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About the GSF

The Global Shippers’ Forum (GSF) is the global voice for shippers, created in 2006 as the successor to the Tripartite Shippers’ Group, first organized in 1994. Like the Tripartite Shippers’ Group, the GSF represents the interests of shippers from Asia, Europe, North and South America and Africa. The GSF is focused on the impact of commercial developments in the international freight transportation industry and the policy decisions of governments and international organisations that affect shippers and receivers of freight. The GSF was formally incorporated and registered as a non-governmental organisation in the United Kingdom in June 2011.
I am delighted to introduce this maritime emissions policy briefing from the Global Shippers’ Forum (GSF). Since our last policy briefing, the International Maritime Organization (IMO) continues to make useful progress towards solutions to reduce shipping emissions. In the past year, GSF has taken considerable steps to expand its influence at IMO. We remain convinced that the role of the shipper can help influence the debate and ensure there is a cost effective approach to greenhouse gas (ghg) reduction. Working with the International Cargo Handling Co-ordination Association (ICHCA), GSF has participated in the last three Marine Environment Protection Committees (MEPC) to see at first hand the development of a data collection system for ship fuel consumption. We recognise the significant steps that MEPC is taking to agree a system that is cost efficient and straightforward.

GSF has called for inclusion of data that could help identify energy efficiency, such as cargo carried, distance travelled and transport work within the correspondence group assigned to work on the system and also to MEPC 68. GSF’s approach is supported by most European member states, the United States, Canada, Japan, Australia and New Zealand. Increasingly shippers are required to provide carbon data for their movement of goods; this demand will only increase and shipowners must play their part in making the data accessible to shippers. It will be a missed opportunity not to investigate data elements that could help to establish energy efficiency, though we do not underestimate the complex nature of this work. Meanwhile, the European Commission has pressed ahead with steps to introduce a monitoring, verification and reporting (MRV) system from 2018 for all large ships that use EU ports. GSF anticipates that the MRV system will help to establish a consistent methodology for carbon data capture from ships. We also note the continued work of many voluntary initiatives that seek to compare ships and journeys by energy efficiency.

The scale of the greenhouse gas challenge is not going away. Ahead of reaching a global deal for ghg emissions at Paris in December 2015, the United Nations Framework Convention on Climate Change (UNFCCC) is proposing that reduction targets are set for shipping and aviation. Under pressure and scrutiny the sector may favour market-based measures such as a bunker levy or an emissions trade system. GSF’s goal is to block such proposals which will only serve to increase freight rates to pay for the environmental cost of shipping goods without encouraging any real carbon efficiency. This is why it remains so important for shippers to be central to ongoing negotiations at IMO to ensure that the whole supply chain is fully represented.

I hope that you will find this third guide a useful overview of the current maritime emissions debate and to understand the issues from the shippers’ perspective. This policy briefing complements previous GSF maritime emission policy briefings which provide further detailed insight into the issues.

Chris Welsh
Secretary General
Global Shippers’ Forum
Carbon emissions from international maritime shipping make up 2.2 per cent of the global total, but left unchecked could increase by as much as 250 per cent in the period to 2050.¹ This document examines the latest developments within maritime emission policy, focusing on IMO’s progress towards a data collection system for fuel and the European Commission’s steps towards a Monitoring, Reporting and Verification (MRV) scheme. It also looks ahead to future policy approaches by key stakeholders and the continuing need for shippers to have a voice in the debate.

Shipping already offers a highly carbon efficient mode for transporting goods, carrying approximately 90 per cent of all world trade. However, it is predicted to grow significantly in pace with world trade and currently has no regulatory mechanism to restrain the future growth of greenhouse gas (ghg) emissions. Total shipping fuel consumption is dominated by three ship types: oil tankers, bulk carriers and containerships as shown in the graph below. IMO is responsible for developing an eventual market-based measure (MBM) to facilitate the required reductions as governments and pressure groups remain keen to regulate the sector. GSF is working to raise the important profile of shippers’ needs in maritime emissions policy development.

