

# A new challenge for shipping: IMO strategy Greenhouse Gas (GHG) emissions

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Since 2003, IMO has been working to address greenhouse gas (GHG) emissions from ships, by developing policies and practices related to the reduction of such gas emissions, including incentives for research and development and monitoring of these emissions, in order to achieve the limitation as far as practically possible, of GHG emissions from international shipping.

On July 2011, regulations on energy efficiency for ships in MARPOL Annex VI were adopted, introducing mandatory technical (EEDI) and operational (EEOI - SEEMP) measures, for the energy efficiency of ships. The 3rd IMO GHG Study (2014), estimated that GHG emissions from international shipping in 2012, accounted for up to 2.2% of anthropogenic CO2 emissions and that such emissions could grow by between 50% and 250% by 2050.

On October 2016, amendments to MARPOL Annex VI, introduced the data collection system for fuel oil consumption of ships, containing mandatory requirements for ships to record and report their fuel oil consumption. 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 other, additional specified data, including proxies for "transport work". IMO identifies levels of ambition for the international shipping sector, noting that technological innovation and the global introduction of alternative fuels and/or energy sources, will be integral to achieve the overall target. This is to reduce CO2 emissions per transport work, as an average across international shipping, consistent with the Paris Agreement temperature goals.

On April 2018, IMO addressed the global challenge of Greenhouse Gas (GHG) emissions and has initiated a strategy with worldwide application, for the reduction of any such emissions from ships, by adopting technical and operational requirements for new and existing vessels. The IMO's vision is to phase-out (GHG) emissions within the end of the current century. The aim is to reduce total emissions from shipping by 50% in 2050 and to reduce the average carbon intensity by 40% in 2030 and 70% in 2050, compared to 2008 figures. The IMO's next step will be to prioritize and decide on which measures to follow up and to develop an action plan.

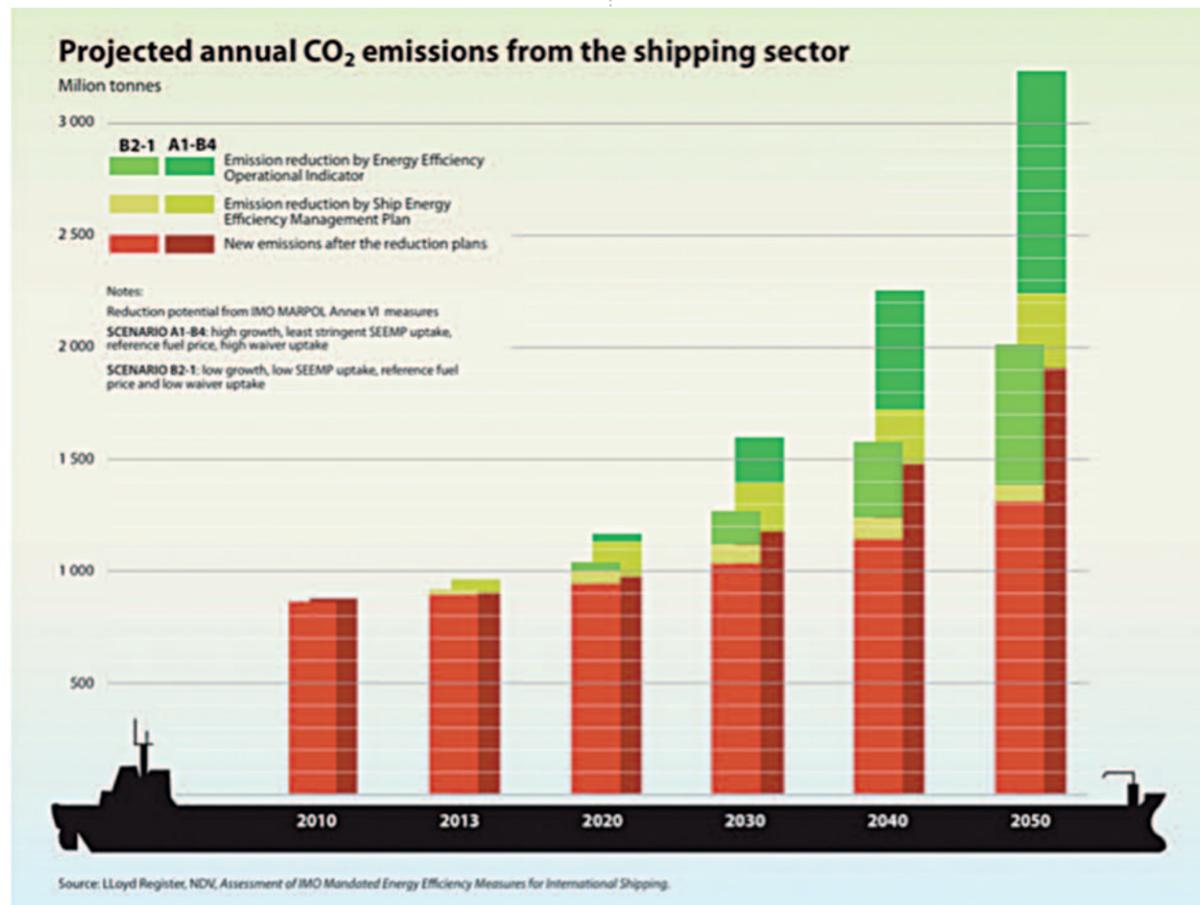
Adequate technological solutions will be required, largely depending on the design and the technology of the constructed ships, their engines and machinery and the fuels used for propulsion. The 50% emission reduction will most likely call for widespread uptake of zero-carbon fuels, in addition to other energy efficiency measures. The IMO strat-

