissions reduction potential and other associated sustainability aspect, so that fuels with high WtW emissions will be gradually phased-out whilst the uptake of alternative fuel technologies in new builds will be incentivized.

3. Zero Emission Shipping Fund (ZESF) - Fund and Reward (Feebate) Mechanism
   - In addition to a GHG Fuel Standard as a technical measure, this proposal is for ships to make contributions to the ZESF per tonne of CO_{2eq} emitted, and to receive rewards per tonne of CO2e prevented by using eligible zero/near-zero GHG energy sources. Life-cycle emissions of zero and near-zero GHG fuels (including the biofuel component of blends) can be considered when setting the contribution and reward rate per tonne of these fuels consumed. This mechanism does not use surplus or remedial units to incentivize first movers, but instead, provides rewards to ships using eligible zero/near-zero GHG fuels for the CO_{2eq} emission prevented to reduce the cost difference with conventional fuel.
   - The reward rate per tonne of CO_{2eq} prevented will be guaranteed for a minimum 5 years to incentivize the accelerated production and uptake of zero/near-zero GHG emission fuels with a clear signal to the industry. It also avoids the problems associated with penalizing non-compliant ships through the purchase of remedial units. Subject to the results of the Comprehensive Impact Assessment, a reward rate of around 100 USD per tonne of CO_{2eq} prevented has been proposed to reduce the cost gap with conventional fuels.

[3] Over-compliant ships earn rewards by selling the units to non-compliant ships
[4] Non-compliant ships buy GHG Remedial Units at a certain price from GFS Registry as a last resort compliance option
[5] The mechanism would permit a ship, or ships, which 'over-comply' with the required GFI - operated by the same or different companies and registered with one or more flag states - to share the 'excess' required GFI with another ship or ships in the 'pool' that may be unable to comply fully with the requirement.
[6] Tank-To-Wake(Propeller) emissions factor, also known as downstream or direct emissions, is an average of all the GHG emission released into the atmosphere from a fuel consumption to operate a ship.
[7] Well-To-Tank emissions factor, also known as upstream or indirect emissions, is an average of all the GHG emissions released into the atmosphere from the production, processing and delivery of a fuel or energy vector.

4. Simplified Global (GHG) Fuel Standard with energy pooling compliance mechanism
   - The [5%] reduction in GFI for 2030 and [30%] reduction in GFI for 2040 were proposed, subject to the review of alternative fuel availability to be undertaken by 2028 which is similar with the approach used for the IMO 2020 sulphur limits. A flat rate contribution from ships as part of a fund and reward measure and the need to narrow the price gap between alternative and conventional fuels via a rewards programme for CO_{2eq} or GHG emissions prevented by ships using eligible alternative fuels were proposed.
   - The simplified GFS does not involve any financial penalties for non-compliance with the required GFI. The simplified GFS includes provisions for an "energy pooling compliance mechanism" that may be used on a voluntary basis by ships to comply with the GFS, and thus it can avoid the need on the trading system for "compliance units" and "remedial units". Bunker Delivery Note (BDN) can be used as a basis for compliance with the required GFI for individual ship. Under this scheme, a ship not able to purchase compliant fuel oil to meet the required GFI is allowed to consider FONAR (Fuel Oil Non-Availability Report) system.

5. Feebate mechanism - mandatory contribution on GHG emissions and reward for zero emission vessels by the Zero Emission Shipping Fund (ZESF)
   - In addition to a Global GHG Fuel Standard as a technical measure, mandatory contribution and reward mechanism are proposed to bridge the cost gap between conventional fuels and zero or near-zero GHG emission fuels. Under this framework, fuels with WtW GHG intensities assessed as below a certain threshold will be defined as eligible fuels for reward. Mandatory contribution will be imposed based on the WtW (or TtW) GHG emissions as assessed under the LCA guidelines.
   - Under the assumptions that a reward rate of 100 USD/CO2eq per GHG reduction is set to avoid over-subsidizing zero or near-zero GHG fuels (eligible fuels) and two billion USD will be raised annually to finance activities to promote a just and equitable transition, the contribution rate of 20 USD/CO2e ton is suggested to be implemented for the first five years (2027-2031) and revenues raised in the same period is estimated as 9 to 10 billion USD annually.

