

# SHIPPING, WORLD TRADE AND THE REDUCTION OF CO<sub>2</sub> EMISSIONS

UNITED NATIONS FRAMEWORK CONVENTION  
ON CLIMATE CHANGE (UNFCCC)



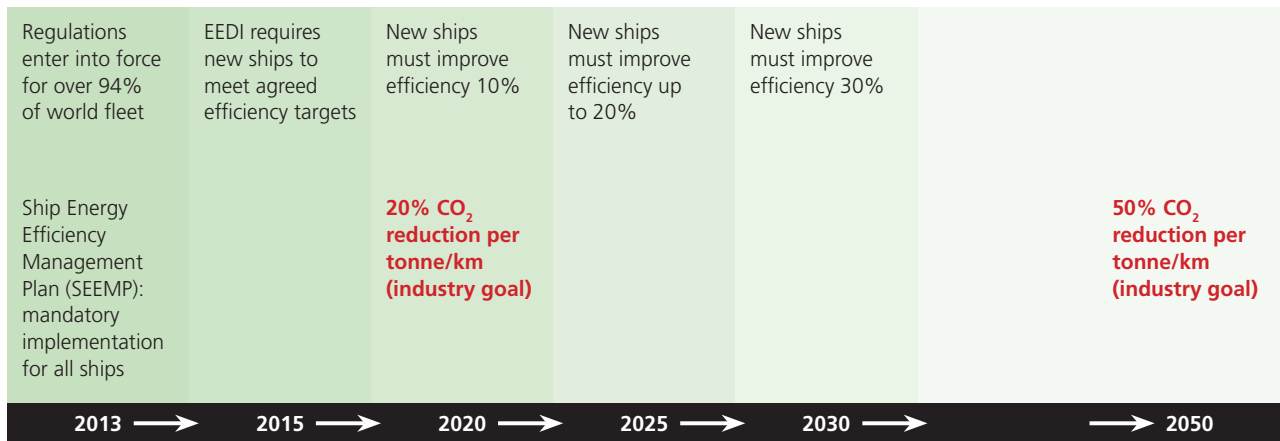
**INTERNATIONAL CHAMBER OF SHIPPING (ICS)**

*Representing the Global Shipping Industry*

**COP 20  
LIMA**

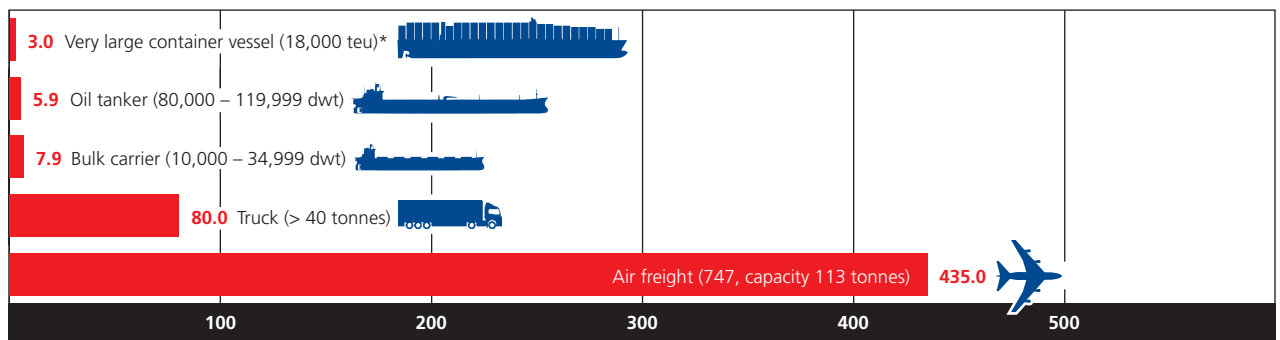
# IMO AGREEMENT ON TECHNICAL REGULATIONS WILL REDUCE SHIPS' CO<sub>2</sub>

MARPOL Annex VI, Chapter 4 adopted July 2011, which entered into force in January 2013



## COMPARISON OF TYPICAL CO<sub>2</sub> EMISSIONS BETWEEN MODES OF TRANSPORT

Grams per tonne-km



Source: IMO GHG Study, 2009 (\*AP Moller-Maersk, 2014)

