

# Shipping, World Trade and the Reduction of

# CO<sub>2</sub> Emissions

United Nations Framework Convention on Climate Change  
International Maritime Organization  
Marine Environment Protection Committee



**International Chamber of Shipping**  
Representing the Global Shipping Industry

**COP 17  
DURBAN**

## UNFCCC Must Agree a Mandate for IMO

The international shipping industry is firmly committed to reducing its CO<sub>2</sub> emissions by 20% by 2020, with significant further reductions thereafter. However, the next United Nations Climate Change Conference (COP 17) needs to give the International Maritime Organization (IMO) a clear mandate to continue its vital work to help deliver meaningful CO<sub>2</sub> emission reductions by international shipping, including 'Market Based Measures'.

The global shipping industry, represented by the International Chamber of Shipping (ICS), very much hopes that governments at COP 17 will respond positively to the significant IMO agreement, in July 2011, to adopt a package of technical measures to reduce shipping's CO<sub>2</sub> emissions (see green box). This is the first ever international agreement containing binding and mandatory measures to reduce CO<sub>2</sub> emissions that has so far been agreed for an entire industrial sector.

Most importantly - and without prejudice to what governments might agree at UNFCCC – the shipping industry believes that IMO is now very well placed to continue the real progress it is making on Market Based Measures to help deliver further emissions reductions. This includes a possible shipping industry environmental compensation fund with possible linkages to any 'Green Fund' agreed by UNFCCC. This could address the Kyoto Protocol principle of 'Common But Differentiated Responsibility' (CBDR) by directing the lion's share of any funds raised from international shipping to environment related projects in developing countries.

It is vital for all governments to understand that in the absence of a global framework agreed by IMO there is a serious risk of regional or unilateral measures regulating CO<sub>2</sub> emissions for shipping. This would have a seriously distorting effect on international shipping markets, but most importantly would be much less effective in delivering meaningful reductions in CO<sub>2</sub> emissions by the global shipping sector as a whole.



## International Shipping - Servant of World Trade

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 Asia and other emerging economies, which has in large part been responsible, in recent years, for dramatic improvements in global living standards.

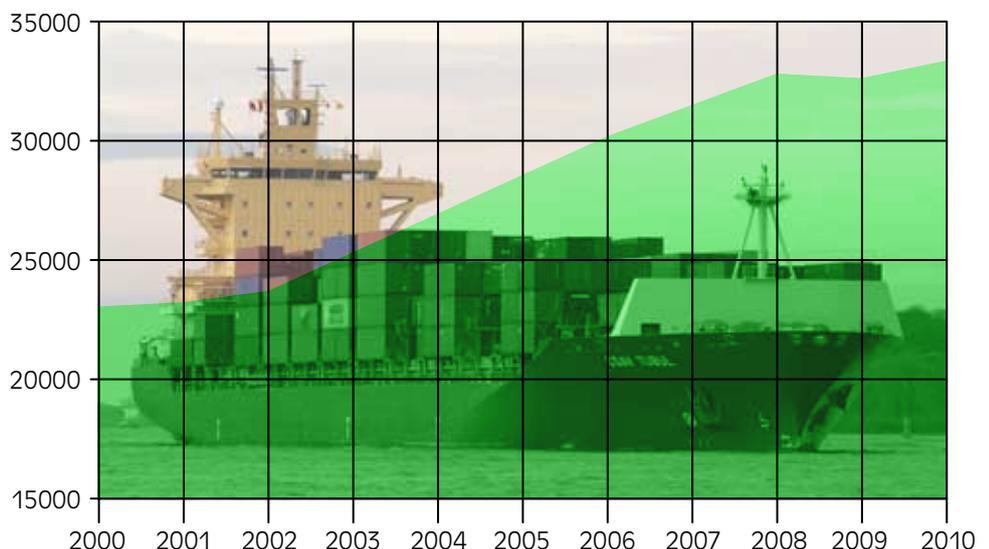
Notwithstanding the recent contraction in trade resulting from the present economic downturn, the world economy is expected to continue to grow and shipping will need to respond to the demand for its services (unless existing patterns of global trade were to be fundamentally transformed).

Shipping is an inherently international industry which depends on a global regulatory framework to operate efficiently. If a ship trades from Brisbane to Buenos Aires, 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).

