A new market-based CO_2 emission reduction scheme

[SD2: Supporting Document #2 for discussion of MEPC 56/4/9]

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SUMMARY

Executive Summary: In this document an International Maritime Emission Reduction Scheme (IMERS) is described. The scheme does not require a reliable emission baseline and avoids the complexity of emission allocation. Significant industry improvements would be achieved while reducing emission. At the same time contributory funding for climate adaptation in developing countries would be provided.

Related documents: Resolution A.963(23), MEPC/Circ.471

Introduction

1. In the resolution A.963(23), the Assembly urged MEPC to undertake further work to identify and develop the necessary mechanisms needed to achieve limitation or reduction of greenhouse gas (GHG) emissions from ships. Until now, significant progress has been made primarily on a voluntary Scheme for CO_2 Emission Indexing. In this document we suggest a possible way forward on limitation of GHG emission from international shipping.

2. The scenarios for stabilization of the concentration of greenhouse gases in the atmosphere call for drastic global GHG emission reductions in the next few decades. The projections for maritime transport in this period show a continued growth linked to expected growth in international trade. Hence, the shipping sector faces a great challenge if it intends to participate in the global effort to reduce greenhouse gases.

3. The impasse in establishing a policy to address climate impact of shipping is often attributed to the nature of the Kyoto Protocol, for which only developed countries (Annex 1) have quantitative emission reduction targets. The reality and the problem itself are however, much more complex. A new approach that balances interests and concerns of developing and developed countries, as well as the shipping industry might be needed to break the impasse.

4. If no action is decided by the IMO, this might lead to a mixture of regional and national regulations, with negative impacts on competitiveness, costs and the environment.

Note: The scheme was shaped further during 2007 (see MEPC 57/4/27 for design principles, delivery details not included)

Recent Experiences and Observations

5. Markets for CO_2 have been created in the last few years and are maturing rapidly[1]. New hybrid policy instruments can now be successfully employed that do not require a reliable baseline before a scheme starts[2].

6. The Subsidiary Body on Scientific and Technological Advice (SBSTA) of the UNFCCC has considered eight emission options for allocating GHG emissions from international aviation and shipping to countries. One of them is "no allocation", which means that emissions are not allocated to countries. Our approach is based on this option for the maritime sector, providing a global approach is agreed.

7. According to the recently approved reports of the IPCC, developing countries are already suffering the effects of climate change and will be hardest hit in the future. Adapting to climate change is therefore essential for developing countries. However, the international funding dedicated to adaptation is a lot smaller than the anticipated needs.[3].

8. Taking advantage of the above changes, an efficient international scheme to limit emissions of greenhouse gases from ships is proposed below, addressing both climate change mitigation and adaptation concerns.

Scheme Goals

9. To tackle the complex issue of GHG shipping emissions a new international maritime emissions reduction scheme is proposed. The proposed scheme is global in order to maximise economic efficiency and avoid competitive issues of regional and national schemes.

10. The scheme is designed to fulfil four main goals:

- Reduce the maritime GHG impact through near-term technical and operational industry improvements and accelerating long-term step changes;
- Mitigate emissions through the most cost effective measures;
- Contribute to adaptation to climate change in developing countries;
- Provide a global approach that may be implemented within the next 2 years.

11. The scheme minimizes the administration burden and costs for ship owners, since it is a centralised system. It also avoids two major obstacles: unreliable emission baselines and allocation of emissions from international bunker fuel to countries.

Scheme outline

12. The scheme proposed is based on several elements. Firstly, we propose that a cap on the total CO_2-emissions from international shipping is agreed by the IMO. Secondly, we propose the implementation of a charge on CO_2-emissions from all international shipping. Furthermore, it is suggested that a fund is established under the IMO, to which the emission

[1] In 2006 1.6 GtCO2 was traded worth $29bn, more than double that of 2005.
[2] These hybrid instruments were not available to policy makers a few years ago as pure quantity mechanisms were needed to create price for carbon. The baseline is improved while the scheme operates, and commitments are adjusted accordingly.
[3] Additionally with projected rising of sea levels, appropriate adaptation planning and best practices for port facilities might be critical for the maritime industry to keep its low cost advantage in future.

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charge would be paid to. The fund should be controlled by a Board established under the IMO. The purpose of the fund is threefold, and the collected money would go to:

- Maritime industry GHG improvements;
- CO_2-credits purchased on the emissions trading markets;
- Climate change adaptation in developing countries.

The first two parts should jointly deliver the required emission reductions to meet the cap through improvement programmes and emission offsets, as required.