## IMO IN SESSION IN LONDON



Front cover photo: Hapag-Lloyd



# INTERNATIONAL SHIPPING – SERVANT OF WORLD TRADE

## UNFCCC SHOULD CONTINUE TO SUPPORT SIGNIFICANT PROGRESS ON REDUCING SHIPPING'S EMISSIONS AT IMO

The global shipping industry is firmly on track to reduce its CO<sub>2</sub> emissions per tonne-kilometre by more than 20% by 2020,<sup>1</sup> with significant further reductions going forward.

Global shipping, which transports around 90% of world trade, only produced about 2.2% of the world's total GHG emissions during 2012 compared to 2.8% in 2007. Total shipping emissions have reduced by over 10% during the same period.<sup>2</sup>

The shipping industry is the only industrial sector which is already covered by a legally-binding global agreement to reduce its CO<sub>2</sub> emissions, through technical and operational measures adopted by the International Maritime Organization (IMO).

The next United Nations Climate Change Conference (COP 20) therefore needs to maintain its support for IMO as the principal forum for addressing emissions from maritime transport as it continues its vital work of delivering further CO<sub>2</sub> emissions reductions from international shipping.

IMO work currently includes the establishment of a global data collection system to measure CO<sub>2</sub> emissions from individual ships. The development of Market Based Measures for shipping also remains on IMO's agenda.

Shipping is a global industry requiring uniform global regulation. As demonstrated by the ground breaking IMO agreement that entered into force worldwide in 2013, IMO is the best place for the delivery of further emissions reduction measures by the entire international shipping sector, in a manner that avoids market distortion or disruption to international trade flows, while being compatible with the principle of 'Common But Differentiated Responsibility (CBDR)'.

<sup>1</sup> Compared to 2005

<sup>2</sup> Third IMO GHG Study, 2014

The international shipping industry is responsible for the carriage of about 90% of world trade and is vital to the functioning of the global economy.

Intercontinental trade, the bulk transport of raw materials and the import/export of affordable food and goods would simply not be possible without shipping.

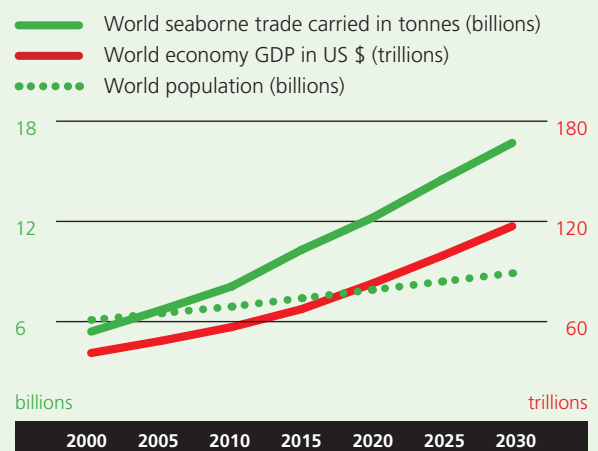
It is the availability, low cost and efficiency of maritime transport that has made possible the major shift towards industrial production in emerging economies, which has in large part been responsible, in recent years, for dramatic improvements in global living standards.

The world's population and economy is expected to continue to grow and shipping will need to respond to the demand for its services (unless existing patterns of global trade were to be fundamentally transformed).

Shipping is an inherently international industry which depends on a global regulatory framework to operate efficiently. If a ship trades from Doha to Dalian, the same rules need to apply (for example: concerning construction, navigation or atmospheric emissions) at both ends of the voyage. Otherwise there would be chaos and serious inefficiency.

For over 50 years this global regulatory framework has been very successfully provided by the United Nations International Maritime Organization (IMO).

### PREDICTED INCREASES IN WORLD SEABORNE TRADE, GDP AND POPULATION



Sources:

World seaborne trade – IHS Global Insight

World economy – OECD Statistics

World population – UN Department for Economic and Social Affairs, Population Division



## REDUCING SHIPPING'S CO<sub>2</sub>

The international shipping industry is firmly committed to playing its part in reducing emissions of CO<sub>2</sub> and other Green House Gases.

