INTERNATIONAL MARITIME ORGANIZATION

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Agenda item 12 (b)
"Methodological issues: emissions from fuel used for international aviation and maritime transport"

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

SUMMARY

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

Since SBSTA 64 in June 2026, IMO held one session of the Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG-GHG 22).

This note is an update of the IMO submission to SBSTA 64 and focusses on the latest developments on various GHG-related workstreams at IMO.

Update on the development of mid-term GHG reduction measures

1 As presented in previous IMO submissions to SBSTA, the Marine Environment Protection Committee (MEPC) of IMO, and its Intersessional Working Group on Reduction of Greenhouse Gas (GHG) Emissions from Ships (ISWG-GHG), have been developing a "basket of mid-term GHG reduction measures", aimed at delivering on the reduction targets of the *2023 IMO Strategy on reduction of GHG emissions from* ships (2023 IMO GHG Strategy). The text of the draft amendments to MARPOL Annex VI on the IMO Net-Zero Framework was approved by MEPC 83 (April 2025), with a view to adoption at the second extraordinary session of MEPC (MEPC/ES.2) in October 2025.

2 During MEPC/ES.2, held to consider the adoption of the draft amendments introducing the IMO Net-Zero Framework in MARPOL Annex VI, the Committee agreed to adjourn the session for a period of one year. This adjournment enables further efforts to forge a broader consensus on the draft IMO Net-Zero Framework, reconcile remaining differences and respond to the concerns of Member States in relation to the draft amendments, including any necessary adjustments and further development of supporting measures.

3 Following the terms of reference approved by MEPC 83, ISWG-GHG 20 and 21, respectively held the week following the extraordinary session and the week before MEPC 84 in April 2026, made progress on the development of implementing provisions of the draft IMO Net-Zero Framework, with a view to providing further clarifications on technical and operationalization aspects of the framework and addressing some of the concerns expressed. This work was undertaken subject to, and without prejudice to, the adoption of amendments

to the IMO Net-Zero Framework, following the adjournment of the Marine Environment Protection Committee Extraordinary Session.

4 During ISWG-GHG 21, the Group developed texts to be used as a basis for further work on the development of the GHG Fuel Intensity (GFI) calculation, verification and reporting guidelines/guidance, i.e. draft GFI calculation guidelines, draft amendments to the *2022 Guidelines for Administration verification of ship fuel oil consumption data and operational carbon intensity*, and a draft guidance on how to monitor, report and verify the energy derived from wind propulsion systems (WPS).

5 ISWG-GHG 21 also discussed the way forward in relation to developing draft guidelines on rewards for zero or near-zero GHG emission technologies fuels and/or energy sources (ZNZs), the methodology to determine such rewards, and possible governing provisions, including possible disbursement of revenue, for the proposed IMO Net-Zero Fund.

6 As for the IMO GFI Registry, a centralized data platform for the reporting of GFI, ISWG-GHG 21 invited the IMO Secretariat to provide to a future session more information on the possible costs involved in its establishment and operationalization, and to continue further work on developing the registry's functional requirements, taking into account interoperability with existing reporting requirements to the IMO Data Collection System (DCS), cyber security, data governance and geographical inclusivity aspects.

7 MEPC 84 considered how to address remaining concerns and issues with the draft IMO Net-Zero Framework and exchanged views on the preferred way forward on how to ensure making concrete progress in addressing those concerns, in view of the adoption of IMO mid-term measures without any further delay.

8 Some delegations called for the adoption of the draft IMO Net-Zero Framework in its current form and invited to address potential remaining concerns through the development of implementing guidelines and relevant instruments. While other delegations suggested amending the text of the draft IMO Net-Zero Framework or considering alternative proposals to address concerns previously expressed, in particular related to the potential economic burdens of the measures on the shipping industry and States, the global availability of alternative fuels, the role of transitional fuels, and the use of MARPOL Annex VI to introduce an economic element.

