



# Centre for Transport Studies

S T O C K H O L M

## The financial implications of a Levy & GHG Fund

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### *Abstract*

This paper reviews the financial capabilities of a Levy on carbon dioxide emissions from international shipping as proposed in the International Maritime Organization (IMO) by Cyprus, Denmark, the Marshall Islands and Nigeria. The conclusion is that a relatively high levy would be required to create the resources needed for satisfying all four objectives brought forward by the proponents and in addition provide compensation to developing countries based on the principle of *no net incidence*. Choosing a low and stable rate would force the decision maker to forsake the task of offsetting any shipping emissions above a proposed (declining) cap, which would make the scheme less environmentally effective.

*Keywords:* Shipping, climate change, IMO, market-based measures



In recent years several different measures for curbing CO<sub>2</sub> emissions from international shipping have been discussed at the meetings of the International Maritime Organization's environment committee (MEPC). Among the proposals for a market-based measure (MBM) submitted to MEPC by the Parties, a proposal, originally by Denmark, on a levy on bunker fuel has gained growing support from other countries and the shipping industry. The revenues would be allocated to a Fund and used for buying emission credits in the international market to offset any emissions above a baseline or cap that would be gradually lowered over the years. The remaining part of the money would be used for other purposes related to greenhouse gas (GHG) abatement and adaptation.

There appear to be three main reasons for supporting the Levy and Fund concept:

- price predictability
- low transaction costs
- expectations about low cost (relative to other options)

The objective of this paper is, in light of the growing support for the Levy, to assess some practical aspects of this MBM, and in particular to review its financial capabilities. The assessment is based on a recent submission to IMO's MEPC greenhouse gas working group (GHG-WG 3/3/4) by Cyprus, Denmark, the Marshall Islands and Nigeria which, thanks to its legal form, provides additional clarity to the earlier submissions by the Parties on the GHG Levy and Fund.

### **The concept**

The idea to use the revenues of a levy on bunker fuels to buy carbon credits to the extent needed for offsetting any GHG emissions from international shipping above a cap could be seen as an innovative form of emissions trading aimed at keeping transaction costs low. According to GHG-WG 3/3/4, the liability will either be placed up-stream with the bunker fuel suppliers (Art. 6 Option A) or down-stream with the ship owners (Art. 6 Option B). In both cases, the liable entities would pay the GHG contribution to a Fund under the auspices of IMO. The administration of the Fund would use most of the revenue to buy emission credits in the international markets (currently from CDM-projects). This could be seen as an extreme up-stream allocation of responsibility as the Fund would buy credits on behalf of the entire shipping industry. If shipping emissions continue to grow while at the same time the cap is gradually lowered, the Fund might after some years become a dominating player in the global credit market.

The future of the international credit market is uncertain both with regard to supply and the risk of carbon leakage. No decision has yet been taken on the CDM mechanism post the Kyoto commitment period (2008-2012), and leakage will occur to the extent that the principal of "additionality" is not achieved in practice. However, this may also be a problem with an emissions trading scheme (ETS), especially if no limit is set on the amount of credits that may supplement the shipping emission allowances that would be sold on auction in that type of MBM.

The Levy will be graduated according to the fuel's carbon content (for fuels other than heavy fuel oil as a percentage of the GHG effect of each fuel compared to HFO). The levy may thus be likened to a tax on carbon emitted from fossil fuels. Relevant for the choice between Art. 6 options A and B are the risk of fraud (which may be greater with Option A) and difficulties for some Parties to allow a supra-national authority to collect taxes/charges on activities that take place on its territory. In Option B, it would effectively be ships paying an international duty on emissions caused by the combustion of fuel essentially on the high seas. Payment would in this case be made directly to an international agency (i.e. IMO) and not involve participation of national authorities.

The effectiveness of the Levy will depend on its rate and the size of the cap. Assuming that shipping emissions would be capped by the Parties at the same level regardless of whether the MBM is designed as a traditional ETS or as Levy and Fund there would be no difference between the two options in their general effectiveness. However, if the rate of the Levy differs from the price of carbon, the incentive provided to owners and operator of ships will differ between the two alternative schemes. A difference would also occur if the right to supplement allowances by emission credits is limited as is the case in the EU ETS.