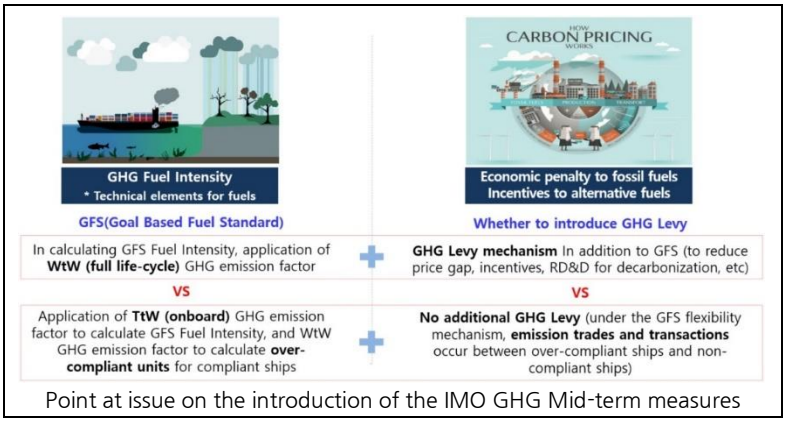
6. Green Balance Mechanism (GBM)
   - Although it does not propose the specific GHG intensity threshold (GFI), the Green Balance GFI to enable the use of green fuel, based on a GFI reference line which is aligned with IMO's net-zero endpoint, was proposed. Incentivization and penalization would be determined by the performance of a ship relative to the GFI and Green Balance GFI reference line. The GBM would use WtW calculations to establish the attained GFI value for the reporting period and allows for the use of flexible compliance mechanisms or pooling of ships.
   - Payment into, and allocation from, the Green Balance Fund would be proportional to the GHG reduction achieved as follows:
     1. Ships which have an attained GFI equal to, or inferior to the GFI value would be required to contribute into the green balance fund;
     2. Ships with a WtW GHG intensity better than the GFI value, but not meeting the GBM GFI threshold (10% more stringent than the GFI) would neither pay into nor receive payment from the green balance fund; and
     3. Ships with a WtW GHG intensity equal to or better than the GBM GFI threshold would receive a green balance allocation from the green balance fund.

7. Universal Mandatory GHG Levy, acting in combination with a Simplified Global GHG Fuel Standard
   - A carbon levy ($ 150) to be introduced in 2027 based on well-to-wake CO_{2eq}, in accordance with the guidelines on lifecycle GHG intensity of marine fuels (LCA guidelines). The levy contribution of

each ship can be defined from data collected in IMO DCS. At each 5-year period the levy rate (per tonne of CO_{2eq}/GHG) will be reviewed and increased as necessary to further reduce or eliminate the price gap between fossil fuels and low- and zero-GHG technologies and fuels.

- A flexibility mechanism involving credit trading such as the FCU/SRU units, equivalent to a cap and trade policy, is not required under this framework. The significant complexity a flexibility mechanism generates, both in its negotiation and its implementation, is therefore unnecessary.

The uptake of alternative fuels needs to be introduced in the international shipping to meet Goal-Based Marine Fuel Standard as a technical measure, while a Flexible Compliance Mechanism which enables non-compliant ships using fossil fuels to be continuously operated would be introduced. The non-compliant ships using fossil fuels that cannot meet Goal-Based Marine Fuel Standard may comply with the standard by purchasing Flexible Compliance Units (FCU) from the ships using alternative fuels with low GHG emissions or GHG Remedial Units (GRU) from GFS Registry and ships using alternative fuels with low GHG emissions can receive incentives to compensate for the capital expenditure put into new building construction and the price gap between alternative fuels and fossil fuels. In addition, possibility of introducing pooling compliance allowed for non-compliant ships by teaming up with over-compliant ships will be discussed, this mechanism would permit over-compliant ships to share their emission credits with non-compliant ships in the same pool.