9 In considering how to address the concerns expressed and forge a broader consensus on IMO's mid-term measures, all delegations that spoke during MEPC 84 expressed their continued commitment and willingness to work together towards convergence on a global measure. To facilitate focused discussions, the Committee agreed on the holding of two ISWG-GHG meetings ahead of MEPC 85 (30 November to 3 December 2026), respectively from 1 to 4 September and 23 to 27 November. Member States were invited to submit proposals on how to address concerns with the draft amendments to MARPOL Annex VI on the Net-Zero Framework, in line with the 2023 IMO GHG Strategy. MEPC 84 also agreed to resume the second extraordinary session of MEPC (adjourned in October 2025) on 4 December 2026, subject to confirmation by MEPC 85.

10 During ISWG-GHG 22 (September 2026), Member States and international organizations considered how to address remaining concerns on the draft IMO Net-Zero Framework under the following components:

.1 GHG fuel intensity (GFI) calculation, reporting, verification and certification requirements;

.2 GFI reduction pathway;

.3 GFI compliance approaches;

.4 Establishment of a Fund/Facility; and

.5 ZNZ Reward mechanism and incentives for the uptake of new fuels and technologies.

11 Following consideration, ISWG-GHG 22 invited interested delegations to continue to consult intersessionally to address remaining concerns with the draft amendments to MARPOL Annex VI, in line with the 2023 IMO GHG Strategy, taking into account views expressed at this session, with a view to submitting concrete proposals reflecting enhanced convergence allowing timely adoption and effective implementation. The outcome of ISWG-GHG 22 and ISWG-GHG 23 will be considered by MEPC 85.

Life cycle GHG intensity assessment (LCA) of marine fuels

12 As presented in the previous IMO submission to SBSTA, MEPC 80 (July 2023) adopted *Guidelines on life cycle GHG intensity of marine fuels* (LCA Guidelines), allowing for a Well-to-Wake (WtW) calculation, including Well-to-Tank (WtT) and Tank-to-Wake (TtW) emission factors, of total GHG emissions related to the production and on-board use of marine fuels. These Guidelines are a key implementation instrument of the mid-term GHG reduction measures, providing a robust international framework to assess the GHG intensity and sustainability of marine fuels with the overall objective of reducing GHG emissions within the boundaries of the energy system of international shipping and preventing a shift of emissions to other sectors.

13 MEPC 81 (March 2024) adopted *2024 Guidelines on life cycle GHG intensity of marine fuels* (2024 LCA Guidelines), including amendments on a revised calculation for default emission factors and new templates for their submission; and established a Working Group on Life Cycle GHG Intensity of Marine Fuels under the UN's Joint Group of Experts on Scientific Aspects of Marine Environmental Protection (GESAMP-LCA WG).

14 The GESAMP-LCA WG was tasked to provide the best possible scientific and technical assessment of issues related to the implementation of the LCA Guidelines, such as methodological refinement of the emission quantification to ensure the integrity of the data provided, refine and explore indicators and approaches under the sustainability themes/ aspects, and methodological requirements with regard to certification. The Group is currently composed of 13 experts, acting in their individual capacity, and has held four sessions since its establishment. The fourth meeting of the Group was held from 29 June to 3 July 2026.

15 To date, default emission factors for ethanol, liquefied natural gas (methane), ammonia and renewable diesel (HVO, FAME and FAEE), have been submitted to GESAMP-LCA WG for review. Based on the Group's review and recommendations, MEPC 84 started considering initial default emission factors.

16 MEPC 84 invited GESAMP-LCA WG to submit a detailed report to MEPC 85 on its proposed risk-based classification approach for indirect land use change (ILUC). The Committee also invited GESAMP-LCA WG to continue its work on defining system boundaries for onboard carbon capture systems (OCCS), and on the development of an accounting methodology for carbon capture utilization (CCU), taking into account relevant existing frameworks, such as IPCC Guidelines and ICAO/CORSIA frameworks. Since MEPC 84,

GESAMP-LCA WG held its fourth meeting in July 2026. The outcome of this meeting will be considered by MEPC 85 (November-December 2026).

