IMO’s efforts in phasing out GHG emissions from international shipping

February 2023

Roel Hoenders
Head, Air Pollution and Energy Efficiency
IMO Secretariat
International Maritime Organization (IMO): a global regulator for a global industry

- United Nations Specialized Agency mandated to define a global regulatory framework to ensure safe, secure and efficient shipping on cleaner oceans

- Established in 1948. Headquartered in London

- 175 Member States, 3 associated members, 143 observer organizations (IGOs and NGOs)

- IMO regulates > 50,000 ships trading worldwide

- IMO’s instruments contain binding obligations, which are enforced globally by flag and port States

Safe, secure and efficient shipping on cleaner oceans
Climate change impacts

WMO: Climate change in Africa can destabilize ‘countries and entire regions’

Climate Change in Africa

Africa, despite its low contribution to greenhouse gas emissions, remains the most vulnerable continent.

Africa is the most vulnerable continent to climate change impacts under all climate scenarios above 1.5 degrees Celsius. Despite having contributed the least to global warming and having the lowest emissions, Africa faces exponential collateral damage, posing systemic risks to its economies, infrastructure investments, water and food systems, public health, agriculture, and livelihoods, threatening to undo its modest development gains and slip into higher levels of extreme poverty. The following factors contribute to Africa’s vulnerability:
Climate change impacts on seaports: A growing threat to sustainable trade and development

04 June 2021
Written by Regina Asariotis, Article No. 75 [UNCTAD Transport and Trade Facilitation Newsletter №90 - Second Quarter 2021]
Maritime outlook

Figure 1.4: International maritime trade, by region, 2021 (percentage share in world tonnage)

- Asia: 64%
- Americas: 23%
- Europe: 16%
- Oceania: 1%
- Africa: 5%

Source: UNCTAD secretariat, based on table 1.2 of this report.
Climate change impacts

**Annual CO₂ emissions by world region**

This measures fossil fuel and industry emissions\(^1\). Land use change is not included.

---

1. **Fossil emissions**: Fossil emissions measure the quantity of carbon dioxide (CO₂) emitted from the burning of fossil fuels, and directly from industrial processes such as cement and steel production. Fossil CO₂ includes emissions from coal, oil, gas, flaring, cement, steel, and other industrial processes. Fossil emissions do not include land use change, deforestation, soils, or vegetation.

Source: Our World in Data based on the Global Carbon Project (2022)  
OurWorldInData.org/co2-and-greenhouse-gas-emissions • CC BY
Action to reduce GHG emissions from international shipping: 2018 IMO Initial GHG Strategy

World Nations Agree to At Least Halve Shipping Emissions by 2050

Resolution 194(11) of the Marine Environment Protection Committee

1. RECOGNIZING Article 5(2) of the Convention on the International Maritime Organization; and
2. RECOGNIZING the Framework Convention on Climate Change, and
3. ADOPTING the Initial IMO Strategy on Reduction of GHG Emissions from Ships, and

RESOLUTION 194(11)

Initial IMO Strategy on Reduction of GHG Emissions from Ships
IMO’s existing strategic objectives in reducing GHG emissions from international shipping

2018 Initial IMO GHG Strategy

Vision

- To phase out GHG emissions from international shipping as soon as possible in this century

Levels of ambitions

- Further strengthen energy efficiency design requirements for ships
- 2030: reduce carbon intensity by at least 40%, compared to 2008
- 2050: reduce total GHG emissions by at least 50%, compared to 2008

Other key elements

- Impacts on States of candidate GHG reduction measures to be assessed before adoption
- Initial Strategy to be revised by 2023
MARPOL Annex VI: IMO’s binding regulations to reduce air pollution from ships

MARPOL is the International Convention for the Prevention of Pollution from Ships, adopted in 1973

MARPOL Annex VI on Air Pollution from Ships:
- adopted in 1997
- ratified by 105 States - 97% of world tonnage
- converts strategic objectives (GHG Strategy) into binding requirements
- Chapter 3 regulates air pollution: sulphur content of bunker fuels (“IMO2020”) – emission control areas (ECAs), NOx emissions from engines, etc.
- Chapter 4 regulates carbon intensity of ships (GHG emissions)
GHG reduction: Over 10-years of mandatory IMO energy-efficiency requirements in MARPOL Annex VI

MARPOL Annex VI regulations

Ship Energy Efficiency Management Plan (SEEMP)
Since 2013: Each ship shall have a ship-specific SEEMP on board

Energy Efficiency Design Index (EEDI)
Since 2015: Gradually more stringent energy efficiency performance of new build ships under subsequent EEDI phases