Point at issue on the introduction of the IMO GHG Mid-term measures

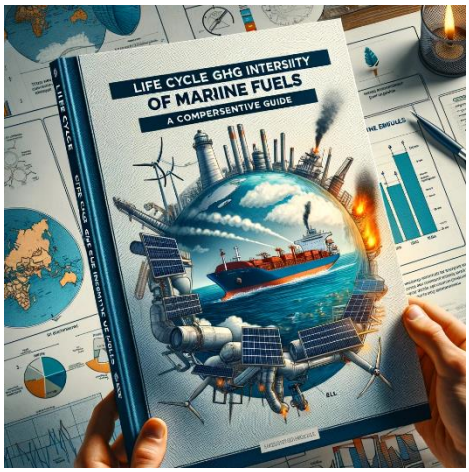
However, there were oppositions raised that such a flexibility mechanism would lead to possible unintended consequences and inequal access to such compliance options between States, inter alia, the countries which are served by older shipping tonnage. Above all, it was also noted that a separate GHG Pricing Mechanism should not be implemented to reduce the significant economic effects of international shipping, since the transaction method itself which enables GHG emissions credits to be traded between ships or through GFS Registry can also be considered as an economic measure.

The Committee could not reach a consensus on the various proposals on the basket of mid-term measures, it was agreed to hold a two-day expert workshop (GHG-EW 5) on the further development of the basket of mid-term measures to facilitate the understanding of the preliminary findings of the comprehensive impact assessment, including the modelling of revenue disbursement used as part of the assessment of impacts on States. Moreover, it was further agreed to hold ISWG-GHG 17, to be held back-to-back with MEPC 82, for further consideration of the development of the basket of candidate mid-term measures, taking into account the final report on the comprehensive impact assessment of the basket of candidate mid-term measures and the report of the expert workshop (GHG-EW5) on the further development of the basket of mid-term measures.

The discussions to develop Mid-term measures for further reducing GHG emissions from international shipping will be continued by future ISWG-GHG and MEPC meeting. In particular, while it is anticipated that the details on technical and economic measures surrounding Mid-term measures would be determined at MEPC 82 which will be held in October 2024, the disbursement of the revenues which will be generated through the economic measures will also be holistically discussed. In addition, draft amendments to MARPOL Annex VI for

implementation of Mid-term measures will be approved at MEPC 83 which will be held on the first half of 2025, and then after adoption of those amendments by extra session of MEPC will be held in the latter half of 2025, it will enter into force in 2027.

4.2 Further development of the Life Cycle Assessment Framework



Last MEPC 80 adopted Res.MEPC.376(80) on the draft Guidelines on Life Cycle GHG Intensity of Marine Fuels, while the Committee agreed to establish the correspondence group to complete the identification of default emission factors for the existing pathways and to further consider specific methodological issues that are relevant for measuring actual emission factors, and further agreed to hold a dedicated expert workshop to consider the more detailed way to implement LCA Guidelines and to facilitate the development of procedures and criteria to recognize certification schemes and guidance for third-party verification as well as the operationalization of the sustainability criteria.

ISWG-GHG 16 and MEPC 81 considered a report of the Correspondence Group on the Further Development of the LCA Framework as follows:

1. Development of a template for tank-to-wake default emission factors for the fuel pathway
   - With respect to the C_{fCH4} and C_{fN2O} emission factors, it was supported to use the current NOx Technical Code test cycles as a reference to establish measurement procedures. However, the need for revision of the NTC test cycles was raised with the aim of being applicable to other technological option such as fuel cell and being more representative of the real-world emissions.
   - Regarding the test cycle (weighted or constant load) to establish a default C_{slip}, there was a preference for weighted test cycle. However, there were other views that a 50% constant load test might be a better way forward considering that C_{slip} is highly dependent on engine load (e.g. higher C_{slip} at lower loads) and the weighted test cycle should consider load points and weights that properly represent current operations for each ship type and size.
   - With respect to the C_{fug} emission factor, it was supported to include C_{fug} emission factor, while it was also raised that there were difficulties and complexity to measure fugitive emissions through onboard measurements.
   - With respect to the Aftertreatment systems, it was noted that the LCA Guidelines did not consider a procedure to properly account for the balance of emissions of aftertreatment system, while the reduction of CH_4 emissions from conversion/oxidation of methane may increase CO_2 emissions, and it may also increase the emissions due to energy consumption from the aftertreatment system as well as the possible emissions of N_2O. Although it was supported that the LCA Guidelines should allow for the possibility to account for the reduction of emissions from aftertreatment/abatement systems, it was opposed to have default emission factors since these systems will have quite varying performance and it should only be allowed the deduction of emission through a certification scheme.