13. The first portion of the fund would thus go to ship-owners applying for financial aid for implementation of low-emission technology and practices, and to stimulate infrastructure improvements. The GHG reductions obtained would be additional to the ongoing technical and operational industry improvements.

14. The second portion would be used on emission reduction certificates and units purchased on the emissions trading markets if the reductions from GHG projects within the shipping sector would not be enough to meet the cap. The emission reduction certificates would be purchased through existing carbon markets, *inter alia* project-based agreements such as the Clean Development Mechanism (CDM). Effectively, this portion of the fund would offset the emissions above the cap of the entire international maritime transport with emission reductions elsewhere, at the lowest cost.

15. The third portion of the fund would be spent on adaptation projects in developing countries, or to the adaptation fund under the UNFCCC.

16. We suggest that ship managers are responsible for reporting the fuel used data for the voyages ended in the previous month (CO_2 emissions will be calculated from that data). We further suggest that fuel payers, typically charterers, are responsible for payment of emission invoices issued on monthly basis[4]. Billing will be centralised and will reflect the different commercial and leasing agreements.

17. With the proposed scheme, the complex distribution of allowance is not needed and therefore avoided, together with the additional administration. The scheme brings the benefits of a financial clearing house, while the clearing actually happens through the emission charge mechanism. Additionally, new market entrance would not pose any problem as no allowances are distributed.

Scheme Benefits and Incentives for Participation

18 It is estimated that the required long-term funding and policies would bring forward technological step changes by 10 years and therefore significantly contribute to the total emission reductions (changes like a switch to hydrogen powered engines for example) [5].

19 The binding emission cap could be met on a 3-year rolling period, to allow for initial uncertainty of the emission baselines and to further reduce the cost of the scheme[6]. The

[4] By separating the reporting and paying entities the scheme reduces risk of fraudulent behaviour.
[5] For the shipping industry where emission is expected to grow continually in the next few decades, the ability to significantly reduce emissions in the future is critical. The longer-term aspect of mitigation should be considered as important as the short-term emission offsetting.

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mitigation fund will perform a de-facto clearing house role through a dedicated registry for the global maritime emissions, when the cap is not met by the improvements projects alone.

20 Incentives for participation for shipping industry include:

- Increased cash flow as a result of improved operations and reduced fuel.
- Hassle free solution for CO_2 emissions without administration costs (no allowances to manage, no individual cap to comply with, services provided, no set-up costs).
- Reduced risk of fuel disputes.
- No impact on international competitiveness (level playing due to global implementation).
- Free access to selected data and benchmarks could further improve profits.
- Compliance easily verifiable (via fuel and voyage data, and analytical tools).
- Reduced regulatory and reputational risks.
- Benefits of better image (clean transport, social responsibility).

Administrative procedures

21 Data collection. We propose that ship managers submit a fuel used record to the scheme database for the recent voyages once a month, along with the volume of work and distance travelled for all ships under their management[7].

22 Monitoring and reporting. For monitoring and subsequent reporting the emissions are calculated by the scheme based on amount of voyage fuel used and type of vessel/engine, using appropriate emission factors (tier 2 methodology as per IPCC, 2006 Guidelines for National Greenhouse Gas Inventories).

23 Verification. Accounting and verification will be subject to ISO 14064 standard for greenhouse gas accounting and verification[8]. Independent audits by an accredited organisation will be employed to verify the reliability, credibility and correctness of data and processes. Electronic verification of fuel reports might be augmented in certain cases with the ship log verification by an authorised official at any port participating in the scheme.

24 Enforcement. It is proposed to enforce the compliance in selected ports for:

- Provision of relevant data for the most recent voyages (paragraph 32);
- Payment of the emission charges for the period ending three months earlier (or similar).

In cases of non-compliance port enforcement measures could be used, such as local financial penalties up to detention of the ship.

[6] Multi-year approach allows banking and borrowing of emission certificates, and other more sophisticated investment mechanisms like hedging.
[7] The additional data is required to derive performance benchmarks needed to drive and monitor emission improvements (their definitions are similar to the ones used for the IMO CO_2 Indexing Scheme, as in MEPC/Circ.471). The ship managers already have the data so no additional effort is needed.
[8] To further industrialize the processes, business intelligence tools will be used to verify the completeness of reports as well as check for any potential fraudulent activities (using records of ship movements, among others).

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Organisation and Governance

25 Organisation: We propose establishing a Board as an organisation accountable to IMO. The Board will provide collection and disbursements services for international maritime CO_2 emissions.

26 Adjustments to New Realities. Periodic governance mechanisms would allow for adjustment of charges and funding policy to new realities[9].

