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PREVENTION OF AIR POLLUTION FROM SHIPS

Technical evaluation of market-based instruments

Submitted by Oil Companies International Marine Forum (OCIMF)

SUMMARY

Executive summary:	This document considers the relative advantages and disadvantages of an Emission Trading Scheme and the GHG Compensation Fund proposal
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.3
Action to be taken:	Paragraph 19
Related documents:	MEPC 59/4/5; MEPC 57/21 and GHG-WG 1/5/7

Introduction

1 International shipping is a global service industry carrying over 80% of world trade and hence is of fundamental importance to the economies of both the developed and the developing world. Whatever growth scenario is assumed for world trade, shipping will grow at a similar rate, since the two are inexorably linked.

Background

2 Measures to reduce GHG emissions from shore based industry are being implemented around the world and there are increasing calls for shipping to be subject to similar reductions, however the nature of international shipping is such that there are particular challenges to be faced when considering how best to address GHG emissions. Some of the significant points are as follows:

.1 Broad range of IMO Member States making agreement on legislation difficult;

.2 Geographical distribution of vessel owners and managers and flag States;

.3 Approximately 55,000 ships > 400 GT;

.4 Long lifespan of ships, typically around 25 years; and

.5 The shipping industry has no established baseline and hence no abatement curve in terms of CO_2 emissions.

3 To date, the focus of shipping R&D has been on fuel efficiency per cargo tonne mile and this had the consequential benefit of reducing CO_2 emissions. IMO is developing practical standards, such as the Energy Efficiency Design Index for new ships and an Energy Efficiency Operational Indicator for shipping, both aimed at reducing GHG emissions. With these as a starting point, new strategies to further reduce GHG emissions are under consideration along the following lines:

.1 Operational optimizations;

.2 Use of innovative fuel technologies, e.g., LNG and biofuels;

.3 Novel technologies, including advanced hull forms and alternative propulsion systems;

.4 Fuel efficiency measures;

.5 Market-based instruments. Those currently proposed are:

- Emission Trading Schemes (ETS); and

- GHG Compensation Fund.

4 Recognizing that the world's shipping fleet is long lived, a typical ship operating life is 25 years, and that fuel efficiency per tonne mile transported is already a fundamental of this mature industry, one must conclude that operational and technical improvements will be gradual rather than revolutionary. Building on the improvements in vessel and engine design efficiency initiated since 1990, industry studies have concluded that the application of existing technology to the current fleet of 55,000 ships and the adoption of energy saving best practice in the construction of new ships has the potential to contribute a 15% reduction in CO_2 emissions by 2030. Further reductions in carbon emissions from ships will require radical changes to ship and engine design and possibly a change away from traditional hydrocarbon based fuel. While some of the technology solutions are known in principle, to deliver practical improvements, substantial development work is required across the industry from machinery manufacturers, ship builders, designers, regulators and academics. Such fundamental changes will only be delivered on a long timeline and require considerable investment in R&D on a scale unprecedented in this industry. Thus it is inevitable that some form of 'offsetting' of carbon emissions from shipping must be developed in the short term, but a significant portion of the revenue generated, by the chosen market-based instrument, must be directed to marine R&D to develop cost effective technologies to reduce GHG emissions from shipping.

5 A GHG "abatement curve" is required for world shipping so that ship builders, operators and regulators understand the relative merits and the potential GHG reductions that could be achieved through to the 2050 year horizon. The abatement curve should be a precursor to any IMO mandated design index performance standards.

Goals/Objectives

6 Recognizing the need to reduce GHG emissions and that shipping emissions will be subject to regulation:

.1 legislation must be effective in reducing emissions;

.2 the impact of legislation must be shared equally, regardless of flag State, ship-type, etc;

.3 the process adopted must be transparent, rigorous and enforceable, and deliver measurable reductions;

.4 measures must not result in a modal shift to other less efficient means of transport or act as a constraint to global trade; and

.5 real GHG reductions must be delivered, not merely a transfer of funds from UNFCCC Annex 1 countries to non-Annex 1 countries.