2. Consideration of the methodological elements
   - e_l (annualized emissions (over 20 years) from carbon changes caused by direct land-use change). It was raised that equation (e_l) should include annualized GHG emissions expressed as CO_{2eq} that occurred from the biomass burned during the clearance of native forests or native grasslands before the establishment of new bioenergy crop plantation, while CO_{2eq} emission from the biomass burn should be included if there was evidence of such emissions.
   - e_{sca} (annualized emissions savings (over 20 years) from soil carbon accumulation via improved

agricultural management). It was supported that soil carbon accumulation should be encouraged, while the equations should be verified and clarified in terms of the possibility of double counting emissions from other terms of the LCA framework and the inaccuracy/limitations in estimates and measurements of carbon stock, and the importance of a verification and regular monitoring process.

- C_{fug} (accounting for the fuel which escapes between the tanks up to the energy converter which is leaked, vented or otherwise lost in the system). Regarding the development of the fugitive emission factor, it was recommended not to use the differentiation criteria until there is robust data showing their effect on the amount of fugitive emissions, since the current measurement methods are limited and emissions significantly vary depending on the different operating conditions.
- e_{ccu} (emission credits from the used captured CO_2 as carbon stock to produce synthetic fuels in the fuel production process). In terms of the methodological considerations regarding fuels from Carbon Capture and Utilization pathways, it was supported that when used into a fuel, no specific credit for removal of carbon from the atmosphere can be generated for CCU pathways in the WtT since the final destiny of the carbon source is the atmosphere.
- e_{occs} (emission credit from carbon capture and storage, where capture of CO_2 occurs onboard). The need for extending the system boundaries of the analysis up to the final storage of the CO_2. It was also recommended that where capture of CO_2 occur onboard, the calculation boundaries would need to be defined in this equation, and how to provide for the emissions after CO_2 transfer to land.
- C_{fCO2} emission factor for fuels other than those contained in Res.MEPC.364(79). The C_{fCO2} emission factor other than Res.MEPC.364(79) should be calculated by dividing the molar ratio of carbon to CO_2 by the molar ratio of carbon to the fuel. If fuels cannot be represented using chemical formula such as biofuels and fossil fuels, the C_{fCO2} factor can be calculated using actual measurement carbon content.
- C_{fCH4} and C_{fN2O} emission factors. It was noted that C_{fCH4} and C_{fN2O} emission factors depend on the type of fuel, engine and the engine load. These factors for existing fuels and engines can be obtained using reference values from 4th IMO GHG Study, while these need to be measured for a new type of fuel and engines. Considering that engine degradation had not been considered in the other existing regulations such as NOx and SOx emissions, it was opposed to consider the engine degradation in the shop test, while it was raised that the methodology of the NOx Technical Code based on either the parameter check method or direct measurements was more appropriate to confirm that engines remain operating in their approved condition.

3. **Consideration of the methodological elements on evaluating carbon GHG intensity of electricity (including Onshore Power Supply - OPS) and the Tank-to-Wake methodologies for actual onboard emission factors**
   - Technical procedures for evaluating carbon GHG intensity of electricity (including OPS). It was supported to use the average GHG intensity of the national grid to be used as input data for relevant default values and for OPS values. Regarding the actual values, it was agreed that appropriate documented evidence such as Power Purchase Agreement (PPA) and related GHG Intensity should be included.
   - Development of technical procedures for onboard measurements and certification of actual/ onboard emission factors. It was agreed to develop technical procedures for onboard measurement based on test cycle approach and onboard continuous monitoring. The procedures should be based on the NOx Technical Code, integrating relevant elements from ISO 8178 regarding measurement procedures for CH_4 and N_2O.

