



Building Capacity Towards Reducing GHG Emissions from Global Shipping

with Multi-Sectoral Collaboration and Private Sector Engagement

PROJECT FULL NAME	COUNTRY & REGION	IMPLEMENTING AGENCY	EXECUTING AGENCIES
Transforming the Global Maritime Transport Industry towards a Low Carbon Future through Improved Energy Efficiency (GloMEEP)	Global 	United Nations Development Programme (UNDP)	International Maritime Organization (IMO)
		FOCAL AREA	IMPACT AREAS
GEF PROJECT ID: 5508	GEF PERIOD: GEF-5	<ul style="list-style-type: none"> Multi Focal Area 	<ul style="list-style-type: none"> Climate change mitigation International Waters
PROJECT TYPE: MEDIUM SIZE PROJECT		GEF Project Grant \$1,900,000	Co-financing Total \$17,154,000

Summary

International shipping contributes approximately 2 percent to global CO₂ emissions. The need for shipping services is projected to increase over the coming decades, so emissions are expected to rise as well. To curb this development, the International Maritime Organization (IMO) agreed to include Annex VI to the International Convention for the Prevention of Pollution from Ships (MARPOL).¹ Annex VI requires signatory countries to develop and implement legal frameworks aimed at reducing emissions of harmful gases from ships, thereby reducing impacts on climate change, ocean acidification, and local air quality. The GEF, IMO, and UNDP launched Transforming the Global Maritime Transport Industry towards a Low Carbon Future through Improved Energy Efficiency (GloMEEP) to support 10 Lead Pilot Countries (LPCs)—Argentina, China, Georgia, India, Jamaica, Malaysia, Morocco, Panama, Philippines, and South Africa—in their efforts to implement MARPOL Annex VI with the necessary legal, policy, and institutional reforms.

The project focused on providing capacity building, enhancing inter-governmental coordination, promoting public private partnerships for innovation and technology deployment, including through high-quality training

in collaboration with international organizations and academic institutions.

As a result of GloMEEP, LPCs developed not only the legal framework to fulfil the requirements of MARPOL Annex VI, but also the implementation capacity. Thus, emission reduction from ships in LPCs became more sustainable after the project. Furthermore, LPCs also actively contributed to discussions on the development and adoption of new international resolutions on greenhouse gases (GHG) such as the IMO Initial GHG Strategy that sets out emissions reduction targets for the maritime sector, stating a reduction of at least 50 percent of total annual GHG emissions by 2050 compared to 2008. The Global Industry Alliance to Support Low Carbon Shipping greatly contributed to the maritime sectors' efforts to reduce emissions through their work on the identification of barriers towards low-carbon shipping and the development of innovative solutions for their reduction. In addition, IMO scaled up the project in 12 countries with \$5.4 million in new funding from the Government of Norway, and the project provided a successful model of long-term emission reduction from ships and ports.

¹ Greenhouse gas emissions from international shipping are addressed at the global level, although they are not covered under the 1997 Kyoto Protocol to the Convention. Article 2.2 of the Protocol specifies that parties shall pursue the limitation or reduction of emissions of greenhouse gases from marine bunker fuels by working through IMO.



GloMEEP workshop on the IMO data collection system for fuel oil consumption (November 2018, Hangzhou, China)

Results, Global Environmental Benefits, and Adaptation Benefits

The project's key results are:

- All 10 LPCs have further developed their legislative frameworks and drafted legislation for incorporating MARPOL Annex VI (Prevention of Air Pollution from Ships) into national law. Strategies for maritime energy efficiency and emission controls both for ships and port operations were also developed.
- Nearly 1,000 stakeholders across all the LPCs and other interested countries were trained to improve national capacities on shipping energy efficiency regulations, operation, and enforcement (through Port State Control) through more than 30 workshops and "train-the-trainer" training.
- A Ship and a Port Emissions Toolkit were developed to support LPCs and other countries in assessing ship and port emissions and to develop national emissions reduction strategies.
- The Global Industry Alliance to Support Low Carbon Shipping (Low Carbon GIA), an alliance of maritime industry leaders, was inaugurated on 29 June, 2017. With 14 active members across the shipping and linked sectors, GIA has raised \$640,000 from its members to support GIA activities. GIA developed, among other outputs, the "Just In Time Arrival Guide" to encourage voluntary cooperation between the port and shipping sectors to reduce GHG emissions from ships.
- The project significantly increased the uptake of MARPOL Annex VI. If efforts are further sustained, they are estimated to catalyze an additional reduction in the sector up to 71 million tonnes/year of CO₂ by 2050, compared to the baseline scenario.²

