

Policy brief

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Green shipping – A solution to mitigate Climate Change

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Executive statement

Green shipping is a global innovative concept in maritime transport that is aimed at promoting transportation of using minimal resources and energy, as a way of protecting the environment from pollutants generated by ships.

Green Shipping is an important part of a sustainable blue economy; one that promotes economic growth and people's wellbeing through sound production, trade and shipping practices without impairing the health of the ocean. In other words, green shipping promotes cleaner practices to enforce emission control, efficient port management, and equipment management.

Maritime Shipping is integral to the global economy. Over 80 percent of traded goods travel by ship, while states and the International Maritime Organization (IMO) have stalled in the regulation of the environmental impacts of ocean transit, new private "green shipping" initiatives are emerging. These are supported by powerful corporate institutions. The largest container shipping customers, multinational brand retail companies.

Among many strategies proposed by the IMO , this policy brief recommends a Six-point Green Shipping initiative plan that should be implemented by flag states to mitigate climate change.

1. Switching to Low-Sulfur fuel
2. Renewable Energy
3. Slow ship travel time to save energy and reduce emission
4. Waste Heat Recovery System (WHRS)
5. Application of the Best Anti-Fouling Hull Paint
6. Battery Boats



Background

Scientists have warned that by 2050 shipping could account for 17% of greenhouse gases if mitigating measures are not put into place. International trade is still hugely dependent on noxious bunker fuels hence the shipping industry is one of the main targets for reduction of carbon emitting fuels.

Main greenhouse gasses such as carbon dioxide, methane, nitrous oxide, fluorinated gasses have been the main causes of global warming. Over the years there has been global growing concerns on how to control the green house effects, this has led to the IMO and other environmental stakeholders to shift their focus to 'Greener Shipping "and other sources of energy like liquid hydrogen or ammonia.

The concept of green shipping encourages the movement of ships using cleaner and alternative sources of energy that protects the environment. IMO continues to contribute to the global fight against climate change, in support of the UN Sustainable Development Goal 13, to take urgent action to combat climate change and its impacts.

IMO has adopted mandatory measures to reduce emissions of greenhouse gases from international shipping, under IMO's pollution prevention treaty (MARPOL). The Energy Efficiency Design Index (EEDI) mandatory for new ships, and the Ship Energy Efficiency Management Plan (SEEMP). In 2018, IMO adopted an Initial Strategy on the reduction of GHG emissions from ships, setting out a vision which confirms IMO's commitment to reducing GHG emissions from international shipping and to phasing them out. In an aim to mitigate CO₂ emissions , the IMO is also executing global technical cooperation projects to support the capacity of States, particularly developing States, to implement and support energy efficiency in the shipping sector.

The convention of the International Maritime Organization (IMO) on the prevention of pollution from ships (MARPOL) and the directive on ship-generated waste seeks to regulate this type of pollution. Annex VI of the Energy Efficiency Design Index (EEDI) and Energy Efficiency Operational Index (EEOI) is oriented towards eco-innovation. In North America, the Green Marine Environmental Program (GMEP) offers a framework to establish and reduce environmental footprints. Shipping emissions are expected to double by 2050. The EEDI entered into force recently for all vessels, is an effort to reduce CO₂ emission. To achieve this the industry is going through some innovations like the establishment of some green corridors which is a lane for zero carbon shipping.

Introduction (problem Statement)

Climate change refers to long-term shifts in temperatures and weather patterns. These shifts may be natural, such as through variations in the solar cycle. However according to the United Nations, climate in action since the 1800s, human activities have been the main driver of climate change, primarily due to burning fossil fuels like coal, oil and gas.

Climate change is causing some serious changes in oceans such as temperature increase, sea level rise, and acidification. Oceans are becoming more acidic as they absorb more CO₂ from the atmosphere, and concurrently oxygen levels are declining. Greenhouse gas concentrations are at their highest levels in 2 million years and emissions continue to rise. As a result, the Earth is now about 1.1°C warmer than it was in the late 1800s (IMO Climate Action, 2022).

Maritime shipping, which accounts for nearly 3 percent of global greenhouse gas emissions, transports approximately 80 percent of world trade. Shipping contributes to atmospheric climate change in various ways, through emissions of Carbon dioxide, produced by combustion of fossil fuels, incineration of waters, refrigerator and air-conditioning system and firefighting. It is a notable fact that if the sulphur emissions are not reduced, it can cause more than a million premature deaths between 2020-2025 (Shaini, 2019)



