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# Raising Climate Finance from International Transport Sectors

Identification and Analysis of  
Governance Structures

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## **RAISING CLIMATE FINANCE FROM INTERNATIONAL TRANSPORT SECTORS: IDENTIFICATION AND ANALYSIS OF GOVERNANCE STRUCTURES**

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The paper is available from: <http://www.climatestrategies.org/research/our-reports/category/72.html>

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# Raising Climate Finance from International Transport Sectors

## Identification and Analysis of Governance Structures

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## Executive Summary

Greenhouse Gas (GHG) emissions from international transport need to be addressed. GHG emissions from international aviation and maritime transport accounted for approximately 5% of global anthropogenic emissions in 2005 and are rising rapidly (UNEP 2011). There is a clear need to address these emissions in order not to undermine policies for mitigating land based emissions. One of the ways of doing so would be through market based instruments (MBIs) – cap-and-trade schemes or taxes. Since these sectors are regulated internationally, and since emissions are from mobile sources, the best level for any instrument would be global. At the same time, any instrument would have to comply with the principle of common but differentiated responsibilities (CBDR) in order to find broad acceptance among developing countries.

The most effective way to achieve this is through a universally applied market-based instrument that satisfies the principle of common but differentiated responsibilities through differentiated use of revenues. An MBI that is not universally applied would result in avoidance and undermine its environmental effectiveness. It is possible to merge universal application of obligations on shipping companies and airlines with differentiated treatment of states. A share of the revenues of an MBI can be used to ensure that the instrument has no net incidence on developing countries.

MBIs in international transport may provide new sources of climate finance for developing countries. Developing countries need financial support to carry out climate policies, both adaptation and mitigation. The UN Framework Convention on Climate Change (UNFCCC) makes policies by developing countries conditional on climate finance. In the current economic and financial circumstances, there is a need for new sources of finance. Market based instruments in international transport have been highlighted as one of the sources (AGF, 2010; World Bank 2011).

The purpose of this report is to analyse governance structures of MBIs for international transport that are effective in reducing emissions and politically feasible. The effectiveness of the MBI is determined to a large extent by the scope of application. Universal application limits the possibilities for avoidance and thus maximises the environmental effectiveness. The political feasibility depends on several factors:

- The MBI should be in line with the principle of CBDR through the differentiated use of revenues;
- The MBI should not resemble an international tax, the concept of which is opposed by many states because it would infringe their sovereignty;
- The MBI should not involve direct funding of an international organisation, which is also opposed on the same grounds;
- The MBI should not rely on earmarking of national fiscal revenue, which is opposed in many states since it reduces the allocative efficiency of the tax/benefit system;
- The MBI should make maximum use of existing or proposed governance structures in order to minimise the administrative burden.

We find that the governance structure needs to comprise of several elements in order to meet these criteria.

A universally applied MBI can be governed through existing IMO structures. A new IMO convention can establish an MBI for shipping. While the cap-and-trade scheme or levy would be universally applied to ensure the effectiveness of the MBI, the convention should have a clear provision on ensuring no net incidence on developing countries.

The MBI can either be a cap-and-trade scheme or a levy. While the levy-based proposals currently being discussed in IMO have several provisions to distinguish them from an international tax, a cap-and-trade scheme has a smaller chance of being regarded as a tax. After all, in contrast to taxes, cap-and-trade schemes do not entail an obligatory payment to a fiscal authority. Moreover, the allowances are tradable assets, in contrast to tax obligations.

The net incidence on developing countries can be counteracted by transferring a share of the allowances or revenues to affected developing countries. By transferring allowances to developing countries, these countries would have ownership of these allowances generate revenues by

auctioning them. This way, the objection against direct funding of an international organisation is overcome. Developing countries could sell or auction allowances, or appoint a trustee to organise the auction on their behalf. Since the net incidence is related to the price of the allowances, auctioning by developing countries would ensure a complete reimbursement of the impact. A levy-based MBI could reduce the incidence on developing countries by transferring levy-revenues to them, e.g. through the Rebate Mechanism.

The remaining allowances or revenues would be fit for climate finance. Since the remaining revenues would not generate a net incidence on developing countries, they can be considered to be a contribution from developed countries.

The allowances or revenues can be transferred to the Green Climate Fund. A central fund is needed to ensure that climate finance is adequate and predictable, and that developing countries have equal access to it. By transferring allowances to the Fund rather than money, and having the Fund auction them, objections against direct funding of an international organisation can be countered.

The Green Climate Fund would disburse funds to developing countries. As is the case with other sources of climate finance, the GCF would fund projects or programmes in the field of adaptation or mitigation in developing countries

A share of the allowances or revenues can be used to finance fuel-efficiency improvements in international transport. While the MBI itself would provide a powerful incentive to improve fuel-efficiency, some of the revenues could be used to overcome barriers to development of technology, diffusion of innovation or other means of improving fuel efficiency. Funding could be especially relevant for measures that involve co-ordination between actors and where there may be a split incentive.

## 1. Introduction

Greenhouse gas emissions from aviation and maritime transport account for approximately 5% of total anthropogenic emissions and they are rising rapidly (UNEP 2011). Being a significant source, they should be included in any future climate agreement. Yet this has proven to be a difficult issue. While the Kyoto Protocol instructs Annex I countries to pursue limitation or reduction of emissions from bunker fuels, working through IMO and ICAO, little progress has been made towards the reduction of these emissions within these bodies.

However, there is a renewed interest in climate policies for aviation and maritime transport for three reasons:

- The effectiveness of global GHG mitigation efforts would be improved if these sectors were included. Continuation of the current situation where these sectors are not included in emissions reductions targets would undermine the overall effectiveness of a future climate agreement.
- These sectors could be sources for new and additional climate finance. In most countries, aviation and maritime transport are currently exempt from many taxes, including fuel tax, however they could provide for an efficient mechanism for generating revenue to fund climate actions in developing countries.
- In the general debate on the architecture of a future agreement, proposals have been made for sectoral approaches. Since aviation and maritime transport are largely governed in a sectoral way and have, for example, specialised sectoral UN agencies, they seem to be ideally suited to demonstrate the viability of a sectoral approach (although the distinct nature of these sectors also means that if a sectoral approach is feasible here, it need not be feasible in other sectors).

The main reason why it has been difficult to agree on the inclusion of international transport in climate policy in the past is the difference in principles of governance of climate policy on the one hand and international transport policy on the other (CE Delft 2008; Kågeson 2011). Policies in international transport, as set by the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) are based on equal treatment of all ships and aircraft, regardless of their nationality. One of the reasons for this is that ships and aircrafts are mobile, and for maritime transport, that ships can change their country of registration in a simple administrative procedure. As a result, regulation that discriminates between flags could be easily avoided.

In contrast, the Framework Convention on Climate Change (UNFCCC) builds on the principle of Common but Differentiated Responsibilities and calls for developed country Parties to take lead in combating climate change. In the Kyoto protocol to the UNFCCC, this principle has been implemented by requiring Annex I countries to limit or reduce their GHG emissions while non-Annex I countries need not do so. The reasons for this differentiation are the historical responsibility of developed countries and the link between GHG emissions and development.

Simply applying this principle to shipping or aviation, e.g. by specifying that ships flying an Annex I flag would have to reduce their emissions while other ships do not, would be ineffectual as ships can easily change flag (CE Delft 2008).

There have been various proposals to bridge the gap between the principles. One is to allocate emissions of international transport to countries, which would have to limit or reduce them in accordance with their general climate policy commitments (CE Delft et al., 2006). Another is to design market based climate policy instruments for international transport sectors that apply indiscriminately to aircraft and ships, and to offset the impacts on developing countries through a differentiated use of revenues. This idea has been developed by several authors (e.g. Müller and Hepburn 2006; Stochniol 2009; Stochniol 2012). An advantage of this idea is that a share of the revenues can be used as climate finance. Therefore, this report is based on universal application of a climate policy instrument in shipping and aviation and differentiated use of revenues.

This report aims to develop the proposal of an indiscriminately applied market based instrument with differentiated use of revenues further by focussing on its governance. This poses significant obstacles since it has to meet seemingly conflicting criteria for political acceptability:

- As a climate policy instrument, it has to respect the principles of the UNFCCC and meet the criteria developed in the current climate negotiations. While there are many principles, two have been especially prominent in the debate. The first is the overarching goal to 'stabilis[e] greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system' (UNFCCC Art. 2), or, as specified in the Copenhagen Accord, limit the increase in global temperature to two degrees centigrade. The second is that policies should be in accordance with the 'common but differentiated responsibilities and respective capabilities' of countries and that developed country Parties should take lead in combating climate change (UNFCCC Art. 3.1). The convention further asks developed country Parties to provide new and additional financial resources to developing country Parties to cover fully agreed incremental costs of climate actions (UNFCCC Art 4.3) with Article 4.7 further pointing out that developing country commitments will depend on the financial resources transferred from the developed countries.
- As a policy instrument for international transport sectors, it has to follow the principles and governance practices dealing with these sectors. While there are differences between aviation and maritime transport, both sectors in general have rules that all ships or aircraft have to meet, regardless of their nationality. In several cases, regional differentiation of policies has been implemented, albeit on a non-discriminatory basis. And in some cases, ships or aircraft from developing countries have been given more time to implement a measure.
- As a revenue raising scheme, it has to meet two apparently contradictory demands. First, if the revenues are collected by an international body, the scheme should not be an international tax, as international taxes are opposed by many countries. Second, if the revenues are collected by national states, the collection should be co-ordinated amongst states and the revenues earmarked to be used for the purposes of the scheme. Some states have severe objections against earmarking revenues.

While the new instrument will be agreeable only if it is based on all principles and meet most of the criteria, if not all, this is not necessarily the case for each element of the new instrument. Indeed, one basic element of the general idea is that the apparently contradictory principles of non-discrimination and CBDR could be met by uniformly applying (universal application) a revenue raising instrument but discriminating in the use of the revenues (selective disbursement) so that there is no net incidence on developing countries. As stated above, this report continues along this avenue.

The objective of this report is therefore to analyse possible governance structures of a market based climate policy instrument for international transport that complies with the principles of CBDR, non-discrimination, is effective and raises revenue for climate finance. The report does not intend to develop a blueprint for such a scheme, but rather to identify the advantages and disadvantages of several design options. In this report, governance is defined as 'the use of institutions, structures of authority and collaboration to allocate resources and coordinate or control activity in society'<sup>1</sup>. The main focus of the report is on the maritime sector.

