

**Note by the International Maritime Organization to the fifty-first session of the
Subsidiary Body for Scientific and Technological Advice (SBSTA 51)
Madrid, Spain, 2 to 9 December 2019**

Agenda item 10(e)

**“Methodological issues under the Convention: emissions from fuel used for
international aviation and maritime transport”**

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

SUMMARY

The *Initial IMO Strategy on reduction of GHG emissions from ships* (the Initial Strategy), adopted in April 2018, identified that short-term measures should be finalized and agreed by MEPC between 2018 and 2023, in parallel with assessment of their potential impact on States. Two Member States reserved their position with regard to the adoption of the Initial Strategy.

IMO’s Marine Environment Protection Committee (MEPC) addresses greenhouse gas (GHG) emissions from ships engaged in international voyage. Its Working Group on Reduction of GHG emissions from ships met for its sixth intersessional meeting (ISWG-GHG 6) from 11 to 15 November 2019, at IMO Headquarters in London, with the participation of nearly 400 representatives from 67 Member States, as well as representatives from the UNFCCC, the European Commission, the League of Arab States and 25 non-governmental organizations. ISWG-GHG 6 made significant progress towards achieving the levels of ambition set out in the Initial Strategy.

Context

1 International shipping plays an essential role in the facilitation of global commerce as the most cost-effective and energy-efficient mode of mass cargo transport, making a vital contribution to international trade and being a key pillar of the development of a sustainable global economy. UNCTAD¹ has identified that in 2018 seaborne trade volumes grew by 2.7% to a total of 11 billion tonnes.

2 The International Maritime Organization (IMO) was established in 1948 as a specialized United Nations agency to provide the machinery for intergovernmental cooperation in the field of regulation of ships engaged in international trade. IMO is responsible for the global regulation of all aspects of international shipping and has a key role in ensuring that lives at sea are not put at risk, including security of shipping, and that the environment is not polluted by ships’ operations – as summed up in IMO’s mission statement: **Safe, secure and efficient shipping on clean oceans.**

3 This document provides information on IMO’s activities on GHG reduction from ships and an update of previous submissions by IMO to SBSTA.

¹ *Review of Maritime Transport 2019.* UNCTAD

IMO's work on control of GHG emissions from international shipping

4 In 2011, measures to improve energy efficiency of international shipping were adopted by Parties to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL) as a new chapter in MARPOL Annex VI that entered into force on 1 January 2013. The *Regulations for energy efficiency of ships* apply to ships engaged in international voyage of 400 gross tonnage and above, and make mandatory the:

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

Requirements for new ships

5 The EEDI is a performance-based mechanism that leaves the choice of technologies to use to the shipowner. So long as the required energy-efficiency level is attained, ship designers and builders are free to use the most cost-efficient solutions for the ship to comply with the regulations. EEDI requirements are increasingly strict over time.

6 As previously reported to SBSTA 50, MEPC 74 approved, for adoption at the next session in April 2020, draft amendments to MARPOL Annex VI to significantly strengthen the EEDI phase 3 requirements. The draft amendments bring forward the entry into effect date of phase 3 to 2022, from 2025, for several ship types, including containerships, gas carriers, general cargo ships and LNG carriers and at the same time, raised the EEDI reduction rate for some ship types. This means that new ships built from that date must be significantly more energy efficient than the baseline. For example, for a containership of 200,000 deadweight tonnage and above, the EEDI reduction rate is expected to be set at 50% from 2022, instead of 30% from 2025.

Requirements for ships engaged in international voyage

7 Each ship of 400 gross tonnage and above engaged in international voyage is required to keep on board a ship-specific SEEMP which establishes a mechanism for operators to improve the energy efficiency of the ship. This should be achieved by monitoring the energy efficiency performance of a ship's transportation work and at regular intervals considering new technologies and practices to improve energy efficiency.

8 Following the entry into force on 1 March 2018 of amendments to MARPOL Annex VI, it is mandatory for ships to collect and report ship fuel oil consumption data. Since 1 January 2019, ships of 5,000 gross tonnage and above (representing approximately 85% of the total CO₂ emissions from international shipping) are required to collect consumption data for each type of fuel oil they use, as well as additional specified data including deadweight as proxy for "transport work". The data primarily collected by the flag States is subsequently transferred to the IMO Ship Fuel Oil Consumption Database. The first report analysing and summarizing the data collected in 2019 will be presented at MEPC 77, in spring 2021. This mechanism is expected to provide robust data on international shipping fuel consumption and GHG emissions and inform the Committee.