¹ IMO Third GHG Study 2014
GSF is supportive of schemes that can enable the accurate reporting of shipping emissions and incentivise actions to reduce them rather than market-based measures (MBMs) that can lead to increased costs along the supply chain. In 2011, with the publication of its first maritime emissions briefing, the GSF established the following principles for the shipping industry to reduce carbon emissions. The principles highlight the value of shippers within the maritime emissions debate.

- Transparency of carbon emissions and interventions is essential so that shippers can identify their maritime supply chain carbon footprint in order to meet their Scope 3 reporting obligations.

2 Scope 3 are indirect emissions from activities carried out on their behalf.

- For any scheme to be acceptable to shippers it should target operational efficiency, focusing on the efficient management of fuel and fuel costs, and lowest carbon cost per unit moved.

- Measurement and recording of fuel usage and activity is an essential first step in delivering low cost and best value solutions, rather than emission reductions at any cost. It is also a prerequisite for any future cap and trade scheme.

- Shippers urge the shipping industry to take direct responsibility for setting and delivering a clear target for reducing carbon emissions. GSF supports the potential development of a voluntary shipping industry initiative to reduce carbon emissions.

### Maritime emissions key milestones

1997
- Kyoto Protocol responsibility for reducing maritime emissions assigned to Annex 1 countries working through IMO

2000
- IMO First GHG Study published

2009
- IMO Second GHG Study published
- IMO agreement to disseminate a package of interim and voluntary technical and operational measures to reduce ghg emissions

2010
- IMO expert group reviews MBM proposals

2011
- EEDI and SEEMP approved by MEPC 62

2012
- European Commission consults on proposals to introduce a regional MBM

2013
- EEDI and SEEMP come into force
- European Commission launches MRV proposals
- Green Climate Fund launched

2014
- Data collection system proposed at MEPC 66
- Correspondence group progresses data collecting system proposals at MEPC 67
- IMO Third GHG study published

2015
- European Commission MRV regulations come into force
- MEPC 68 takes place
- Universal climate agreement expected at Paris UNCCC
IMO key challenges

As ships are registered in a large number of countries and operate regularly between ports in over 200 countries, the IMO has a huge challenge in securing emission reductions in the maritime sector. The many different trades and vessel types such as cargo, containers and tankers also operate very differently, further complicating policy. In July 2011, MEPC 62 succeeded in adopting the Energy and Efficiency Design Index (EEDI) and Ship Energy Efficiency Management Plan (SEEMP) to help reduce ghg emissions but it is inevitable that an MBM may be needed for more significant emissions reduction. Recently, attention has been given to the development of a data collection system for fuel consumption. GSF believes that the key challenges ahead for the IMO are as follows.

Establishing a data collection system fit for purpose

At recent MEPCs, focus has been diverted towards the development of a data collection system to record fuel consumption. A correspondence group has been specifically set up to develop this system. However, there is debate on the level of detail that the system should include. For instance, many countries such as UK, US, Norway, Denmark and the European Commission would like to see inclusion of some form of energy efficiency metric to better fully assess shipping emissions. Consensus to actually develop a data collection system is recognised as a positive step by IMO (see page 8).

Pursuing a market-based measure

IMO has committed to carrying out a further impact assessment up to 2050 to examine the socio-economic impacts on developing countries of introducing an MBM, both positive and negative. There is concern that an MBM will impose a disproportionate burden of economic cost on developing countries which are not currently the highest emitters of greenhouse gas (ghg) emissions. Some countries remain opposed to any form of MBM as they believe it is incompatible with World Trade Organization rules. Proposed MBMs have included a bunker levy, an emissions trading scheme and schemes based on energy efficiency (see box on page 7). However, discussion on MBMs has largely been suspended as work has begun on the data collection system. Further information on MBM proposals can be found in previous GSF maritime emission briefings at www.globalshippersforum.com