Benefits of Green-Shipping

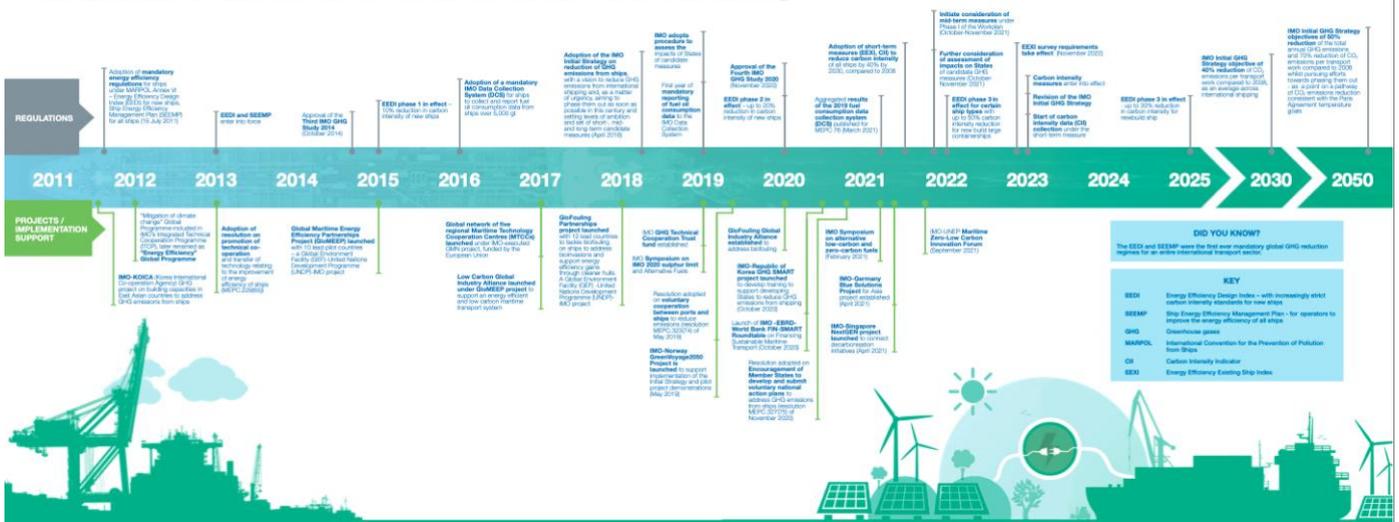
According to the International Maritime Organisation (IMO) a switch to alternative fuel oil that emits less than 0.50% sulphur into the environment can lead to a 77% drop in the emission of SOx from the ships and thereby reducing air pollution.

The existing modes of transportation utilize sources of energy such as fossil fuels which produce a variety of greenhouse gases to the environment. Moving to Green shipping will eliminate toxic gases in the atmosphere.

Green Shipping contributes to the building of a sustainable economy through the creation of more jobs in the transport sector minimizing social-economic disparities and building up a sustainable economy. Furthermore it will minimize over-reliance on fossil fuels, which take strain on the economy.

Green Shipping also contributes to the social well-being of people through improved health, energy sources from fossils fuel emit toxic gases that negatively affect the health of people. These gases are associated with rising cases of cancer and other cardiovascular diseases. The emissions produced by green ships are not harmful to human health. Embracing green shipping will only improve a country's health status.

Addressing climate change A decade of action to cut GHG emissions from shipping



Recommendations

It is worth noting that climate change so far has had devastating effects on the marine environment. The risk of Irreversible losses of marine coastal life has increased due to rising temperatures. These and more; are the challenges of climate change due to greenhouse emissions hence the need to revert to green shipping.

There are 16 compliant solutions/ strategies being adopted by shippers to ensure that their operation is in compliant with IMO Rules in relation to green ship and green shipping. To mitigate climate change , we recommend a Six-point Green Shipping initiative plan that should be implemented by flag states.

1. Switching to Low-Sulphur fuel

Flag states need to ensure the implementation of the “IMO 2020” rule which limits sulphur in the fuel oil used on board ships operating outside designated emission control areas to 0.50% m/m (mass by mass) - a significant reduction from the previous limit of 3.5%. Sulphur oxides are harmful to human health, causing respiratory, cardiovascular and lung disease.

“Once released in the atmosphere, SOx can lead to acid rain, which impacts crops, forests and aquatic species and contributes to the acidification of the oceans.

The resulting reduction in sulphur oxide (SOx) emissions from ships is having major health and environmental benefits for the world, particularly for populations living close to ports and coasts” (IMO 2020 – cutting sulphur oxide emissions, 2022).

2. Renewable Energy

Flag states are encouraged to Increase funding for renewable energy technologies (solar, wind and gas). Vessels to adopt the old tradition of using wind- power technologies as is the case of France that has developed a sea wing (a gigantic and automated kite) which can tow a ship reducing co2 emissions by 20%.



3. Slow ship travel time to save energy and reduce emission

Vessel owners are advised to regulate the speed of ships (So slower speeds may cut costs and reduce emission). Large ships might burn 280-300 metric tons of high sulfur fuel oil a day at high speeds, but only 80*90 metric tons a day at slower speeds. Ship owners may reduce overall fuel consumption by 4% on a voyage if they use eco-friendly and cost- efficient steering gears like hydraulic and electro-hydraulic gears.

4. Waste Heat Recovery System (WHRS)

Waste Heat recovery systems are becoming eco-friendly. Ships should have an appropriate waste heat recovery system to reduce fuel consumption by converting the waste heat from the exhaust gases into steam. The steam can be used in other capacities such as heating the cargo area.

5. Application of the Best Anti-Fouling Hull Paint

Green shipping can also be achieved by applying the best anti- fouling hull paint at the right area to reduce frictional resistance of ship hence saving 3- 8 % of fuel .The use of cargo tank coating with improved cleaning capacity using the right cargo in a chemical tanker can have a positive impact for a green ship. Cargo coating produces an ultra-smooth surface so tanks can be cleaned faster and use less fuel for heating thus reducing fuel consumption and emissions.

6. Battery Boats

Governments should implement the use of Battery boats to reduce the amount of emission of fuel gases into the atmosphere in an aim to reduce greenhouse gases. For example , Norway as part of its Climate change mitigation strategy has mandated all its ferries to be electrified by 2030.

Conclusion

Over the years Climate change has been a growing concern globally in the Maritime sector. Although there is “no clear-cut” solution, various strategies have been developed over the years across different sectors. In the Shipping Industry, Green shipping has proved to be a feasible solution and an appropriate tool to mitigate climate change.

As recommended above, the Six-point Green Shipping Initiative plan if implemented will lead to the reduction of 50 % of Green House Gases (GHG) by 2050. This ties in with IMO’s initial GHG Objective strategy which is consistent with the Paris Agreement temperature goals



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