17 ISWG-GHG is currently developing the IMO framework on sustainable fuel certification, with the development of draft guidelines on requirements and procedures for recognition of sustainable fuel certification schemes and reporting of certification activities (SFCS guidelines), including draft terms of reference for the SFCS Assessment Group. The recognition of SFCS will allow the use of actual certified emission factors instead of default values.

18 To support the development of the SFCS guidelines in relation to chain of custody models for fuel supply traceability (physical segregation, mass balance and book-and-claim models), the IMO Secretariat organized a dedicated expert workshop in July 2026.

Implementation and review of the short-term GHG reduction measure

19 MEPC 80 (July 2023) adopted a *Review plan of the short-term GHG reduction measure*, to be completed by 1 January 2026, to review the short-term measure currently in force to reduce GHG emissions from ships by enhancing the energy efficiency of the global fleet. These regulations, adopted in 2021 and effective since 1 January 2023, require existing ships to measure their energy efficiency by calculating their attained Energy Efficiency Existing Ship Index (EEXI) and to continuously improve their annual operational carbon intensity indicator (CII) rating.

20 MEPC 82 (September/October 2024) agreed on a two-phase approach to address a number of key challenges or gaps identified in the implementation of the short-term measures over the past years, ranging from CII impact on individual ships assessments or operational energy efficiency performance and potential penalization of ships on short voyages to the lack of incentivization for port call efficiency and just-in-time (JIT) arrival of ships. Following the agreed two-phased approach, some of the challenges and gaps were to be addressed before 1 January 2026 (Phase 1), while others after 1 January 2026 (Phase 2).

21 MEPC 83 finalized Phase 1 by adopting amendments to the *2021 Guidelines on the operational carbon intensity reduction factors relative to reference lines* (resolution MEPC.400(83)) and defining new CII reduction factors for 2027 to 2030, resulting in a 21.5% reduction in 2030 compared to 2019; and approving draft amendments to MARPOL Annex VI on clarification of entries and data reporting of ship fuel oil consumption data and operational carbon intensity, accessibility to the IMO Ship Fuel Oil Consumption Database (IMO DCS) and review clause of the short-term GHG reduction measure. These amendments were adopted by MEPC 84 and are expected to enter into force on 1 September 2027.

22 With regard to Phase 2, MEPC 84 adopted amendments to the *2022 Guidelines on operational carbon intensity indicators and the calculation methods* (CII Guidelines, G1) and the *2024 Guidelines for the development of a Ship Energy Efficiency Management Plan* (2024 SEEMP Guidelines) to prevent unintended impacts on CII calculations arising from the enhanced IMO DCS granularity reporting, resulting from the adoption of the related amendments to MARPOL Annex VI. The Committee also expressed interest in enhancing the SEEMP framework and further developing the CII metrics, including to better reflect operational realities of international shipping.

Update on emissions and the carbon intensity and efficiency of the fleet

23 In 2025, fuel oil consumption data was reported by more than 30,000 ships, which reported the use of 221 million tonnes of fuel, which is 1.2% less than in 2024. The use of

alternative fuels continues to increase, representing almost 8.3% of total fuel consumption, compared to 7.5% in 2024 and 6.5% in 2023. Biofuels and bio-blended fuels represent over 2.5 million tonnes (1.2% of total fuel use) in 2025.

24 The latest report on the carbon intensity of the existing fleet between 2019 and 2025, to be considered at MEPC 85, highlights progress made towards reducing the carbon intensity of international shipping by at least 40% in 2030, compared to 2008 levels. When comparing to 2008 levels, carbon intensity has improved by 33.1%in 2025, using the supply-based measurement approach.

Onboard Carbon Capture and Storage (OCCS)

25 MEPC 84 continued its work on the development of a regulatory framework for the use of Onboard Carbon Capture and Storage (OCCS) and agreed to develop specific methodological guidance on OCCS accounting, verification, and certification.

26 A revised work plan on the development of a regulatory framework for the use of OCCS was adopted by MEPC 84, aiming at completion of the work in 2028.