European Commission introduction of an MRV system

For a number of years, the Commission had been disappointed with IMO’s progress on introducing a global MBM and threatened to press ahead with its own regional MBM. Following initial consultation in 2012, in late 2014 the Commission formally proposed the introduction of a monitoring, verification and reporting (MRV) system from 2018, which will establish a methodology for data collection for the maritime sector. This system goes beyond that currently being debated at a global level. The EU MRV would need to be reviewed in the event that an international agreement to reduce ghg emissions from maritime transport is reached (see page 10).

Reporting statistics on maritime ghg emissions

MEPC 67 approved the third IMO GHG Study 2014 reporting that international shipping represented 2.2 per cent of global carbon emissions in 2012, against 2.8 per cent in 2007. However, ‘business as usual’ scenarios continue to indicate that those emissions are likely to grow by between 50 per cent and 250 per cent in the period to 2050, depending on future economic growth. IMO considers the new study to represent the most detailed and comprehensive global inventory of shipping emissions to date (see page 12).
Energy efficiency measures for ships

IMO has continued its work on further developing technical and operational measures relating to energy efficiency measures for ships, following the entry into force, on 1 January 2013, of the new chapter 4 of MARPOL Annex VI, which includes requirements mandating the Energy Efficiency Design Index (EEDI) and Ship Energy Efficiency Management Plan (SEEMP). EEDI will drive more energy-efficient ship design whilst SEEMP provides a framework for existing ships.

These mandatory measures address ship types responsible for 70 per cent of greenhouse gas emissions from international shipping.

IMO states that the introduction of the EEDI for all new ships will mean that between 45 and 50 million tonnes of CO\textsubscript{2} will be removed from the atmosphere annually by 2020, compared with ‘business as usual’ and depending on the growth in world trade. For 2030, the reduction will be between 180 and 240 million tonnes annually.

Overall, huge credit has been accorded to the IMO in gaining a majority global agreement on the first ever energy efficiency regulations. However, these measures alone will not be sufficient to satisfactorily reduce ghg emissions due to the expected growth of the world economy and associated transport demand.

Negotiations at UNCCC

Negotiations on an eventual introduction of an MBM are very much subject to a final universal climate agreement in 2015 at the UN Climate Change Conference (UNCCC) in Paris. According to the UN, the most recent conference at Lima in November 2014 has kept governments on track towards this agreement, which will come into force from 2020. At the time of writing, the United Nations Framework Convention on Climate Change (UNFCCC) was negotiating whether to set emission reduction targets for international shipping (and aviation).

GSF comment

GSF welcomes IMO’s focus on technical and operational measures to reduce maritime emissions rather than simply introducing an MBM which will ultimately lead to financial cost without necessarily improving efficiency. However, GSF recognises that technical measures alone may not be enough to meet the climate change challenge. The drive towards data collection will enable IMO to more accurately assess maritime emissions and help the industry to identify where the most practical carbon savings can be made. GSF is calling for a greater range of data. We recognise the difficulties in comparing ship performance across vessel types but a number of existing voluntary initiatives are already going well beyond what is proposed in the data collection system. The European Commission’s upcoming MRV may also assist with helping to develop energy efficiency metrics.

MBM proposals

- An international fund for greenhouse gas emissions from ships – Cyprus, Denmark, the Marshall Islands, Nigeria, International Parcel Tankers Association (IPTA) and the Republic of Korea
- A global Emission Trading Scheme (ETS) for international shipping – France, Germany, Norway and the UK
- Efficiency Incentive Scheme (EiS) – Japan and World Shipping Council (WSC)
- Ship Efficiency Credit Trading with Efficiency Standards (SECT) – United States
- Alternatives to market-based measures – the Bahamas
- Reducing greenhouse gas emissions from ships through port state institutional arrangements – Jamaica
IMO data collection system

IMO is considering the importance of enhancing energy efficiency and reducing ship fuel consumption. Originally, at MEPC 65, the Committee discussed a proposal from the United States to enhance energy efficiency through a phased approach starting with data collection. This led to the establishment of a Correspondence Group at MEPC 66 on Further Technical and Operational Measures for Enhancing Energy Efficiency under the coordination of Cyprus. This group discussed the elements of a data system including the threshold tonnage and data that should be captured. GSF noted that only one country, Belgium, made reference to the usefulness of data collection to help companies provide the carbon footprint of transported products.

