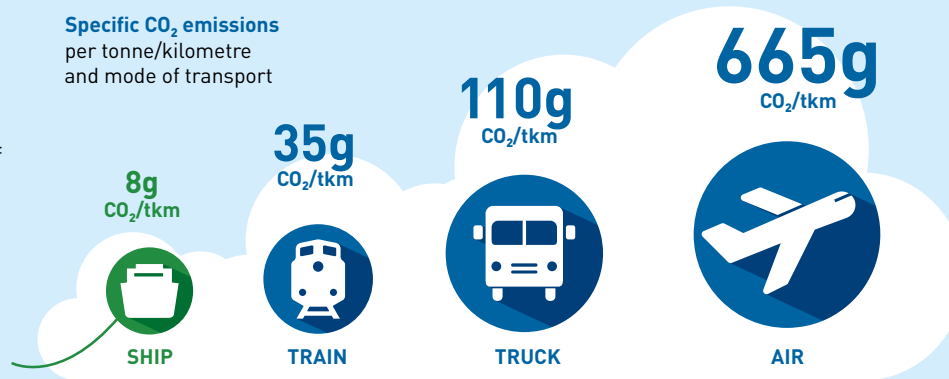


Maritime shipping: on course for climate protection

SHIPS ARE THE MOST EFFICIENT MODE OF TRANSPORT

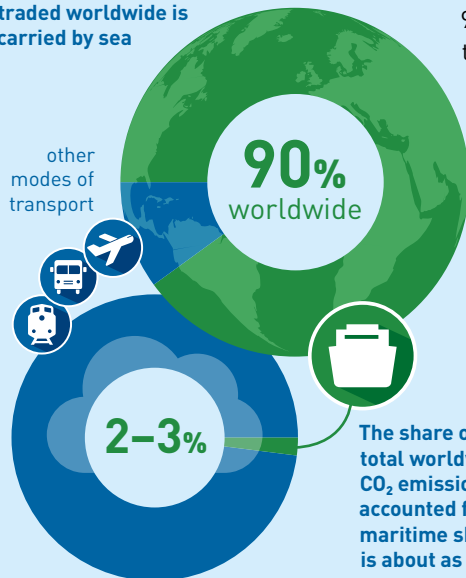
Ocean-going vessels are the key mode of transport for international trade, with the lowest CO₂ emissions of all. To carry a container across a distance of one kilometre, a truck discharges about 14 times as much CO₂ as a **modern cargo vessel**.

Specific CO₂ emissions per tonne/kilometre and mode of transport



Source: Third IMO Greenhouse Gas Study 2014

90% of merchandise traded worldwide is carried by sea

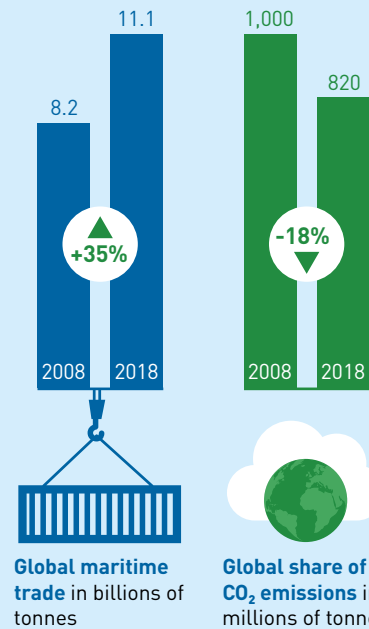


Global trade needs ships

90% of the merchandise traded worldwide (and 40% traded within Europe) is transported by sea. Only about 2 to 3% of all CO₂ emissions worldwide are attributable to maritime shipping.

More trade, less CO₂

What other industries cannot accomplish: even though an increasing volume of goods is transported by sea, the level of CO₂ emissions is actually declining.



Source: Clarksons Research

SHIPS ARE BECOMING INCREASINGLY CLEANER

Fuel consumption is the key cost factor in operating any vessel. Shipowners therefore have a huge interest in improving the efficiency of vessels and lowering their level of CO₂ emissions in doing so.



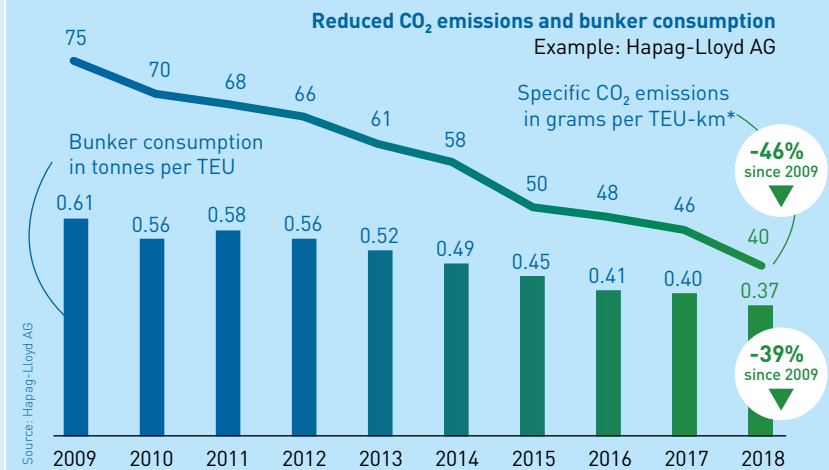
Innovative technologies

Modern ships feature a wide variety of technologies to enhance their efficiency. These include IT-supported navigation (e.g. weather routing and trimming), remote onshore monitoring and innovative design of propellers, bulbous bows and ships' hulls.