International shipping is already, by far, the most carbon efficient mode of commercial transport and continues to improve fuel efficiency and thus reduce CO<sub>2</sub> emissions. But it is fully recognised that CO<sub>2</sub> emissions from the industry as a whole (some 2.2% of global emissions) are comparable to those of a major national economy.

However, shipping is the servant of world trade. The total emissions of shipping, as a sector, will therefore be determined, to a significant extent, by the expected long term growth of the world economy (and population) between now and 2050.

## CO<sub>2</sub> REDUCTION MEASURES FOR SHIPPING SHOULD BE LED BY IMO

As already acknowledged by the Kyoto Protocol, emissions from international shipping cannot be attributed to any particular national economy. Multilateral collaborative action will be the most appropriate means to address emissions from the maritime transport sector.

Multilateral collaborative action will be best achieved by governments at the specialist United Nations agency – the IMO – which has a successful track record in the development of global regulations governing the shipping industry's environmental performance. For example, the International Convention on the Prevention of Pollution by Ships (MARPOL), which now contains technical regulations for the reduction of CO<sub>2</sub>, has been ratified and enforced globally through a combination of flag state and port state control by IMO Member States.

The delivery of significant emission reductions by the maritime sector will require that any mandatory measures adopted are applied on a uniform and global basis to avoid 'carbon leakage'.

Most shipping companies have the freedom to decide to register their ships with the 'flag state' of their choice including those which, under the current Kyoto Protocol, are not Annex I nations. Measures to deliver meaningful emission reductions are thus much more likely to be achieved by instruments developed by governments at IMO.

**In 2014, only about 35% of the world merchant fleet is registered in UNFCCC Annex I countries.**

## TAKING ACCOUNT OF CBDR

The UNFCCC principle of 'Common But Differentiated Responsibility' (CBDR) cannot be practically applied directly to individual ships without the danger of significant 'carbon leakage'. The 'flag state'<sup>3</sup> with which a ship is registered, or indeed the 'nationality' of the entity operating the ship, can change frequently, especially when ships are bought and sold. The direct application of the CBDR concept would also cause gross distortion of shipping markets, reducing the efficiency of maritime transport and thus the smooth flow of world trade.

**Failure to deliver a global and uniform CO<sub>2</sub> reduction regime for international shipping will greatly reduce the ability of the shipping sector as a whole to reduce its emissions.**

However, the IMO principle of 'no more favourable treatment' ensures that standards adopted for shipping are applied equally throughout the world, delivering maximum environmental protection and improvement.

The international shipping industry therefore believes that the achievement of meaningful reductions in CO<sub>2</sub> emissions will be best achieved if nations agree that the development of detailed measures for the international merchant fleet should be directed by governments at IMO - while fully respecting the UNFCCC CBDR principle.

## IMO AGREEMENT ON CO<sub>2</sub> TECHNICAL RULES

**In July 2011, governments at IMO agreed a comprehensive package of technical regulations for reducing shipping's CO<sub>2</sub> emissions which entered into force in January 2013.**

The amendments to the MARPOL Convention (Annex VI) include:

- A system of energy efficiency design indexing for new ships (similar in concept to the ratings applied to cars and electrical appliances). The IMO EEDI will lead to approximately 25-30% emission reductions by 2030 compared to 'business as usual'.
- A template for a Ship Energy Efficiency Management Plan (SEEMP) for use by all ships. The SEEMP allows companies and ships to monitor and improve performance with regard to various factors that may contribute to CO<sub>2</sub> emissions. These include, inter alia: improved voyage planning; speed management; weather routing; optimising engine power, use of rudders and propellers; hull maintenance and use of different fuel types.

## RECOGNITION OF CBDR

The July 2011 agreement demonstrates that IMO is eminently capable of delivering a global solution for shipping which can be reconciled with the principle of CBDR - without prejudice to what UNFCCC might decide with respect to other industries. To address CBDR, the IMO agreement includes a regulation for the promotion of technical co-operation and the transfer of technology relating to the improvement of energy efficiency of ships, and requires maritime administrations - in co-operation with IMO - to provide support directly to developing states that request technical assistance.