Initial IMO Strategy on Reduction of GHG emissions from ships and follow-up actions up to 2023

9 In April 2018, MEPC 72 adopted resolution MEPC.304(72) on the *Initial IMO Strategy on reduction of GHG emissions from ships* (the Initial Strategy) as previously reported to SBSTA 48. Two Member States reserved their position with regard to the adoption of the Initial Strategy. This important agreement represents the framework for further action of the Committee, setting out the future vision for international shipping. The Initial Strategy envisages for the first time a reduction in total GHG emissions from international shipping

which, it says, should peak as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008, while, at the same time, pursuing efforts towards phasing them out entirely. IMO Member States agreed to keep this Strategy under review, including adoption of a Revised Strategy in 2023.

10 In October 2018, MEPC 73 approved a *Programme of follow-up actions of the Initial IMO Strategy on reduction of GHG emissions from ships up to 2023*, as set out in annex 1 to the IMO submission to SBSTA 49. This document constitutes a planning tool on the work for IMO in meeting the timelines identified in the Initial Strategy, with eight parallel streams of activity and their expected timeframes up to 2023.

Outcome of ISWG-GHG 6

11 MEPC 74 in May 2019 made significant progress in implementing the Initial Strategy and its programme of follow-up actions up to 2023 as reported in the IMO submission to SBSTA 50. ISWG-GHG 6 gathered from 11 to 15 November 2019 and made further progress on several parallel work streams, for reporting to MEPC 75 in April 2020.

Development of a draft MEPC resolution on National Action Plans to address GHG emissions from international shipping

12 The Initial Strategy includes, inter alia, a candidate short term measure to encourage the development and update of national action plans to develop policies and strategies to address GHG emissions from international shipping in accordance with guidelines to be developed by the Organization, taking into account the need to avoid regional or unilateral measures.

13 ISWG-GHG 6 agreed to the text of a draft resolution for adoption by MEPC 75 to be held from 30 March to 3 April 2020. The draft resolution urges Member States to develop and update a voluntary National Action Plan (NAP) with a view to contributing to reducing GHG emissions from international shipping.

14 It suggests such National Action Plans could include but are not limited to: (a) improving domestic institutional and legislative arrangements for the effective implementation of existing IMO instruments, (b) developing activities to further enhance the energy efficiency of ships, (c) initiating research and advancing the uptake of alternative low-carbon and zero-carbon fuels, (d) accelerating port emission reduction activities, consistent with resolution MEPC.323(74), (e) fostering capacity-building, awareness-raising and regional cooperation and (f) facilitating the development of infrastructure for green shipping.

15 The draft resolution invites Member States to elaborate those arrangements (legal, policy, institutional, etc.) that they put in place or plan to do so to support emission reduction from ships, in accordance with their national conditions, circumstances and priorities and encourages those States which had already adopted national action plans to share their experiences with IMO.

Consideration of various concrete proposals for mandatory short-term measures to further reduce GHG emissions from ships

16 Proposals for a technical approach to reduce the carbon intensity of international shipping were discussed at ISWG-GHG 6. They included, for example, an Energy Efficiency Existing Ship Index (EEXI), which would require ships to make technical modifications, e.g. mandatory power limitation in order to improve their energy efficiency.

17 Proposals for an operational approach include focusing on strengthening the ship energy efficiency management plan (SEEMP) based on i.e. carbon intensity reduction

targets and/or regular audit of the ship. This approach may include measures to limit or optimize speed for the voyage.

18 There was general agreement in ISWG-GHG 6 that a mandatory goal-based approach for both the technical and operational approaches would provide the needed flexibility and incentive for innovation. A goal-based approach would set the objective to be achieved, while leaving room for a range of methods or innovation to achieve the set goal. The technical and operational approaches should be further developed in parallel at ISWG-GHG 7 to be held from 23 to 27 March 2020.

Assessment of impacts on States

19 Along with concrete proposals to improve energy efficiency of international shipping, ISWG-GHG 6 considered initial impact assessment of the proposals, with a view to identifying the remaining issues to be further considered, including whether the proposed measure may generate disproportionately negative impact on States.

20 ISWG-GHG 6 invited the sponsor(s) of proposed measures to continue their work on impact assessment, paying particular attention to the needs of developing countries, especially SIDS and LDCs, in accordance with the procedure approved by the Committee and to submit their assessment to the next meeting.