7 Reflecting the nine basic principles of Shipping GHG Legislation under IMO as agreed by MEPC 57, OCIMF believes that the requisite legislation:

.1 must be established under the auspices of IMO;

.2 must deliver real reductions in CO_2 emissions which are measurable and transparent;

.3 must utilize the design index concept and support eventual introduction of mandated standards;

.4 must use a substantial proportion of the revenue generated [50%], from any market-based measure to promote and facilitate marine R&D aimed at reducing shipping GHG emissions;

.5 must not create an imbalance or modal shift in transport to the detriment of the environment overall;

.6 must, in order to be effective, apply to all vessels over 400 GT regardless of flag or nationality; recognizing that if not universally adopted from the outset, must be constructed to allow phased implementation leading to the global coverage of shipping emissions;

.7 must be practical to administer, monitor reductions, enforce compliance with legislation and function at the lowest possible administrative overhead;

.8 must be responsive to new entrants and fleet divestments; and

.9 must facilitate interaction with shore based industries in order to maximize global GHG emission reductions.

8 To date, two approaches have been proposed for offsetting shipping emissions, it is not the intent of this document to go into the details of the structure and operation of the two schemes and what follows is a brief overview of the two alternatives. In both cases there is the potential to generate substantial funds for marine emission R&D, Clean Development Mechanism, Joint Implementation Schemes, and Adaptation Projects under the auspices of the UN.

Emission Trading Scheme (ETS)

9 By its nature, trading effectively sets a market price for carbon which, like any commodity, will fluctuate as the supply and demand balance changes. Individual industries can then choose to make emissions reductions in their own operations or to fund reductions in another industries where the cost of abatement may be lower. There are two types of emission trading scheme; "cap and trade" or "baseline and credit".

10 To date, the most detailed submission to the IMO describing the operating mechanism for a marine cap and trade ETS, has been proposed by Germany (GHG-WG 1/5/7) and is outlined below:

.1 Free Allocation system – existing vessels are allocated an annual emissions allowance free of charge, either based on historical performance or based on a defined allocation formula, reflecting ship type and size. However, allocation based on historical emissions of individual ships would be extremely complex and require the calculation of allowances for many different ship types and sizes. The basic fuel consumption data required to effect the allocation is neither readily available nor accurate. Free allocation methods do not give credit to shipowners who have already taken action to reduce GHG emissions;

.2 Auction system - this does not require a reliable baseline. Participants purchase allowances based on their forecast demand during the trading period. It is sufficient for the Administrator to allocate a shipping sector allowance, corresponding to what is estimated to have been the emissions in a baseline year, e.g., 2005. However, if the introduction of an ETS is phased, it will be necessary to estimate what portion of global emissions are included, but again this does not require absolute accuracy for implementation. It is envisaged that with each bunker purchase the ship operator will purchase the equivalent emission units from the Administrator, at the market price of CO_2 on the day of the bunker purchase, only if shipping overall exceeds the cap level will the Administrator have to purchase additional credits from the carbon market; and

.3 A third possibility for the allocation of credits is by a combination of the above two, whereby participants are given a percentage of their annual emission allowance free of charge and the balance is then purchased from the Administrator under auction.

GHG Compensation Fund

11 The GHG Compensation Fund as proposed by Denmark (MEPC 59/4/5) is summarized below:

.1 A fixed contribution in US$/tonne, established by the Administrator, to be added to the price of bunker fuel as the required contribution to the GHG Compensation

Fund and recorded in the bunker delivery note. A State party to the Convention must "licence" the bunker suppliers within its territory and these suppliers must be registered with the Compensation Fund Administrator. Registration will require agreement to specific reporting and recording requirements as well as the collection and transfer of the GHG contributions to the GHG Fund Administrator;

.2 Flag States signatory to the Convention must require that ships entitled to fly their flag purchase fuel from a "licensed" bunker supplier;

.3 Ships which cannot document that bunker fuel has been purchased from a registered bunker supplier and/or that the required contribution to the Fund has been paid may, as a condition of entry into the port of a signatory State, be required to make a contribution corresponding to the amount of bunker fuel consumed during the last 90 days; and

.4 The monies collected will be used by the Administrator to operate the fund, finance clean development projects (CDM) in developing countries, support marine fuel emission R&D and support adaptation projects in developing countries, etc.