The general scheme has several elements, each of which may have a different governance structure, based on different principles and meeting different sets of criteria. The elements are:

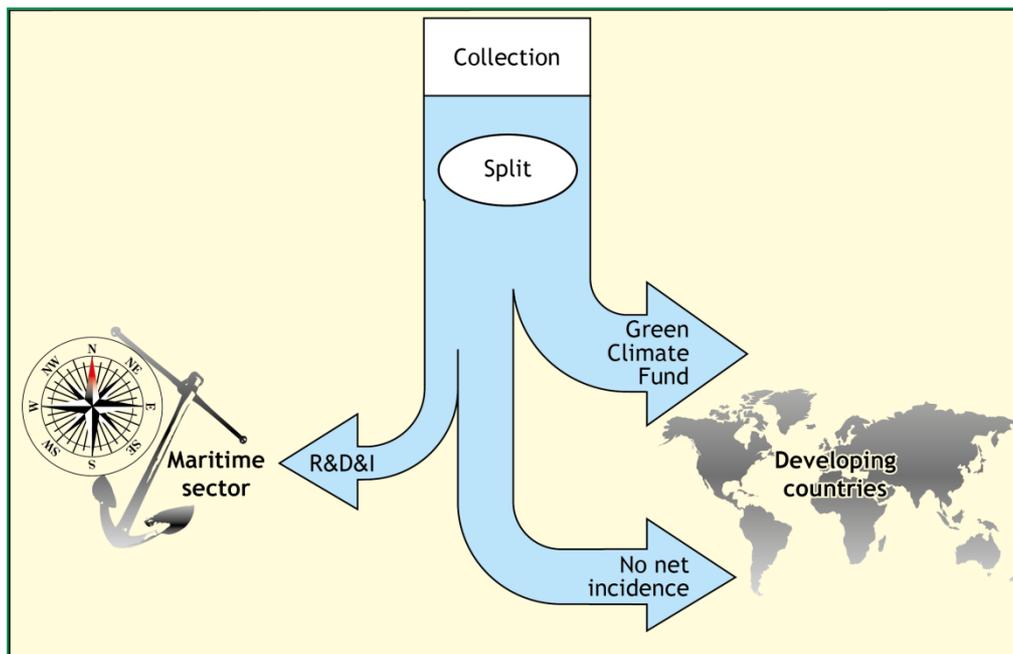
- **The market based instrument that addresses GHG emissions from international transport** while raising revenues from these sectors and disbursing a share to developing countries to ensure the instrument has no net incidence on them;
- **Administration and disbursement of the generated revenue:** The division of the revenues over two causes: climate finance for developing countries; R&D for efficient technologies in the

<sup>1</sup> Adapted from Bell, Stephen, 2002. Economic Governance and Institutional Dynamics, Oxford University Press, Melbourne, Australia

sector including innovation and technology transfer so as to ensure long-term transition in the sector and willingness of all actors in the sector to contribute;

- **Use of the revenues for the purpose of climate finance and efficiency improvement.**

**Figure 1 presents an overview of the scheme.**



Subsequent chapters analyse the governance of separate elements of the scheme. Chapter 2 analyses the choice of the market based instrument to address GHG emissions from international transport, the governance of the climate policy instrument and the collection of the funds, based on the current governance structure of environmental policy in international transport. Chapter 0 analyses how, by whom and on what basis the revenues are to be divided over the three main causes. The use of the revenues for reimbursement of costs, climate finance and fuel efficiency improvements is discussed in Chapter 4. Chapter 5 concludes.

## 2. A Universally Applied MBI

### 2.1 Introduction

This chapter analyses the MBI that will:

- address GHG emissions in international transport; and
- raise revenue for climate finance.

The MBI needs to be effective and politically acceptable. Section 2.2 analyses the implications of the effectiveness while Section 2.3 elaborates criteria for political acceptability. Section 2.4 briefly describes how international transport sectors are currently governed. The various proposals for MBIs are introduced in Section 2.5. Section 2.6 evaluates the proposals for MBIs in the maritime sector, which are furthest developed, on the basis of the criteria developed in Section 2.3. Section 2.7 concludes.

### 2.2 Effectiveness criteria

The effectiveness of an MBI for maritime transport depends on the amount of emissions within the scope of the scheme, the possibilities and incentives for avoiding the scheme, and the stringency of the target. This section will focus on the first two factors because the third depends on the overall climate target (e.g. 2°C above pre-industrial times) and on the division of the emissions over various sectors, which is beyond the scope of this report.

The amount of emissions is determined by the scope of the MBI. The larger the amount of emissions in the system, the more emissions can be abated. The fewer exceptions, the fewer possibilities exist to avoid the MBI and thus reduce its environmental effectiveness. Hence, from an environmental effectiveness perspective, the MBI should ideally include all emissions from all ships or aircraft worldwide. However, there may be reasons to exclude some emissions. This section discusses the impacts of various ways to exclude emissions on the environmental effectiveness.

For shipping companies, it is relatively easy to change the flag of their ship. It is an administrative procedure that can take place at any time, even when the ship is at sea. Changing flag is quite common and can occur for many different reasons (Cariou and Wolff, 2010). Because ships can change their flag easily, an instrument that would impose a higher burden on ships from developed countries than on ships registered in developing countries would lead to changes of flag, thus relocating emissions rather than reducing them. The same holds for an instrument that would impose a higher burden on ships owned by legal or natural persons registered in Annex I countries, since a ship owner can be just a legal entity with a PO box and can be easily incorporated in any country (Stopford 2009).

Hence, the only way in which a climate policy for shipping can be effective in reducing greenhouse gas emissions is by being implemented in a **flag-neutral way**, i.e. applying to all ships regardless of their registry or their ownership<sup>2</sup>. All other ways would lead to relocation of emissions rather than reduction. This means, however, that the application of the policy instrument does not comply with the CBDR principle. As a consequence, other elements of the scheme, notably compensation, have to ensure that the overall scheme meets this principle.

In shipping, limiting the scope geographically to certain routes also opens up the potential for avoidance, albeit to a lesser extent than flags. The reason is that the cargo needs to be delivered in a

<sup>2</sup> The only way in which a climate policy for shipping could differentiate between Annex I and non Annex I countries immediately is by introducing a differentiation on a geographical basis, e.g. on routes or on emissions in certain sea areas (CE Delft et al., 2006). In a similar way, the IMO has implemented emission control areas where all ships, regardless of their flag, need to comply with certain air pollutant emission standards. A similar way would be to exempt certain routes from a scheme, again in a flag neutral way.

A route or area based differentiation could still lead to evasion, depending on how it is implemented (CE Delft et al., 2009). However, the extent to which this leads to a relocation of emissions rather than a reduction is smaller.

port near the final destination. There are two ways to avoid a geographically limited scheme. One is to offload the cargo in a port of a state outside the geographical scope and use another transport mode to bring it to the final destination. The other is to change routes in order to limit emissions in the geographical scope. So in the case where ports of parties to the MBI are close to ports of non-Parties, avoidance may occur, but as long as the Parties are a geographical block, the impact of this is likely to be small. The second way to avoid a geographically limited system may have a larger impact. It depends to some extent on the definition of a route. If routes are simply defined by two port calls, an additional port call could be added to a voyage that would normally have been sailed without interruption in order to limit the emissions under the scheme. Although making an additional call entails costs like expenditures for harbour dues and opportunity costs for time lost, it could still be profitable on many routes (CE et al., 2009). However, if routes are defined as the distance from the port of lading to the port of destination, emissions under the scheme can only be reduced by transshipping the cargo. This would considerably increase the costs of avoidance for bulk shipping, as transshipment is time-consuming. However, the concept of a port of lading makes little sense for some kinds of shipping such as container transport.

One could imagine excluding certain ship types such as research vessels. As long as these vessels have a small amount of emissions and don't compete with other vessel types, this would not have a large impact on the scheme. Hence, cargo ships cannot be excluded, as they account for a large share of emissions and different cargo ship types compete to some extent with each other. Excluding all non-cargo ships would reduce the amount of emissions under the scheme by 16% (CE Delft et al., 2010). Excluding research, patrol and rescue vessels would reduce emissions under the scope of the scheme by less than 1% (Buhaug et al., 2009).

A size threshold could be introduced for two reasons. First, if there are many small vessels which collectively have fewer emissions than large vessels, having a size threshold would reduce the number of ships more than the amount of emissions. This would limit the administrative burden. However, if ships over and below the threshold operate in the same market, a threshold could distort the market. Moreover, since small ships are generally less fuel efficient than larger ships, a size threshold could at the margin have an environmentally perverse effect by shifting cargo from larger to smaller ships. Furthermore, as long as there are no other instruments to limit international maritime emissions, exclusion rules should be designed carefully, as small ships also compete with other transport modes

To summarise, the scope of the MBI should ideally be global and cover CO<sub>2</sub> emissions of all ships and aircraft above a certain size threshold. A global scheme would be more environmentally effective since it would cover all shipping emissions. Moreover, it would not suffer from avoidance and avoid thus distortion in competition.

## 2.3 Political acceptability criteria

The MBI that addresses the emissions of the international transport sector and generates funds for climate finance has a complex nature, which is relevant for its political acceptability. We find that there are four aspects that are especially relevant:

- The MBI is a climate policy instrument;
- The MBI raises revenue;
- The MBI contributes to climate finance;
- The MBI should be feasible to implement.

Below, we identify ten criteria that would contribute to the political acceptability of the MBI.

Criteria stemming from the fact that the MBI is a climate policy instrument:

1. Climate policy instruments for international transport should be effective in limiting or reducing emissions from aviation and maritime transport.
2. Climate policy instruments for international transport should, to the extent possible, conform to the way in which these sectors are usually regulated under ICAO or IMO. (In the Kyoto Protocol Article 2.2 calls for developed country Parties to pursue limitation or reduction of emissions of greenhouse gases from aviation and marine bunker fuels, working through the

International Civil Aviation Organization and the International Maritime Organization, respectively. However, the Protocol does not clearly state whether ICAO or IMO will be acting as an advisory body or a policy-forming and implementing body of policies and instruments;

3. As climate policy instruments they should take the principle of CBDR into account (UNFCCC Art 3.1).

Criteria stemming from the fact that the MBI would raise revenue:

4. The MBI should not resemble an international tax, the concept of which is opposed by many states because it would infringe their sovereignty;
5. The MBI should not involve direct funding of an international organisation, which is also opposed on the same grounds;
6. The MBI should not rely on earmarking of national fiscal revenue, which is opposed in many states since it reduces the allocative efficiency of the tax/benefit system;

Criteria stemming from the fact that some of the revenue would be used for climate finance:

7. in conformity with UNFCCC art 4.3 and 4.7, the revenue should be new and additional;
8. together with other revenue streams, it should be predictable;
9. together with other revenue streams, it should be adequate.

Criteria for the feasibility of implementation

10. The MBI should make maximum use of existing or proposed governance structures.

#### **Box 1: Objections against international taxation.**

International taxation is often opposed on the ground that it compromises the sovereignty of states. Ring (2008) has analysed the meaning of the term 'sovereignty' in the debates on international taxation. She finds that sovereignty is related to significant functional roles played by a nation-state (revenue and fiscal policy) and to important normative governance values (accountability and democratic legitimacy). A loss of sovereignty can then mean:

1. a loss of taxing powers that enable the state to raise revenues to fulfil its obligations to its citizens;  
or
2. a loss of decision-making powers linked to the local, democratic, political process

It can be argued that since GHG emissions from international bunker fuels are currently not taxed, nor are other revenues derived from them (with the exception of a share of aviation emissions included in the EU ETS), the first point is not less important than the latter. This has an implication for the governance structure. Primarily, it has to ensure that national decisions and preferences can be voiced and can be used to influence decisions on the allocation of revenues.

## **2.4 Governance of international transport modes**

Standards and regulations for ships and aircraft engaged in international transport are set by the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) respectively. Though there are differences in how these organisations set rules, there are also common aspects. These are that rules are laid down in conventions that need to be ratified by a sufficiently large number of countries (the actual number may vary, while in shipping the ratifying countries also need to have at least a certain share of the world fleet in their register). Once the conventions enter into force, they apply to all aircraft and all ships.

Thus, in maritime transport, non-discriminatory treatment of ships is a central principle in regulation of environmental, safety, and other aspects. When a certain convention enters into force, all parties to that convention have the obligation to ensure that ships flying their flag comply, regardless of where they sail. Simultaneously, all parties have the right to inspect ships in their ports for compliance, regardless of the flag they fly. This enforcement regime of flag state obligations and port state rights ensures that the vast majority of ships engaged in international transport comply with

legislation (Stopford, 2009). For aircraft, the situation is similar, as all aircraft have to comply with the environmental standards set by ICAO, e.g. on engine emissions.

## 2.5 Policy proposals

The MEPC is currently considering nine proposals for market-based instruments to address the climate impact of shipping, including three variants of an emissions trading scheme<sup>3</sup>. Of these, proposals, four will raise significant revenue when implemented. These are:

- The International Fund for Greenhouse Gas emissions from ships (GHG Fund)
- The Port State Levy (PSL)
- The Global Emission Trading System for International Shipping (ETS)
- The Rebate Mechanism for a market-based instrument for international shipping (RM)

Each one will be described below.

### 2.5.1 International Fund for Greenhouse Gas emissions from ships

The International Fund for Greenhouse Gas emissions from ships (GHG Fund) collects revenues and uses these to offset GHG emissions of the shipping sector above a certain target line.