Prior to MEPC 67, GSF made a submission to the correspondence group outlining the important role of shippers in the development of the system and the need to report Scope 3 emissions.

A proposed data collection system to include total annual fuel consumption per fuel type, the potential for total annual tonne-miles, total annual distance travelled and total annual service hours was submitted to MEPC 67. GSF attended MEPC 67 where delegations agreed on the need to be able to report carbon emissions but consensus could only be reached on a very simplified system based on fuel consumption alone.

The correspondence group therefore moved to develop a full language for the data collection system for fuel consumption that could be readily used for voluntary or mandatory application of the system.

Reported feedback has highlighted an increasing difference in opinion of countries and non-governmental organisations on the development of the data collection system. Many countries such as the UK, Denmark, Germany, Japan plus the European Commission view a system which makes no attempt to capture data, such as cargo carried,
transport work or distance travelled, as being unfit for purpose as it will be unable to assess energy efficiency.

Ahead of MEPC 68, the European Commission and all 28 European member countries submitted a joint paper calling for the continuation of discussions on a global data collection system, including the possibility of also collecting some form of activity data, but recognising that a policy decision is needed by MEPC for this to be pursued.

In a separate paper, Belgium, France, Germany and the United Kingdom called for fuel consumption data to be coupled with some form of activity data (cargo, distance travelled, hours of operation) to provide a basis for conclusions on ships' efficiency. The United States has also strongly pressed for the inclusion of transport work or a similar proxy in the development of the data collection system in a submission to MEPC 68.

In its own response to the correspondence group, GSF urged IMO to learn from existing voluntary initiatives that already capture data, as shippers have been at the forefront of these schemes in collaboration with the shipping industry. GSF also submitted a short technical paper ahead of MEPC 68 supporting the correspondence group's proposal to establish a data collection system for fuel consumption, but stressing the need for wider information such as distance travelled and cargo information.

At MEPC 68 in May, GSF made an intervention to put forward shippers' views on this matter. The correspondence group met during MEPC 68 and there was consensus to collect fuel data from ships with the added agreement that there continue to be discussion of including activity data such as distance travelled, cargo characteristics and service hours. An intersessional group will be formed to conduct an analysis of the different types of activity data that could be calculated and to evaluate the options for whether energy efficiency metrics can be applied. A report will be submitted to MEPC 69. A three-step approach proposed by the United States – data collection, data analysis, followed by decision-making – was particularly influential as this is the usual approach adopted by bodies of the organization when considering additional measures. Representatives of shipowners do, however, remain concerned over the confidentiality of data and this will need to be further considered. IMO will also need to decide whether the data collection system will be voluntary or mandatory.

**GSF comment**

At this stage, IMO is making good progress on the development of a data collection system for fuel consumption of ships. GSF believes that some form of energy efficiency data should be included within the system considering the increasing pressure on shippers who are required to report Scope 3 emissions. GSF raised these points within IMO's correspondence group and, via a joint submission with the International Cargo Handling Co-ordination Association (ICHCA), to MEPC 68. GSF therefore welcomes the outcome of MEPC 68 where consensus has been reached on an analysis of energy efficiency metrics. The benefits of data collection will help decarbonise the maritime sector and assist shippers in making carbon efficient supply chain decisions.
European Commission Monitoring, Reporting and Verification System