After consideration, MEPC 81 made the following decisions:

1. Adoption of Res.MEPC.391(81) on the revised Guidelines on life cycle GHG intensity of marine fuels

(LCA Guidelines, Res.MEPC.376(80)), resulting from consideration of the methodological elements, in particular the quantification of parameters related to biofuel production, evaluation of GHG intensity of electricity and the tank-to-wake methodologies for actual/onboard emissions factors;

2. Given the need for a continuous scientific review of the LCA Guidelines to ensure that new technological advances and scientific knowledge are taken into account, it was agreed to establish an GESAMP Working Group on Life Cycle GHG Intensity of Marine Fuel (GESAMP-LCA WG) to review technical issues related to the implementation of the LCA Guidelines such as possible approaches to address Indirect Land Use Change (ILUC), system boundaries of the LCA guidelines in relation to onboard carbon capture systems, whether to reflect regional characteristics where sustainable marine fuels are produced and how to certify actual emission values, etc.;

3. Besides, a more correspondence group was established to further consider "Other social and economic sustainability themes/aspects of marine fuels", as referred to in paragraph 7.1 of the 2024 LCA Guidelines, for possible inclusion in the Guidelines; and

4. Given the various views as to whether a new mandatory requirement related to emissions of CH_4 and N_2O should be developed, and which subsidiary bodies would be appropriate to handle the engine certification regime in relation to the measurements of CH_4 and N_2O, it was agreed that the matters how to develop a framework for the measurement and verification of Tank-to-Wake emissions of CH_4, N_2O and other GHGs along with associated engine certification issues will be further discussed by a correspondence group.

4.3 Onboard CO_2 capture (CO_2 removal)

Previous MEPC sessions considered onboard CO_2 capture system and particularly noted that development of a specific work plan to initiate a holistic consideration on how to best reflect onboard CO_2 capture in various IMO instruments and a careful approach would be required on this issue, such as accounting, storage, disposal, and relevant certification schemes, to ensure effective implementation so that carbon captured would not be released back into the atmosphere.

MEPC 81 couldn't reach a consensus on how to incorporate onboard CO_2 capture in the IMO regulatory framework due to the various views expressed that whilst recognizing that onboard CO_2 capture can play an important role in the reduction of GHG emissions from international shipping, a more holistic approach was needed as part of the further development of the LCA framework due to the technical immaturity with various safety issues with a preference to focus work on ways to incentivize the uptake of zero or near-zero fuels instead of onboard CO_2 capture. Moreover, the committee particularly noted that the use of onboard CO_2 capture could considerably increase the ship's energy demand and associated fuel use, and thus, it was too early to consider integrating onboard CO_2 capture in existing energy efficiency regulations, such as the EEDI, EEXI and CII.

However, given that there was broad support to continue consideration of proposals related to onboard CO_2 capture and some elements would have to be considered as part of the further development of the LCA framework, MEPC 81 agreed to establish a correspondence group to develop a work plan on the development of a regulatory framework for the use of onboard CO_2 capture.

4.4 5th IMO GHG Study

MEPC 81 considered a proposal to initiate 5th IMO GHG Study 2025 (using the relevant data for 2018~2023) and an indicative timeline; and highlighting the importance of such a study for facilitating a comparative analysis of the results after the implementation of short-term measures from 2023, as well as the Initial Strategy and the 2023 IMO GHG Strategy.

After consideration, while having noted the need for further discussion on possible terms of reference and timelines, MEPC 81 agreed that there was general support to initiate a 5th IMO GHG Study, and subsequently instructed the Secretariat to submit a proposal with draft terms of reference, suggested timelines, logistics and administrative arrangements to MEPC 82.

Moreover, MEPC 81 further agreed to instruct ISWG-GHG 17(Inter-sessional Working Group on Reduction of GHG emissions from ships, ISWG-GHG 17) to develop draft terms of reference for 5th IMO GHG Study including other ongoing GHG related works.