The GHG Fund collects contributions paid by either fuel suppliers or ship owners, based on the amount of bunkers sold or bought, to the International GHG Fund. Payment of the contribution is obligatory for all fuel suppliers or ships. The fund is administrated by the GHG Fund Administrator, which acts on behalf of the Parties to the convention that will implement the system. The Administrator will allocate the revenues according to the Parties' decisions.

Allocation of revenues should ensure that emissions above the target line are offset. To that end, a share of the revenues will be used to buy offsets. Fixed shares of the remainder will be used for adaptation projects; R&D projects aiming to reduce shipping CO<sub>2</sub> emissions; and technical co-operation under the UNFCCC (GHG-WG 3/3/4).

The proposal of the GHG Fund has been submitted by Cyprus, Denmark, the Marshall Islands, Nigeria and the International Parcel Tanker Association (IPTA) (MEPC 60/4/8).

### 2.5.2 Port State Levy

The Port State Levy requires Port States to levy a uniform emissions charge on all vessels calling at their respective ports based on the amount of fuel consumed by the respective vessel on that voyage.

The rate of the PSL (that is; the amount paid per tonne of fuel) would determine the extent to which an incentive would be created to reduce emissions from international shipping, as the number of cost-effective emissions reduction opportunities for international shipping would be higher if emissions attract a carbon price. The proposal does not describe a method to set the rate.

The proposal endorses the plan to use the funds raised for mitigation and adaptation measures to aid countries such as SIDS. It does not, however, set out a governance structure. From the way the PSL is described, it is clear that the charge will be levied by states, who then can use the revenues as they see fit.

The PSL proposal has been submitted by Jamaica (MEPC 60/4/40).

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<sup>3</sup> The GHG Fund (Denmark, Cyprus et al.), ETS (three proposals, Norway, Germany, France, UK), the Ship Efficiency Credit Trading scheme (United States), a mandatory improvement of a ship's efficiency (Bahamas), the Efficiency Incentive Scheme (Japan and World Shipping Council), Port State Levy (Jamaica), Rebate Mechanism (IUCN).

### 2.5.3 Emissions Trading Scheme for Shipping

The Emissions Trading Scheme for Shipping (ETS) would set a sector-wide cap on net emissions from international shipping and establish a trading mechanism to facilitate the necessary emission reductions, be they in-sector or out-of-sector. The use of out-of-sector credits allows for further growth of the shipping sector beyond the cap. In addition the auction revenue would be used to provide for adaptation and mitigation (additional emission reductions) through UNFCCC processes and R&D of clean technologies within the maritime sector. A number of allowances (Ship Emission Units) corresponding to the cap would be released into the market each year. It is proposed that the units would be released via a global auctioning process. Ships would be required to surrender one Ship Emission Unit, or one recognized out-of-sector allowance or one recognized out-of-sector project credit, for each tonne of CO<sub>2</sub> they emit.

The emission allowances would be auctioned (sold), and put on the market by an international entity established by the instrument. A Fund would be established by the auctioning of emission allowances. Since the quotas would be put on the market by an international entity, revenues would go directly to that entity. The GHG Fund would be administered by the International entity which would be under the control of the Parties to the system. The GHG Fund can be used for climate change mitigation and adaptation purposes in developing countries as well as technical cooperation activities.

The proposals for an ETS have been submitted by Norway, France and Germany.

The UK has proposed an ETS that differs from the Norwegian proposal in one important governance aspect. The UK proposal suggests that allowances could be allocated to national governments for auctioning. Funds collected through national auctioning would remain with the government to which the auction allowance was initially allocated. The proposal mentions that funds may be used for a variety of purposes but do not specify what those would be. This means remaining proceeds would not be collected centrally and may hence not be used for the range of purposes set out in the Norwegian ETS proposal.

### 2.5.4 Rebate Mechanism

The Rebate Mechanism (RM) proposes that each ship pays a levy to a predetermined global bank in accordance with its emissions. The revenues are used for three purposes: adaptation to climate change in developing countries; reduction of emissions from deforestation and forest degradation (REDD+); and Technology R&D, transfer, and transformation in the shipping sector.

The proposal focuses on a mechanism to compensate developing countries for the financial impact of a MBM. A developing country's rebate would be calculated on the basis of their share of global costs of the MBM, using readily available data on a developing country's share of global imports by value as a proxy for that share (or another metric such as value-distance if data becomes available). The proposal indicates that, in principle, the Rebate Mechanism could be applied to any maritime MBM which generates revenue such as a levy or an ETS.

The proposal for a Rebate Mechanism has been submitted by the International Union for Conservation of Nature (IUCN).

## 2.6 Evaluation of maritime policy proposals

The proposals for maritime transport have been relatively well developed. This allows us to evaluate them using the criteria for effectiveness and political acceptability that have been outlined in sections 2.2 and 2.3.

All MBIs for shipping are proposed to be applied universally to all ships, although some allow for regional differentiation either by exempting certain routes (e.g. to and/or from remote island states) or by (implicitly) allowing states to set different rates for a levy (only for the Port State Levy). All would be agreed upon within IMO and based on existing IMO governance structures. A major difference between the proposals is related to their nature as international, revenue raising MBIs, viz.

how they steer clear of objections against international taxes and against hypothecation of national fiscal revenues. In this respect, the proposals have significant differences with regards to who raises the revenue and how. In some of the proposals, an international body collects the revenues whereas in others, states do so (see table 1). Also, some of the proposals are for a financial instrument (raising a levy or a contribution) whereas others are allowance based systems that raise revenues when the allowances are auctioned (see table 1). Hence, the proposals can be categorised in four categories:

**Table 1: Instrument type and level of collection of revenue raising MBIs**

	<b>Financial instrument</b>	<b>Allowance-based instrument</b>
<b>International collection or allowance distribution</b>	GHG Fund, Rebate Mechanism	ETS (Norway, France, Germany)
<b>National collection or allowance distribution</b>	Port State Levy	ETS (UK)

The GHG Fund, the rebate mechanism and the Norwegian, German and French version of an ETS all collect funds centrally. In these proposals, an administrator collects the funds (either directly or through auctioning allowances) under the authority of the Parties to a convention governing the instrument. Collectively, the Parties can specify how the funds are to be used.

Centralised collection of revenues would have several advantages:

- Since the revenues are collected by an organisation that has no other sources of revenues, there is no possibility to shift budgets and additionality of the funds can be easily ensured. This is an important criteria for climate finance.
- Since the revenues are centrally collected, one single organisation can decide on the use of the revenues so the use of the funds can be tailored to the purposes envisaged, without the need for co-ordinated spending.
- Attribution is easy and increases transparency and MRV ability (discussed in detail in next chapter)

The main disadvantage of centralised collection of funds is that it can be considered to be an international tax or direct funding of an international organisation. To many countries, international taxes are unacceptable. Moreover, the organisation will need a legal system to settle disputes which may be costly to develop and maintain as it would be unique.

The proposals have also discussed ways to lessen the resemblance to an international tax and thus increase their acceptability.

According to its proponents, the contribution to the GHG Fund differs from an international tax as it is intended mainly for one purpose, viz. to fund enough emission reductions outside the shipping sector to offset shipping emissions above the target. By implication, the level of the contribution is determined by the difference between the actual emissions from shipping and the emissions target, and by the price of offsets. Minor other purposes are funding of the organisation that administers the fund and R&D.

An ETS differs from a tax (and by implication also from an international tax) because:

- there is no obligation on the regulated entities (e.g. ships or shipping companies) to acquire allowances from the administration. They can as well acquire them from other companies and/or from project mechanisms. This implies that there is no obligatory transfer of money to the administration as is the case for a tax;
- the allowances, in contrast to a tax, have a value and are tradable. For the companies that own them, they are assets rather than liabilities.
- Income from selling or auctioning allowances is realised only when they are sold. This can be done by the organisation that administers ETS, as proposed by the proponents of this system, or further downstream, as indicated below. The latter option would imply that the

ETS creates value by creating scarcity of allowances, but that the revenues from this value creation are realised by other organisations.

Hence, the ETS can hardly be regarded an international tax. However, if the central organisation organises the auction, as proposed by Norway, France and Germany, an objection against the system could be that it constitutes direct funding of an international organisation.

If the funds are collected by states, as in the PSL or the UK version of an ETS, States can make a sovereign decision on their use. The main advantage of such a system would be that it cannot be regarded as an international tax. However, many states would object to the revenues being hypothecated for climate finance, because they object to hypothecation in general. Moreover it could be difficult to show that the funds spent by states on climate finance would be additional. In order for the funds to be recognised as additional, transparent reporting of the collection and use would be required. Without transparency, and with funds being assembled in the fiscal budget, it would be hard to demonstrate that the funds are additional.

In summary, there are four categories of revenue raising climate policy instruments for international maritime transport. They differ in who collects the revenues (states or other organisations) and the way in which they are raised (by financial transfers or by selling allowances). All categories have drawbacks: national collection of revenues would need hypothecation, co-ordination between states and elaborate reporting in order to be acceptable as climate finance. International collection may resemble an international tax. Since an ETS is clearly not a tax, the objections against an international ETS may be less than that against any of the other categories. An ETS offers additional flexibility because the organisation that creates value of the allowances need not be the same organisation that collects the funds. This will be explored further in subsequent chapters.

Based on the analysis above, and on the description of the instruments in Section 2.5, Table 1 presents a summary of the evaluation.

**Table 2: Assessment of the political acceptability of universally applied MBIs for shipping**

Criteria	PSL	GHG Fund	ETS (global auction)	ETS (national auction)	Rebate Mechanism
Effective in reducing emissions	Yes, depending on the level of the levy and the number of states imposing it	Yes, depending on the target	Yes, depending on the cap	Yes, depending on the cap	Yes, depending on the target
Conform with current IMO governance	Yes, universal application, enforcement relies on port state control	Yes, universal application, enforcement relies on flag state obligations and port state rights	Yes, universal application, enforcement relies on flag state obligations and port state rights	Yes, universal application, enforcement relies on flag state obligations and port state rights	Yes, universal application, enforcement relies on flag state obligations and port state rights
CBDR provisions	States can determine the level of the levy. Thus, in setting the rate, states could take their level of development and historical responsibility into account.	A share of the revenues is used to buy offsets, a share of which originates in developing countries. Other shares are used for adaptation in developing countries, and technical co-operation.	Yes if a share of the revenues from the auction is used to ensure no net incidence on developing countries as proposed by Germany and France in MEPC 62/5/15 and MEPC 62/5/34.	The UK proposal does not contain provisions to ensure compliance with CBDR.	A share of the revenues would be used to ensure no net incidence on developing countries.

Criteria	PSL	GHG Fund	ETS (global auction)	ETS (national auction)	Rebate Mechanism
Not an international tax	No, it is a national levy	There would be centralised collection of contributions by the collecting organisation, but it would be restricted in the ways to use the revenue	No, an ETS is not a tax	No, an ETS is not a tax	There would be centralised collection of contributions, but the collecting organisation, but it would be restricted in the ways to use the revenue
No direct funding of an international organisation	No, it is a national levy	There would be direct funding of the collecting organisation, but it would be restricted in the ways to use the revenue	Since the administering organisation would auction the allowances, it would have a direct source of funding	No, governments would auction allowances	There would be direct funding of the collecting organisation, but it would be restricted in the ways to use the revenue
Not rely on hypothecation of national fiscal revenue	Yes, it would need to rely on hypothecation in order to contribute to climate finance	No, since the revenue would be raised on a global level there is no need for national hypothecation	No, since the revenue would be raised on a global level there is no need for national hypothecation	Yes, it would need to rely on hypothecation in order to contribute to climate finance	No, since the revenue would be raised on a global level there is no need for national hypothecation
New and additional source of finance	A new source. The additionality depends on budget decisions of states collecting the levy.	Yes	Yes	A new source. The additionality depends on budget decisions of states collecting the levy.	Yes
Contribute to predictability	Maritime transport and fuel use are volatile	Maritime transport and fuel use are volatile; price of offsets is also volatile	Maritime transport and fuel use are volatile; allowance prices are also volatile	Maritime transport and fuel use are volatile; allowance prices are also volatile	Maritime transport and fuel use are volatile
Contribute to adequacy	Yes	Yes	Yes	Yes	Yes
Use existing governance structures	Enforcement and governance can be based on existing structures; new fiscal arrangements may be needed.	Enforcement and governance can be based on existing structures; a new organisation administering the MBI would be needed.	Enforcement and governance can be based on existing structures; a new organisation administering the MBI would be needed.	Enforcement and governance can be based on existing structures; a new organisation administering the MBI would be needed.	Enforcement and governance can be based on existing structures; a new organisation administering the MBI would be needed.