Alternative fuels

21 When considering mid-/long-term measures, and in order to encourage the uptake of alternative low- and zero-carbon fuels in the shipping sector, ISWG-GHG 6 recognized the importance of this issue and agreed on the establishment of a dedicated workstream for the development of lifecycle GHG/carbon intensity guidelines for all relevant types of fuels. This could include, for example, biofuels, electro-/synthetic fuels such as hydrogen or ammonia, etc. Many participants to ISWG-GHG 6 highlighted the importance of undertaking this work as soon as possible, in order to pave the way for the decarbonization of the shipping industry.

22 The issue of methane slip was discussed in relation to the uptake of methane-based fuels such as Liquefied Natural Gas (LNG). ISWG-GHG 6 noted that the issue of methane slip would need further consideration including enhanced understanding of the problem, how methane slip could be measured, monitored and controlled and which measures could be considered by IMO to address the matter. Interested Member States and international organizations were invited to suggest a way forward on the reduction of methane slip at ISWG-GHG 7.

Fourth IMO GHG Study

23 Based on the recommendation of a Steering Committee of Member States, IMO has contracted with an international consortium to perform the Fourth IMO GHG Study with a view to its approval by MEPC 76 to be held in autumn 2020. This major study will include an inventory of current global emissions of GHGs and relevant substances emitted from ships of 100 gross tonnage and above engaged in international voyages. The inventory should include total annual GHG emission series from 2012 to 2018, or as far as statistical data are available. The study will also include estimates of carbon intensity from 2012 to 2018 and possible estimates for the year 2008 (the baseline year for the levels of ambition identified in the Initial Strategy). The Study will project scenarios for future international shipping emissions from 2018 to 2050.

Capacity-building and technical cooperation activities

Integrated Technical Co-operation Programme

24 To ensure effective implementation and enforcement of the energy efficiency regulations and support the achievement of the goals of the Initial GHG Strategy, IMO maintains continuous efforts on technical cooperation and capacity building. In 2019, under the Integrated Technical Co-operation Programme (ITCP) of IMO, seven regional and national workshops on implementation of the measures to address emissions from international shipping have been organized, in every continent.

Global Maritime Technology Cooperation Centres Network (GMN)

25 In 2017, IMO has set up five Maritime Technology Cooperation Centres (MTCCs) in Latin America, the Caribbean, Pacific, Asia and Africa, with financial assistance from the European Union. These five MTCCs constitute the Global MTCC Network (GMN), which is implementing the IMO project titled “Capacity Building for Climate Mitigation in the Maritime Shipping Industry”². This Network promotes the uptake of low-carbon technologies and operations in maritime transport in developing countries with a view to limiting GHG emissions from their shipping sectors through technical assistance and capacity building. The role of MTCCs is specifically mentioned in the Initial Strategy.

26 The Network has completed many pilot projects over the past three years. Tangible results have already been observed, for example in port energy audits and retrofitting of domestic ships for better energy efficiency. The MTCCs engaged with 97 participating countries, involved more than 2,000 participants in more than 50 maritime energy efficiency workshops to date, and have been working with 1,179 participating ships to deliver sets of fuel oil consumption data which can help inform and support energy efficiency improvement.

Global Maritime Energy Efficiency Partnerships Project (GloMEEP)

27 The GEF-UNDP-IMO Global Maritime Energy Efficiency Partnerships Project (GloMEEP Project³), launched in 2015, has supported developing countries in the effective implementation of MARPOL Annex VI through legal, policy and institutional reforms, and awareness raising and capacity-building activities. The project has developed and published a series of toolkits, namely the Ship Emissions Toolkit and Port Emissions Toolkit, to support countries to quantify their maritime and port emissions and develop strategies to address them. The project established a successful public-private partnership, the “Global Industry Alliance to Support Low Carbon Shipping” (GIA), bringing together leading maritime industry companies with a view to developing solutions to increase the uptake and implementation of energy efficiency technologies and operational measures in the maritime sector. The GIA has been working on the development of a standardized reporting protocol for the validation of performance of energy efficiency technologies, an energy efficiency E-learning course aimed at seafarers and shore-based personnel, and a Guide for shipping and ports to implement the concept of Just-In-Time arrival of ships. The GloMEEP Project will come to a conclusion on 31 December 2019.