According to Article 8 of the recent proposal, the revenues shall be allocated as follows:

1. [x] % of revenues to mitigation purposes under the UNFCCC in order to ensure that the prescribed reduction target is reached by calculating the appropriate CO<sub>2</sub> reduction equivalence.<sup>1</sup>
2. [x] % of revenues to adaptation projects under the UNFCCC ensuring that the Fund's contribution is duly recognized.
3. [x] % of revenues to R&D projects with the aim of reducing the shipping industry's CO<sub>2</sub> emissions.
4. [x] % of revenues to the Organization's Technical Cooperation Programme.

Article 7 makes clear that “the Parties shall decide on the size of the contribution every [4] years. The contribution shall be adjusted to ensure that sufficient revenues are available to ensure the purchase of necessary greenhouse gas offsets to reach the agreed reduction target.” This means that priority is given to the first of the four objectives of Art. 8. This makes sense as the main objective of the Fund is to keep shipping emissions below a certain threshold either directly or by offsetting any excess emissions. However, note that the shares laid down in Art. 8 are fixed in relation to each other. As a consequence, the amount of money available for tasks 2-4 will depend on the rate required for meeting objective 1.

### **How it may work in a short-term perspective**

The outcome of this formula can be illustrated by an example where the IMO's decision in, say, 2011 is to split the net revenue in four parts where tasks 1-4 get respectively 80, 15, 3 and 2 per cent, and where the Levy initially is set at USD 30 per ton HFO (approximately equivalent to USD 10 per ton CO<sub>2</sub>) and the emissions in 2020 are capped at 85 per cent of

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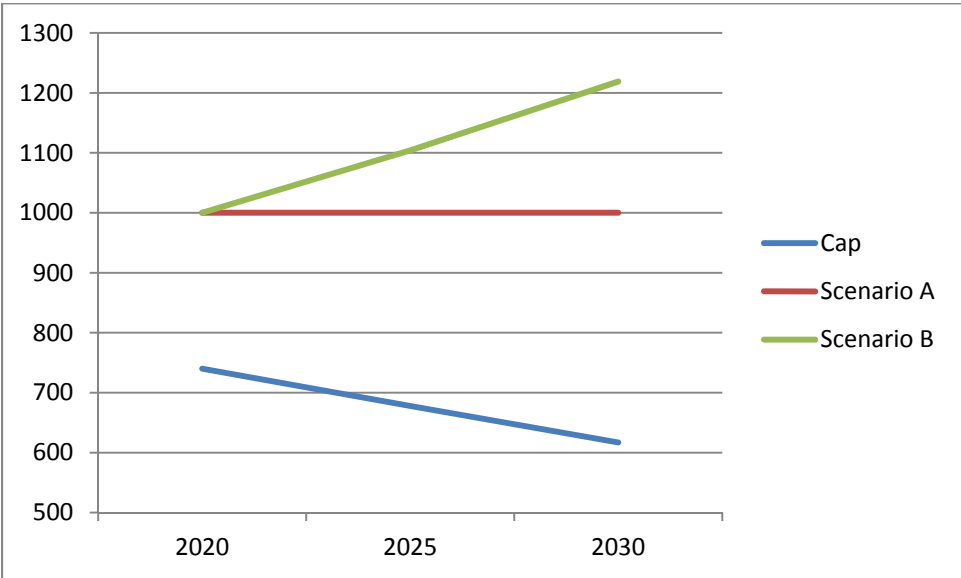
<sup>1</sup> This should be interpreted to mean that credits will be purchased to balance any emissions above the cap.

their 2007 level (figures that were mentioned in MEPC 60/4/8). Assuming that real emissions in that year amount to 1,000 Mt CO<sub>2</sub> (15% above the 2007 level) and that the average credit price is USD 30 per ton CO<sub>2</sub>, the revenues raised will be approximately USD 10,000 million and the cost of purchasing the credits will be USD 7,815 million<sup>2</sup>. Then approximately 2,200 million can be set aside for tasks 2-4, equal to 22 per cent of the gross proceeds in 2020 (rather than 20%).<sup>3</sup> In this case, the math works. However, in a situation where the price of credits is higher, tasks 2-4 would get less than the intended shares.