egy will result to competitive technical proposals with better GHG footprint, to be made available to the market. This is an initial strategy which will be reviewed in 5 years, based on the results from the IMO DCS (Data Collection System for the Monitoring, Reporting and Verification of CO2 emissions from ships) and a 4th IMO GHG study, scheduled to be undertaken in 2019.

The EU has also called for a global approach to reducing greenhouse gas emissions, considering shipping as a large and growing source of emissions. The EU MRV-regulation 2015/757, which stands for Monitoring, Reporting and Verification, aims to quantify and reduce CO2 emissions from shipping. Entered into force on 1st July 2015, is already fully effective since 1st January 2018. Ship owners and operators should arrange for their vessels:

- Development of ship-specific Monitoring Plan and continuously assessing it,
- Monitor and report vessel's emissions and activity data,
- Have vessel's Emissions Report independently verified by an accredited body,
- Carry on-board a Document of Compliance (DOC).

Although the MRV Regulation and the IMO data collection scheme (DCS) are both intended to capture fuel use data in order to quantify carbon emissions from shipping, they are significantly different, with the unfortunate result that ship operators will have to manage two separate reporting schemes for the fuel they use. The two systems are fundamentally different in 6 key respects:



### What does MRV Regulation apply to?

**EU** ALL commercial voyages to, from and in-between EU ports

**ALL flag states**

**5,000 GT** ALL ships above 5,000 gt

**55%** ships above 5,000gt

**90%** emissions represent

Ships above 5,000gt account for 55% of ships calling into European Union ports and represent around 90% of related emissions

**Includes:**

- Time at sea
- Time at berth and anchor
- Ballast and laden voyages

**CO<sub>2</sub> emissions can be derived from:**

- Bunker fuel delivery notes
- Fuel tank sounding
- Flow meters
- Direct emission measurement

1. Data reported under the MRV Regulation will be published with ships identified along with their data. Data reported under the IMO DCS will be anonymised before it is made public by IMO.
2. The MRV regulation requires reporting of actual cargo carried, whereas the IMO DCS uses ship DWT as a proxy for cargo.
3. The MRV Regulation requires that data is verified by an EU accredited verifier, not by the ships Flag Administration. This verifier which is EU accredited by a national body (which may also be a class society, or may be another verification body with the appropriate accreditation). The IMO DCS requires that data is verified by the Flag Administration or one of their Recognised Organisations.
4. The MRV Regulation applies to voyages to, within and from a port of call under the jurisdiction of an EU Member State. The IMO DCS is applicable to all voyages.
5. The MRV Regulation provides requirements for monitoring plans including their format, the IMO DCS requires that this forms Part II of the SEEMP, named Ship Fuel Oil Consumption Data Collection Plan with its own format.
6. The MRV Regulation applies to ships carrying passengers or cargo for commercial purposes and excludes several voyage categories, such as those undertaken by offshore vessels and dredgers. The IMO DCS does not offer these exclusions and all vessels have to report their fuel use.

