

# A global cap-and-trade system to reduce carbon emissions from international shipping





“Cap-and-trade has been proven to cut pollutants substantially, rapidly and cost-effectively.”

**Global Carbon Trading: A framework for reducing emissions**

Mark Lazarowicz, UK Prime Minister’s Special Representative 2009



## Contents

<b>INTRODUCTION</b>	<b>5</b>
<b>THE CHALLENGE OF IMPROVING CO<sub>2</sub> PERFORMANCE</b>	<b>5</b>
<i>Figure 1: Comparison of CO<sub>2</sub> emissions by different transport modes</i>	<i>6</i>
<b>ADVANTAGES OF A TRADING REGIME</b>	<b>6</b>
<b>KEY FEATURES OF A CAP-AND-TRADE SYSTEM FOR SHIPPING</b>	<b>7</b>
<b>HOW CAP-AND-TRADE WILL WORK FOR SHIPPING</b>	<b>8</b>
<b>HOW TO OBTAIN CARBON CREDITS</b>	<b>9</b>
<b>TWO POSSIBLE AUCTION FRAMEWORKS</b>	<b>10</b>
<b>Sectoral approach</b>	<b>10</b>
<i>Figure 2: Framework for Sectoral Approach for a shipping ETS</i>	<i>11</i>
<i>Figure 3: Purchased vs actual emissions</i>	<i>11</i>
<b>'Distributed' auction approach</b>	<b>12</b>
<i>Figure 4: Distribution of international bunkers (in CO<sub>2</sub> terms)</i>	<i>13</i>
<i>Figure 5: 'Distributed' Auction Approach</i>	<i>14</i>
<b>Comparison of the two approaches</b>	<b>14</b>
<i>Figure 6: Comparative auction approaches</i>	<i>14</i>
<b>REPORTING AND VERIFICATION</b>	<b>15</b>
<b>Managing verification at a company level</b>	<b>16</b>
<b>Managing verification at a ship-specific level</b>	<b>16</b>
<b>CONCLUSION</b>	<b>17</b>
<b>ANNEX 1: CARBON CURRENCIES</b>	<b>18</b>
<b>ANNEX 2: GLOSSARY</b>	<b>18</b>



## Introduction

The national shipowner associations of Australia, Belgium, Norway, Sweden and the United Kingdom firmly believe that the best way to achieve a real and lasting reduction in CO<sub>2</sub> emissions from shipping – over and beyond efficiencies in ship design and operation – is through a global and open emissions trading system. That will provide strong incentives for the industry to reduce emissions through ever increasing efficiency and innovation, as well as funding for climate change adaptation and mitigation measures.

A number of national and international shipping industry associations have expressed their support for the introduction of an economic or market-based instrument (MBI) to reduce CO<sub>2</sub> emissions from international shipping. The global shipping industry supports the efforts of governments in Copenhagen in December 2009 to negotiate a post-2012 climate regime that includes provisions for international shipping. It expects those measures to be effective, equitable and enforceable. Most importantly, they need to deliver a defined objective.

The shipping industry believes that the discussions and agreements reached at the UN Framework Convention on Climate Change (UNFCCC) conference must involve, and take

account of the work of, the International Maritime Organization (IMO), the specialised UN agency which is tasked with developing the greenhouse gas (GHG) regulatory framework for shipping.

In recent months, our associations have assessed the options for achieving real emissions reductions in depth. Our objective was – and remains – to ensure a sustainable future for the industry, nationally and internationally, by finding and recommending the most practical policy for addressing CO<sub>2</sub> emissions from shipping.

This discussion paper:

- explains why we believe that a global emissions trading system (ETS) is the approach most likely to achieve the desired environmental results for shipping; and
- demonstrates how such a system can work in practice at the shipowner / operator level.

However, our associations recognise that more work needs to be done with regard to the associated background architecture of an emissions trading regime for shipping and urge governments and other interested parties to develop this option as a matter of high priority.

## The challenge of improving CO<sub>2</sub> performance

The shipping industry is a global industry and one of the world's largest employers. It is vital to the world economy, carrying over 80% of international trade by volume. As Figure 1 (overleaf) shows, shipping is already the most carbon-efficient way of transporting goods in the global economy. It is vital, therefore, that future measures to reduce CO<sub>2</sub> emissions do not compromise the industry's competitiveness with other modes of transport.

The latest IMO GHG Study<sup>[1]</sup> (April 2009) estimated that CO<sub>2</sub> emissions from international shipping in 2007 accounted for approximately 2.7% of global CO<sub>2</sub>. The industry has, even without regulation, already improved its environmental performance significantly – driven by environmental concerns but also particularly by the catalyst of the high proportion of operating costs represented by fuel costs and the need to gain or maintain commercial advantage. Fuel-efficient ships are more carbon-efficient ships. Energy efficiencies have brought

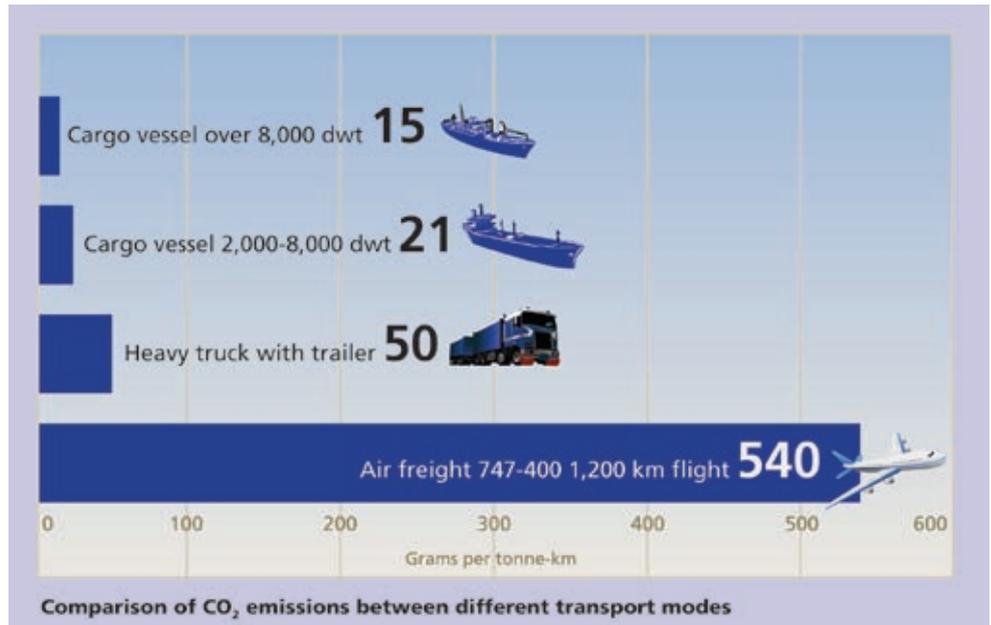
substantial progress in the oil consumption of ship engines since the 1970s<sup>[2]</sup> and we expect new technologies and designs to deliver energy efficiency savings of up to 40% on new ships relative to typical ships delivered in the 1990s. The IMO study suggests that 'by application of known technology and practices, shipping could be 25-75% more energy-efficient, depending on the ship type and the degree of compromise'.