Measurement and verification of non-CO_2 GHG emissions (methane and nitrous oxide)

27 MEPC 84 developed three sets of guidelines on measurement of non-CO_2 GHG emissions, i.e. methane (CH_4) and nitrous oxide (N_2O), and agreed that, without prejudice to any future mandatory frameworks, actual Tank-to-Wake emission values for CH_4 and/or N_2O emissions may be quantified, on a voluntary basis, using the following approaches:

.1 engine load monitoring, using the *Guidelines for engine load monitoring (ELM) and calculation of emission values* (ELM Guidelines), in conjunction with the *2026 Guidelines for test-bed and onboard measurements of CH_4 and/or N_2O emissions from marine diesel engines*; and/or

.2 continuous emissions measurement system, using the *Guidelines for continuous emission monitoring systems (CEMS) used to quantify CH_4 and/or N_2O emissions from marine diesel engines*.

28 MEPC 84 also encouraged interested Member States and international organizations to conduct voluntary measurements and studies using the aforementioned approaches, and share information on their implementation at a future session.

Fifth IMO GHG Study

29 To support evidence-based decision-making when addressing GHG emissions from international shipping, IMO regularly conducts studies to estimate global emissions from the sector and project possible developments. The Fourth IMO GHG Study was published in 2020, providing emission inventories, carbon intensity trends as well as emission projections for global shipping.

30 MEPC 84 approved the terms of reference for the Fifth IMO GHG Study to inform, inter alia, the review of the 2023 IMO GHG Strategy, assess the differences before and after the implementation of short-term measures starting in 2023 and provide the Organization with relevant GHG emission data which could inform the Committee's GHG related policy discussions. For the first time, the Fifth IMO GHG Study will provide estimates of emissions on a Well-to-Wake basis, in addition to the traditional estimates tank-to-wake (TtW) emissions.

31 The Fifth IMO GHG Study will cover the period from 2018 to 2025, providing an updated inventory of GHG emissions from international shipping, and revised estimates of the world fleet's GHG fuel intensity and carbon intensity. It will also include emissions projections for 2025-2050. The conduct of the Study is overseen by a Steering Committee of 16 Member States and the Study is expected to be finalized by the end of 2027.

Development of the necessary safety regulatory framework allowing safe handling of alternative fuels on board ships

32 IMO's Maritime Safety Committee (MSC) at its 110th session (June 2025) identified actions needed to address existing regulatory barriers and gaps related to alternative fuels and new technologies and assigned specific tasks to the IMO Sub-Committees on Carriage of Cargoes and Containers (CCC), Ship Design and Construction (SDC), Ship Systems and Equipment (SSE) and Human Element, Training and Watchkeeping (HTW). MSC 111 (May 2026) endorsed related work plans for Sub-Committees under its purview.

33 Since the last IMO update to SBSTA 64, CCC 12 (September 2026) finalized the revision of guidelines for ethanol/methanol as fuel with a view to their approval at MSC 113 (June 2027), initiated the development of interim safety guidelines for ships using OCCS, and established a correspondence group which is expected to report back to CCC 13 (September 2027).

34 Work on various aspects of the development of a safety regulatory framework to support the reduction of GHG emissions from ships using new technologies and alternative fuels will continue during HTW 13 (February 2027), SSE 13 (March 2027) and SDC 13 (May 2027).

Informed policy making

35 IMO supports developing countries, in particular SIDS and LDCs, in addressing GHG emissions from international shipping, in line with its Capacity Development Strategy and its various implementing technical cooperation activities, through a variety of programmes, projects and activities. In addition, the IMO multi-donor GHG Trust Fund, established in 2019, continues to fund important studies and additional support to inform decision making on IMO's GHG reduction measures.