**More complicated in the longer term**

So what may happen post 2020? Suppose the decision is to lower the cap in a linear manner so that shipping emissions are cut in half between 2020 and 2050. This means that the cap is lowered gradually from 740 Mt in 2020 (85% of 2007) to 370 Mt in 2050. In 2025 the cap will be 678 Mt and in 2030 617 Mt. What happens next depends on the extent to which in-sector abatement measures are cheaper than out-of-sector measures (and on whether all low-hanging fruit in the shipping sector has been picked), which is currently very difficult to predict. Let’s assume two scenarios and that in both of them transportation by ship grows annually by 4 per cent. In Scenario A, the annual specific improvement in energy efficiency (or substitution of fossil fuels by other types of energy) is 4 per cent and in Scenario B it is 2 per cent per annum.

In Scenario A shipping emissions remain at the level of 2020 (i.e. 1,000 Mt based on the assumption above), while in Scenario B emissions grow to 1,104 Mt in 2025 and 1,219 Mt in 2030. Now, to make the math simple, let’s assume that the price of credits in both cases is USD 40 per ton in 2025 and USD 50 per ton CO<sub>2</sub> in 2030. The cap is, of course, the same, i.e. 678 and 617 Mt respectively. The difference between the two scenarios is displayed below.



<sup>2</sup> (1,000 – (0.85 x 870) x 30)

<sup>3</sup> The administrative cost, which may correspond to 1-2% of the turnover, is for the sake of simplicity disregarded in this example.

This results in the cap being exceeded in Scenario A by 322 Mt in 2025 and by 383 Mt in 2030, and in Scenario B by respectively 426 and 602 Mt. The cost in US dollars of buying credits in Scenario A will then be 12,880<sup>4</sup> in 2025 and 19,150<sup>5</sup>, in 2030, and in Scenario B 17,040 and 30,100. In all cases, the Levy will have to be set at 1.25 of the cost of the credits in order to maintain the way the proceeds should be divided among the four tasks as decided at the outset. Table 1 provides the required rates and Table 2 the amount of money that would be allocated to each of the four tasks.

Table 1. Required rate of the levy in different scenarios. USD per ton fuel (HFO).<sup>6</sup>

	<b>2025</b>	<b>2030</b>
Scenario A	48.3	71.8
Scenario B	57.9	92.6

Table 2. Allocation of funds in respectively 2025 and 2030. Million USD.

	<b>Required rate of the Levy</b>	<b>Amount of money allocated to different tasks, million USD/y</b>			
	USD/ton HFO	Task 1	Task 2	Task 3	Task 4
<b>2025</b>		Emission credits	Adaptation projects	R&D projects	IMO Technical Cooperation
Scenario A	48.3	12,880	1,932	386	258
Scenario B	57.9	17,040	2,556	511	341
<b>2030</b>					
Scenario A	71.8	19,150	2,873	575	383
Scenario B	92.6	30,100	4,515	903	602

It makes sense that a substantial amount of money can be allocated to Tasks 3 and 4 in Scenario B when shipping emissions continue to rise. The effect on Task 2 is more complicated. In the first place, “adaptation projects under the UNFCCC” could not be viewed as compensation to developing countries for the incidence of the scheme on their economies. AGF (2010) makes a clear distinction between transfers to compensate developing countries for incidence impacts and transfers to enable action on climate change.

<sup>4</sup> 322 x 40

<sup>5</sup> 383 x 50

<sup>6</sup> The rates in Table 1 were calculated by using the following formula: Cost/number of tons sold x 3 (for the weight difference between fuel and CO2) x 1.25 (to take account of tasks 2-4).

### **Little room for compensation based on no net incidence**

To be become politically acceptable to most developing countries, any market-based scheme aimed at shipping emissions would probably have to take account of the principle of *no net incidence* as defined by AGF. IMERS (imers.org), AFG (2010) and Faber et al (2010) have shown that short-term about one third of the proceeds of a globally applied levy or emissions trading scheme would suffice for compensation to all non-Annex I countries based on no net incidence. In the longer term these countries will become more affected as their share of world trade grows. On the other hand, some of them will over the years become so economically advanced that they should be regarded as developed countries.