The challenge therefore is to find the most appropriate policy levers to accelerate new technology and innovation to deliver improvements in energy efficiency. The overall magnitude of CO<sub>2</sub> emissions from a growing shipping industry means that further industry initiatives and international policy action are both inevitable and desirable. The international industry is fully committed to achieving significant and demonstrable reductions in CO<sub>2</sub> emissions through the IMO. Our associations go further and believe that the most likely measure to incentivise CO<sub>2</sub>

[1] Second IMO GHG study 2009 – April 2009. Submitted to IMO as MEPC59/INF.10

[2] Source: Danish Shipowners' Association study shows average consumption at 212 g/kw/hr in 1970s compared to 170 g/kWh in 2000s

**Figure 1: Comparison of CO<sub>2</sub> emissions by different transport modes**



Source: NTM (Swedish Network for Transport and the Environment)

reduction through technological and operational measures in the international shipping industry is an emissions trading system.

Our associations are committed to an ‘outcome-focused’ approach. We consider it an urgent priority for there to be a global agreement on measures that will achieve ‘real and meaningful’ reductions in CO<sub>2</sub> emissions for the shipping sector, while avoiding any modal shift away from the most carbon-efficient means of transporting cargo.

The IMO and UNFCCC should, in close cooperation and as an integral part of the wider Copenhagen Agreement, be as specific

as possible in defining ‘real and meaningful reductions’ for international shipping and agree a global net emission reduction target for shipping over a set period. It is crucial to have clarity as to the long-term objective and for the desired outcome to drive the method, rather than the other way round.

The IMO should take account of marginal abatement costs in the sector and shipping’s overall contribution to global climate change when designing the most appropriate trajectory to meet the emissions reduction target.

## Advantages of a trading regime

The key advantages of emissions trading are that it:

- provides for certainty of environmental outcome;
- allows the market to set the price of carbon;
- allows the shipping company to find the most cost-effective solutions;
- resonates with other legislative developments around the world; and
- fits well with other existing carbon reduction infrastructure, such as Clean Development Mechanisms and Joint Implementation processes under the Kyoto Protocol.

The attraction of the cap-and-trade scheme is that the market-based approach allows for choice and adaptability within the fundamental parameters of the scheme. This goal-based approach fits well for such a diverse industry as international

shipping and allows owners to make the necessary reductions at lowest cost. This is reinforced by the fact that the additional costs imposed by an emissions trading scheme would force shipping companies to consider where to allocate shareholder capital to maximise returns. Thus the ‘decision to emit’ would require an assessment of both the internal costs of abatement and the market price of allowances.

The creation of a genuine global market for carbon for shipping – and its interaction with other existing trading schemes – also means that a ‘true’ price is established. A system based on this general approach, whereby the system is fully interactive with other schemes, also allows for greater opportunity of purchasing options by allowing shipping companies to buy units in other existing and future emissions trading markets.

# Key features of a cap-and-trade system for shipping

The basic principle of a cap-and-trade system for international shipping would be similar to that for land-based industries within existing trading schemes. We recognise the value in learning the lessons from existing schemes and applying them to our sector.

Each regulated entity has a certain number of carbon allowances that it has either been given or has bought during the compliance period. At the end of the compliance period, each regulated entity must submit to the regulator a number of carbon allowances equal to its verified emissions during the period. If the entity has more allowances than it is required to surrender, then it will benefit either by retaining (or 'banking') the allowances it has not used or by selling them to the market. If it has to surrender more allowances than it already has, it will have to purchase these additional allowances from the market (or, if the scheme were to allow it, 'borrow' them from a subsequent compliance period).

The cap-and-trade system described in this paper complies with the nine principles laid down by the IMO for a global economic or market-based instrument to encourage emissions reductions. Condensing these, the proposed system would be effective, equitable, enforceable, and governable – all of which are essential if it is to deliver the desired outcome.

The cap-and-trade system would be effective because it is outcome-focused and ensures that the abatement action occurs in the most cost-efficient way and because it sets a fixed outcome combined with market flexibility that ensures the goal is attained. The system would allow a goal-based approach, whereby market forces drive certain standards and behaviours. For example, it would force operators to pay more attention to efficient voyage planning and management of their fleet.

The system would promote change by making innovation and technological development financially beneficial. It would encourage and reward both efficiency improvements on existing ships and new technology on new ships, through the operation of the market.

Although the lead times for new technology and the lifecycle of ships are considerable, the technology exists today to improve the fuel-efficiency of shipping. The cap-and-trade system presents an opportunity for governments to impose a

legislative solution that encourages shipping companies, ship designers, shipyards, charterers and ship financiers to identify and implement the new technology that will, in time, deliver the long-term objective of zero-carbon shipping.

Furthermore, cap-and-trade for the shipping industry is the option that is most in line with the principles of sustainable development. Because there is a direct correlation between shipping and trade, any carbon reduction mechanism for this sector must allow shipping to continue to underpin and meet the demands of world trade.

Maintaining a level playing-field in international shipping is vital. The proposed cap-and-trade system would be equitable for the shipping industry, as it would be administered globally and apply to all ships of all flags operating internationally above a certain tonnage size (to be determined by IMO). Any scheme administered by the IMO must conform to that organisation's principle of 'no more favourable treatment'.

The outcomes that governments are looking to achieve internationally are ambitious. No system that achieves these outcomes will be effective without governments' commitment to both general and administrative support. Any scheme would need to be structured in such a way as to minimise opportunities for evasion, especially in the transition period prior to all countries implementing the necessary legislation. Our associations are confident that any scheme based upon traditional IMO enforcement structures will be successful in minimizing evasion.

We expect that, at the forthcoming UNFCCC meeting in Copenhagen, the international community will agree in principle to include international shipping in any post-2012 climate regime. Should this fail to materialise, it is likely that different regions around the world will introduce different carbon reduction schemes for shipping. This could lead operators to re-register their vessels in flag states that are not covered by any one system, or re-route their ships, in order to avoid any costs of compliance. This would not only undermine the effectiveness of global reduction targets for CO<sub>2</sub> emissions but also place some shipping companies at a competitive disadvantage. A global framework would ensure a level playing-field – only an agreement at this level will deliver a system that is fair.