Differences and communalities

12 A fundamental difference between the two schemes is that with an ETS there is a direct link to the market price of carbon, whereas the US$/tonne contribution to the GHG Compensation Fund will be a political decision which may, or may not, be referenced to a carbon value. What both schemes have in common is the potential to generate billions of dollars, which must be effectively managed and controlled if real GHG reductions are to be delivered, not merely a transfer of funds from Annex 1 to non-Annex 1 countries.

Summary

13 Both the ETS and the GHG Compensation fund proposals are founded on the implicit assumptions that:

.1 It will require the development and implementation of new technologies if the desired overall reductions in emissions from ships are to be achieved, particularly in the light of any increased global fleet requirement to meet an increase in global trade. Therefore, some form of market-based instrument is required to provide the funds to purchase offsets to cover the difference between required and actual GHG emissions; and

.2 Although the global economy relies upon shipping, there is increasing pressure to address the shipping industry's carbon footprint in line with the restrictions being applied to shore-based industry.

Evaluation of ETS and GHG Compensation Fund

14 In the following diagrams the ETS and GHG Compensation Fund are analysed:

ETS

Pros:	Cons:
• Reflects market price of carbon. • Can link shipping into wider GHG reduction initiatives. • Direct purchase of CO_2 units from Administrator reduces opportunity for evasion. • With enforcement by port states, implementation can initially be limited to Annex 1 countries (80% of world trade). • Equal treatment of international trading vessels > 400 GT regardless of ownership, flag State, or port of origin. • Enables the "invest-or-buy" concept. • By definition, environmental objective is addressed.	• Marine ETS still at conceptual stage, allowance allocation and/or auctioning needs to be defined. • Will require definition of a "Cap". • Fluctuating carbon market price introduces investment uncertainty for GHG reduction technology. • Requires set-up of trading administration and agreement on an effective monitoring, verification and enforcement system. • Effective enforcement will require the set up of a data exchange process involving all participating States. • Requires strict investment criteria and monitoring of fund expenditure. • "Critical mass" of Annex 1 and non-Annex 1 countries must be signatory to be effective.

GHG Compensation Fund

Pros:	Cons:
• Provides shipowner some certainty over costs. • Conceptually simple to implement. • Equal treatment of international trading vessels > 400 GT regardless of ownership or flag State. • Use of bunker delivery note as evidence of payment facilitates enforcement. • Accuracy of the bunker oil consumption baseline will improve as global compliance is achieved. • Data can be used for Annex VI supply/demand studies. • Introduces an "invest-or-pay" concept.	• May not reflect the price of carbon. • Requires monitoring and adjustment of levy to achieve desired outcome. • "Critical mass" of major bunker supply countries must be signatory for effective implementation. • Issues of principle, governance and administration need to be resolved. • For reductions in GHG emissions to be achieved, strict investment criteria and monitoring of fund expenditure are required. • Setting the contribution level to the fund is subject to political pressures. • The complexity of the bunker supply chain makes collection of funds by the Administrator unlikely to be 100% effective. • Once introduced, a levy is unlikely ever to be removed even if the CO_2 reduction target is achieved.

Conclusions

15 As both schemes are conceptual, an informed judgement as to which would be the more effective at driving tangible GHG reductions cannot be made as yet. Both have design challenges:

.1 Both face the need to create an effective management system to govern the collection, distribution and expenditure of revenues generated, whilst remaining simple to administer;

.2 The lack of a linkage to the market price of Carbon in the Compensation Fund proposal; and

.3 Given the large number of ships involved, the Marine ETS has the potential to create a heavy administrative burden on shipowners.

16 Both schemes will inevitably result in an increase in cost to the consumer.

17 Any market-based instrument selected must have the direct effect of driving global emission reductions from the shipping industry, without restricting world trade and avoid the creation of disparate, regional solutions.

18 In conclusion, it is essential that the nine basic principles agreed at MEPC 57 are reflected in the final IMO Instrument.

Action requested of the Committee

19 The Committee is invited to consider the issues identified in this document when evaluating the relative merits of market-based instruments to combat greenhouse gas emissions from international shipping.