Environmental Challenge

MARPOL Annex VI seeks to minimize airborne emissions from ships and their contribution to local and global air pollution and environmental problems. Shipping's greenhouse gas emissions have increased from 977 million tonnes in 2012 to 1,076 million tonnes in 2018—a 9.6 percent rise. Emissions are projected to increase by up to 50 percent over the next few decades to 2050, relative to 2018, despite further efficiency gains, as transport demands are expected to increase. In 2011, IMO expanded MARPOL Annex VI to include mandatory technical and

operational energy efficiency measures to reduce the amount of CO₂ emissions from international shipping. Flag States³ or Port States are responsible for the effective implementation and enforcement of the regulatory framework. To achieve global scale compliance with MARPOL Annex VI and ensure significant GHG emissions reduction, it is important to address barriers to implementation and support countries, in particular developing countries that have special needs with regard to capacity building and technical cooperation, in their efforts to fully and effectively implement IMO's regulatory framework.

Integrated Approach and Key Features

The project was built upon the implementation design experiences of the successful GEF-UNDP-IMO GloBallast Project,⁴ which supported knowledge sharing, training, and capacity building for ballast water management of shipping through a network of government, industry, and academia. Via the creation of the first of several Global Industry Alliances, the GloBallast project promoted a strong public-private partnership for technical innovation and created transformational changes, including catalyzing the negotiation, adoption, and coming into force of the global convention on ship's ballast water and sediments.⁵ Following this success, the GloMEEP project applied a similar project design: focusing on capacity building of the LPCs through networking, guidance, and training for developing the LPCs' legislative framework to enable compliance with MARPOL Annex VI; building public private partnerships; and developing supportive mechanisms at national, regional, and global levels to create transformational change.

A catalyst for better collaboration and capacity building in countries

GloMEEP became a catalyst for stronger collaboration among different government units and other key stakeholders. The establishment of National Task Forces (NTF) across different government department. NTF also included private sector representation from shipping, ports and technology firms in each LPC, which is a good example of cross-sectoral collaboration to fast-track the drafting of the legislation needed to translate MARPOL's Annex VI into national law. It significantly supported fostering multi-agency support for the implementation of legislation as well as in the identification of resources to support the process (e.g. for monitoring and enforcement).

For example, Jamaica, one of the LPCs, noted that the project had helped them significantly in overcoming limited resources and realigning or expanding their legislative framework to ensure compliance with treaties. The project had broken through the common 'silo' approach of government departments working in isolation, with overlapping and often



GloMEEP National workshop in Johor, Malaysia (February 2017)

² This assumes nearly complete uptake and implementation of MARPOL Annex VI in the 10 LPCs, which alone represent 33 percent of global shipping tonnage.

³ A flag state is the location of where a commercial ship is registered or licensed with (The Maritime Industry Knowledge Centre 2020).

⁴ The GEF-UNDP-IMO GloBallast project closed in June 2017. Among its accomplishments, the project: formed regional task forces in 12 developing sub-regions and developed regional strategies and action plans on ballast water management (BWM) involving more than 100 countries; assisted 80% of its lead partnering countries in drafting and adopting national legislation; and prepared countries and the shipping industry to implement the BWM Convention. GloBallast also pioneered a public-private sector partnership through its inclusion of shipping companies alongside IMO, GEF, UNDP and national governments.

⁵ International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM) [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-\(BWM\).aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships'-Ballast-Water-and-Sediments-(BWM).aspx)

conflicting mandates. The project had brought them together through the NTF, which then acted as an excellent inter-agency body dealing with transport, environment, energy, and policy along with the private sector. Prior to establishment of the NTF, there was generally low awareness throughout the government departments even of the existence of MARPOL, let alone Annex VI. The establishment of NTF has sparked considerable interest from other government sectors as well as academia and NGOs. The capacity building, training, and awareness given by the project strengthened collaboration among the government departments to reduce emissions from shipping and ports together.