36 The **IMO Future Fuels and Technology (FFT) project**, funded by the Republic of Korea, supports IMO's regulatory discussions at the Marine Environment Protection Committee to advance the implementation of the *2023 IMO Strategy on Reduction of GHG Emissions from ships* by promoting knowledge exchange and access to the latest information on zero and near-zero marine fuels and technologies . To achieve this goal, the FFT Project has three main workstreams:

.1 Online information portal (futurefuels.imo.org), launched in April 2024, aims at providing free and easy access to the latest developments and research on zero and near-zero marine fuels and technologies, including fuel pricing information. The FFT online portal has been created in collaboration with more than 24 data providers, including international organizations, research institutions, industry groups, and other relevant stakeholders;

.2 Technical Seminars are designed to enhance understanding of the readiness and latest developments in zero and near-zero marine fuels and technologies by bringing together international experts and fostering knowledge exchange. To date, the project has organized Seminars on

Onboard Carbon Capture and Storage (OCCS) systems (September 2025); the energy transition of shipping (during Hong Kong Maritime Week in November 2025); marine biofuels (February 2026); methane-based fuels (May 2026) and ammonia as marine fuel (September 2026). It is expected that the next Technical Seminar dedicated to ethanol and methanol will be held in early 2027; and

.3 Global studies and research: The FFT project regularly conducts global studies to support evidence-based decision-making policy discussions on the reduction of GHG emissions from international shipping. The FFT Project has initiated a global study to assess the current status on the development of infrastructure required to enable the large-scale uptake of renewable fuels, in collaboration with the GreenVoyage2050 programme, the World Maritime University (WMU), and conducted by the International Renewable Energy Agency (IRENA).

Targeted, needs based capacity development to enable implementation to the 2023 IMO GHG Strategy in developing countries

37 The 2023 IMO GHG Strategy establishes a common level of ambition for all Member States: achieving net-zero GHG emissions from international shipping by or around, i.e. close to, 2050. However, countries enter this transition from different starting points, reflecting their national circumstances, capacities and priorities. To ensure that no country is left behind, IMO's capacity-development support under the Climate Action and Clean Air Thematic Programme translates country-specific needs into targeted interventions.

38 IMO's thematic programme "Supporting Climate Action and Clean Air in Shipping" brings together activities under the Integrated Technical Cooperation Programme (ITCP, annually approximately USD 700,000), donor-funded projects and partnerships (approximately USD 60 million, implementation periods spanning between 2020 and 2030), all guided by technical cooperation requests, findings of the IMO Member State Audit Scheme (IMSAS), the Comprehensive Impact Assessment of the basket of candidate mid-term GHG reduction measures, regional priorities identified by the countries and by IMO Regional Presence Offices.

39 IMO portfolio of seven externally funded projects include **GreenVoyage2050** (Phase II, 2024–2030; over USD 27 million, funded by Denmark, Finland, France, Germany, the Netherlands and Norway), supporting National Action Plans, knowledge products, feasibility studies and technology demonstration pilots; the **Global Maritime Technology Cooperation Centres Network (GMN)** (Phase II, 2024–2027; EUR 10 million, funded by the European Union), focusing on technology demonstrations and regional capacity-building; **Future-Ready Shipping in Africa (FRS)** (2026–2029; EUR 5 million, funded by the European Union), covering maritime governance, alternative fuels feasibility, digitalization and maritime education; **GHG-SMART** (2020–2026; USD 4.5 million, funded by the Republic of Korea), providing targeted training for SIDS and LDCs on regulatory, technological and financial aspects of maritime decarbonization; **SMART-C GHG** (2023–2027; USD 4 million, funded by the Republic of Korea), strengthening policy, institutional and data-management capacities in the Philippines and Viet Nam; **Blue Solutions** (2026–2030; USD 6 million, funded by Germany), supporting policy and institutional strengthening and port-based pilots in South-East Asia; and **FIN-SMART+** (USD 1.2 million, GEF-funded), implemented by IMO in collaboration with the EBRD and World Bank to strengthen climate-finance capacity and investment preparation in developing countries. Together, these initiatives support countries from policy development and capacity-building through feasibility assessment and technology demonstration towards investment readiness and implementation.