In the absence of international agreement at the IMO, in 2013 the Commission proposed the establishment of an EU-wide system to reduce carbon emissions from the maritime sector. Currently international maritime shipping remains the only means of transportation not included in the EU’s commitment to reduce greenhouse gas (GHG) emissions. Meanwhile, the Commission has approved a 2030 Framework for Climate and Energy and committed to a binding target of at least 40 per cent reduction in GHG emissions compared with 1990 levels. This commitment created added momentum for both the European Council and Parliament to agree, at the end of 2014, to legislate for a monitoring, reporting and verification (MRV) system for large ships (over 5,000 gross tons) from 1 January 2018. This sector accounts for around 55 per cent of ships calling into Union ports and represents around 90 per cent of related emissions. The system will focus on carbon only, as it is considered by far the most relevant GHG emitted by maritime transport. The regulation, once formally adopted, will enter into force on 1 July 2015.

From 1 January 2018, shipowners will have to monitor and report the verified amount of carbon emitted by their large ships on voyages to, from and between EU ports (including ballast voyages). The rules will apply in a non-discriminatory manner to all ships regardless of their flag. To ensure a level-playing field for ships operating in less favourable climatic conditions, it will be possible to include specific information relating to the ship’s ice class and navigation through ice.

Actual fuel consumption for each voyage will be used and shipowners will be able to select one of four monitoring methods below.

- Bunker fuel delivery notes and periodic stock takes
- Bunker fuel tank monitoring on board
- Flow meters for applicable combustion processes
- Direct emissions’ measurements

Owners will also be required to provide other information to determine the ship’s energy efficiency.
Port of departure and port of arrival including the date and hour of departure and arrival

Amount and emission factor for each type of fuel consumed

Carbon emitted

Distance travelled

Time spent at sea

Cargo carried

Transport work (determined by multiplying the distance travelled with the amount of cargo carried)

The regulation has been adopted and the Commission is to launch an intensive stakeholder consultation process to set the necessary technical rules for MRV by the end of 2016. GSF has been invited to participate in an EC Working Group because of its expertise on the requirements of shippers for reporting carbon emissions.

By 31 August 2017, companies must submit to the verifiers a plan indicating the method chosen to monitor and report their emissions. Reporting and publication of information will be on an annual basis and data must be verified. It is expected that the shipowner will calculate carbon emissions using available emission factors. Annual averages and aggregated figures can be used to address confidentiality issues. A document of compliance issued by an independent accredited verifier should be kept on board of ships to demonstrate compliance with MRV. The verifier must assess the reliability, credibility and accuracy of the monitoring systems and reported data.

Non-compliance with the provisions of MRV will result in penalties issued by member states with maritime ports in their territory.

From 2019, by 30 April each year, companies shall submit to the Commission and to the flag state authorities concerned, an emission report concerning the emissions during the entire reporting period. The European Commission will publish an annual report on emissions from maritime transport to inform the public and to allow for an assessment of the emissions and the energy efficiency of maritime transport per size, type of ship, activity, etc.

The MRV will need to be reviewed in the event that an international agreement to reduce ghg emissions from maritime transport is reached. In a paper submitted to MEPC 68, the European Commission has reiterated that it supports the development and implementation of a robust global data collection system. The Commission believes that experience with the EU MRV system could easily be extended globally.

GSF comment

GSF believes that the EC MRV will allow greater transparency in the measurement of the maritime carbon footprint to give shippers a better understanding of carbon emissions in the supply chain. It therefore echoes many of the voluntary schemes already adopted by industry and will be influential as the IMO develops a global data collection system.
Third IMO GHG Study 2014

In October 2014 at MEPC 67, the Third IMO GHG Study 2014 providing updated estimates for greenhouse gas emissions from ships was approved. This followed a previous study in 2009.