Innovative public private partnership to promote low carbon shipping

To reduce emissions from shipping and ports for the long term, the project also established an innovative public-private partnership, the Global Industry Alliance to Support Low Carbon Shipping (Low Carbon GIA), with the participation of 14 maritime industry leaders (including shipping companies, oil and gas providers, ports, energy efficiency-related technology developers, and data providers). The Low Carbon GIA played a critical role, providing technical expertise on tackling the challenges of decarbonizing the port and shipping sectors. The Low Carbon GIA has also raised \$640,000 from its members to fund GIA activities, including development of innovative solutions to support overcoming existing barriers to low-carbon shipping. The Low Carbon GIA engaged in the development of an E-Learning course on ship and port emission reduction and published the "Just In Time Arrival Guide" to encourage voluntary cooperation between the port and shipping sectors to reduce GHG emissions from ships and ports. The GIA's discussion towards "Just In Time Arrival" particularly provided important technical insights and inputs to the IMO's resolution, "Invitation to Member States to Encourage Voluntary Cooperation between the Port and Shipping Sectors to Contribute to Reducing GHG Emissions from Ships (MEPC.323(74), 17 May 2019)," and promoted stronger collaboration between the port and shipping sectors to reduce GHG emissions from the maritime sector.

Through the development of a protocol for the validation of performance of energy efficiency technologies, GloMEEP proactively addressed a significant problem for the industry. Current performance assessments and validations (such as propeller efficiency) do not present a level playing field. Due to different mechanism and protocols for assessing and calculating the efficiency of new technologies, ship owners were extremely cautious about investing in such technology and there has generally been mistrust in this respect. The Low Carbon GIA has made the Marine Environment Protection Committee (MEPC) in IMO aware of this problem and developed tools to facilitate verification of the impact of energy efficiency technologies and solutions that aim to improve the hydrodynamic performance of ships.

Collaboration with various stakeholders to find better solutions

The impact on climate change, ocean acidification, and port air quality from shipping energy use and fuel consumption necessarily spans the maritime transportation and environmental sectors. Thus, solutions require a coordinated effort between government, industry, and other stakeholders across these sectors. GloMEEP stakeholders included all relevant maritime sectors such as government agencies, international organizations, industry groups, training and R&D institutes, and environmental organizations. To facilitate this wider participation of stakeholders, the project management structure defined each party's role at national, regional, and global levels. Within this three-layer approach, LPCs were able to receive support through the project. For example, technical guidance and training was



Global Industry Alliance to Support Low Carbon Shipping, Task Force Meeting in London, United Kingdom (December 2017)

developed at a global level but adjusted and adapted to national circumstances. GloMEEP also organized, in collaboration with Singapore, the Future Ready Shipping Conference in 2017, in which all LPCs participated. A back-to-back, one-day GloMEEP workshop was also held to exchange experiences and lessons learned from developing a national strategy to address GHG emissions from shipping. Thus, national experiences were shared at regional and global levels.

To develop tools to reduce port emissions, GloMEEP developed a strategic partnership with the International Association of Ports and Harbours (IAPH), an industry-based organization, which is interested in the control of emissions in the context of the health hazards as well as climate change and energy efficiency. IAPH supported GloMEEP in the development of the Toolkit on Port Emissions and IAPH believes that this strategic partnership produced long-term value to both, ports and the shipping industry. The project also closely collaborated with the Institute of Marine Engineering (IMarEST) as a strategic partner. IMarEST has a Special Interest Group that aims to understand shipping's role in GHG emissions and air pollution, including black carbon. IMarEST has developed three guides (combined into a Ship Emissions Toolkit) in collaboration with GloMEEP.

Lessons learned

Guidance, training, and knowledge sharing for capacity building and transformational change

The project's high-quality guidance materials, training, and capacity building throughout the LPCs and beyond made this project sustainable and created transformational change. The technical support and capacity building included provision of the Shipping Emission and Port Emission Toolkits and series of training, which assisted LPCs in developing the legislative framework for the effective implementation of MARPOL Annex VI as well as a National Maritime Emission Reduction Strategy and Roadmap. As a part of capacity building, the project has also created sustainable management structures of GHG emission reduction from shipping and ports within the LPCs including active NTFs and identification of responsible individuals within the Lead Agencies. Through capacity building and awareness raising at the national level, country ownership has been significantly expanded and enhanced, which has then strengthened national representation of countries at IMO and particularly at meetings of the MEPC. As a result, GloMEEP LPCs greatly contributed to discussions and negotiations that resulted in the adoption of the important IMO resolution, "Initial IMO Strategy on Reduction of GHG Emissions from Ships (MEPC.304(72), 13 April 2018)" that includes ambitious emissions reduction targets for the maritime sector "to reduce the total annual GHG emissions from international shipping by at least 50% by 2050 compared to 2008."