40 The eight pathways of change under the Thematic Programme represent complementary and mutually reinforcing forms of capacity-development support, addressing different but interconnected needs of developing countries in advancing maritime decarbonization. The following sections present the support delivered during the reporting period under each pathway, identifying the relevant IMO programmes, projects and initiatives through which it was provided.

Human capacity and maritime workforce development on individual level

41 To build national and regional capacity, the GMN programme held national workshops in Ecuador (July 2026), Comoros (August 2026) and in Mauritania (October 2026), while the GHG-SMART programme has provided throughout the year SIDS and LDCs specific annual training programme on regulatory, policy, technological and financial aspects of maritime decarbonization, with a further cohort of 30 in training in 2026 and two full scholarships for the Master's in Maritime Energy Management at the World Maritime University (WMU).

42 The Global Industry Alliance to Support Low Carbon Shipping (Low Carbon GIA), supported by the GreenVoyage2050 programme, has significantly expanded access to maritime energy-efficiency knowledge and training worldwide, with more than 40,000 learners enrolled in its ship energy-efficiency e-learning courses available through the UN CC platform. This complements targeted in-person training for maritime administrations and training-of-trainers activities, extending the reach of IMO's capacity-development support to a wider audience.

43 In addition, the Future-Ready Shipping in Africa (FRS Africa) project supports Maritime Education and Training (MET) in Côte d'Ivoire, Ghana, Nigeria, South Africa and in Tanzania to develop the maritime workforce needed to implement the maritime energy transition. Activities include curriculum development, specialized training, capacity development for maritime educators and professional development opportunities, aimed at equipping maritime professionals with appropriate technical knowledge.

Legal, policy and institutional strengthening

44 To strengthen national capacities for the implementation of MARPOL Annex VI and the 2023 IMO GHG Strategy, IMO continued to provide developing countries with technical expertise, capacity-development support and guidance on how to develop relevant regulatory and institutional frameworks. During the reporting period, the SMART-C GHG project supported national authorities in the Philippines and Viet Nam in assessing their existing regulatory frameworks and institutional arrangements, including through specialized training on the implementation and enforcement of MARPOL Annex VI, held in Busan, the Republic of Korea in October 2026. In addition, through the Integrated Technical Cooperation Programme (ITCP), IMO has started providing guidance, relevant expertise and capacity-building to Morocco, to support the national authorities in developing necessary frameworks to give effect to MARPOL Annex VI and strengthen its effective implementation and enforcement.

45 Under the EU-funded Future-Ready Shipping in Africa (FRS Africa) project (2026–2029), IMO provides technical assistance and capacity-development support to Benin, Congo, Guinea-Bissau, Kenya and Togo to strengthen national maritime governance and regulatory frameworks. Through technical guidance, knowledge sharing and the sharing of international best practices, the project supports national authorities in assessing existing institutional and regulatory arrangements, identifying gaps and developing the capacities needed to formulate, adopt and implement maritime policies and legislation in support of the transition towards low- and zero-GHG emission shipping, in line with the 2023 IMO GHG Strategy.

National Action Plans development support, including analysis of maritime transition pathways

46 The GreenVoyage2050 programme supported 11 countries in developing their National Action Plans (NAPs). The Cook Islands approved its NAP in February 2026, focused on a more sustainable and efficient domestic fleet, and Belize completed its NAP, prioritizing ports, the domestic fleet and the domestic uptake of alternative fuels, which is awaiting Cabinet approval. NAPs are also under development in Bangladesh, Egypt, Ghana, Kenya and Mexico, and in preparation in Colombia, Nigeria, Senegal (latter with ITCP support) and South Africa, with priorities ranging from port development, shipyards and alternative fuel supply to seafarer training, green jobs, transition finance and a just transition.

47 The SMART-C GHG project advanced NAP development in the Philippines and Viet Nam through baseline assessments, emissions data collection frameworks, stakeholder consultations and implementation roadmaps, and participants in the GHG-SMART programme have been supported by the annual training programme on how to develop a NAP for their countries. In addition, in September 2026, the Blue Solutions project began exploring the potential for NAP or port decarbonization policy development in Cambodia, Indonesia, Malaysia and Thailand.