Slow steaming and reduction of engine power

Ships today travel much slower than only ten years ago. A reduction in speed from 20 to 16 knots can lower fuel consumption and emissions by 40%. New engines have already been optimised for travel at reduced speeds.



*Calculation according to Clean Cargo methodology

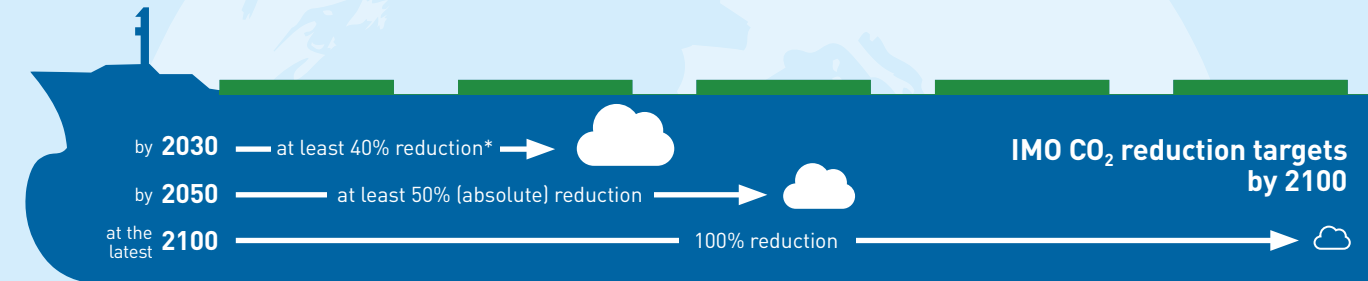
GERMAN SHIPOWNERS ARE COMMITTED TO THE AIM OF OPERATING CLIMATE-NEUTRAL SHIPS AS SOON AS POSSIBLE

■ CO₂ REDUCTION: TIMETABLE IS FIXED

International maritime shipping is the first industry worldwide that has already had a globally binding climate accord in place (since as early as 2013) on far-reaching requirements to achieve a reduction in CO₂ emissions for newbuilds: the Energy Efficiency Design Index (EEDI).

Not only newbuildings: more than 50,000 ships in service will become even more efficient

From 2023 onwards, all existing ships must apply strict performance standards. With the new Energy Efficiency Existing Ship Index (EEXI), each ship is required to improve its efficiency by applying a reduction factor – dependent on the ship type – of up to 50% measured relative to a baseline. Furthermore, ships are required to ensure continuous improvements of their operational



carbon intensity by applying an annual operational carbon intensity indicator (CII). The ships annual improvements of their operational efficiency performance will be rated on a yearly basis in categories A to E - indicating a major superior or an inferior performance level. The ratings will be continuously tightened until 2030. A ship rated D or E for three consecutive years, would have to submit a corrective action plan to the competent authorities, to show how the required index (C or above) would be achieved.

Concrete CO₂ reduction targets

In 2018 the member states of the United Nations' International

Maritime Organisation (IMO) adopted a concrete timetable for CO₂ reduction. It provides for the maritime shipping sector ...

- to cut its total global CO₂ emissions by at least half by the year 2050 (reduction in absolute terms compared to 2008)
- to ensure that ocean-going vessels will not discharge any CO₂ at all by the year 2100 at the latest
- to ensure that maritime shipping will reduce its CO₂ emissions, measured according to the industry's transport output, by at least 40% by the year 2030

*measured according to the industry's transport output



INTERNATIONAL REGULATIONS ARE CRUCIAL

Maritime shipping is organised with a global reach, probably more so than any other industry. The need for really sustainable climate and environmental protection calls for rules and regulations to be imposed by the IMO that are applicable worldwide – also in order to create a level playing field on an international scale for this highly competition-intensive industry.

■ WHAT WILL DRIVE MARITIME VESSELS IN FUTURE?

The maritime shipping sector will meet its CO₂ target for the year 2030. However, in order to achieve a reduction of CO₂ emissions by half in absolute terms by the year 2050 in relation to 2008, the fuels deployable today will not be sufficient:

- While LNG is the cleanest fuel available at present, it can merely serve as a bridging technology since it does not reduce CO₂ emissions to an adequate degree.
- Wind and battery power are merely interesting as additional drive systems for large merchant vessels

- The future of climate-neutral fuels lies in synthetic fuels derived from regenerative energy sources ("Power-to-X")

Accordingly, this will call for an innovation offensive in research and development. Governments worldwide must cooperate with the maritime industry sector and jointly make financial resources available to fund this technological revolution.

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