The project left a legacy of training and awareness materials which is of undoubted global value. In addition to in-country trainings, the project created the global GloMEEP 'train-the-trainer' course. Participants in the course delivered trainings in their own countries and regions as IMO consultants, and maritime energy efficiency experts in IMO's roster of consultants are increased. All training packages are with LPCs for wider dissemination and have been shared globally through IMO. The project also identified Maritime Training Centres in each LPC to focus on training-the-trainers. In order to further improve the quality of training, selection of candidates should be even more rigorous in the future, with clear criteria for selection and a follow-up online test or evaluation questionnaire leading to certification.

Scaling up and replication of successful project model

With remarkable capacity building of LPCs and a legacy of training and awareness materials, IMO succeeded in scaling up the GloMEEP project through the \$ 5.4 million IMO-Norway GreenVoyage2050 Project, funded by the Government of Norway. IMO fully utilized tools, training, and experience from GloMEEP for development of this new project which includes a broad range of coordinated actions by countries, industries, and strategic partners at national, regional, and global levels. Following the GloMEEP experience, pilot countries were strategically selected to achieve maximum global environment benefits to reduce GHG emissions from ships.

With twelve countries from six priority regions, the scaling-up project follows a similar project framework as GloMEEP and aims to expand government and port management capacities to undertake legal and policy reforms, develop National Action Plans to reduce GHG emissions, catalyze private sector partnerships, promote innovation, enable technology transfer, and deliver pilot demonstration projects to facilitate low carbon technology uptake. This successful project model has been applied to another GEF International Waters project titled "Building Partnerships to Assist Developing Countries Minimize the Impacts from Aquatic Biofouling (GloFouling Partnerships, GEF ID 9605)" by UNDP and IMO. Applying a similar project model, UNDP is also in upstream discussions with IMO and GEF on 'GloNoise,' which would focus on the issue of ship-based ocean noise pollution and reducing its impact on ecosystems and species.

Adjusting scope of the project depending on countries' needs

It was critical to adjust the scope of GloMEEP in close consultation with the LPCs. Due to the LPC's legislation system and status of their regulatory frameworks, LPCs needed to address both, GHG emissions and air pollution from ships, which was not originally envisaged in the project design. The project was originally designed to only focus on providing support to countries on the domestication of Chapter 4 of Annex VI which sets out energy efficiency regulations for ships and hence addresses GHG emissions – rather than the entire Annex which includes, inter alia, regulations on Air Pollution (Chapter 3 of MARPOL Annex VI). As legally Chapter 4 cannot be implemented in isolation from the rest of Annex VI, during the project implementation and in consultation with LPCs, the project coordination unit identified the need to adjust the scope for all LPCs that had not yet domesticated Chapter 1 to 3 of MARPOL Annex VI. GloMEEP hence provided also support to those countries in developing the regulatory framework to implement the entire MARPOL Annex VI.

The adjustment of the scope of the project was also reflected in the project activities. In order to include air pollution in the scope of the project, GloMEEP also worked on Chapter 3 within

the workshops, while emphasizing the importance that effective implementation of MARPOL Annex requires implementation of all its chapters. The workshops made it clear that there were obvious synergies: improving the energy efficiency of ships reduces fuel consumption which not only reduces GHG emissions but also associated air pollutants (e.g. SOx, NOx). With regard to ports, while the Project Document focused on GHG / energy efficiency in ports, many LPCs had concerns about the health impacts of air pollutants in ports. This was the primary driver to adjust the scope of the project. Consequently, GloMEEP made sure that the Port Emission Toolkit provided guidance for ports to reduce both, air pollutants and GHG emissions.

References and multimedia

- **TERMINAL EVALUATION**, <https://erc.undp.org/evaluation/evaluations/detail/9744>
- **Project Document**, https://www.thegef.org/sites/default/files/project_documents/2-23-2015_ID5508_ProDoc_IMO_Final.pdf
- **GEF-UNDP-IMO GloMEEP Project publication** (including Ship and Port Emissions Toolkits), <https://glomeep.imo.org/resources/publications/>
- **GEF-UNDP-IMO GloMEEP Project and members of the GIA, 2020: Just In Time Arrival Guide – Barriers and Potential Solutions** <https://wwwcdn.imo.org/localresources/en/OurWork/PartnershipsProjects/Documents/GIA-just-in-time-hires.pdf>

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