As regards the IMO GHG strategy, over time, requirements are expected to apply for both new designs and existing ships. Short-term measures will be finalized and agreed between 2018 and 2023. Dates of entry into force and when the measure can effectively start to reduce GHG emissions, will be defined for each measure individually. Mid-term measures are scheduled to be finalized and agreed between 2023 and 2030 and long-term measures have been planned for 2030 and beyond.

It's not only the ships, but also ports need to develop more and smarter incentives, in order to meet the IMO Greenhouse Gas targets. Currently, there is very limited information available, on the impact of port-based incentives. According to a report, published by the Organization for Economic Co-operation and Development, only a limited number of the ships, which are calling at ports with Green Port fees, actually get a deduction of the port fee. Consequently, the impact of Green Port fees on shipping's GHG emissions is negligible, as the indicators in which CO2 emissions have substantial weight (CSI and RightShip) are only used by few ports. Plus, there is a need to apply the polluter principle via a system of environmentally differentiated port fees, applicable to all ships, not just a rebate for the greenest ships. At the current stage, none of the green port fees takes actual GHG emissions as a base, for the fee-reduction.

Speaking about incentives for Shipping Companies, these are broadly provided through the Green Award Foundation

scheme by over 110 external organizations and many more expected to follow soon. Already the Green award foundation has noticed a faster growth in ships applying for certification. Green Award has been focusing a lot on the part of monitoring and the reduction of polluting air emissions. The Check-list with the Ranking Criteria for Certification, includes relevant sections such as "Air Emission Monitoring" and "Air Emission Reduction" by target setting controlled by the Management system, with direct reference to CO2 emissions, NOx emissions, particulate matter (PM) emissions and to the reduction of the sulphur content in the fuel, as this is contributing directly to the SOx emissions of engine and boiler system. Whilst the basic approach in monitoring and recording of statistical data remains a scope within the Green Award requirements, a new approach has been added into the certification criteria, in line with IMO strategy, focusing towards the reduction of harmful air emissions (NOx, SOx and PM) and the improvement of energy efficiency and taking the first steps on lower carbon fuels and renewal energy sources (reduce of CO2 or fuel consumption) on Green award vessels, by aligning with the international framework while targeting to prepare for IMO-set global limits.

Alternative fuels come as solutions to the above task. But engines burning other kind of fuels (such as LNG, LPG Liquid Hydrogen, Ethane, Methanol, compressed natural gas (CNG), bio-fuel) and dual-fueled engines (gas and liquid) are still not wide-spread, partly because bunkering infrastructure is not fully developed globally and partly because the technology is not mature enough.

The biggest decision is whether to fit an exhaust gas cleaning scrubber, for the gases produced by ship engines before these are released into the atmosphere, or not. It is a trade-off, which depends on the individual economic and operational specifics of each ship and trade. Fitting a scrubber, involves significant capital expenditure, crew training costs and ongoing costs in energy use, maintenance and possibly waste removal (according to scrubber type).

There's also a wider regulatory risk with all types of scrubbers, in that they are not designed to cope with all of the environmental regulations likely to be imposed on shipping over the next decade. The current technology is suitable for removing sulfur and nitrogen from emissions and with some modifications may be able to remove most particulate matter. But with restrictions on carbon emissions coming into force, the current scrubber technology would not be a cost-effective means of complying.

Reducing GHG emissions from shipping is a challenging task. Ship owners, policy makers and local authorities, need to develop an appropriate, robust strategy for further reducing the environmental footprint of shipping, in a manner that will ensure that the industry stays the world's largest and most environmentally friendly transport sector.