## IMO IS ALSO DEVELOPING ADDITIONAL MEASURES

The IMO agreement on technical measures demonstrates that there is widespread understanding amongst governments worldwide that the most effective means of reducing CO<sub>2</sub> emissions from ships will be for COP 20 to recognise IMO's ability to regulate shipping, so that it can continue its consideration of Market Based Measures (MBMs).

Governments have already made various detailed proposals for a shipping MBM. These have been assessed by an international panel of experts.

### AN MBM LINKED TO FUEL CONSUMPTION?

In the event that IMO Member States should decide to develop a climate change funding mechanism to which shipping might contribute, the clear preference of the majority of the shipping industry is for a mechanism linked to fuel consumption, rather than a system based on emissions trading. Most shipping companies, perhaps 90%, are small to medium sized enterprises that have a sound dislike of unnecessary complication. An IMO MBM linked to fuel consumption is the option which most shipping companies can probably accept and support, if agreed by governments.

### CO<sub>2</sub> DATA COLLECTION

As an interim measure IMO has now agreed in principle to the development of a global data collection system to measure CO<sub>2</sub> emissions from individual ships. This is fully supported by the industry provided that the system is primarily based on fuel consumption, is simple to administer, and will not be used to develop a mandatory operational index with the risk of market distortion (identical ships on identical voyages may have very different fuel consumption due to differing ocean and weather conditions).

## SHIPPING AND THE UNFCCC GREEN FUND

If IMO Member States so decide, any MBM adopted by IMO could potentially involve a linkage to the Green Climate Fund that was established by COP 17, in Durban, in 2011. However, this is a decision for IMO Member States which will be best placed to develop an approach that can reconcile the principle of CBDR with the need for all ships, regardless of flag, to be treated in a uniform manner.

The Green Climate Fund aims to generate US\$100 billion per year by 2020, in order to help mitigation and adaptation projects in developing nations. The position of ICS is that any contribution by shipping must reflect the sector's modest contribution to total global CO<sub>2</sub> emissions. As such, ICS will firmly resist any suggestion that shipowners should collectively pay tens of billions of dollars per year. The international shipping industry is not a cash cow!

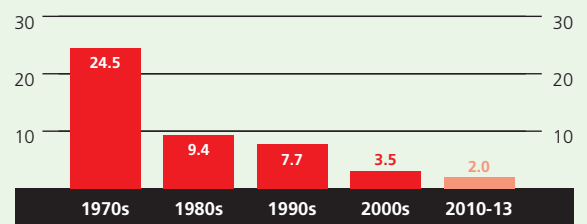
## IMO'S TRACK RECORD ON ENVIRONMENTAL REGULATION

The level of ratification and enforcement of IMO Conventions is very high in comparison to international regulations governing many land based industries.<sup>4</sup>

The impressive track record of IMO is demonstrated by the success of the MARPOL Convention (which also now includes regulations to reduce ships' CO<sub>2</sub>) in contributing to the substantial reduction of oil pollution since it entered into force.

### MARPOL 73/78 HAS HELPED ENSURE A DRAMATIC REDUCTION IN OIL SPILLED

Average number of major oil spills per year (over 700 tonnes)

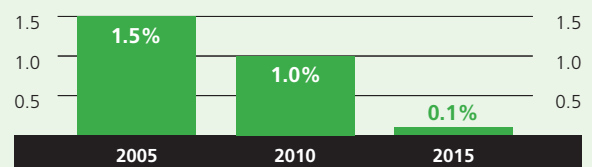


Source: ITOFF

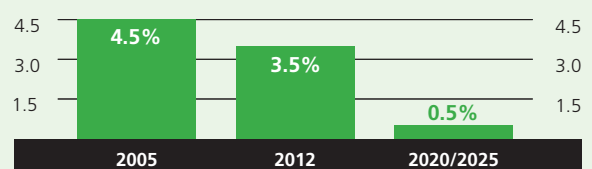
In addition to the ground breaking agreement to reduce CO<sub>2</sub>, the ability of governments at IMO to respond to political pressure and to deliver global environmental regulations involving complex issues has also been demonstrated by the agreement<sup>5</sup> to reduce pollutant atmospheric emissions (such as sulphur) from ships dramatically.