Technical implementation and operational measures support, technology cooperation and transfer, research, pilot initiatives and innovation

48 The Global Maritime Technology Cooperation Centres Network (GMN) programme advanced technology demonstration pilots, including just-in-time (JIT) port operations in Namibia and onboard solar photovoltaic (PV) power generation in Mauritius. In Ghana, the GreenVoyage2050 programme supported agreement on the introduction of JIT arrival measures at the Port of Tema and established cooperation with the China Maritime Safety Administration to advance standardized operational data exchange and port-to-port JIT pilots.

49 Under GMN Phase II, demonstration pilots are being developed in the Pacific, covering onboard solar PV systems in Fiji, vessel fuel consumption monitoring in Solomon Islands, solar PV and battery storage at Queen Halaevalu Wharf in Tonga, and emissions-reduction technologies on board a ferry in Vanuatu. In the Caribbean, pilots under development include port-based wind power in Saint Kitts and Nevis, emissions-reducing antifouling coatings in Trinidad and Tobago, and battery-electric ferry propulsion in Barbados.

50 In Latin America, the GMN programme tested IMO fuel oil consumption reporting using data from 68 vessels in Chile, Panama and Peru, and initiated a pilot on AI-enabled vessel performance monitoring in Mexico. In parallel, work is under way to establish a voluntary fuel consumption reporting system for domestic fleets in Pacific SIDS.

51 In Africa, the Future-Ready Shipping in Africa (FRS Africa) project supports maritime digitalization and Maritime Single Window (MSW) implementation in Benin, Côte d'Ivoire, Madagascar, South Africa and the United Republic of Tanzania, focusing on strengthening digital infrastructure, interoperability and data-driven maritime administration to improve operational efficiency and environmental sustainability.

Transition opportunity assessment and investment preparation

52 Feasibility and pre-feasibility studies play an important role in helping developing countries translate maritime decarbonization ambitions into concrete project opportunities and informed investment decisions. In response to requests from Member States in this area, IMO has been providing technical assistance to support country-led assessments of potential

decarbonization solutions, including their technical and economic viability, infrastructure requirements and financing needs, thereby informing national decision-making and preparing the ground for future investment and implementation.

53 In India, the GreenVoyage2050 programme supported development of a study (concluded in October 2026), based on request of the Directorate General of Shipping and the Ministry of Ports, Shipping and Waterways to assess future demand for alternative marine fuels at Indian ports, including fuel supply scenarios, infrastructure requirements and investment opportunities.

54 In Türkiye, GreenVoyage2050 supported a study (concluded September 2026), based on request from the Ministry of Transport and Infrastructure, examining the technical, operational, economic and environmental feasibility of introducing hybrid and fully electric propulsion across 67 Ro-Ro and Ro-Pax ferries serving 26 ports in the Sea of Marmara, including associated shore-side infrastructure and investment requirements.

55 In Indonesia, GreenVoyage2050 supported past months development of a pre-feasibility assessment initiated by the Ministry of Transport and PT ASDP on converting the Ro-Pax ferry **KMP Lakaan** to hydrogen fuel-cell propulsion, with electric and hybrid propulsion alternatives also under consideration.

56 In Barbados, at the request of the Government and with support from the Integrated Technical Cooperation Programme (ITCP), IMO undertook a pre-feasibility assessment of potential green shipping corridors, focusing on the Bridgetown–Portsmouth (United Kingdom) and Bridgetown–Castries (Saint Lucia) routes. The assessment examined alternative fuel pathways, infrastructure requirements, costs, potential GHG emission reductions and financing options.

57 In Djibouti, Kenya, Madagascar, Mauritius and Togo, the Future-Ready Shipping in Africa (FRS Africa) project has been supporting past months development of feasibility assessments and the preparation of investment-ready proposals for alternative fuel infrastructure and green shipping corridors, with a view to identifying viable investment opportunities and supporting subsequent project development.

58 In South-East Asia, the Blue Solutions project, launched in October 2026, will support the identification and technical feasibility assessment of port-related decarbonization pilot projects to inform subsequent project preparation and implementation.