A cap-and-trade system would clearly be enforceable. Shipping is already extensively regulated by global conventions and other instruments under the auspices of the IMO and guidance on their implementation is clearly set out in IMO Resolution A.973(24) – Code for the Implementation of Mandatory IMO Instruments, which was adopted in 2005. Under this:

- States must enact national legislation to reflect the international convention.
- Both flag states and port states must take necessary measures to ensure compliance, which include punitive measures such as fines, detention, etc.
- All the major conventions include the “No more favourable treatment principle”, which means that port states are obliged to impose the conditions of the conventions on all ships visiting their territory.

Regulation and compliance are second-nature to an industry that needs international agreement and cooperation, in

order to run smoothly on a day-to-day basis. While we recognise that the Kyoto Protocol principle of “common but differentiated responsibilities” may also need to be reflected in an emissions trading scheme for shipping, there are more sophisticated ways of meeting this principle than by simply excluding ships of a given flag. Shipping companies which choose to trade internationally should expect to comply with international legislation.

The principal difficulty is that the shipping industry is not governed by the rules of a single country or region – like, say, the electricity or inland transport sectors. Nevertheless, shipping is subject to strict governance – through its own global, regulatory authority, i.e. IMO, and through the governments both of the country in which the ships are registered and of the ports in which the ships load and discharge. This multi-tiered structure, under the direction of the UN, can be utilised to implement an effective global cap-and-trade scheme for shipping.

## How cap-and-trade will work for shipping



Under the proposed scheme:

- The only GHG subject to the cap, at least initially, would be CO<sub>2</sub>.
- Monitoring would apply to CO<sub>2</sub> emissions from all fuel bunkered regardless of where it was used onboard (i.e. from both main engines and boilers).
- CO<sub>2</sub> emissions would be calculated based on fuel-type, carbon conversion factors and quantity consumed. Data regarding consumption could be collected from fuel purchase records, specifically the Bunker Delivery Note mechanism, which is already a feature of existing global legislation (MARPOL Annex VI).
- 1 emissions allowance would be equivalent to 1 tonne of CO<sub>2</sub>.
- The agreement would cover all international shipping above a certain vessel size, to be determined by IMO. (Domestic shipping – e.g. ferries, tugs and inland waterway vessels – could either be included within existing national targets in developed countries and regulated through national legislation or permitted to join the international regime at the discretion of their national governments.)
- The ‘responsible’ entity would be each individual ‘company’ as per SOLAS IX/1 (the Document of Compliance company). Typically this will be the technical operator but may be the owner where the ship is directly managed by the owner. Such companies can be readily

identified by their company IMO number, as required from 1 January 2009, which itself provides a direct link to their ships' IMO number(s) used for verification purposes. Carbon credits could be auctioned or sold, based on the number and type of ships in the individual company's fleet.

- In all cases, the Document of Compliance (DoC) holder is responsible for ensuring that sufficient carbon credits are purchased for the volume of bunkers consumed.
- At all times each ship will be required to have on board the appropriate documentation that demonstrates compliance, i.e. certification of credits corresponding to emissions as calculated from a ship's Bunker Delivery Notes.
- Where charter agreements place the long-term logistical control of ships with commercial operators, this approach allows the market to set prices for ships according to efficiency, so as to encourage charterers to use more environmentally efficient ships.

The important first step is to agree the baseline. This is the figure that represents the aggregate emissions from

international shipping at a given point in time and provides a level against which to assess future reductions.

The setting of the baseline allows decisions to be taken on how targets are set for emissions reductions and how allowances are allocated. As historical CO<sub>2</sub> data for the shipping industry is incomplete and potentially inaccurate, it is recommended that any baseline should be calculated in the coming few years before the trading scheme goes live.

Once the baseline is established, the IMO, possibly in conjunction with the UNFCCC, would set the cap by reference to the baseline. The IMO would need to agree the starting point in terms of emissions and the desired outcome, both for the initial period and the longer term, so that an appropriate reductions trajectory can be defined. The parties to a shipping agreement (i.e. national governments within IMO/UNFCCC) would decide on the emissions cap for international shipping for the compliance period under discussion (e.g. 2013-2018), taking into consideration the technical and economic implications of such a cap.

## How to obtain carbon credits

The next step is the allocation of allowances. One option would be for allowances to be allocated free of charge, with the total number of allowances allocated equivalent to the global cap and individual shipping companies liable only for the costs of CO<sub>2</sub> emissions incurred above their allocation – i.e. they would have to buy any additional allowances that they needed from the market. However, to make this process fair, accurate baseline and/or benchmark data for each vessel type and size would be required from the industry before allowances were allocated between different companies. Our associations consider that the practical challenges in setting such benchmarks would be prohibitively time-consuming and contentious – the extensive difficulties associated with establishing benchmarks for existing vessels seen in the parallel discussions at IMO on the Energy Efficiency Operational Indicator bear witness to this conclusion. We therefore strongly suggest that the scheme's architecture should be viable without benchmarks, i.e. based on historical emissions.

Another option is for 100% of allowances to be purchased either through an auctioning process or by direct purchasing at the current market rate. This means a GHG emitter would have to buy an allowance for every tonne of CO<sub>2</sub> emitted. This would be easier to initiate, because there would be no requirement

for a benchmarking process. Shipping companies themselves would assess how many allowances they need to buy, rather than be granted them based on an external assessment. This method of allocation would also benefit companies who have already invested in efficiency safety measures, because they would not need to buy as many allowances at auction.

The revenue generated from the auction would be disbursed in accordance with an international agreement and could be beneficial to Non Annex I countries by, inter alia, providing adaptation and mitigation funding for the global carbon agenda. However, and recognising that the long-term objective of the shipping ETS is the orderly transition of the sector to a carbon-free (or very low-carbon) industry, the disbursement of revenues could also usefully be invested in research, development and deployment (RD&D) funds to investigate and promote best practice in ship design and operation. Other similar funds which sought to accelerate the process towards low-carbon shipping by incentivising industry could also be considered. A recycling of revenues to carbon-reduction measures which are explicitly of benefit to the shipping industry would also be a welcome recognition of the extra burden placed on this sector by the immediate introduction of 100% auctioning.

In order for an approach based on 100% auctioning to be acceptable, the industry would need to be confident that the following four key conditions had been satisfactorily addressed:

- Valid use of revenues generated
- Prevention of carbon/fund leakage through universal coverage
- Practical design and execution of the auction scheme and
- Strong governance processes for monitoring, reporting and verification (MRV).