### Growth in world seaborne trade (billion tonne-miles)

Source: Fearnleys



## 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. But it is fully recognised that CO<sub>2</sub> emissions from the industry as a whole (some 2.7% of global emissions) are comparable to those of a major national economy.

The shipping industry therefore accepts that the CO<sub>2</sub> emission reduction which ships must aim to achieve should be at least as ambitious as the CO<sub>2</sub> emissions reduction agreed under any new United Nations Climate Change Convention.

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 2011, 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>1</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.

## IMO Agreement on CO<sub>2</sub> Technical Rules

In July 2012, governments at IMO agreed a comprehensive package of technical regulations for reducing shipping's CO<sub>2</sub> emissions which will enter 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.

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. CBDR can be reconciled with the need for uniform rules through a Market Based Measure, such as an IMO compensation fund, whereby the majority of funds collected would be used for climate change mitigation and adaptation projects in developing nations.

**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.**

## IMO is also Developing Market Based 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 17 to give IMO a clear mandate, so that it can finalise the Market Based Measures (MBMs) that IMO has also developed. If governments so decide, this could also involve a linkage to any 'Green Fund' that is established by UNFCCC.

Governments have already made various detailed proposals for a shipping MBM. These have been assessed by an international panel of experts and will be taken forward by IMO Member States during early 2012. However, this task will be made easier if COP 17 can confirm IMO's mandate to regulate shipping's CO<sub>2</sub>, and provide additional clarity on how IMO might reconcile CBDR with the shipping industry's need for an MBM that applies to ships on a uniform basis regardless of flag.

### An MBM Linked to Fuel Consumption

With respect to a climate change funding mechanism, the clear preference of the majority of the shipping industry is for an international compensation fund 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 compensation fund linked to fuel consumption is the option which most shipping companies can probably accept and support, if agreed by governments.

### International shipping does not lend itself to inclusion in national emission targets.

*A ship may be registered in one country while the beneficial owner of the ship may be located in another. The cargo carried by the ship will be of economic benefit to a variety of different importing and exporting nations.*

*Most ships do not follow fixed routes and they will collect and deliver varying amounts of cargo in a large number of different nations throughout the course of a voyage. Moreover, the nationality of the entities exporting and importing the cargo carried will vary considerably from voyage to voyage.*

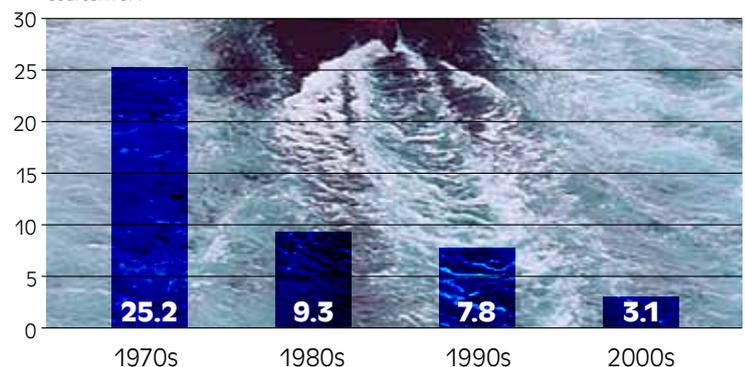
## IMO's Track Record on Environmental Regulation

The level of ratification and enforcement of IMO Conventions is very high in comparison to international regulations governing many land based industries<sup>2</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.

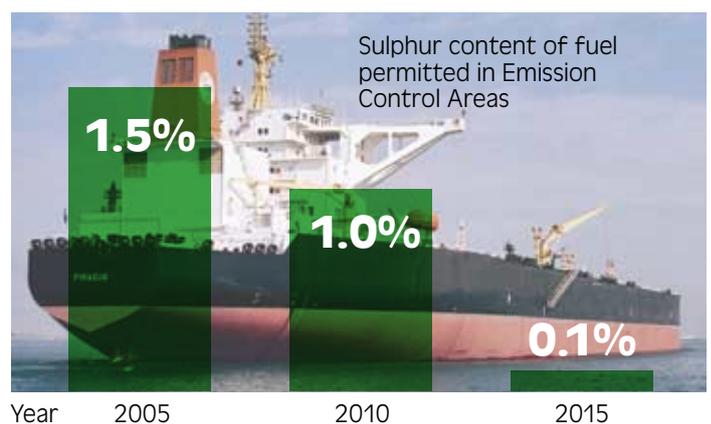
### MARPOL 73/78 has helped ensure a dramatic reduction in oil spilled by shipping

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



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>3</sup> to reduce pollutant atmospheric emissions (such as sulphur) from ships dramatically.