IMO’s Fuel Consumption Data Collection System (DCS)
Since 2019: Ships over 5,000 gt to report annual fuel consumption data to their Administration; forwarded to IMO
2021: 109 Administrations - ≥ 28,000 ships - 212 million tonnes of fuel
Implementing the Initial GHG Strategy: IMO short-term GHG reduction measure

New regulations in MARPOL Annex VI on ‘EEXI’ and ‘CII’

- Entry-into-force November 2022 – review/strengthening by 2026
- Designed to attain 2030 target in IMO GHG Strategy: reduce **40% carbon intensity reduction of global fleet**
- Each ship to achieve an **annually carbon intensity reduction factor**
- Based on annual fuel consumption, ships are **rated** against peers (ship type/size)
- **First annual CII rating (A – E)** to be based on **2023 fuel consumption**
- **CII rating** to be issued by Flag Administration: “**statement of compliance**”
Implementing the Initial GHG Strategy: IMO short-term GHG reduction measure

New regulations in MARPOL Annex VI on ‘EEXI’ and ‘CII’

**CARBON INTENSITY INDICATOR (CII RATING)**

Improving the operational performance of existing ships

1. Each year, ships of 5,000 gross tonnage and above collect and report fuel consumption data. On the basis of this data, a **carbon intensity rating is assigned to the ship, from A to E**

2. There are a variety of operational means to **improve the carbon intensity of existing ships** and achieve the Required CII, e.g.:
   - Ship speed optimization
   - Weather routing
   - Just-in-time arrival
   - Trim, draft, and ballast optimization

3. Poorly rated ships have to implement a **plan of corrective actions**, and the company is regularly audited. Incentives may be provided to best rated (A/B) ships

4. **The requirements for CII rating entered into effect on 1 January 2023**
Implementing the Initial GHG Strategy: IMO short-term GHG reduction measure

New regulations in MARPOL Annex VI on ‘EEXI’ and ‘CII’

CII to enhance transparency and involvement of the maritime value chain:

- **easy comparison tool** enhancing awareness of energy efficiency at all corporate/policy levels
- **valuable tool** for ports, charterers, financial sector, insurers, cargo owners, manufacturers to provide **incentives** to most energy efficient ships
- **increased** insight in “Scope-3” emissions
- continuous energy efficiency improvements will **reduce the world’s fleet overall energy needs**
- provides **building blocks** for future IMO GHG reduction measures
IMO goal-based regulations drive innovation and reduced fuel demand: carbon intensity compliance options
Towards the decarbonization of shipping: need to accelerate climate action

Source: International Energy Agency (IEA)
Towards the decarbonization of shipping: energy efficiency measures alone will not be enough

Liquid hydrogen as shipping fuel | Pioneering intercontinental H2 carrier gets technical green light

Kawasaki Heavy-designed vessel engineered to store 100 times more hydrogen than shipbuilder’s Suiso Frontier, which delivered world’s first liquefied H2 cargo in early 2022

Op-Ed: Putting Bio-LNG and Synthetic LNG Into Focus

Shipping giant Maersk to become major green hydrogen consumer as it embraces methanol fuel

Danish company has ordered 12 methanol-powered container vessels from shipbuilder Hyundai Heavy Industries

Rio Tinto and BP Starting Year-Long Sustain Trial of Biofuels

RTM Tasman loading at Iron Ore Company of Canada’s Sept-Iles port in Quebec, during the first trial voyage using biofuel

Shipbuilders Make Progress with Designs for Ammonia-Fueled Ships

Mitsubishi completed designs for a LPG-fueled gas carrier that it says will be simple to convert to ammonia (Mitsubishi Shipbuilding)
Developing the global regulatory framework aimed at decarbonizing international shipping and ensuring a global level-playing-field

IMO’s ongoing work on 5 key-pillars:

.1 Revision of the Initial IMO GHG Strategy (2023)

.2 Lifecycle GHG emission guidelines

.3 Safety regulations for low-carbon marine fuels

.4 Further enhancement of the IMO Mandatory Fuel Consumption Reporting (MRV)

.5 Development of mid-term GHG reduction measures – including possible economic measures
Revision of the 2018 IMO GHG Strategy

MEPC 79 (Dec. 2022) reaffirmed its commitment to:

- adopt a revised IMO GHG Strategy by MEPC 80 (July 2023)
- revise the IMO GHG Strategy in all its elements
- including a strengthened level of ambition

Main outstanding issues:

- **2050** level of GHG reduction; and possible **intermediate targets**
- How to ensure a “**just and equitable**” transition which leaves nobody behind
- **Life-cycle approach** to defining reduction targets (upstream vs. downstream emissions / well-to-wake vs. tank-to-wake)
- Supporting **1st movers** whilst ensuring a **global level-playing-field**
Developing the next set of mandatory GHG reduction regulations to enable the global fuel transition

- The ‘basket’ to contain both **technical** and **economic elements**
- Proposals for **technical measures**: e.g. ‘command-and-control measures’ based on a global GHG fuel standard
- Proposals for **economic measures**: e.g. carbon pricing based on a “levy”, “feebate”, “reward/incentive scheme”
- **Assessing impacts** of proposed measures on States
- Ensuring a **fair and equitable transition**

**MEPC 79 (Dec. 2022) reaffirmed its commitment to develop a ‘basket of mid-term GHG reduction measures’**

---

**Climate-resilience of seaports: Adequate finance is critical for developing countries but remains a major challenge**

Climate change impacts on seaports can result in significant and costly damage, operational disruption and delay across global supply chains, with important implications for international trade and the sustainable development prospects of the most vulnerable countries. Timely and effective action on adaptation is a matter of growing urgency. Major scaling up of capacity-building and finance will be critical for developing countries, and time is of the essence.

**Climate-resilient seaports are critical for sustainable trade development**

With over 80% of global trade in goods carried by sea, seaports are key nodes in the network of global supply chains and critical for access to global markets, as well as the ocean economy. At the same time, these complex infrastructure assets, often integrated within large urban agglomerations, are at the frontline of climate change. Rising mean and extreme sea levels and extreme weather can result in significant damage, as well as costly disruption and delay across supply chains, with potentially far-reaching consequences for international trade and the sustainable development prospects of the most vulnerable nations.

*This document has not been formally adopted.*
Towards 2050: ensuring a “just and equitable transition” in the revised IMO GHG Strategy and IMO’s next GHG reduction measures

“Leaving nobody behind”

Possible building blocks:

- An IMO **2050** reduction target for international shipping would **not** prejudge national GHG reduction targets
- Assess potential impacts on States: e.g. GDP, imports of carbon price on trade/imports of essential goods before adoption of a future IMO measure
- **Use carbon revenues** to support developing States mitigating negative impacts of an IMO measure (e.g. port infrastructure, re-skilling, yard/retrofitting capacity)
- **Increased capacity building and technology cooperation** by IMO: ITCP, IMO GHG Trust Fund, Projects
- Climate crisis requires **urgent action** by all sectors

Key drivers influencing ship decarbonization
Source: DNV
Call for accelerated climate action in the maritime sector by various States and industry leaders

At COP 26 (Glasgow - Nov. 2021), the Climate Vulnerable Forum (CVF) expressed support for a global marine fuel levy

Vulnerable countries need help to adjust to carbon cuts in maritime transport

05 July 2021

Technical and financial assistance to poorer nations will help alleviate the costs of a planned transition to low-carbon shipping.

More countries back net-zero target at IMO

July 2023 is the next MEPC meeting to watch as countries decide which carbon-pricing plans to support

13 Jun 2022 | NEWS
Opportunities in the decarbonization of international shipping

Exploring opportunities in renewable fuel production for shipping in developing States

- Shipping is both the ‘enabler’ of the global energy transition and a ‘consumer’ of renewable marine fuels
- A global regulatory framework set by IMO will provide certainty and predictability which can unlock investments and reduce freight rate fluctuations
- IMO supports renewable energy production initiatives in developing countries

6 African countries launch the Green Hydrogen Alliance

Six African nations have formally launched the Africa Green Hydrogen Alliance. They include South Africa, Kenya, Egypt, Morocco, Namibia and Mauritania

- The Africa Green Hydrogen Alliance targets accelerating the transition from fossil fuels overreliance that has made the continent reluctant, as fossil fuels drive most economies in the continent
- Green hydrogen could provide Africans with new access to cleaner energy sources, employment opportunities, public health benefits due to cleaner air, GDP creation and export revenues outside Africa
Supporting developing States in renewable fuel production for the shipping industry

IMO’s GHG regulatory agenda

Main focus of two Intersessional Working Group meetings (March and June 2023):

- revision of the Initial GHG Strategy
- further consideration of proposals for future technical and economic GHG reduction measures
- consideration of draft IMO GHG Life-cycle guidelines

Expected deliverables at MEPC 80 (3-7 July 2023):

- adoption of a Revised IMO GHG Strategy
- agreement on the outline of a “basket” of next GHG reduction measures with technical and economic elements to be developed as a priority
- Initiate a high-level analysis of possible impacts of the basket?
- adoption of 1st version of IMO GHG Life-cycle intensity guidelines

Next steps