Implication Analysis

- Regarding the "Mid-term measures to further reduce GHG emissions" as referred in paragraph 4.1 above, it needs to be considered regarding the **implications and preparations as per introduction of IMO GHG Mid-term measures**. **IMO GHG reduction strategy will be strengthened over time** and **fossil fuels will have significant environmental and economic disadvantage** in terms of more GHG emissions and penalty. However, **early introduction of alternative fuels will have significant environmental and economic benefits** in terms of incentives, and it can secure competitiveness in achieving 2050 net-zero GHG emissions. Above all, in implementing GHG Pricing Mechanism, an economic feasibility assessment should be made in a timely manner on **whether to maintain fossil fueled ships continuing to impose taxes per GHG emissions or to receive incentives by introducing alternative fueled ships**.

- In addition to the IMO GHG Mid-term measures, the indicative checkpoint for the 20~30% reduction of GHG emissions from international shipping by 2030 will be implemented at the same time as **the current 40% carbon intensity reduction requirement**. This particularly means that it will significantly affect future decisions on the remaining carbon intensity reduction factors for the years of 2027 to 2030, which were left blank, and further strengthened reduction factors will be introduced.

- Onboard CO_2 capture as referred in paragraph 4.3 above, as a full discussion on how to reflect this technology into the IMO environmental framework, the system's manufacturers, relevant industries and stakeholders are invited to particularly note the discussion progress in the future for the purpose of developing the relevant technologies.

- Given that the discussions on the further development of Mid-term measures to reduce GHG emissions and Lifecycle GHG assessment guidelines for marine fuels will be continued by future ISWG-GHG and MEPC meeting, readers are invited to note future discussion progress with the terms of references and agendas of ISWG-GHG as follows:

- ISWG-GHG 17 (23 to 29 September 2024)
  .1 Further consideration of the development of the basket of candidate mid-term measures;
  .2 Further development of the Life Cycle GHG Assessment (LCA) framework; and
  .3 Development of draft terms of references for the Fifth IMO GHG Study.

- With respect to the alternative fuels to reduce GHG emissions from ships, please refer to the information on the use of Hydrogen, Ammonia, Biomass and Methanol (click to link).

5. Marine Plastic Litter from ships (Agenda 8)

Last MEPC 80 noted PPR Sub-Committee's consideration of how to proceed in relation to reducing the environmental risk associated with the maritime transport of plastic pellets. Due to the lack of clarity on the most appropriate mandatory instrument to reduce the environmental risk associated with the maritime transportation of plastic pellets in freight containers, two-step approach was provided: 1) developing a voluntary MEPC circular containing recommendations for the carriage of plastic pellets by sea in freight containers, addressing packaging, stowage and labelling requirement; and 2) developing a mandatory instrument by experience gained from the voluntary measures proposed in the circular following the agreement by MEPC.

In this regard, MEPC 81 noted that PPR 11 finalized a draft MEPC Circular on Recommendations for the carriage of plastic pellets by sea in freight containers, following the review by CCC 9. The circular was developed as a short-term measure for the purpose of reducing the environmental risks associated with the carriage of plastic pellets in packaged from by sea ahead of mandatory instruments being developed. After consideration, MEPC 81 approved MEPC.1/Circ.909 providing guidance containing the following elements:

1. Plastic pellets should be packed in good quality packaging which should be strong enough to withstand the shocks and loadings normally encountered during transport. Transport information should clearly identify, as an addition in the cargo information required by SOLAS regulation VI/2, those freight containers containing plastic pellets; and
2. Freight container containing plastic pellets should be properly stowed and secured (underdeck wherever reasonably practicable or inboard in sheltered areas of exposed decks).

Furthermore, MEPC 81 noted that PPR 11 finalized best practice guidelines to clean up spills of plastic pellets providing practical guidance to member States and relevant stakeholders when responding to the spills of plastic pellets from ships, and then agreed that this guidance will be approved by MEPC 82 after further consideration.