It would be possible to create a transition process to help ease individual companies and other interested parties into the scheme by establishing and running an emissions trading system that allows for 'learning by doing'. One way would be for

companies to trade credits 'virtually' for a fixed period – i.e. to impose during this time a trading scheme which allowed entities to become familiar with 'buying' and 'selling' credits (which would have no value), while having to comply with actual and enforceable verification procedures. This 'virtual' trading could run in the period up to the scheme's 'go live' date and be used by companies to identify the clearest possible picture of the number of credits they would need to buy in the first year of actual trading and how they should acquire them. This would not delay the start of the scheme registration. Indeed, reporting of ship emissions as a prelude to trading would be a surer step to implementation, as it would allow baselines to be set and make data both transparent and subject to peer review.

## Two possible auction frameworks

The following methods for obtaining carbon credits are designed to fit in with the current systems for credits which operate under the Kyoto Protocol (see Annex 1 – 'Carbon Currencies' for more detail).

### SECTORAL APPROACH

One possible methodology for an emissions allowance auction for the shipping industry could be based on a sectoral approach. Under this, the UNFCCC would treat the international shipping industry both as a discrete entity and as an 'international industry sector' similar to a country. The international shipping sector would, through the administrative body established by IMO, be allocated a CO<sub>2</sub> budget or a cap based on the IMO's updated GHG study.

This budget would take the form of AAUs (Assigned Amount Units). These AAUs could then be auctioned either:

- i) in a closed auction available only to regulated entities within the shipping industry (so that only genuine shipping companies would be permitted to purchase these credits when auctioned); or
- ii) in an open auction with sufficient governance to ensure allowances are available for all compliance parties, for example a system based upon a 'justified bid'; or
- iii) alternatively, all of the AAUs could be sold to shipping companies at the current market price at any time throughout the year – a 'pay-as-you-go' approach – instead of at a limited number of auctions.

Equally, allowing companies to choose their own combination of an auction and 'pay-as-you-go' might provide companies

more flexibility by allowing them to commit such funds for carbon credits as appropriate to their business model.

Under the sectoral approach, there would be one legal agreement, one set of terms and conditions for the scheme, and one central register (as under other existing UNFCCC mandated schemes) which would be operated by the administrative body (IMO). The register would, in effect, hold the participant's carbon bank account. A participant's carbon credits would be added to or removed from this register and the status of the accounts would be monitored by the administrator. This would have the advantage that IMO would not have to set up a separate register for any other sectors such as the bunker industry.

Shipping companies would be required to surrender emission allowances equivalent to the CO<sub>2</sub> emitted in the compliance period.

This sectoral approach is shown in figure 2 (top right).

If the shipping company operated its fleet within the allowances purchased, there would be no requirement to buy additional credits from the international carbon market – that would only be necessary if a shipping company's emissions exceeded the equivalent allowances purchased at auction. Credits could be 'banked' from one compliance period to another. In addition, a shipping company with a number of vessels would be permitted to balance its aggregate carbon position by off-setting within its fleet. This process is shown in figure 3 (bottom right).