GreenVoyage-2050

28 IMO and the Government of Norway have recently initiated the GreenVoyage-2050 project expected to complement and scale-up GloMEEP's most successful activities and support countries in the implementation of concrete measures that are identified in a country's National Ship Emissions Reduction Strategy (NSERS)/NAP. The project will initiate and promote global efforts to demonstrate and test technical solutions for reducing GHG

² Project website: <http://gmn.imo.org/>

³ Project website: <https://glomeep.imo.org/>

emissions, as well as enhancing knowledge and information sharing to support the Initial Strategy. A large number of developing countries across the globe are expected to participate in the project, including strategic partners from the private sector, who will contribute expertise and experience.

Multi-donor trust fund for reduction of GHG emissions from ships

29 A voluntary multi-donor trust fund to provide a dedicated source of financial support to sustain the Organization's technical cooperation and capacity-building activities to support the implementation of the Initial Strategy (the "GHG TC-Trust Fund") has also recently been established.

Outreach and communication activities

30 The IMO secretariat led by its Secretary-General Kitack Lim attended the United Nations Climate Action Summit held in New York, United States, on 23 September 2019. During the Summit, many business leaders and local government representatives announced concrete actions to address climate change. For instance, an industry-led initiative called "Getting to Zero Coalition" committed to the deployment of viable zero-emissions vessels (ZEVs) by 2030 to support the achievement of the goals of the Initial IMO Strategy was announced. The UN Secretary-General António Guterres committed the UN system to support implementation of plans presented at the Summit, with an initial report to be delivered at COP 25. In closing the Summit, the UN Secretary-General praised the progress made by shipping in the race against the climate crisis, describing it as a "huge step up".

31 On the occasion of the Summit, the IMO Secretariat prepared a leaflet on IMO action to reduce greenhouse gas emissions from international shipping as set out for information in the annex to this document.



IMO ACTION TO **REDUCE GREENHOUSE GAS EMISSIONS** FROM INTERNATIONAL SHIPPING

IMPLEMENTING THE INITIAL
IMO STRATEGY ON REDUCTION
OF GHG EMISSIONS FROM SHIPS

The Initial IMO Strategy on reduction of GHG emissions from ships



IMO remains committed to reducing GHG emissions from international shipping and, as a matter of urgency, aims to phase them out as soon as possible in this century.

This is the vision in the initial strategy on reduction of GHG emissions from ships, adopted in April 2018.

Levels of ambition include:

- Reduction of CO₂ emissions per transport work (carbon intensity), as an average across international shipping, by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008; and
- For the first time a reduction of the total annual GHG emissions from international shipping by at least 50% by 2050 compared to 2008, while, at the same time, pursuing efforts towards phasing them out as called for in the vision, for achieving CO₂ emissions reduction consistent with the Paris Agreement goals.

Reducing GHG emissions from ships – why it matters

Maritime transport is the backbone of international trade and the global economy. Around 80% of global trade by volume is carried by sea, and international seaborne trade has been constantly growing for the last decades (UNCTAD, *Review of Maritime Transport 2018*).

IMO (International Maritime Organization) is a specialized agency of the United Nations.

Our mission: safe, secure, clean and sustainable shipping.

CO₂ emissions from international shipping were estimated (2012) to be 2.2% of global anthropogenic emissions (*Third IMO GHG Study 2014*).

Timetable of IMO action to reduce GHG emissions from ships

1997

Resolution on “CO₂ emissions from ships” establishes IMO mandate on GHG emission control

2003

Resolution on “IMO Policies and Practices related to the Reduction of Greenhouse Gas Emissions from Ships”

2015

EEDI phase 1: 10% reduction in carbon intensity of the ship

2018

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

2013

New regulatory tools to improve the energy efficiency of international ships:

- Mandatory design requirements (**EEDI**) for new ships, which set increasingly strict carbon intensity standards
- Mandatory Ship Energy Efficiency Management Plan (**SEEMP**) for operators to improve the energy efficiency of all ships

2016

Mandatory IMO **Data collection system**: Ships of 5,000 gross tonnage and above (~85% of emissions from international shipping) are required to collect fuel oil consumption data for annual reporting to IMO, from 1st January 2019

2019

Adoption of a procedure to **assess the impacts on States** of candidate measures.