Table 2 shows that the main differences of political acceptability are related to the criteria of compliance with CBDR, international taxation, direct funding of an international organisation and hypothecation of revenues. All proposals in their current form give rise to one or more objections:

- The PSL would rely on hypothecation of national fiscal revenue in order to contribute to climate finance;
- The GHG Fund would need to set aside a share of the revenues to ensure no net incidence on developing countries; and its political acceptability could suffer from the fact that it raises revenue internationally directly from ships or fuel suppliers;
- The ETS with a global auction would need to set aside a share of the revenues to ensure no net incidence on developing countries; and while it is clearly not a tax, its political acceptability could suffer from the fact that it involves direct funding of an international organisation;
- The ETS with national auctions would rely on hypothecation of national fiscal revenue in order to contribute to climate finance;
- The Rebate Mechanism's political acceptability could suffer from the fact that it raises revenue internationally directly from ships or fuel suppliers;

Chapter 0 discusses how the political acceptability of these MBIs can be enhanced.

## 2.7 Conclusion

Climate policy instruments for the international transport sectors need to be applied indiscriminate of the nationality of the ship, aircraft, shipping company or aircraft operator to be effective. Selective application to certain flags, for example, would result in changing flag and would thus hardly reduce emissions. These instruments can be implemented and enforced using existing governance structures in these sectors.

In order for these instruments to be in line with the CBDR principle, the use of revenues should be differentiated, compensating developing countries on the basis of no net incidence. Probably between a third and two thirds of revenues should be used to ensure there is no net incidence, but more study is needed to develop a good way of determining incidence.

In the shipping sector, several proposals have been made for revenue raising climate policy instruments. They differ in the choice of instrument (a financial instrument or a cap-and-trade scheme) and in the organisation that collects the revenues (states or a central organisation). One of them explicitly uses revenue for compensation, while most of them raise sufficient revenue to ensure no net incidence on developing countries.

All the proposals in their current form give rise to one or more objections from the perspective of their political feasibility. They either rely on hypothecation of national fiscal revenue or require direct funding of an international organisation or raise revenues internationally. The next chapter will discuss ways to reduce these objections.

## 3 Governance of Selective Disbursement

### 3.1 Introduction

A universally applied market based instrument for international transport that raises revenues for climate finance needs to selectively disburse the revenues raised or value created, as shown in Chapter 2. The revenues need to be used for the following purposes:

- In order to ensure that the market-based instrument is in line with the principle of common but differentiated responsibilities, the revenues or value has to be disbursed selectively to ensure there is no net incidence on developing countries.
- In order to contribute to climate finance, revenues or value needs to be disbursed to the Green Climate Fund;

In addition, a share of the revenues may be used for:

- Efficiency improvement of international transport modes.

Chapter 2 concluded that all proposals for MBIs in the maritime transport sector in their current form give rise to one or more objections related to their political acceptability. These are related to:

- The avoidance of net incidence on developing countries; and/or
- The reliance on direct international collection of revenues; and/or
- Direct funding of an international organisation; and/or
- Hypothecation of national fiscal revenue.

This chapter discusses how the governance of the proposals can be modified to overcome one of these four objections that states may raise. Section 3.2 analyses how each of the proposals can be amended to explicitly avoid net incidence on developing countries. Section 3.3 explores how objections against international taxation, direct funding or hypothecation can be overcome. Section 3.4 concludes.

### 3.2 Avoiding net incidence on developing countries

Of the proposals for MBIs in maritime transport, the Rebate Mechanism explicitly addresses the issue of net incidence on developing countries. As a solution, it proposes to offer developing countries a direct unconditional payment (called rebate) from the revenues of the fuel levy. The rebate is calculated annually in proportion to a country's share of global seaborne imports (attribution key) and the gross revenue raised. A developing country could voluntarily decide to forego the rebate, or a part of it, and record its decision.

Germany and France have proposed ways to ensure that developing countries are compensated for the net impact of an ETS on their economies (MEPC 62/5/15 and MEPC 62/5/34). They have proposed using a share of the revenues of the centralised auction to ensure no net incidence.

All the other proposals do not explicitly aim to ensure no net incidence on developing countries. This section explores ways to do so. Subsection 3.2.1 discusses ways to determine the net incidence, and Subsection 3.2.2 analyses ways to change the governance of the PSL, the ETS proposals and the GHG Fund to ensure no net incidence.

#### 3.2.1 Determining net incidence

For any universally applied climate policy instrument, there needs to be selective disbursement in order to ensure compliance with the CBDR principle, for reasons given above. The Rebate Mechanism proposal is built on this principle. The Norwegian and French ETS proposals do not mention compensation explicitly, but they do mention using the revenues from auctioning allowances for climate finance purposes, and Germany and France have elaborated on this in separate proposals. The GHG Fund proposal discusses climate finance although it is not clear whether this would come in place of offsetting shipping emissions or in addition to it.

This section discusses how much of the potential revenues should be set aside for compensation purposes. The next chapter discusses the governance of the division of revenues.

There are several ways to quantify the impact based on different methodologies. Most are either based on the impact on transport costs and related costs of imports and/or exports; or on beneficial ownership of the fleet. We will briefly describe the main ones below.

The transport-costs based approach starts from the assumption that the main impacts are caused by rising costs of maritime transport. Rising transport costs would affect different sectors in developing countries in different ways. Sectors that provide substitutes for imports may benefit from rising transport costs, while exporting sectors or sectors that use a lot of imports may be impacted negatively. The balance is likely to be different for each country (MBM EG, 2010). Most efforts to quantify the net incidence use a highly simplified method, often assuming that the net incidence can be assessed by assessing the impacts on the costs of imports, and often based on a static analysis. The only exception is Vivid Economics (2010), but that report only provides partial impacts for specific countries and trades.

The AGF (2010) estimated the incidence of climate policies for international transport on developing countries to be 30% of the total emissions. No justification for this figure has been presented in the AGF report. The 30% figure has also been put forward by André Stochniol who based this on the share of developing countries imports (in value) of total world imports. He has later recalculated the figure as 40% of the share of global imports from non-adjacent countries by developing countries (GHG-WG 3/3/11). This estimate is correct if the increase in transport costs mainly affects the price of imports and if the amount of emissions per unit value of imports is a constant.

A study CE Delft et al. 2010 (MEPC 60/4/54), estimates the economic impact on developing countries based on a ship emissions inventory model. The report further assumes that countries will be impacted by the emissions of incoming voyages and acknowledges that this is a worst-case assumption for developing countries, because the existing trade imbalances generally result in the allocation of a larger share of costs to routes to developed countries. It shows that in 2006, 58% of global maritime emissions were on voyages to developing countries. Hence, assuming that the impact will correlate with the emissions of incoming voyages, developing countries could bear up to 58% of the costs. This estimate is correct if the increase in transport costs mainly affects the price of imports (and not exports).

The report shows that large differences exist between groups of developing countries. The report groups developing countries on a regional basis of in common groupings such as least developed countries or small islands developing states. Each group could be completely compensated if 67% of the revenues of the auction were used for this purpose. Many groups of countries would be overcompensated.

In a series of case studies of specific trades, Vivid Economics (2010) showed that the impact of climate policies on import values depends on many factors, including the share of imports in domestic consumption, the distance, the cargo type, et cetera. An important conclusion from this study is that in order to fully assess the impact on individual countries it is necessary to consider all specific impact and trade factors that are relevant for that country.

The beneficial ownership based approach assumes that the incidence is caused by the beneficiaries of shipping companies. It is often based on the UNCTAD estimates of fleet under beneficial ownership. The most recent version (UNCTAD 2010) shows that about one third of this tonnage is controlled by owners from developing countries and about two thirds by owners from developed countries. Hence, compensation based in this would be lower than on the basis of transport costs.

In summary, there are different metrics of the impact on developing countries that can be used for estimating the compensation needed. Some are easily established, while others require detailed calculations. There appears to be a trade-off between accuracy for individual countries and the level of detail of the calculations. From a policy perspective, a choice has to be made between a clear, generic rule that would have the risk of over-compensating some countries while under-compensating others, or a detailed method which would provide less clarity but could provide more accurate compensation. Apart from the metric, it is clear that the impacts vary from country to country as they depend on specific circumstances. Hence, whichever measure is chosen, it should be country specific. More work is needed to develop a good metric to base the compensation on.

### 3.2.2 How the policy proposals can reduce net incidence

#### Port state levy

The PSL allows or instructs states to impose a charge on emissions from ships in their ports. If this system is designed in such a way that developing countries would be free not to impose the charge, it could be argued that there is no need for compensation. After all, in that case the costs of imports in developing countries would not be directly affected, and exports from developing countries to other developing countries would also not be affected. So if it is accepted that the net incidence on developing countries stems mainly from the rise of import costs, the governance structure could focus on climate finance and funding for efficiency improvements.

#### Greenhouse Gas Fund

In its current form, almost all of the revenues collected from contributions in the GHG Fund would be used to buy offsets to ensure that the net emissions of the shipping sector do not exceed the target.

Net incidence on developing countries can be compensated if the contribution is raised to generate additional funds. This would require substantially higher contributions than envisaged in the key proposal MEPC 60/4/8. These funds would need to be disbursed to developing countries based on the key chosen to determine net incidence.

#### ETS with global auctioning

In its current form, the auction revenues will flow into a fund that can be used for, among other things, climate finance.

Net incidence on developing countries can be compensated if a share of the auction revenues are disbursed to developing countries based on the key chosen to determine net incidence.

Another way to reduce the net incidence would be to allocate some of the allowances to developing countries so that these countries could auction them (or appoint an organisation to auction them on their behalf). This would have two additional benefits:

- First, developing countries would have ownership over the means to ensure there is no net incidence on them;
- Second, the incidence is related to the price of the allowances. As the price of allowances may fluctuate over time, developing countries could auction a share of the allowances they receive so that at each point in time the net incidence is fully compensated.

#### ETS with national auctioning

In its current form, countries would have sovereignty over how they spend the revenue from the auction. This could be maintained as long as the allocation of allowances to countries takes the net incidence into account. For example, if allowances are allocated to countries using whichever key is chosen for determining net incidence, the developing countries could auction them when and in the way they choose.

### 3.3 Limiting resemblance to international taxation, direct funding of international organisations or reliance on hypothecation

As shown in Chapter 2, all proposals for MBIs in the maritime transport sector in their current form could give rise to objections related to the way they raise and transfer revenue, viz:

- The reliance on direct international collection of revenues; and/or
- Direct funding of an international organisation; and/or
- Hypothecation of national fiscal revenue.

This section analyses how these objections can be minimised or overcome through governance structures. The analysis of the governance structure depends on the type of instrument (financial or quantity-based) and on the collecting entity (states or an international organisation). In line with table 1, there are four combinations. We will describe possible governance structures for each one subsequently.

### 3.3.1 States impose a charge on emissions from ships in their ports

The Port State Levy is an example of this instrument. When states impose a charge, and collect the revenues, the main aim of the governance structure is to ensure that the revenues are used for climate finance. Since climate finance is a transfer of funds from developed countries to developing countries, this section focuses on developed countries. (As indicated in Section 3.2.2, a way to ensure there is no net incidence on developing countries could be to allow them not to impose the levy).