Figure 2: Framework for Sectoral Approach for a shipping ETS

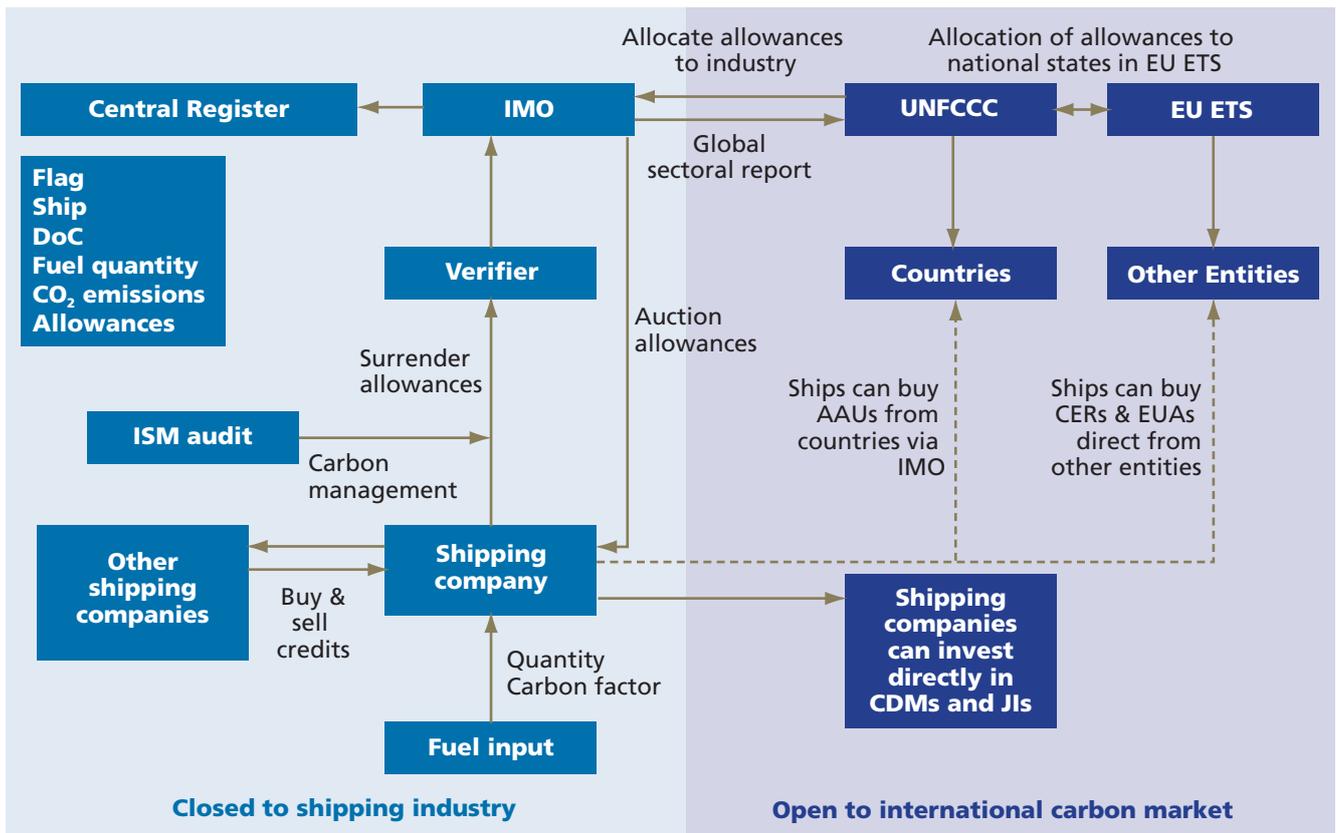
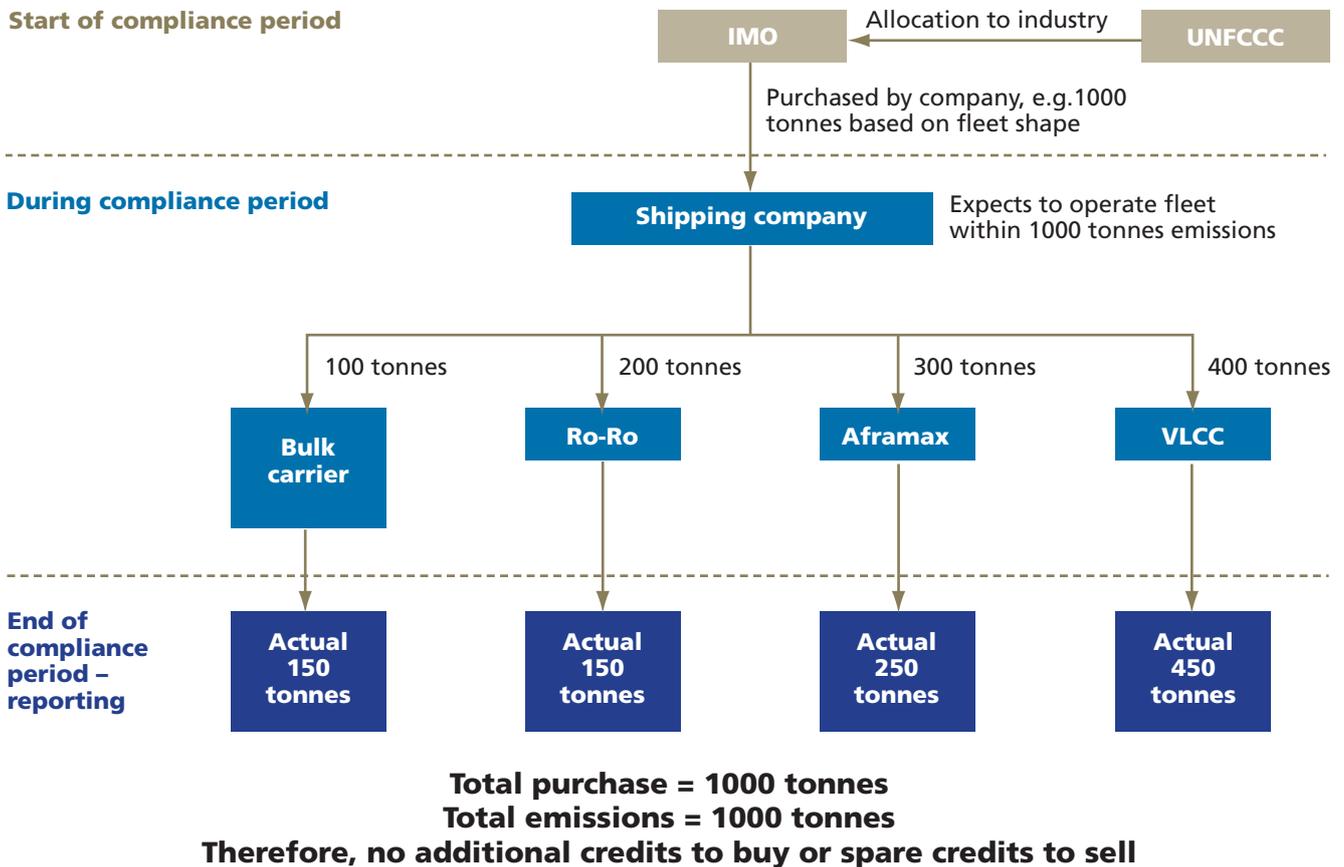


Figure 3: Purchased vs actual emissions





The international trading scheme for shipping would run parallel to existing schemes, such as the EU Emissions Trading Scheme, so that credits could be bought and sold across different schemes. The international shipping scheme would therefore need to be fully interchangeable with existing ETS architecture elsewhere, including with the Clean Development Mechanism / Joint Implementation processes, in order to allow for global, open trading.

### **'DISTRIBUTED' AUCTION APPROACH**

A second possible methodology could be described as a 'distributed' auction approach. The UNFCCC would establish a new emissions unit for shipping called the Shipping Emission Unit (SEU). An SEU would not be issued per se, rather it would be created by converting an Assigned Amount Unit (AAU) or any equivalent unit defined in Copenhagen for the post-2012 world. Each conversion would 'retire' the original AAU or unit. (These could include any unit linked to an AAU, such as a European Allowance, or a Certified Emission Reduction – the currency of the Clean Development Mechanism.) This process would be carried out through a gateway in the International Transaction Log (ITL). The process of AAU/SEU conversion would be managed by the IMO.

The International Transaction Log is the mechanism already used by the EU's Emissions Trading Scheme and by the UNFCCC and it will be central to any fund that may be developed as part of the chosen economic or market-based instrument. It is paralleled by similar transaction logs at national level. In this context, it would serve three essential purposes, to:

- verify that a transaction (ie sale or purchase of credits) is compliant with the rules
- check whether actual emissions for the sector are within/over/below targets and
- verify that the original units had been 'retired' on conversion.

The overall cap for shipping emissions would be implemented by the IMO limiting the conversion of AAUs/other units to Shipping Emission Units through the ITL gateway in accordance with the agreed cap (see page nine).

Through the International Transaction Log, the vessel operator would maintain a verified record of compliance, identifying the purchase of bunkers (and implied emissions of CO<sub>2</sub>) and the surrender of SEUs. A ship would operate on a [three] [six] [twelve] month compliance window, meaning that a vessel would never be more than a few months in arrears with regard to surrendering SEUs against emissions of CO<sub>2</sub>.

The shipping industry would have to create sufficient SEUs to match the bunkers it consumed or limit emissions to the equivalent of the number of SEUs available through the gateway. If the industry consumed 200 million tonnes of bunker fuel, it would require about 660 million SEUs (using agreed conversion factors and based on 2006 data). These would be sourced as follows:

- In addition to the allocation of Assigned Amount Units to countries against their respective national caps for the compliance period in question (e.g. the UNFCCC allocated 3.41 billion AAUs to the UK for the period 2008-2012), the UNFCCC would allocate additional AAUs to those countries who supplied bunkers to international shipping in the baseline year, in proportion to the amount they supplied, but adjusted for the agreed cap. (Supply data is published by the International Energy Agency.)
- Governments in possession of AAUs issued against shipping bunkers would auction SEUs to the international shipping market. Governments could also sell AAUs from other sources to shipping entities.
- Shipping companies could also procure other emission reduction units from the open carbon market or initiate projects in developing countries to produce such units, which would then be converted to SEUs through the IMO process and recorded in the International Transaction Log.