### IMO AGREEMENT TO REDUCE ATMOSPHERIC POLLUTION FROM SHIPS

Sulphur content of fuel permitted in Emission Control Areas



Sulphur content of fuel permitted outside Emission Control Areas



<sup>3</sup> Under the United Nations Convention on the Law of Sea (UNCLOS), the flag state is the administration or government of the state whose flag the ship is entitled to fly.

<sup>4</sup> MARPOL Annexes I and II (governing prevention of oil and chemical pollution) have been ratified by 150 nations covering over 99% of the world merchant fleet. Recent amendments to MARPOL Annex VI (which now address CO<sub>2</sub>) already cover over 94% of the world fleet.

<sup>5</sup> The 2008 amendments to MARPOL Annex VI will, inter alia, reduce the sulphur content in fuel to just 0.1% in Emission Control Areas in 2015.

## HOW IS SHIPPING REDUCING ITS CO<sub>2</sub> EMISSIONS?

The consensus of opinion within the global industry is that it will be possible for shipping to reduce CO<sub>2</sub> emitted per tonne of cargo transported one kilometre (tonne/km) by 20% between 2005 and 2020, through a combination of technological and operational developments, as well as the introduction of new and bigger ships, designed to the new IMO Energy Efficiency Design Index.

In the longer term, depending on technological developments which at the moment cannot be fully anticipated, the industry believes it should be possible to deliver even more dramatic emissions reductions.

Although the shipping industry is already very energy efficient, additional improvements to hull, engine and propeller design are expected to produce further reductions in fuel consumption. There may also be possibilities for the better utilisation of waste heat.

The increasing size of many ships is also expected to improve fuel efficiency. In addition, operational measures (e.g. better speed management throughout the course of a voyage) are also expected to reduce fuel consumption and are addressed in detail by the new Ship Energy Efficiency Management Plan that has been made mandatory by IMO.

Shipping companies have a very strong incentive to reduce their fuel consumption and thus reduce their CO<sub>2</sub> emissions: bunker costs represent an increasingly significant proportion of ships' operational expenses, having increased by about 400% since 2000.

There is every expectation that marine bunker prices will remain high. Furthermore, the cost of ships' fuel is expected to increase by a further 50% as a result of the increased use of (low sulphur) distillate fuel that will follow the implementation of the new IMO rules (MARPOL Annex VI) that will apply in Emission Control Areas in 2015 and globally from 2020.

### ALTERNATIVE FUEL SOURCES



The latest IPCC Synthesis Report (November 2014) suggests that all fossil fuels should be phased out by 2100. For the immediate future, shipping will probably remain dependent on fossil fuels. In the longer term, however, the shipping industry is exploring a number of alternative fuel sources to help reduce CO<sub>2</sub> emissions.

**Liquid Natural Gas (LNG)** produces lower CO<sub>2</sub> emissions and could be an interim solution until a viable alternative to fossil fuels is eventually found, especially for shorter voyages provided that supply infrastructure can be developed. Third or fourth generation **biofuels** might conceivably provide a possible alternative although there is, of course, considerable public debate about the net environmental costs (and social effects) of the wider use of such fuels.



**Renewable energy** sources, such as wind and solar power, may have a place in helping to meet some ancillary requirements, such as lighting on board ships. However, they are not practical for providing sufficient power to operate ships' main engines (the huge physical size of ships should not be underestimated).



**Fuel cells** may be a possibility for new ships in the very long term, although they are currently too limited in range to offer a viable solution. Even **nuclear propulsion** for merchant ships is technically possible, although safety and security implications and support infrastructure costs would require serious consideration.

The current assumption, therefore, remains that ships will continue to burn fossil fuels for the foreseeable future, and that the most significant means of reducing CO<sub>2</sub> emissions will be achieved by further improvements in efficiency across the entire transport chain.

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The International Chamber of Shipping (ICS) is the global trade association for shipowners and operators, comprising national shipowners' associations from 36 countries, representing over 80% of the world merchant fleet.