### IMO agreement to reduce atmospheric pollution from ships



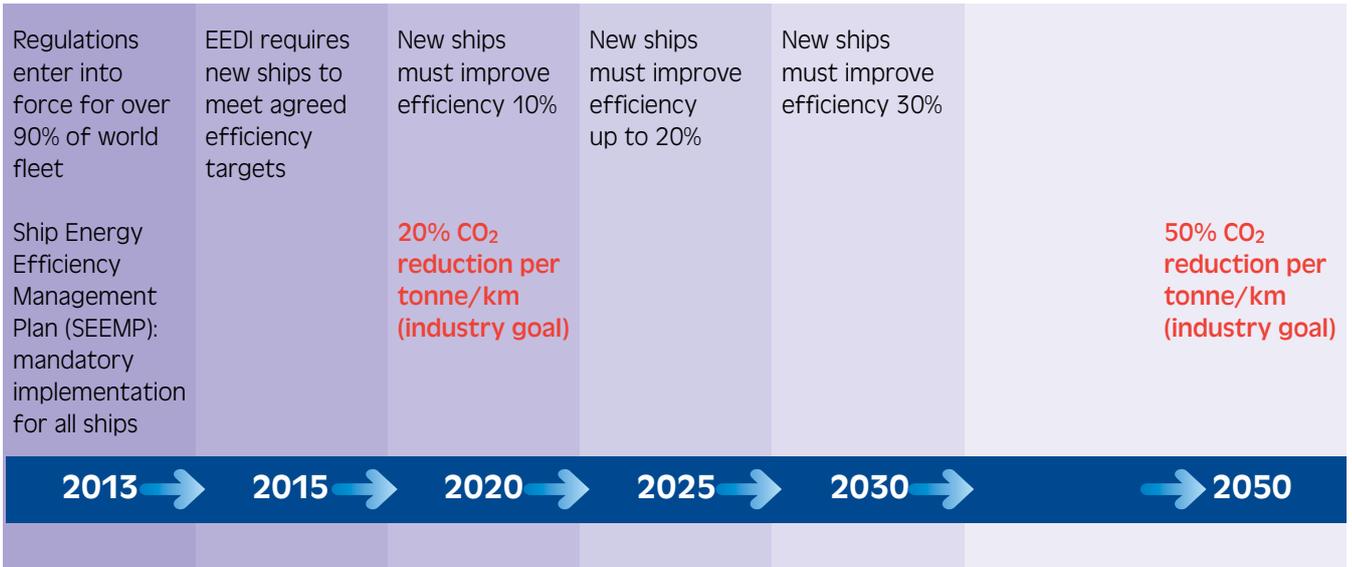
<sup>1</sup> Under the United Nations Convention on the Law of Sea (UNCLOS), the flag state is the administration or government of the state whose flag the ship is entitled to fly.

<sup>2</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 90% of the world fleet.

<sup>3</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.