This approach would have an important, additional political dimension, since it would help to encourage a number of countries (e.g. China, India, Singapore and UAE) to adopt formal UNFCCC targets, so that they would also be entitled to receive additional AAUs for bunkers supplied from their ports.

If this approach were in practice today, some 300 million SEUs would come from government auctions of shipping AAUs, leaving another 300 million to be found in the Certified Emission Reduction market, or from other governments prepared to sell a proportion of their existing allocation of AAUs to the shipping industry. This is equivalent to the current size of the CER market. However, the surplus of AAUs in a number of countries would doubtless come to the market as well.

Should a small number of nations who are also large bunker suppliers also take on national targets, the number of AAUs issued for shipping would rise, possibly to as high as 80% of the global requirement (see Figure 4).

A schematic of the ‘distributed’ auction approach is contained in Figure 5 (below).

**Figure 4: Distribution of international bunkers (in CO<sub>2</sub> terms)**

Annex 1 countries                    287 MT CO<sub>2</sub>  
 Non-Annex 1 countries            295 MT CO<sub>2</sub>

**Key suppliers are**

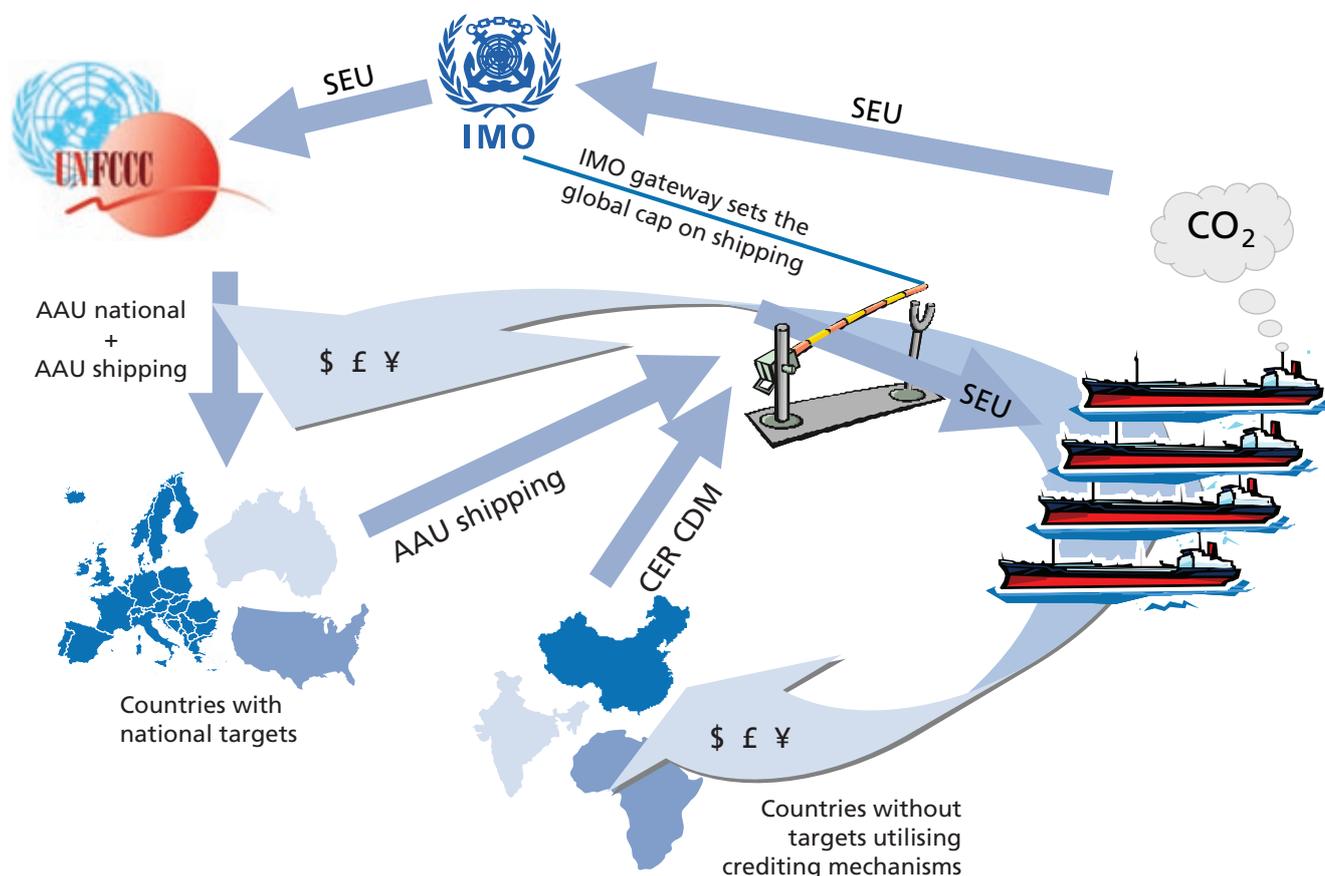
<b>USA</b>	88 MT
<b>Japan</b>	19 MT
<b>EU-27</b>	171 MT
<b>Singapore</b>	86 MT
<b>Taiwan</b>	7 MT
<b>UAE</b>	41 MT
<b>Saudi Arabia</b>	8 MT
<b>Korea</b>	33 MT
<b>Brazil</b>	11 MT

This means that about 50% of global (international) bunkers are within countries likely to have absolute targets under the next international agreement on climate change.

Another 175 MT CO<sub>2</sub> are in five countries that are prime candidates for adopting absolute national targets.

Source: IEA

**Figure 5: ‘Distributed’ Auction Approach**



## COMPARISON OF THE TWO APPROACHES

The differences between these two possible methodologies lie only in the auction process. The other processes that comprise the emissions trading scheme framework are the same.

For both the sectoral and the ‘distributed’ auction approaches:

- Under the transitional ‘learning by doing’ process described on page ten, it would be prudent to keep the International Transaction Log gateway open in the early years of the system, giving the shipping community time to adjust to the reality of CO<sub>2</sub> management. With the

gateway open, there would be no formal absolute cap on shipping, only the need to match shipping emissions with SEUs and hence no need to go to the wider market for additional SEUs.

- Credits purchased and SEUs created which were not used in a given year could be ‘banked’ for future use – except where SEUs were created during a period when the International Transaction Log gateway had no limits in place.

To aid understanding of the two alternatives, the table below provides a comparison.