Strengthening of the EEDI requirements for some ship types

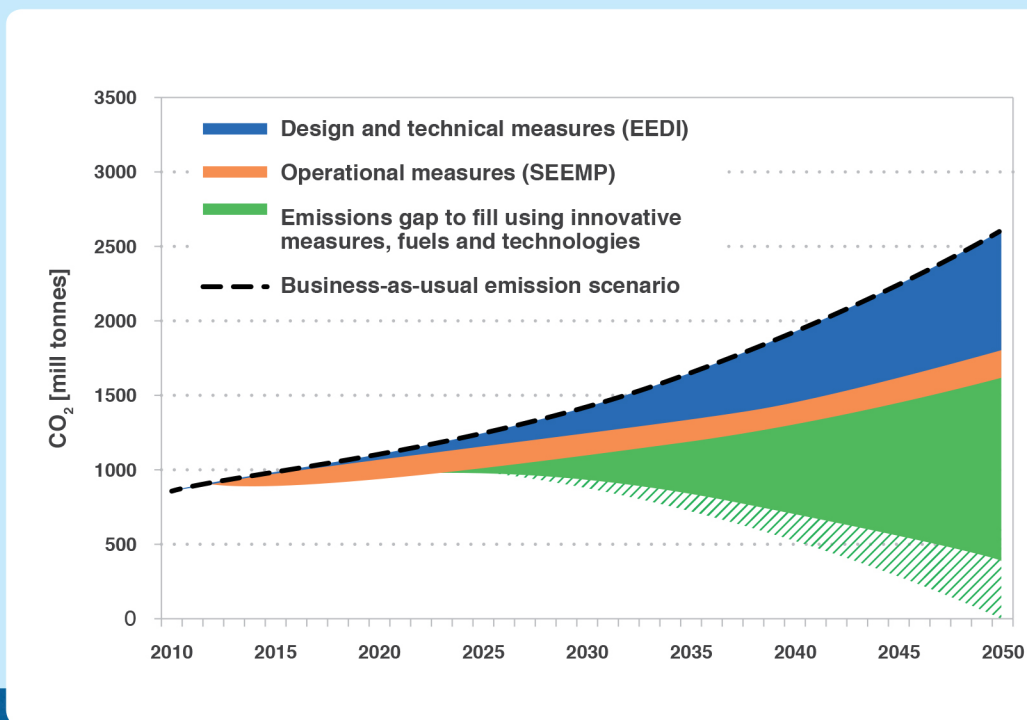
Resolution on ports and shipping cooperation

Establishment of a GHG Technical cooperation Trust Fund within IMO

IMO2050: How to achieve these ambitious goals

The chart is an illustration of the overall GHG reduction pathway to achieve IMO's ambitious goals, i.e. the absolute level of GHG emission reduction identified in the IMO GHG Strategy (at least 50% reduction by 2050 expressed in the illustrative chart in solid colours and green stripes).

The IMO GHG Strategy provides a wide list of **candidate short-term, mid-term and long-term measures**, including for example further improvement of the EEDI and the SEEMP, National Action Plans, enhanced technical cooperation, port activities, research and development, support to the effective uptake of alternative low-carbon and zero-carbon fuels, innovative emission reduction mechanisms, etc.



2023

Complete short-term measures and revise the Initial Strategy

2023-2030

Mid-term measures to reduce carbon intensity of the fleet by at least 40%

2050

At least 50% reduction of total annual GHG emissions (requires approximately 85% CO₂ reduction per ship)

As soon as possible in this century:

Zero GHG emissions

2020

EEDI phase 2: up to 20% reduction in carbon intensity of the ship

2025

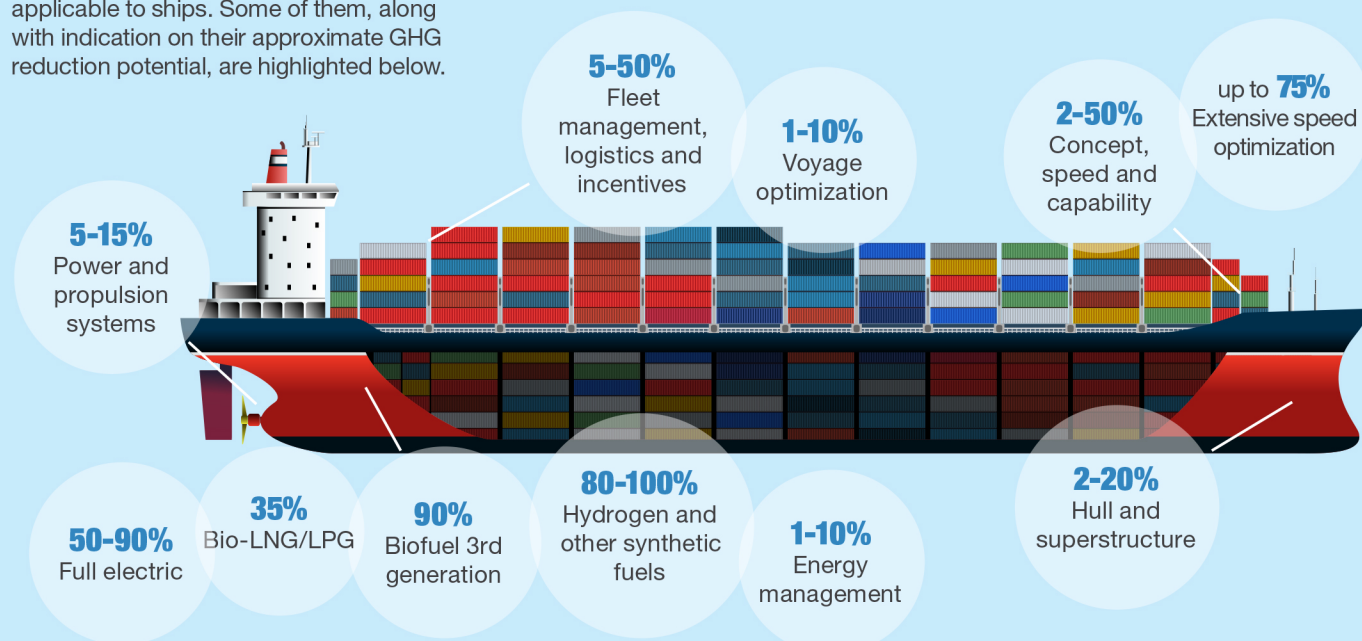
EEDI phase 3: up to 30% reduction in carbon intensity of the ship. Note: early entry into effect (2022) for several ship types with up to 50% carbon intensity reduction for largest containerhips

2030-2050

Long-term measures to reduce carbon intensity of the fleet by at least 70%

A wide variety of design, operational and economic solutions

Achieving the goals of the Initial IMO GHG Strategy will require a mix of technical, operational and innovative solutions applicable to ships. Some of them, along with indication on their approximate GHG reduction potential, are highlighted below.



Global projects supporting the IMO GHG strategy

Support for implementation of IMO's energy-efficiency measures is provided, in particular, through major global projects executed by IMO. These include:

The **Global Maritime Energy Efficiency Partnerships (GloMEEP)** project, supporting the uptake and implementation of energy-efficiency measures for shipping, thereby reducing greenhouse gas emissions from shipping. GloMEEP was launched in 2015 in collaboration with the Global Environment Facility and the United Nations Development Programme. Website: <http://glomeep.imo.org>

The **Global Industry Alliance to Support Low Carbon Shipping** (or GIA), launched in 2017 under the auspices of the GloMEEP project, is identifying and developing solutions that can help overcome barriers to the uptake of energy-efficiency technologies and operational measures in the shipping sector.

Website: <https://glomeep.imo.org/global-industry-alliance/global-industry-alliance-gia>

The **Global Maritime Technology Cooperation Centres network (GMN)** project, funded by the European Union, has established a network of five Maritime Technology Cooperation Centres (MTCCs) in Africa, Asia, the Caribbean, Latin America and the Pacific. Through collaboration and outreach activities at regional level, the MTCCs have been focusing their efforts since 2018 to help countries develop national maritime energy-efficiency policies and measures, promote the uptake of low-carbon technologies and operations in maritime transport and establish voluntary pilot data-collection and reporting systems. Website: <http://gmnm.imo.org/>

GreenVoyage2050 project, a collaboration between IMO and the Government of Norway. The project,

launched in 2019, will initiate and promote global efforts to demonstrate and test technical solutions for reducing such emissions, as well as enhancing knowledge and information sharing to support the IMO GHG reduction strategy. Read more here. (add link)

Multi-donor trust fund on GHG – IMO agreed in May 2019 to establish a voluntary multi-donor trust fund ("GHG TC-Trust Fund"), to provide a dedicated source of financial support for technical cooperation and capacity-building activities to support the implementation of the Initial IMO Strategy on reduction of GHG emissions from ships.