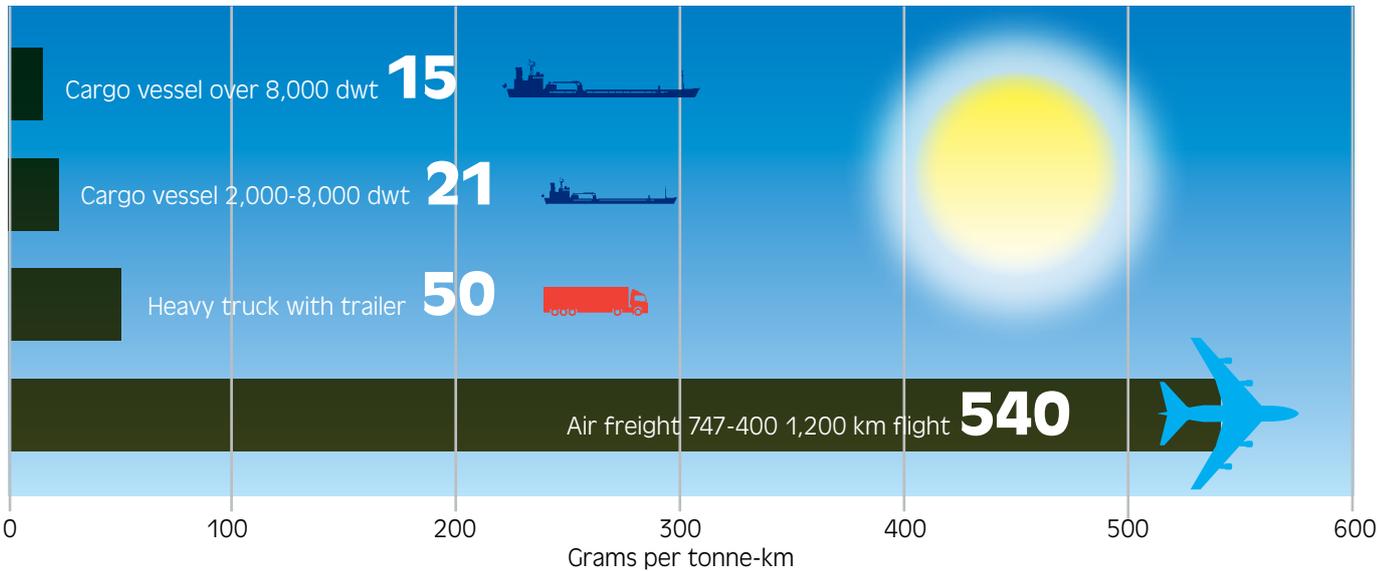
# IMO agreement on technical regulations will reduce ships' CO<sub>2</sub>

MARPOL Annex VI, Chapter 4 adopted July 2011



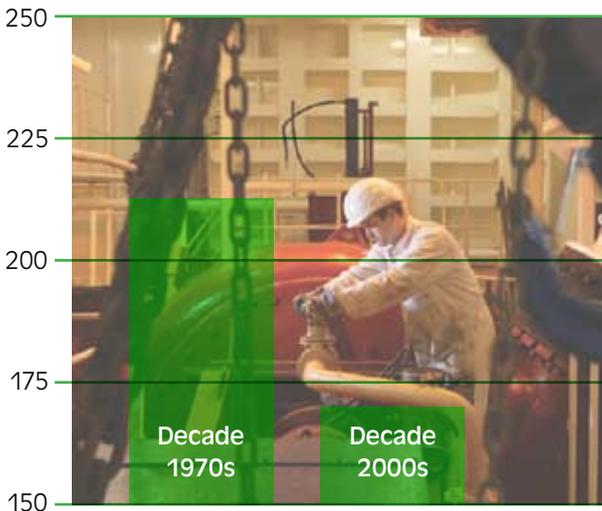
## Comparison of CO<sub>2</sub> emissions between different modes of transport

Source: NTM, Sweden



## Improvements to energy efficiency of ship engines oil consumption (gram/kw/hour)

Source: Danish Shipowners' Association



## IMO in session in London



# 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. This is a significant challenge given that there have already been substantial improvements in the efficiency of ships' engines.

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 emission reductions (although for the foreseeable future shipping will remain dependent on fossil fuels).

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 300% in the last 5 years.

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 globally in Emission Control Areas by 2015.



## Alternative Fuel Sources

The various parts of the shipping industry - shipowners, shipbuilders and classification societies (the depositories of technical expertise in the industry) - are actively examining a number of ways to reduce CO<sub>2</sub> emissions, both for new and existing ships, which are primarily linked to reducing fuel consumption. In the longer term, however, the shipping industry is also exploring a number of alternative fuel sources to help reduce CO<sub>2</sub> emissions.

**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.

**Liquid Natural Gas (LNG)** produces lower emissions, and could be a solution for some short sea trades if supply infrastructure can be developed. Third 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.



The International Chamber of Shipping (ICS) is the principal international trade association for merchant shipowners, representing the global shipping industry at IMO and other inter-governmental fora that impact on the industry. ICS membership comprises national shipowners' associations from 36 nations representing all sectors and trades and over 80% of the world merchant fleet.

### International Chamber of Shipping

38 St Mary Axe  
London EC3A 8BH  
Tel + 44 20 7090 1460  
info@ics-shipping.org  
www.ics-shipping.org  
www.shippingfacts.com