**Figure 6: Comparative auction approaches**

SECTORAL APPROACH	DISTRIBUTED AUCTION APPROACH
The shipping industry is considered as a ‘party’ under the follow-up to the Kyoto Protocol and assigned a number of Assigned Amount Units (AAUs).	For this approach it is not necessary to consider ‘shipping’ as a ‘party’ under the follow-up to the Kyoto Protocol.
The cap is defined by limiting the available AAUs.	The cap is not well defined in the present paper since it talks about limiting the flow of SEUs through a ‘gateway’. Potentially this leads to per ship pro-rata distribution of the cap, which is not practical. So the cap would again have to be based on limiting the AAUs, accepting that this is not as transparent as in the Sectoral Approach.
The AAUs for shipping are held by the IMO as a party to the convention and offered for auction.	The AAUs for shipping are distributed to individual parties as part of a revised national plan, with a national commitment in direct relationship to the size of the country’s marine bunker sales.
The auctioning of shipping emissions is conducted by a single body acting under the authority of the IMO.	The auctioning of shipping emissions is conducted by individual parties, with additional ‘shipping AAUs’ assigned in proportion to their bunker sales.  Shipping entities obtain a conversion of AAUs to SEUs via an IMO-administered ‘register’.
Access to the emissions auctions could be either (1) limited to entities with a direct interest in international shipping or (2) open.	Access to the emissions auctions would be open to all wishing to participate.
The auction proceeds could be made directly available by the IMO to the UNFCCC adaptation and mitigation funds (with an amount being retained to cover the scheme administration costs) and also for use for R&D within the shipping sector.	The auction proceeds could be made directly available to the UNFCCC adaptation and mitigation funds by the parties conducting the auctions. These parties would also contribute a proportion of the auction proceeds to cover the scheme’s administration costs. Parties (i.e. governments) could also be urged to invest some of the revenues in R&D within the shipping sector.

## Reporting and verification

Monitoring, reporting and verification (MRV) are a vital component of any economic or market-based instrument, as carbon reductions must be transparent, measurable and verifiable. Control and verification will play a crucial role in maintaining the integrity of any scheme and ensure that the information and data in the annual emissions reports are free from significant omissions, misrepresentations and errors. Penalties for non-conformance could include a fine plus the surrender of additional allowances.

A standard monitoring plan setting out measures on how to monitor and report emissions would have to be developed by the IMO. Primary data sources for fuel consumption in this monitoring plan could be the engine logbook and the Bunker Delivery Notes (discussed on page eight). The information that has to be recorded in the Bunker Delivery Note includes

(among other data) the name and IMO number of the receiving ship, port of bunkering, marine supplier contact information, and fuel quantity and density.

The control and verification tasks could be addressed in a number of ways and the two following alternatives give an indication of the range of possibilities. Under both approaches, the legal framework would be developed by the IMO, either under a new convention or as an addition to MARPOL. It would be implemented at national level through parties to the agreement having responsibility for ensuring the compliance of vessels entering their waters through Port State Control. Oversight of the compliance process would rest with the parties to any IMO instrument on CO<sub>2</sub> emissions (as described on page eight).



## MANAGING VERIFICATION AT A COMPANY LEVEL

Under this approach, an independent verification body would initiate and own a process that allowed for the issue to companies of a certificate of compliance for the previous compliance period of [three] [six] [twelve] months, which could then be inspected as part of Port State Control requirements and subject to standard Port State Control penalties. The principle of verification would be met by the ship demonstrating that it had surrendered credits or Shipping Emissions Units in relation to its bunker consumption.

At the end of the compliance period of [three] [six] [twelve] months, the shipping companies would have to report back their verified emissions to the Central Register. A deadline would be set – say three months – following the end of the compliance period by when the shipping company (or other operator) would have to submit the required information, in order to allow intra-fleet off-setting and the completion of voyages which straddle the end of the compliance period.

## MANAGING VERIFICATION AT A SHIP-SPECIFIC LEVEL

An alternative approach is to require ships to operate on a 'pay-as-you-go' basis. Under such a system, each time a ship took on bunkers, the purchaser of that fuel would have to deposit an

equivalent amount of CO<sub>2</sub> emission allowances into its unique carbon account held by the administrative body established by IMO unless a surplus from previous deposits was sufficient to prevent a negative balance.

Companies owning a number of ships would be free to buy large quantities of CO<sub>2</sub> allowances and would be able to allocate them across their fleet so long as each ship within that fleet maintained a non-negative carbon account. In addition, companies of whatever size would be permitted to buy additional volumes of allowances in periods they consider the price is low and trade them later – although this is unlikely to be a core business for single-ship or small companies and of interest mainly to larger companies.

Under this approach, the exercise of control would work in the following manner: When a ship enters a port, the Port State Control Officer will check the ship's BDNs and compare them with the electronic carbon account balance also provided by the ship. If the officer has reason to believe there is a discrepancy, he may call up the ship's account with the central register in the administrative body using the ship's IMO number to check if the ship's account is in order, i.e. that sufficient emission allowances corresponding to the BDNs are deposited and thus the ship's carbon account is in balance. If not, the ship is detained until the account is settled.

## Conclusion

The forthcoming Copenhagen COP15 summit raises legitimate expectations that hitherto excluded sectors – international aviation and shipping – will be brought within the overall UN carbon reduction framework. Our associations firmly believe that emissions from international shipping must be explicitly addressed and form part of the equation.

The concept of a global economic instrument for international shipping could be promoted as part of the overall Copenhagen agreement with the specific details left to the IMO. It would be particularly helpful if the Copenhagen agreement could make explicit the fact that shipping must meet any reduction targets while respecting the principle of ‘no more favourable treatment’.

Shipping is the glue that holds world trade together, and is already the most carbon-efficient means of transporting goods. Shipping must be permitted to grow so that it can continue to service the demands of world trade and a rapidly expanding global population – but needs to do so in a sustainable way. Trading under a cap is the only option which would permit

international shipping to do just that – and thereby to meet both the needs of environmental and trade policy.

Our associations firmly believe that a global emissions trading system, administered by the IMO on behalf of the world’s governments and societies, will achieve the outcomes that are necessary – as it will deliver real change both by being explicit about the necessary environmental outcome via the ‘cap’ and by actively encouraging behaviour that will achieve that outcome through the ‘trade’.

We look forward to continuing to contribute to the process.