Developed countries would collect revenue from ships in their ports, linked to the en-route emissions of these ships. These states decide on how the revenues are used. Consequently, the main objective of the governance structure is to co-ordinate the efforts of states. The main obstacle that the governance structure would have to eliminate is the objections many states have against hypothecation of fiscal revenues. There are established ways for doing so.

One way to organise the co-ordination is a donor conference setting, where states would pledge certain funds for certain causes, and report on the amount of funds spend. In a departure from the common donor conferences, this one would also need to report on receipts. Such a structure would have the advantage that states would have a large degree of discretion over how they use their revenues. A disadvantage could be that according to some studies, donor-conference pledges are often not fulfilled (Bredenkamp and Pattillo, 2010). This means that the convention of the system needs to ensure that non-compliant states can be somehow induced to comply (e.g. by suspending voting rights).

Another way to ensure co-ordination is to develop a system of assessed contributions according to which States would pay to one or several central funds, e.g. a fund for climate finance and a fund for R&D and innovation. This has the advantage that it is a well-established way of financing international organisations such as the UN. In the UN system, the assessed contributions are based primarily on the size of ones economy (the gross national income) and adjusted for debt, level of development and subject to caps. In this case, the assessed contribution should be based on the funds collected. An advantage of an assessed contribution system is that it has transparent rules and that the extent to which countries honour their commitments can be clearly determined.

In all cases, it could be hard to demonstrate transparently for all countries that all the funds collected from the port state levy were spent on climate finance and that the funds were additional.

### 3.3.2 Centralised global collection of contributions

In this system, of which the GHG Fund is an example, ship owners or operators, or fuel suppliers, pay a contribution to an international organisation. In this case, the division of revenues is basically a three-step process: first, revenues are used to offset the emissions of shipping above the target. Second, the net incidence on countries or groups of countries is determined. Revenues raised from addressing these emissions should not be counted as climate finance. Moreover, these revenues could be used to compensate developing countries for the impact on their economies in order to make the system compliant with the CBDR principle. The third and final step divides the remainder of the revenues over climate finance and innovation incentives.

There could be objections to a centralised collection of contributions because it could be seen to resemble an international tax. This is a matter of interpretation – the sponsors of the GHG Fund proposal argue that the contribution is not a tax, among others because it is primarily intended to offset emissions above the target. Regardless of whether the contribution is regarded as a tax or not, it is important that the countries where the entities are located that pay the contribution are represented in the governing body of the convention.

In the second step, there may be a tension between the countries that are eligible for compensation, who may want to maximise the share of revenues to be spent on compensation, and the countries who are not eligible, who may want to maximise the share that is counted as climate finance, because the larger this share, the less funds they would need to raise from other sources. In order to prevent this tension from paralysing decision making, the convention should lay down the rules for

the division of the funds (see above for ways to determine the amount for compensation). Also, the voting rights should ideally be balanced between both parties.

The revenues that are intended for compensation are probably best transferred directly to the beneficiary developing countries. This would ensure that the instrument is in line with the principle of common but differentiated responsibilities and that the remaining revenues can be counted as climate finance, as they do not cause a net incidence on developing countries but impact developed countries economically.

### 3.3.3 Emissions trading with centralised allocation of allowances

In this system, as proposed by Norway and other countries, an emissions trading system would be established by adopting a convention under IMO. In the proposals by Norway and others, a central body would auction the allowances and agree on the use of revenues. Because revenues would be raised centrally the governance structure could resemble the structure of the GHG Fund (see above).

It should be noted that as there are clear distinctions between an ETS and a tax, this system has a smaller chance of being regarded as an international tax and the governance structure need not necessarily be designed to represent the taxed entities. The OECD defines taxes as 'compulsory, unrequited payments to general government' (OECD 1996)<sup>45</sup>. In the case of an ETS, a payment is not compulsory but regulated entities are required to surrender allowances. A payment to a central government at an auction can be a means to acquire allowances, but there are other means as well, such as buying allowances from other market actors, receiving them for free, et cetera. Moreover, in contrast to taxes, emission allowances are assets for which the owner has full property rights and which he can trade, bank, lend or borrow without transferring money to the government.

This difference between an ETS and a tax can be exploited to overcome the objection against direct funding of an international organisation. If the organisation that manages the ETS does not auction the allowances itself, but rather transfers the allowances to developing countries to ensure there is no net incidence, and to the Green Climate Fund for climate finance purposes, it has no revenue of its own. The organisation will merely be an administrative body that issues and distributes allowances, maintains a registry and monitors compliance of ships by comparing their emissions reports with the number of surrendered allowances.

By creating scarcity of allowances the ETS would create value, and it would transfer this value to states and other organisations without realising some of the value itself. Hence, the system would not resemble international taxation (because an ETS is not a tax), would not involve a direct revenue stream for an international organisation (because the organisation would still rely on contributions from states) and would not rely on hypothecation of fiscal revenue (because there would not be any fiscal revenue).

### 3.3.4 Emissions trading with national allocation of allowances

This system is being proposed by the UK. It resembles the emissions trading system with centralised allocation in the sense that a central body sets a cap for shipping and possibly receives emission allowances. However, it differs from the Norwegian system in the sense that countries are proposed to auction the allowances. While this reduces the resemblance to an international tax, it introduces the problem of co-ordination and hypothecation. The governance structure has to ensure that, while states have sovereignty over the use of fiscal or other revenues, the revenue serves the purposes of the instrument.

<sup>4</sup> OECD, 1996, Definition of taxes: Note by the Chairman, DAF/MAI/EG2(96)3, <http://www.oecd.org/daf/mai/pdf/eg2/eg2963e.pdf>

<sup>5</sup> The definition specifies that 'taxes are unrequited in the sense that benefits provided by government to taxpayers are not normally in proportion to their payments. General government consists of supra-national authorities, the central administration and the agencies whose operations are under its effective control, state and local governments and their administrations, social security schemes and autonomous governmental entities, excluding public enterprises.'

One way to do so would be for the central organisation to set a cap, create allowances and distribute on the basis of net incidence. Developing countries could auction their allowances when and in the way they choose. Developed countries, however, would pledge to transfer the allowances to the Green Climate Fund, which can auction them in order to raise revenue for climate finance. This revenue would count towards the collective obligation on developed countries. Yet another share can be transferred to IMO to fund technology development and innovation.

Like the GHG Fund, there may be a tension in the central organisation between recipients of compensation allowances and other parties. In order to prevent this tension from paralysing decision making, the convention should lay down the rules for the division of the funds (see above for ways to determine the amount for compensation). Also, the voting rights should ideally be balanced between both parties.

By creating scarcity of allowances the ETS would create value, and it would transfer this value to states without realising some of the value itself. Hence, the system would not resemble international taxation (because an ETS is not a tax), would not involve a direct revenue stream for an international organisation (because the organisation would still rely on contributions from states). It would not rely on hypothecation of fiscal revenue (because there would not be any fiscal revenue) but it would rely on the willingness of developed countries to transfer the allowances to the Green Climate Fund.

### 3.4 Conclusion

This chapter has explored how a climate policy instrument for international transport can be designed to meet four apparently conflicting criteria, viz.:

1. they should be in line with the current international climate policy, and especially with the principle of common but differentiated responsibilities, interpreted as minimising the net incidence on developing countries
2. while at the same time they should maintain a level playing field to ensure that the environmental integrity of the scheme is not undermined by carbon leakage, and in order to be in line with the current regulation of international transport sectors;
3. they should not be regarded as international taxes or rely on hypothecation of national fiscal revenues;
4. while at the same time they should provide for climate finance and technological support in a clear and transparent way.

The first two criteria can be met by applying policy instruments uniformly while using a share of the revenues to compensate developing countries for the net incidence on their economies. There are several ways to calculate net incidence; studies show that between 30% and 67% of the revenues could be used to compensate developing countries. Since it is essential for satisfying the first criterion, more work should be done on determining ways to assess the net incidence.

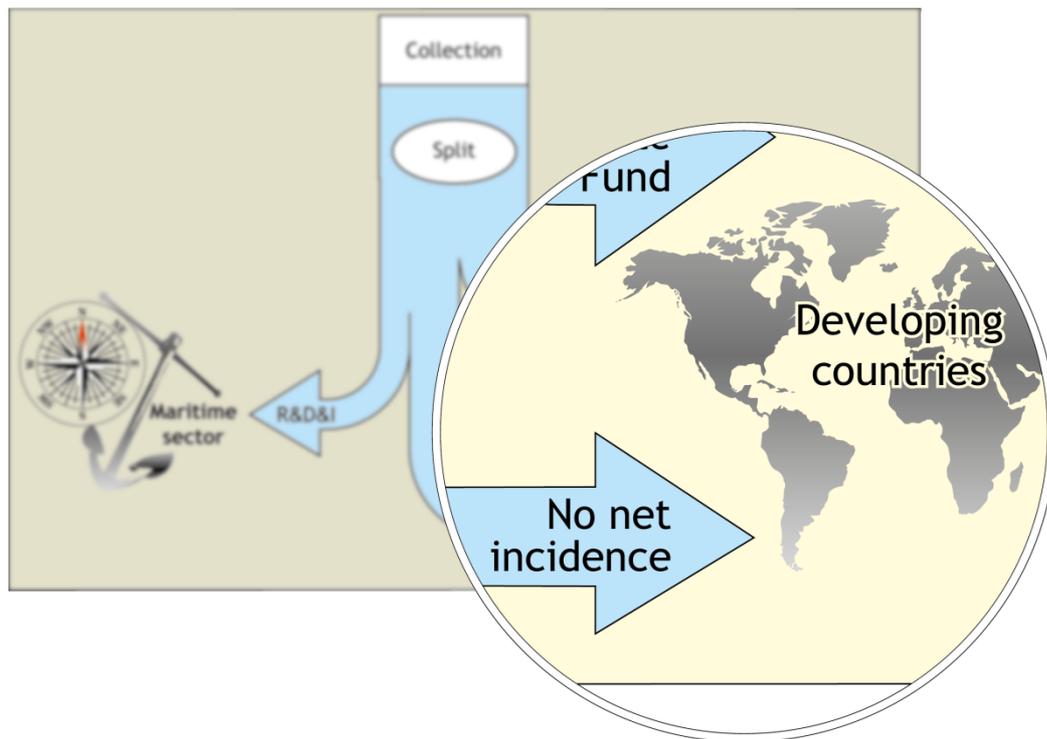
By definition, the remainder of the revenues has no net incidence on developing countries, but rather on developed countries. This share can be used for climate finance and technology transfer.

In meeting the last two criteria, emission trading schemes have a clear advantage over financial instruments (levies or contributions) since they are clearly not taxes: the main obligation in an ETS is to surrender allowances in line with emissions, not to pay a contribution or levy; the allowances can be obtained in various ways, not only from governments; and actors own allowances and can trade them, use them in all kinds of ways that are not possible with taxes. However, a contribution such as is foreseen in the GHG system need not necessarily be regarded as a tax.

The transfer of revenues can be in the form of a transfer of allowances in an ETS, further reducing the number of common aspects of an international emissions trading scheme and an international tax. Developing countries can be compensated by a direct transfer of allowances based on assessed net incidence, while the remaining allowances can be transferred to a green fund for climate finance and to a technology fund for technological development.

## 4 Use of Revenues

### 4.1 No net incidence



As noted in previous chapters, the most effective way to address GHG emissions from international transport is through a universally applied market based instrument that satisfies the principle of common but differentiated responsibilities through differentiated use of revenues. An MBI that is not universally applied would result in avoidance and undermine its environmental effectiveness. It is possible to merge universal application of obligations on shipping companies and airlines with differentiated treatment of states. A share of the revenues of an MBI can be used to ensure that the instrument has no net incidence on developing countries.

Section 3.2 has explored ways to determine net incidence and how the current proposals could be amended to ensure they would not create net incidence. This section discusses how the revenues received or raised by developing countries could be used. The main issue is whether they should be used preferably or exclusively for climate purposes or whether countries are free to use them in whichever way they choose.