Implication Analysis

- Regarding MEPC.1/Circ.909 on the carriage of plastic pellets, this recommendation is not a mandatory requirement referred in IMDG Code but a non-mandatory guidance, while it has been identified that there may be **an argument with PSCO, port Authorities, shippers and relevant stakeholders as to whether a container ship complies with such a carriage requirement**. Thus, ship owners and operators of containers

ships carrying plastic pellets are required to pay particular attention to handle this cargo in accordance with the guidance as much as possible. For the details, please refer to the Technical Information to be published in near future.

6. Report of other Sub-Committees (Agenda 10)

6.1 Report of SDC 10

As it was being recognized that a significant portion of the underwater noise generated by commercial shipping activities may have negative impacts on marine mammals, Last MEPC 80 approved MEPC.1/Circ.906 on the revised Guidelines for the reduction of underwater radiated noise from shipping to address adverse impacts on marine life. These guidelines focus on identifying primary contributors to underwater radiated noise generated by ships and a general approach that designers, shipbuilders, shipowners and ship operators can undertake.

In this regard, MEPC 81 noted that the work of the SDC Sub-Committee on the review of the 2014 Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life (MEPC.1/Circ.833) and identification of next steps had been completed, and agreed to continue the work on reducing underwater radiated noise from ships by introducing an Experience-Building Phase (EBP) and changing the title of the relevant work to “Experience Building Phase for the Reduction of Underwater Radiated Noise (MEPC.1/Circ.906)”.

Furthermore, MEPC 81 endorsed the draft action plan for the reduction of underwater noise from commercial shipping, which outlines overall tasks for implementation by relevant organs and bodies, including:

- Establish an Experience-Building Phase (EBP) for the Revised Guidelines;
- Enhance public awareness, education, and seafarer training;
- Standardize URN Management Planning process;
- Develop URN Targets;
- Create IMO processes/technical groups to share information and take into consideration other IMO regulatory goals;
- Develop tools to collect data and share information;
- Encourage research on URN and GHG/URN and Biofouling;
- Encourage research on impacts of URN on species and habitats

MEPC 81 further agreed to place the revised output on the agendas of MEPC 82 through to MEPC 85 to promote greater access to knowledge and research on URN and the draft guidance on the Experience Building Phase (EBP) for the Revised Guidelines (MEPC.1/Circ.906), which provides key areas for the EBP and process for updating the revised guidelines. An estimated timeline is as follows:

- MEPC 80 (2023) encouraged interested Member States and international organizations to submit to the Committee lessons learned/best practices in the implementation of the Revised guidelines, i.e. an experience-building phase.
- MEPC 82 (2024) will approve MEPC.1/Circ.906/Rev.1 providing the URN planning reference chart and invite member States and international organizations to submit proposals on the action plan’s

implementation.

- MEPC 85 (2026) will assess the outcomes of the EBP and review the action plan. After assessing the progress made, MEPC will decide whether to extend the EBP duration for another two years to gather additional information on lessons learned.

7. Identification and protection of Special Areas, ECAs and PSSAs (Agenda 11)

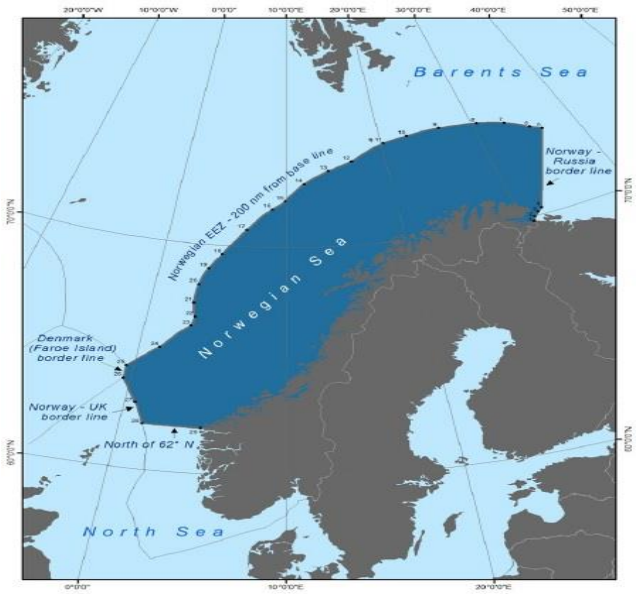
7.1 Canadian Arctic waters as an emission control area for nitrogen oxides, sulphur oxides and particulate matter

MEPC 81 agreed to designate the Canadian Arctic waters as an emission control area for nitrogen oxides, sulphur oxides and particulate matter and approved draft amendments to regulations 13, 14 and appendix VII of MARPOL Annex VI with a view to adoption at MEPC 82. In order to ensure the soonest implementation of the strengthened requirements on NOx, SOx and Particulate Matter in these regions, the effective date of the proposed ECA was agreed to 1 January 2025.