- Every 2-4 years the IMO should undertake a review and potential adjustment of the emission baselines and emission cap, structure and level of charges and the relative size of the three funds.
- Every year the body should undertake a market price review and setting of the new emission unit charge.

Decisions will be valid from the year after next, for the next period (2-4 years and 1 year, respectively). This approach will guarantee predictability and long-term investment signals for the industry.

Roadmap

27 We suggest that the Committee establishes a process on designing the details of the scheme at MEPC 56. This process should include the following elements:

- Building data foundation
  - Creating fuel database
  - Initiating reporting and obtaining baseline
- Emission goal and charges
  - The total emission cap
  - The level of the CO_2-charge
- The distribution of funds
  - Fund governance
  - Execution agencies
- Establishment of the Board

28 To enable rapid start-up and cost effective scaling up of the mitigation activities a phased approach is proposed. It is noted that the collection services could be implemented before the fund disbursement framework and processes are completely finalized.

29 Two implementation phases are proposed:

- Phase 1 to start in 2008 with voluntary fuel reporting for all ships of [400 grt] and above (no charges in place).
- Phase 2 to start in 2009 and apply to ships of [400 grt] and above, for reporting and charges. Enforcement process implemented gradually in major [400] ports.

[9] Changing the portfolio weighting for offsetting/trading, industry improvements, and adaptation to climate change should be based both on the changing needs and past performance. Therefore they should be reviewed by the overseeing international bodies, from time to time.

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Annex

Working proposal

1 The working proposal is to set the global cap at a constant level till 2050 and equal to the emissions of 2005. For the CO_2-charge, we have used a unit emission charge of $10 per tonne of CO_2. This represents 40% of the market carbon price for the first four years of the scheme (assuming no changes to the forward carbon price of $25/t$CO_2$).

2 Our example is estimated to result in a shipping price increase at 3% translating to around 0.1% impact on end customer prices. According to our calculations, a charge of $10/t$CO_2$ would deliver the cap. The unit charge per tonne of CO_2 emitted should be set annually in advance in relation to the emissions above the cap and the CO_2 price trends.

3 The additional technical and operational industry improvements are estimated to reduce the emissions on average by 1% annually till 2050. Effectively, the emission growth would be reduced by half through programmes paid for by a portion of the funds raised.

4 Annual quantum of funding available for the three funds would be $3bn[10].

5 The environmental result of the scheme is estimated as follows (shown in Fig. 1)[11]:

.1 Emission avoidance due to industry improvements of:
7 $GtCO_2$ before 2050, and 21 $GtCO_2$ after 2050[12]

.2 Emission mitigation (offset) of:
8 $GtCO_2$ before 2050, and 10 $GtCO_2$ after 2050

.3 Total environmental benefit:
15 $GtCO_2$ before 2050, and 31 $GtCO_2$ after 2050

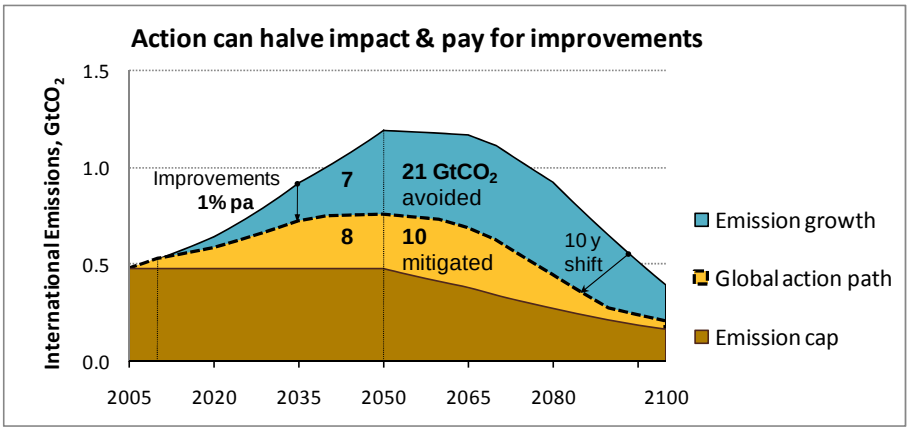

Fig. 1 - Environmental impact of the scheme.

[10] The $3bn annual funding is achieved when the scheme covers in excess of 2/3 of international maritime emissions, and assuming market price of $25/t$CO_2$.
[11] Achieved through balancing short- and long-term improvements and offset investments. Assumptions: cap set at the 2005 level and the emission growth forecast as validated in the separate quantification document.
[12] 1$GtCO_2$ – one Giga-tonne of CO2 equals one billion tonnes of CO2 (metric tonnes).