Because the revenues equate to the incidence of an MBI on developing countries, they can be considered to be raised by developing countries (even though in the maritime transport sector, they could be paid by a shipping company based in a developed country or a ship flying under a developed country flag). It would therefore not be correct to count them towards the goal of climate finance, as suggested implicitly in AGF (2010).

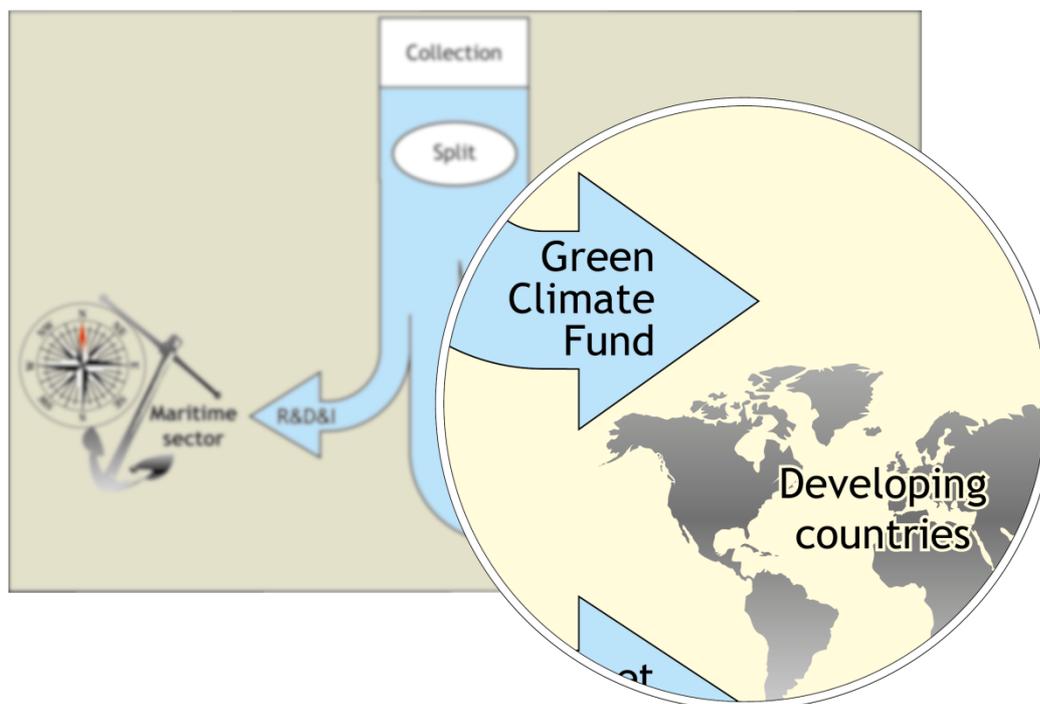
The Rebate Mechanism proposal favours an 'unconditional payment' to developing countries in order to ensure no net incidence. While it may be argued that it is up to developing nations to decide on how to best use the revenue to reduce the economic impact of any MBI, it would be counterproductive if the unconditional payment would be ploughed back into the international transportation sectors or downstream sectors in relation to their carbon emissions. After all, that would eliminate the incentive to reduce emissions. Other ways of ploughing revenues back to the international transport sectors, e.g. by support for R&D&I to improve the fuel-efficiency of ships could have a positive effect.

The Norwegian ETS proposal and the GHG Fund both suggest using revenues for adaptation and mitigation in developing countries. If compensation were to be limited to these causes, there would

be a risk of diminishing returns in countries that rely heavily on international transport yet have very low GHG emissions or and do not require large funds for adaptation.

In our view, countries should have a large degree of freedom on how they spend the revenues as long as it does not undermine the effectiveness of the MBI. This could be achieved by giving developing countries ownership of the revenues or the allowances transferred to them for the purpose of eliminating the net incidence.

## 4.2 Climate Finance



Climate finance is a crucial enabling means to promote indispensable mitigation actions, to develop robust adaptation strategies and to develop new technologies and hence is one of the important building blocks for a successful future climate regime. The Bali Action Plan (BAP) called for enhanced action on the provision of financial resources to support mitigation, adaptation and technology cooperation<sup>6</sup>. Hence, successful action to reduce and to cope with climate change would at large depend on significant long-term financial resources given its links with all the other building blocks. Under Article 4.3 of the FCCC developed country Parties shall provide such financial resources to meet the agreed full costs incurred by developing country Parties<sup>7</sup>. However, developed country Parties have so far failed to commit or deliver substantially on these provisions under the Convention. The Copenhagen Accord emphasised on the need for scaled-up, new and additional, predictable and adequate funding. Further, the accord provided for a Green Climate fund where developed countries committed themselves to a goal of jointly mobilizing US\$100 billion a year by 2020 and US\$30 billion as fast start climate finance during the period 2010-2012 to address the needs of developing countries. The green climate fund was to be created from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance. Key challenges in operationalising the fund include sources of generating finance, governance and institutional design of the green climate fund. The Cancun agreements re-emphasised on the importance of mobilization and provision of scaled up, new, additional, adequate and predictable financial resources to address the adaptation and mitigation needs of developing countries. While calling for scaled-up, new and additional, predictable and adequate long-term funding the Cancun agreements further re-emphasised on the goal of mobilizing jointly USD 100 billion per year by 2020 to address the needs of

<sup>6</sup> Article 1(e) of the BAP

<sup>7</sup> Article 4.3 of the Convention

developing countries in the context of meaningful mitigation actions and transparency on implementation.

Climate Finance is different from compensation in at least two ways:

1. climate finance is related to need, whereas compensation is based on net incidence. Both factors need not be related.
2. climate finance is conditional on developing countries' projects or programmes.

#### **4.2.1 Governance of climate finance**

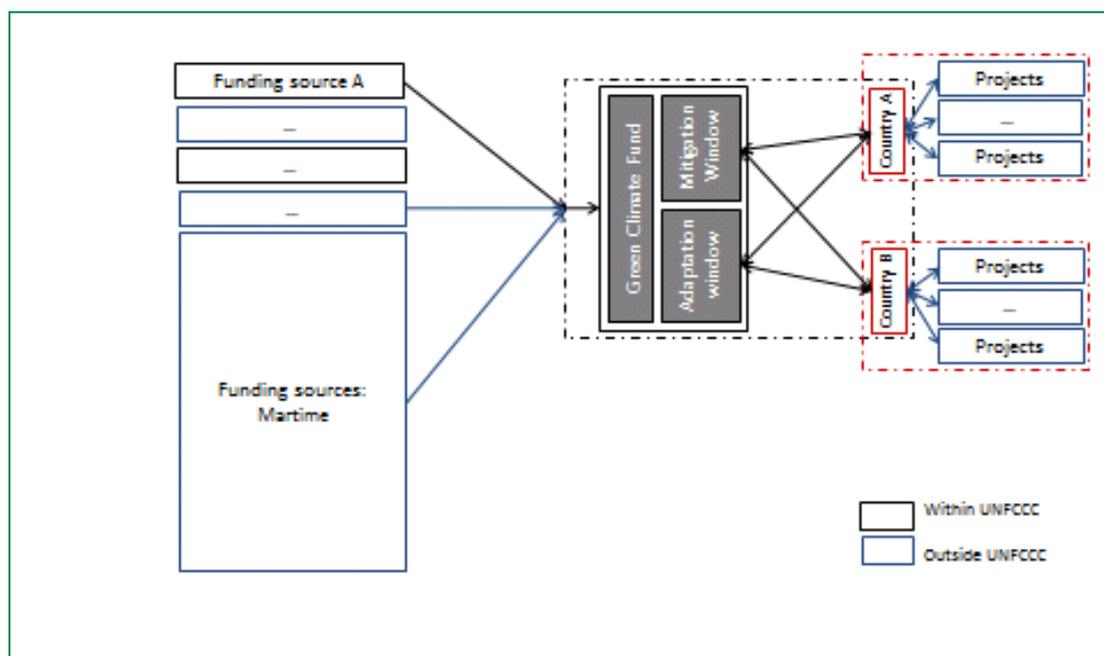
Given that the majority of climate funding available currently is fragmented, there is increased debate in climate negotiations over whether a single centralized institution or a decentralized approach that coordinates international, regional, and national institutions would be more effective. The Cancun Agreements suggested that a significant share of new multilateral funding should flow through the Green Climate Fund. This entails that finance provided to tackle climate change, whether through including multilateral, regional and bilateral channels or any new innovative sources will be included within the overall framework under the newly established fund. Arguably consolidation of international funding streams under the new financial mechanism will provide a degree of coordination and will be easy to oversee and monitor the support and its use.

This will also ensure de-linking the funding stream from its original source which has been one of the important demands from the developing country Parties especially in the context of action being recipient driven rather than donor driven. The consolidation of funding would ensure predictable resources which can then be matched with the support needs of the developing countries thereby facilitating coherent delivery of the support needed by developing countries. This match-making is important also to maintain the regional distribution of the climate finance vis-a-vis mechanisms such as CDM that are being criticised as unequal in distribution with emerging economies having larger share. Such financial mechanisms will help to build confidence and deliver the necessary scale of finance in a timely manner. Müller (2010) suggests the formation of national entities to manage national climate change funds which will be sourced from the green climate fund. The idea is that developing countries recognise their own priorities and identify actions that are appropriate to their national circumstances. A global fund can also provide consistency of rules and operational principles to ensure that different sources of funding do not work at cross-purposes.

#### **Purpose of the fund**

The disbursement of the fund can be by an entity under the COP to the national entities governing the fund for multiple purposes including adaptation and mitigation ensuring that the overall governance is country-driven. The funding could be project based, or for programmes and policies in developing countries. These individual activities can have direct access to national funds. Essentially, direct access would enable national entities to be directly responsible for the implementation without having to rely upon multilateral development banks and implementation agencies thus also avoiding the problem of co-financing requirement, which is a challenge in most developing countries. Having national entities responsible will also ease reporting requirements which will essentially be country-led. The reporting of both support and actions could be on universally accepted principles or guidelines. This will increase the legitimacy of the funding by both developed and developing countries.

**Figure 2. Governance of climate finance**



#### 4.2.2 Revenue from MBIs in shipping for climate finance purposes

As discussed above, funds to be used for climate finance should be new and additional, adequate, predictable and sustainable. This section analyses the proposals on their conformity with these criteria.

All the proposals generate revenue from a new source. Hence, it is clear that the funds are new. In itself, the funds raised by shipping will not be adequate, but they will contribute to adequate funding (AGF, 2010). The amount of revenues raised depends on the instrument. The extent to which the funds are additional depends on whether they come on top of current financing streams or replace them partly. This depends to a large extent on the governance of the scheme and will be discussed below. The predictability and sustainability of the revenues depend on the instrument by which they are generated.

The description of the proposals shows that there are two ways to generate revenue:

1. a contribution, levy or charge based on fuel use or emissions
2. auctioning of allowances

The choice of instrument has an impact on the amount of revenues raised and on the predictability and sustainability of the revenues.

The amount of revenues raised depends on the gross costs to the industry and the cost items. The gross costs to the industry are the lowest in the GHG Fund. Most of these costs are for buying offsets, so a relatively small amount of revenue remains for other purposes. In all the other proposals, the gross costs to the industry are determined by the emissions and the carbon price. For 2030 these are estimated at USD 40 – 49 billion. In the PSL and the UK version of an ETS, revenues are raised by national governments. The extent to which they are available depends on decisions of national governments. Hence, table 3 gives a range starting at zero. In the ETS, only the auctioned allowances create revenues; the costs to the industry are higher because the industry is expected to buy offsets itself.