**Australian Shipowners Association**  
**Royal Belgian Shipowners’ Association**  
**Norwegian Shipowners’ Association**  
**Swedish Shipowners’ Association**  
**Chamber of Shipping of the UK**

*September 2009*



## Annex 1: Carbon currencies

The Kyoto Protocol binds most developed (or 'Annex 1') nations to a cap-and-trade system for the six major greenhouse gases. Emission quotas were agreed by each participating country, with the intention of reducing their overall emissions by 5.2% of their 1990 levels by the end of 2012. Each developed country is issued with a certain number of Assigned Amount Units (AAU) which form one of three measurement criteria for developing (or 'Annex 1') countries to achieve emission reduction targets. The other two mechanisms are Emission Reduction Units (ERU) and Certified Emission Reductions (CER). AAU is a cap and trade mechanism, and the latter two mechanisms deal with actual project-based reduction.

Under the Protocol, for the five-year compliance period from 2008 until 2012, nations that emit less than their quota will be able to sell emissions credits to nations that exceed their quota. It is also possible for developed countries within the trading scheme to sponsor carbon projects that provide a reduction in greenhouse gas emissions in other countries, as a way of generating tradable carbon credits. The Protocol allows this through 'Clean Development Mechanism' (CDM) and 'Joint Implementation' (JI) projects, in order to provide flexible mechanisms to aid regulated entities in meeting their compliance with their caps.

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialised countries with a greenhouse gas reduction commitment to invest in projects that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries. A crucial feature of an approved CDM carbon project is that it has established that the planned reductions would not occur without the additional incentive provided by emission reductions credits, a concept known as "additionality".

The CDM allows net global greenhouse gas emissions to be reduced at a much lower global cost by financing emissions reduction projects in developing countries where costs are lower than in industrialised countries.

The CDM is supervised by the CDM Executive Board (CDM EB) and is under the guidance of the UN Framework Convention on Climate Change (UNFCCC). A project registered and implemented earns credits called Certified Emission Reductions or CERs (where each unit is equivalent to the reduction of one metric tonne of CO<sub>2</sub>), to project participants based on the monitored difference between the baseline and the actual emissions.

Joint implementation (JI) is set forth in Article 6 of the Kyoto Protocol. Under Article 6, any developing ('Annex I') country can invest in emission reduction projects (referred to as 'Joint Implementation Projects') in any other Annex I country as an alternative to reducing emissions domestically. In this way countries can lower the costs of complying with their Kyoto targets by investing in greenhouse gas reductions in an Annex I country where reductions are cheaper, and then applying the credit for those reductions towards their commitment goal.

A JI project might involve, for example, replacing a coal-fired power plant with a more efficient combined heat and power plant. Most JI projects take place in so-called "economies in transition".

Emission reductions are awarded credits called Emission Reduction Units (ERUs), where one ERU represents an emission reduction equaling one tonne of CO<sub>2</sub> equivalent. The ERUs come from the host country's pool of assigned emissions credits, known as Assigned Amount Units, or AAUs.

## Annex 2: Glossary

**AAU:** Assigned Amount Unit. An Assigned Amount Unit (AAU) is a tradable unit of 1 tCO<sub>2</sub> forming part of a country's AA (Assigned Amount), which is the quantity of greenhouse gases that an Annex I (developed) country can release in accordance with the Kyoto Protocol, during the first commitment period of that protocol (2008-12).

**Bunkers:** Fuel used on board ship.

**Bunker Delivery Note:** Bunker Delivery Notes (BDNs) include the name and IMO number of the receiving ship, the port at which

bunkers were taken on and the date of delivery amongst other fuel quality data. BDNs are kept on board and are available for inspection at any time. They are retained for a period of three years after the fuel oil has been delivered on board.

**CER:** Certified Emission Reductions (CERs) are a Kyoto Protocol unit equal to 1 metric tonne of CO<sub>2</sub> equivalent. CERs are issued for emission reductions from CDM project activities. Two special types of CERs called temporary certified emission reduction (tCERs) and long-term certified emission reductions (lCERs) are issued for emission removals from afforestation and reforestation CDM projects.



**COP:** Conference of Parties (COP). The meeting of parties to the United Nations Framework Convention on Climate Change.

**Document of Compliance:** A Document of Compliance (DoC) is issued to every company which complies with the requirements of the International Safety Management Code. It is issued by an administration (or an organisation recognised by an administration) and a copy is kept on board so that the Master can produce it upon request for verification.

**Emissions Trading:** Emissions trading allows for the transfer of AAUs across international borders or emission allowances between companies covered by a cap-and-trade scheme. It is a general term often used for the three Kyoto mechanisms: JI, CDM and emissions trading.

**Flag States:** Countries which have ships registered in their territory and which therefore have legal oversight of those ships.

**IEA:** International Energy Agency.

**IMO:** International Maritime Organization (the UN's specialist maritime agency).

**IMO Ship Identification Number Scheme:** Introduced in 1987 and made mandatory in 1996, this assigns a permanent number to each ship for identification purposes. This number remains unchanged upon transfer of the ship to other flags and is inserted

on a ship's certificates. The IMO number is never reassigned to another vessel.

**IMO Unique 'Company' and 'Registered Owner'**

**Identification Scheme:** This scheme entered into force on 1 January 2009 following its introduction in 2004 through the adoption of resolution MSC.160(78). The number is unique to the company and/or registered owner. Only one number is issued to the company whether it undertakes one or both roles. The scheme applies to ships of 100GT or above engaged on international voyages. The number stays the same when a company changes its name.

**ITL:** The International Transaction Log (ITL) is a planned central database of all tradable credits under the Kyoto Protocol. It is the application that verifies all international transactions and their compliance with Kyoto rules and policies.

**Kyoto Protocol:** The Kyoto Protocol was adopted at the Third Conference of the Parties to the United Nations Convention on Climate Change held in Kyoto, Japan, in December 1997. It commits industrialised-country signatories to reduce their greenhouse gas (or "carbon") emissions by an average of 5.2% compared with 1990 emissions, in the period 2008-2012.

**MARPOL:** The IMO's international convention governing maritime pollution.

**Port State Control:** The inspection of foreign ships in a country's ports by inspectors, for the purpose of verifying that the competency of the master and officers onboard and the condition of a ship and its equipment comply with the requirements of international conventions (e.g. SOLAS, MARPOL, STCW, etc.); and that the ship is manned and operated in compliance with applicable international law.

**SEU:** Ship Emission Unit. An AAU converted for use solely in a ship emissions trading scheme.

**SOLAS:** The IMO's international convention governing Safety of Life at Sea.

**STCW:** The IMO's international convention governing Standards of Training, Certification and Watchkeeping for seafarers.

**UNFCCC:** United Nations Framework Convention on Climate Change (UNFCCC). The international legal framework adopted in June 1992 at the Rio Earth Summit to address climate change. It commits the parties to the UNFCCC to stabilise human-induced greenhouse gas emissions at levels that would prevent dangerous man-made interference with the climate system.

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