Now suppose that Task 2 is altered to be focused on compensation based on no net incidence rather than adaptation. If so, the percentage allocated to this task must correspond to at least one third of the funds needed for buying credits. If account is also taken of the fact that some of the cost for measures taken on board ships will also fall on consumers in developing countries, an even higher percentage may be required. This would, in particular, be the case in a scenario when shipping emissions decline despite growing traffic.

### **Make your own sensitivity analysis**

The author of this memo clearly does not know what the future may bring in terms of emissions and costs. The reader is invited to use the formulas to present results based on differing assumptions. In this context, it may be worth noting that the levy would have to be higher in the case of low fuel prices than in a situation with high prices.

### **Need for flexibility compromises price predictability**

There is no easy way out of the dilemma of not knowing in advance the values of key parameters. Maybe the best solution is to allow a committee of independent experts to take annual decisions on the rate required for raising the funds needed for the four tasks, and without fixing the shares in advance. It should be sufficient to instruct the committee to set the rate so that the proceeds cover the cost of offsetting any emissions above the cap and the cost of compensating developing countries based on no net incidence (clearly defined), and in addition some minimal contributions towards Tasks 3 and 4.

### **Consolidation based on a high initial rate**

Another option might be to decide on a rather high initial rate of the levy and to allow the organization to save part of the money for future use. By consolidation, there would always be funds available to satisfy the four tasks, and if set too high, the Assembly could after some years decide to lower the rate to a level that is better in line with the needs. Setting the levy high would also be the only way to provide price and investor certainty while being sure to be able to honor all objectives.

### **Levy without a cap**

The main reasons for supporting the Levy and Fund concept appear to be expectations about low cost, good price predictability and a limited administrative burden. Some proponents, thus, may disagree with the idea of setting a high initial rate to be on the safe side, and others

may dislike the option of leaving it to an expert group to adjust the rate when needed. Faced with this dilemma, they may favor a Levy and Fund which does not offset all excess emissions. The scheme then becomes much less complicated.

In a case without a cap, 50 per cent of the net revenue could be reserved for compensation based on no net incidence. The actual share that would have to be used for this purpose will change over time to reflect the amount of seaborne trade that is carried out on behalf of customers in countries that are entitled to compensation. The amount needed would depend on how the Common but Differentiated Responsibility (CBDR) for GHG emission abatement in the shipping sector is designed. The basic choice is between distinct categories (Annex I or non-Annex I) and parametric values such as CO<sub>2</sub>/capita and GDP/capita. Another main issue is the duration of the compensation rules. Some non-Annex I countries have already passed the least developed Annex I countries in terms of GDP per capita and/or emissions per capita (Kågeson, 2011). Thus flexibility appears to be needed.

The remaining 50 per cent of the net proceeds could be divided up between other worthy causes related to climate change mitigation and adaptation. The third and fourth tasks proposed by Cyprus et al (GHG-WG 3/3/4) are aimed at in-sector technological development and may require more support in a case where shipping emissions are not capped. Some money may be allocated to purchasing emission credits also in the absence of a cap. However, that part of the proceeds may not suffice to offset all emissions above an imaginary cap. In a case where compensating developing countries requires less than 50 per cent of the money, the surplus could be dedicated to either the procurement of additional emission credits or to adaptation measures in developing countries.

## Conclusions

The conclusion, thus, is that the only way for a GHG Fund to honour all objectives proposed by Cyprus et al, and in addition be capable of compensating the developing countries for the effect on their economies (based on no net incidence), would be to set the rate of the Levy high. Alternatively, one would have to forsake the emissions cap, which makes the scheme less environmentally effective. Disregarding the CBDR principle would make it difficult to attract support from developing countries. IMO could in principle adopt the scheme by majority vote but this would be provocative if those voting against represent a majority of the citizens of the world. India and China alone make up close to 40 per cent of the global population.

A traditional form of emissions trading with all allowances being auctioned, would, by comparison, raise enough money to allow compensation based on no net incidence. This would also be the case in a scenario where shipping emissions grow to twice the level of the cap (taking into account the net incidence of buying allowances and supplementary credits, and undertaking in-sector abatement measures). However, if shipping emissions were this high, not much money would be left for other related tasks.



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