**Table 3: Revenues projected to be raised in 2030**

Source: MEPC 61/INF.2

Proposal	Gross costs to the industry (USD billion)	Amount of revenue raised for purposes other than offsetting (USD billion)
GHG Fund	15 – 25	4 - 5
PSL	40 – 49	0 - 49
ETS (NOR, FR)	40 – 49	31
ETS (UK)	40 – 49	0 - 31
RM	40 – 49	40 - 49

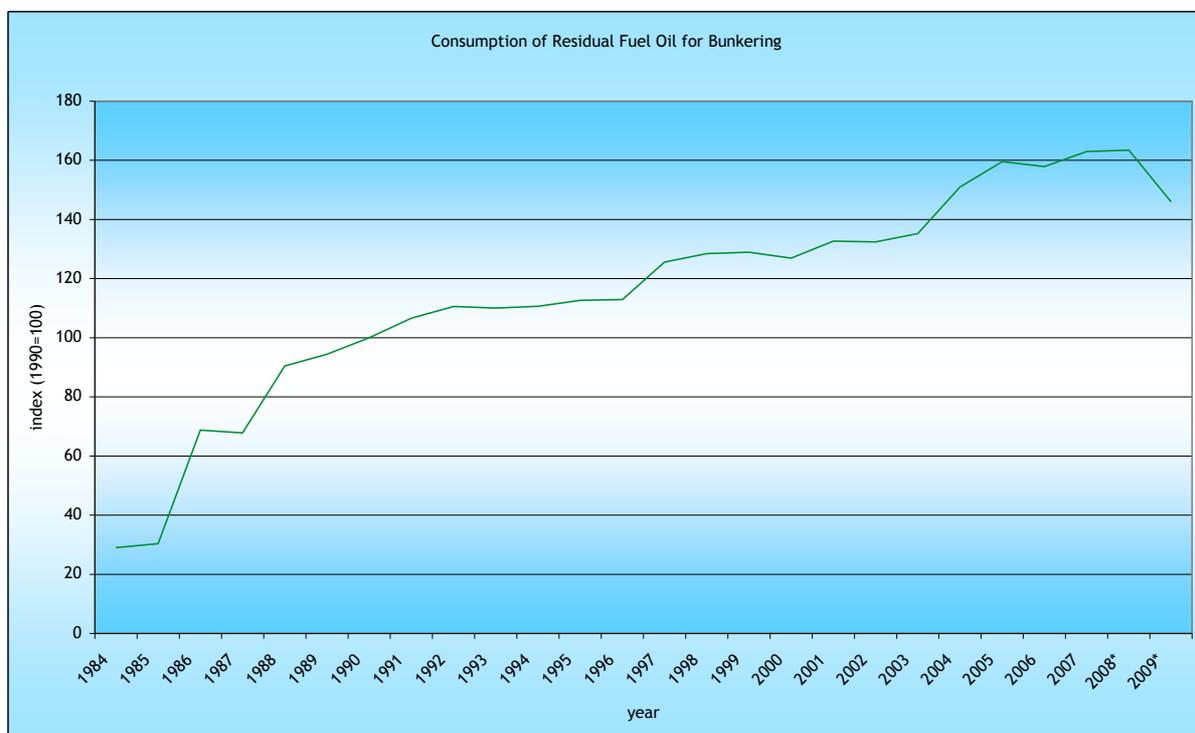
Note: In the PSL and the UK version of an ETS, revenues would be raised by national governments. It depends on decisions of national governments whether the revenues will be used for climate purposes or for other means.

The predictability and sustainability of the revenue stream depends on the predictability and sustainability of the fuel sales or cap, and the predictability and sustainability of the level of the levy and/or the price of the allowances.

The GHG Fund, PSL and RM are based on fuel sales. Global bunker fuel sales have some variation from year to year, as shown in Figure 3. In the longer term, if climate policies for maritime transport would be successful, fuel sales could be expected to decrease. The level of the contribution to the GHG Fund is set for some time. The PSL and RM charge levels are tied to the global carbon price and are adjusted regularly. Hence the short term predictability of the revenues is high for the GHG Fund and lower for the PSL and the RM. The long term sustainability is hard to assess.

**Figure 3: Development of bunker fuel sales**

Source: EIA. Note: data for 2008 and 2009 are projections based on a limited set of countries.

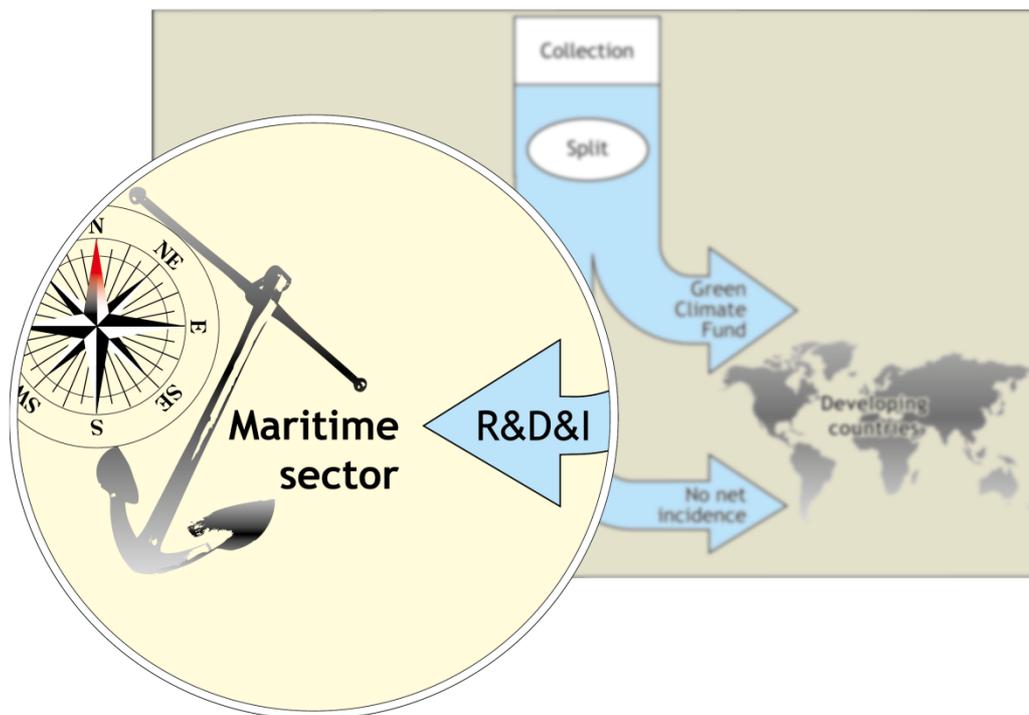


The ETS proposals generate revenue by auctioning allowances. The amount of allowances to be auctioned will be set for a certain period of time – the Norwegian proposal suggests a ten-year cap. During these ten years, the price of allowances may vary. Hence, while the amount of allowances to

be auctioned is highly predictable, the revenue generated is less predictable because of the volatility of allowance prices.

In summary, the amounts raised are equal in all systems except for the GHG Fund, where they are considerably lower. The predictability of the amounts raised is highest in the GHG fund and somewhat lower in the other systems due to their link with the carbon market.

### 4.3 Fuel Efficiency Improvements



There is scope to improve the fuel efficiency of aviation and maritime transport. Especially in shipping, the potential appears to be large (Eide et al., 2011, Wang et al., 2010). Currently, not all the fuel efficiency improvement measures are implemented because of market and non-market barriers (CE Delft et al., 2011).

A market-based instrument will give an additional incentive to improve fuel efficiency (MBM EG, 2010). It is possible, however, that additional improvements can be made. It is outside the scope of this report to assess all the barriers and how they can be overcome, or to evaluate the scope for further technical or operational innovation. Still, a number of observations may guide the governance of funding.

In shipping, the supply of technologies appears to be sufficient, but the take-up of new innovations is relatively low (Wang et al., 2010). In some cases, this can be attributed to split incentives, but many shipping companies appear to be risk-averse. In that case, allowances can be given to shipping companies that volunteer to test a new technology and share the test results.

In shipping, there appears to be a large potential benefit of better communications between ports, terminals and ships, in order to optimise sailing speed. While it is hard to give precise estimates, estimates show that up to 5% of global emissions are associated with ships waiting to enter a port (CE Delft et al., 2009). Since better communication systems need investments both by ports and by shipping companies, as well as standardisation, while only shipping companies or charterers may reap the benefit of lower fuel consumption, it could be contemplated to subsidise standardisation and pilot projects.

In aviation, large fuel efficiency improvements are possible with improved air traffic management. Programmes are being implemented in Europe and the US to improve ATM. Funding could be provided to similar programmes in developing countries, e.g. through grants or allowances to states.

From these examples, it appears that there are projects or programmes that may yield considerable fuel efficiency improvements. Identifying the programmes and managing their support requires excellent knowledge of the sector and the institutions within the sector.

IMO has a Committee on Technical Cooperation, which is currently mainly focussed on institutional capacity building. However, it is also engaged in projects to reduce GHG emissions from shipping, funded by South Korea (IMO 2011)<sup>8</sup>. An expansion of these capacities would allow IMO to administer a fund for technology development and innovation aimed at improving the energy efficiency of ships.

Likewise, ICAO has a Technical Co-operation Programme, currently mainly focussing on capacity building but also doing projects for airlines and airports.

To conclude, a small share of the allowances can be set aside for improving the fuel efficiency of international transport modes. The funds or allowances can be managed by IMO and ICAO, using existing programmes for technical co-operation.

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<sup>8</sup> IMO Briefing 25/2011, April 21, 2011

## 5 Conclusions

It is feasible to design market based instruments for international transport that can address GHG emissions in these sectors while at the same time raise revenue for climate finance. With the right governance structure, these instruments can ensure that the MBIs are effective, in line with the CBDR principle, and politically acceptable. An emissions trading scheme has better chances of being politically acceptable than a levy based system.

**Effectiveness and CBDR:** Universal application and differentiated use of revenues or allowances International aviation and maritime transport are characterised by mobile emission sources (aircraft and ships) and sometimes complex arrangements of ownership and control. Selective application of MBIs, e.g. differentiating the treatment of ships according to their flag would lead to avoidance and undermine the environmental effectiveness. Therefore, the application of the MBI should ideally be flag neutral. This is also in line with existing regulation, environmental and otherwise, in ICAO and IMO. This means that the system can use the existing governance structures for implication and enforcement in these sectors, e.g. in shipping flag state obligations and port state rights.

Because this MBI would be a climate policy instrument, it has to satisfy the principle of common but differentiated responsibility. This can be achieved through differentiated use of revenues, as several authors have previously pointed out. Compensation of developing countries can ensure that there is no net incidence on them. Compensation can occur by transferring allowances in a cap-and-trade scheme, which in turn can be auctioned by the affected countries, or by a money transfer of a share of the revenues of a levy-based system.

The remainder of the allowances or revenues by definition have a net incidence on developed countries only. Hence, they can be used for climate finance. A share can be earmarked for enhancing the fuel efficiency of the transport sector(s) concerned.

### **Political acceptability: transfer of allowances instead of transfer of money**

The political acceptability of a revenue raising MBI would be enhanced if:

- a The MBI is not regarded as an international tax, which is opposed by many states on grounds of sovereignty;
- b The MBI does not result in direct funding of a supra-national or international organisation, which is also opposed by many states as it could infringe their sovereignty;
- c The MBI does not require earmarking national fiscal revenue, which many states object to on the grounds of allocative efficiency.

We find that a cap-and-trade scheme in which the organisation that governs the scheme does not auction the allowances, but rather transfers them to the various beneficiaries has the best chance of being politically acceptable.

In practice this would mean that a new convention, e.g. under IMO, would cap shipping emissions and create a limited number of emission allowances annually. An organisation would be established to administer the allowances and ensure that ships surrender allowances in relation to their emissions.

A share of the annually created allowances would be transferred directly to developing countries to ensure that the MBI has no net incidence on them. These countries would auction the revenues and have a large degree of freedom on how to spend the auction revenues, as long as they do not directly undermine the effectiveness of the climate policy instrument by subsidising fossil fuel use in the international transport sector involved.