Climate finance capacity, investment readiness and partnership development

59 Under the GHG-SMART programme, IMO undertook a pilot study mapping climate-finance flows to maritime decarbonization in developing countries, particularly small island developing States (SIDS) and least developed countries (LDCs). Preliminary findings highlight the need to improve capacities of maritime administration on how to develop bankable project proposals, as well as strengthen coordination among maritime, energy and financial stakeholders to develop investment-ready projects.

60 To address these financing gaps more systematically, IMO launched the GEF-funded FIN-SMART+, in collaboration with the European Bank for Reconstruction and Development (EBRD) and the World Bank. Building on the earlier FIN-SMART Roundtable, the initiative aims to strengthen climate-finance and project-preparation capacities in developing countries, particularly in SIDS and LDCs, facilitating engagement between maritime stakeholders and financial institutions, and supporting the development of bankable maritime decarbonization projects through practical guidance, regional dialogues and matchmaking activities.

Knowledge, evidence and informed decision support

61 Under the ITCP, IMO developed a MARPOL Annex VI Implementation Handbook and, with the Maritime Just Transition Task Force, a Baseline Training Framework for seafarers in decarbonization; produced an International Safety Management (ISM) Code e-learning course in English, French and Spanish; and translated the GHG-SMART training modules into French.

62 The GreenVoyage2050 programme developed the e-learning courses Introductory Course on Energy Efficient Ship Operations and Energy Saving at Sea, launched a Just-in-Time Arrival Portal, produced video series on the Carbon Intensity Indicator (CII) and the Energy Efficiency Existing Ship Index (EEXI), and updated the Energy Efficiency Technologies (EET) Portal and Appraisal Tool. Furthermore, it updated its Alternative Marine Fuels Regulatory Mapping, assessing regulatory readiness and remaining gaps across fuel types.

63 Through the Low Carbon GIA, the GreenVoyage2050 programme advanced guidance on energy-efficiency technologies and operational measures, progressed the Wind Propulsion Technologies Guide, delivered a glossary of life cycle assessment and sustainability criteria terminology and the Key Questions for Alternative Marine Fuel Producers, and convened industry dialogue on chain of custody models for sustainable marine fuels. It also initiated an online Alternative Fuel Training Portal with CIMAC, published training courses on Alternative Fuels and Energy Carriers for Maritime Shipping and Onshore Power Supply, and delivered workshop packages on Route-based Action Plans and Port Actions for Green Shipping; the Port Emissions Toolkit continues to help ports assess and reduce emissions.

64 In addition, the Global Maritime Technology Cooperation Centres Network (GMN) programme supported knowledge generation and exchange on maritime energy efficiency and decarbonization, including an assessment of barriers to the uptake of energy-efficiency measures in six Latin American countries. The findings identified technical, institutional and operational challenges to inform future capacity-development support.

65 Furthermore, in Ghana, the GreenVoyage2050 programme facilitated knowledge exchange and stakeholder coordination on just-in-time (JIT) arrival measures at the Port of Tema through workshops held in June and September 2026.

Cross-cutting issues

66 Gender equality is mainstreamed across the IMO Climate Action and Clean Air Thematic Programme, with dedicated budget and activities under each project and gender markers through each activity. In addition, the GreenVoyage2050 programme has been developing a white paper on careers in maritime decarbonization, with a particular focus on opportunities for women.

Special support to developing countries, particularly SIDS and LDCs to attend and follow IMO GHG related discussions

67 A Voluntary Multi-Donor Trust Fund (VMDTF) was established in March 2023 to assist the in-person attendance of developing countries, especially SIDS and LDCs, in IMO meetings, specifically MEPC and ISWG-GHG, as well as other meetings related to GHG matters. For ISWG-GHG 23 and MEPC 85, the attendance of representatives from 16 countries will be supported through the trust fund. Since the establishment of the trust fund, a total of 237 participants from 59 countries, including 67 women have received financial support to participate in IMO meetings.