Tier III NOx requirement will apply to ships constructed on or after 1 January 2025 and operating in this area, SOx requirement will enter into force on 1 March 2027.

7.2 Norwegian Sea as an Emission Control Area for nitrogen oxides and sulphur oxides and particulate matter

MEPC 81 agreed to designate the Norwegian Sea as an emission control area for nitrogen oxides, sulphur oxides and particulate matter and approved draft amendments to regulations 13, 14 and appendix VII of MARPOL Annex VI with a view to adoption at MEPC 82. In order to ensure the soonest implementation of the strengthened requirements on NOx, SOx and Particulate Matter in these regions, the effective date of the proposed ECA was agreed to 1 March 2026.



However, taking into account that when the keel is laid, the ship can be built, delivered and put into operation several years later, and thus this practice delays the positive health and environmental effects represented by new NOx ECA and hampers a level playing field among the new ships operating in the area, in particular, many keels are being laid prior to the entry into force date of a NOx ECA, the application date of this area includes the “three dates criteria” (building contract, keel laid and delivery date) to prevent delay in implementing Tier III NOx regulations. Thus, Tier III NOx requirement will apply to ships constructed on or after 1 March 2026[8] and operating in this area, SOx requirement will enter into force

[8] ‘Constructed on or after 1 March 2026’ means:

- For which the building contract is placed on or after 1 March 2026;
- In the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 September 2026; or
- The delivery of which is on or after 1 March 2030.

on 1 March 2027.

8. Any other business (Agenda 15)

8.1 Format for mandatory reporting under Article 12 of the Hong Kong Convention (Ship Recycling Convention)

The entry into force conditions of the Hong Kong Convention were met on 26 June 2023, and therefore the Convention will enter into force on 26 June 2025. In this regard, MEPC 81 approved MEPC.1/Circ.910 providing the formats for mandatory reporting under Article 12 of the Hong Kong Convention.

In accordance with sub-paragraphs 1, 4 and 5 of article 12 of the Hong Kong Convention, member States are invited to submit the information on ship recycling facilities (operating under the jurisdiction of the Party) and two annual lists of ships (issued with IRRC and recycled within the jurisdiction of the Party) to the Organization. Until the development of a dedicated ship recycling module within the Global Integrated Shipping Information System (GISIS) is finalized, member States are requested to submit the information via email to med@imo.org.

For the preparation of the implementation of Hong Kong Convention, please refer to the Technical Information "Considerations for Compliance with the Hong Kong Convention (2023-IMO-03 click to link)".

8.2 Legal inconsistencies between Hong Kong Convention and Basel Convention

It was identified that a ship issued with an International Ready for Recycling Certificate (IRRC) under the Hong Kong Convention may be considered a hazardous waste under the relevant provisions of the Basel Convention. It also means that the ship could be at risk of being detained due to the non-compliance with the Basel Convention requirements during entire validity period of the IRRC(up to 3 months).

MEPC 81 agreed that the legal inconsistencies raised should be clarified by reporting of the outcomes of MEPC 81 to next Conference of Parties to Basel Convention and invited interested members States to submit further proposals on the interplay between the Hong Kong and Basel Convention regarding ship recycling to MEPC 82.

8.3 The use of Slop Tank for oil tankers

MEPC 81 considered a proposal to clarify if cargo oil can be shipped in a slop tank onboard oil tanker and referred this proposal to PPR 12 for further consideration, with a view to providing advice on how to proceed this matter.

Should you have inquiries, please contact P.I.C. Thank you.

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