A share of the allowances would be transferred to the Green Climate Fund (GCF). This can be done directly, or on behalf of the developed countries who are impacted by the MBI. The Fund would auction the allowances and the revenues would count towards the collective climate finance goal. Likewise, a small share of the allowances can be transferred to e.g. the IMO Technical Cooperation facility in order to improve the fuel efficiency of shipping.

In this way, there would be no international tax. After all, an ETS has properties that are distinct from a tax, as there is no compulsory payment to a fiscal authority (allowances can also be bought from

other firms or from intermediaries) and the allowances are assets that can be bought, sold or banked as their owner sees fit.

Also, there would be no direct funding of the organisation that governs the MBI: it will not have the power to auction the allowances or otherwise receive a revenue from them. Neither would the system require earmarking of national fiscal revenues.

## References

- AGF 2010. Report of the Secretary-General's High-level Advisory Group on Climate Change Financing (United Nations).  
[http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/AGF\\_reports/AGF%20Report.pdf](http://www.un.org/wcm/webdav/site/climatechange/shared/Documents/AGF_reports/AGF%20Report.pdf)
- Bell, Stephen, 2002. Economic Governance and Institutional Dynamics, (Oxford University Press, Melbourne, Australia)
- Buhaug, Ø., Corbett, J.J., Endresen, Ø., Eyring, V., Faber, J., Hanayama, S., Lee, D.S., Lee, D., Lindstad, H., Markowska, A.Z., Mjelde, A., Nelissen, D., Nilsen, J., Pålsson, C., Winebrake, J.J., Wu, W., Yoshida, K., 2009. Second IMO GHG Study 2009 (International Maritime Organization London, UK) [http://www.imo.org/blast/blastDataHelper.asp?data\\_id=27795&filename=GHGStudyFINAL.pdf](http://www.imo.org/blast/blastDataHelper.asp?data_id=27795&filename=GHGStudyFINAL.pdf)
- CARIOU, Pierre, Francois-Charles WOLFF, 2010, Do Port State Control inspections influence flag- and classhopping phenomena in shipping?, (Lemna Working Paper 2010/08)
- CE Delft, MNP, MMU, 2006. Aviation and maritime transport in a post-2012 climate policy regime (CE Delft) [http://www.cedelft.eu/publicatie/aviation\\_and\\_maritime\\_transport\\_in\\_a\\_post-2012\\_climate\\_policy\\_regime/501](http://www.cedelft.eu/publicatie/aviation_and_maritime_transport_in_a_post-2012_climate_policy_regime/501)
- CE Delft 2008. Left on the High Seas. CE Delft. [http://www.ce.nl/publicatie/left\\_on\\_high\\_seas/845](http://www.ce.nl/publicatie/left_on_high_seas/845)
- CE Delft, DLR, Fearnley Consultants, Nature Associates, Manchester Metropolitan University, MARINTEK, Norton Rose, Oeko-Institut, Oeko-Recherche, 2009. Technical support for European action to reducing Greenhouse Gas Emissions from international maritime transport (CE Delft) [http://cedelft.eu/publicatie/technical\\_support\\_for\\_european\\_action\\_to\\_reducing\\_greenhouse\\_gas\\_emissions\\_from\\_international\\_maritime\\_transport/1005](http://cedelft.eu/publicatie/technical_support_for_european_action_to_reducing_greenhouse_gas_emissions_from_international_maritime_transport/1005)
- CE Delft, DLR, Fearnley Consultants. 2010. A Global Maritime Emissions Trading System: Design and Impacts on the Shipping Sector, Countries and Regions (CE Delft).  
[http://cedelft.eu/publicatie/a\\_global\\_maritime\\_emissions\\_trading\\_system/1024](http://cedelft.eu/publicatie/a_global_maritime_emissions_trading_system/1024)
- CE Delft, Marena, 2011 Analysis of GHG Marginal Abatement Cost Curves Delft, (CE Delft)
- Eide, Magnus S., Tore Longva, Peter Hoffmann, Øyvind Endresen, Stig B. Dalsøren. 2011. Future cost scenarios for reduction of ship CO2 emissions Maritime Policy & Management: The flagship journal of international shipping and port research, 1464-5254, Vol. 38, Issue 1 (2011); p. 11–37
- Kågeson, Per, 2011. Applying the Principle of Common but Differentiated Responsibility to the Mitigation of Greenhouse Gases from International Shipping (Centre for Transport Studies Stockholm). [http://swopec.hhs.se/ctswps/abs/ctswps2011\\_005.htm](http://swopec.hhs.se/ctswps/abs/ctswps2011_005.htm)
- Müller, Benito and Cameron Hepburn 2006. IATAL — an outline proposal for an International Air Travel Adaptation Levy (Oxford Institute for Energy Studies EV 36).  
<http://www.oxfordenergy.org/pdfs/EV36.pdf>
- Müller, Benito 2010. The Reformed Financial Mechanism of the UNFCCC Post Copenhagen Architecture and Governance (ecbi policy brief).  
<http://www.oxfordclimatepolicy.org/publications/documents/ecbiRFM2final.pdf>
- Ring, Diane M., 2008. What's at Stake in the Sovereignty Debate?: International Tax and the Nation-State Boston College Law School Faculty Papers. Paper 219.  
<http://lawdigitalcommons.bc.edu/lisfp/219>

Stochniol, André 2009. A levy on fuel for international shipping, which differentiates responsibilities between developed and developing countries. (IMERS)  
[http://imers.org/files/docs/IMERS\\_UNCTAD\\_Submission.pdf](http://imers.org/files/docs/IMERS_UNCTAD_Submission.pdf)

Stochniol, André 2012. A rebate mechanism for an equitable maritime emission reduction scheme. In: Regina Asariotis and Hassiba Benamara (eds.). Maritime Transport and the Climate Change Challenge (Earthscan Ltd United Kingdom)

Stopford 2009. Maritime Economics (Routledge)

UNEP 2011. Bridging the Emissions Gap. United Nations Environment Programme (UNEP).  
[http://www.unep.org/pdf/UNEP\\_bridging\\_gap.pdf](http://www.unep.org/pdf/UNEP_bridging_gap.pdf)

UNCTAD 2010. Review of Maritime Transport 2010 (UNCTAD).  
[http://www.unctad.org/en/Docs/rmt2010\\_en.pdf](http://www.unctad.org/en/Docs/rmt2010_en.pdf)

Vivid Economics 2010. Assessment of the economic impact of market-based measures (Vivid Economics).  
<http://www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Documents/VividEconomicsIMOFinalReport.pdf>

Wang, H., Faber, J., Nelissen, D., Russell, B. & St Amand, D. 2010. Reduction of GHG Emissions from ships – Marginal abatement costs and cost effectiveness of energy efficiency measures. MEPC 61/INF.18. [http://www.rina.org.uk/hres/mepc%2061\\_inf\\_18.pdf](http://www.rina.org.uk/hres/mepc%2061_inf_18.pdf)

World Bank Group 2011. Mobilizing Climate Finance: A Paper prepared at the request of G20 Finance Ministers (World Bank). [http://www.g20-g8.com/g8-g20/root/bank\\_objects/G20\\_Climate\\_Finance\\_report.pdf](http://www.g20-g8.com/g8-g20/root/bank_objects/G20_Climate_Finance_report.pdf)

## Annex A: Criteria for climate policy instruments in maritime transport

IMO has agreed that a coherent and comprehensive future IMO regulatory framework on GHG Emissions from ships should be (MEPC 57/21):

1. effective in contributing to the reduction of total global emissions of greenhouse gases;
2. binding and equally applicable to all flag states, in order to avoid evasion;
3. cost-effective;
4. able to limit – or, at least, effectively minimize – competitive distortion;
5. based on sustainable environmental development without penalizing global trade and growth;
6. based on a goal-based approach and not prescribe specific methods;
7. supportive of promoting and facilitating technical innovation and R & D in the entire shipping sector;
8. accommodating to leading technologies in the field of energy efficiency; and
9. practical, transparent, fraud-free and easy to administer.

The second criteria was not accepted by all states; some argued that it contravened with the principle of common but differentiated responsibilities and respective capabilities.

In the terms of reference of the Expert Group on Market Based Measures, the MEPC again discussed the criteria that are relevant for market based instruments. Though these are not strictly speaking criteria that instruments should meet, they are criteria which MEPC delegations considered relevant to compare the instruments on. Hence, they can be considered to be relevant criteria. The criteria are:

1. the environmental effectiveness, e.g., the extent to which the proposed MBM is effective in contributing to the reduction of greenhouse gas (GHG) emissions from international shipping;
2. the cost-effectiveness of the proposed MBM and its potential impact(s) on trade and sustainable development;
3. the proposed MBM's potential to provide incentives to technological change and innovation – and the accommodation of current emission reduction and energy efficiency technologies;
4. the practical feasibility of implementing the proposed MBM;
5. the need for technology transfer to, and capacity building within, developing countries, in particular the least developed countries (LDCs) and the small island development states (SIDS), in relation to implementation and enforcement of the proposed MBM, including the potential to mobilize
6. climate change finance for mitigation and adaptation actions;
7. the MBM proposal's relation with other relevant conventions such as the UNFCCC, Kyoto Protocol, and WTO, as well its compatibility with customary international law, as depicted in UNCLOS;
8. the potential additional administrative burden, and the legal aspects for National Administrations by implementing and enforcing the proposed MBM;
9. the potential additional workload, economic burden, and operational impact for individual ships, the shipping industry and the maritime sector as a whole, of implementing the proposed MBM; and
10. the MBM's compatibility with the existing enforcement and control provisions under the IMO legal framework.

There is a considerable overlap between two sets of criteria, as is shown by Table 4.

**Table 4. Criteria for market based instruments**

MEPC 57/21	MBM EG	Remarks
Effective in contributing to the reduction of total global emissions of greenhouse gases	Environmental effectiveness, e.g. (...) effective in contributing to the reduction of greenhouse gas (GHG) emissions from international shipping	MBM EG mentions reductions from international shipping in the example, while MEPC 57/21 clearly emphasises the contribution to global emission reductions
binding and equally applicable to all flag states, in order to avoid evasion		This criteria of MEPC 57/21 was not accepted by all states
cost-effective	cost-effectiveness (...) and its potential impact(s) on trade and sustainable development the potential additional administrative burden, and the legal aspects for National Administrations by implementing and enforcing the proposed MBM; the potential additional workload, economic burden, and operational impact for individual ships, the shipping industry and the maritime sector as a whole, of implementing the proposed MBM	MBM EG seems to consider cost-effectiveness in a broader perspective, including impacts on economies. Moreover, it explicitly includes the administrative costs both for regulators and for actors
able to limit – or, at least, effectively minimize – competitive distortion		This criterion is not included in the MBM EG
based on sustainable environmental development without penalizing global trade and growth		This is a separate criterion in MEPC 57/21 while it is included in the cost-effectiveness criterion in MBM EG
based on a goal-based approach and not prescribe specific methods		This criterion is not included in the MBM EG
supportive of promoting and facilitating technical innovation and R & D in the entire shipping sector accommodating to leading technologies in the field of energy efficiency	the proposed MBM's potential to provide incentives to technological change and innovation – and the accommodation of current emission reduction and energy efficiency technologies	There is no specific reference to R&D in the MBM EG as there is in MEPC 57/21
practical, transparent, fraud-free and easy to administer	the practical feasibility of implementing the proposed MBM the MBM's compatibility with the existing enforcement and control provisions under the IMO legal framework	MEPC 57/21's criteria transparent and fraud free are not reflected in the MBM EG, while the administrative issues are part of the cost-effectiveness evaluation
	the need for technology transfer to, and capacity building within, developing countries, in particular the least developed countries (LDCs) and the small island development states (SIDS), in relation to implementation and enforcement of the proposed MBM, including the potential to mobilize climate change finance for mitigation and adaptation actions	This has been added in the MBM EG evaluation criteria
	the MBM proposal's relation with other relevant conventions such as the UNFCCC, Kyoto Protocol, and WTO, as well its compatibility with customary international law, as depicted in UNCLOS	This has been added in the MBM EG evaluation criteria

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