This latest study estimated that international shipping emitted 796 million tonnes of carbon dioxide (CO₂) in 2012, against 885 million tonnes in 2007. This represents 2.2 per cent of the global emissions of CO₂ in 2012, against 2.8 per cent in 2007.

However, ‘business as usual’ scenarios continue to indicate that those emissions are likely to grow by between 50 per cent and 250 per cent in the period to 2050, depending on future economic growth.

IMO considers the new study to represent the most detailed and comprehensive global inventory of shipping emissions to date. Since 2009, greater geographical coverage achieved via satellite technology/Automatic Identification System (AIS) receivers has improved the quality of data available to characterize shipping activity beyond the state of practice used in the Second IMO GHG Study 2009.

The study also makes use of bottom-up estimates based on ship activity levels by calculating the fuel consumption and emissions from individual ship movements. The chart on page 4 details the carbon emissions by ship type for 2012 calculated using these estimates.

The three most significant sectors of the shipping industry from a carbon perspective are oil tankers, containerships and bulk carriers which have experienced different trends over the period of the study (2007–2012). IMO concludes that all three have latent emission increases (suppressed by slow steaming and historically low activity and productivity) that could return to activity levels that create emission increases as the global economy recovers.

UN Climate Change Conference, Lima

IMO attended UN Climate Change talks held in Lima, Peru in December 2014 to report on its work during 2014. This included the outcome of MEPC 67 and reporting progress made on technical and operational measures.

Delegations at Lima managed to agree a plan to fight global warming that would for the first time commit all countries to cutting their greenhouse gas emissions. However, some commentators said that the deal is too weak to limit warming to the internationally agreed limit of up to 2ºC.

Whilst shipping already offers a highly carbon efficient mode for transportation, due to its global nature like aviation, the sector will be expected to play a significant role in meeting the climate change challenge.

At a further Climate Change Conference held in Geneva in February 2015, negotiators called for global sectoral emission reduction targets for international maritime transport and aviation. IMO and the International Civil Aviation Organization (ICAO) must develop policy frameworks to achieve the targets. Both sectors are also being placed under pressure to develop a levy scheme to provide financial support for an adaptation fund for climate change (see Green Climate Fund opposite).

**GSF comment**

Progress at future MEPCs on maritime emissions will be very much dependent on the outcome of the United Nations Framework Convention on Climate Change (UNFCCC) Conference in Paris in December 2015, which is expected to find a resolution to replace the Kyoto Protocol and finally agree a global deal to curb greenhouse gas emissions. The requirement for a global sectoral emission reduction target will pressure IMO to introduce an MBM.
An agreement to establish the Green Climate Fund was reached at the UN Framework Convention on Climate Change (UNFCC) held in Copenhagen in December 2009. The fund will support countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, in particular small island developing states, least developed countries and Africa. This should, therefore, encourage these countries to also commit to emissions cuts alongside developed countries. The fund aims to generate US$100 billion per year by 2020. The fund is governed and supervised by a 24-member board with equal representation from developed and developing countries. The Republic of Korea has been appointed to host the Green Climate Fund. Further information can be found at www.gcfund.net

Both the shipping and aviation industries have been highlighted as areas where significant funding could be raised. At MEPC 64, climate finance was debated, including the potential to use a rebate mechanism in MBMs based on a country’s share of value-distance global imports. At 2012 global climate change talks in Doha, Qatar, Japan and China rejected calls for international shipping to help finance the Green Climate Fund. The International Chamber of Shipping has agreed in principle to the concept but firmly stated that any contribution by shipping must reflect the sector’s ‘modest’ contribution to total global carbon emissions.

The Green Climate Fund did not have the most positive start in 2013. At climate change talks in Warsaw that year, UN Secretary-General Ban Ki-moon described the current state of the new Green Climate Fund as ‘an empty shell’ and called for it to be brought into full operation as soon as possible.

In November 2014, the Global Certification Forum (GCF) organised a pledging conference to encourage countries to announce contributions to raise $10 billion for the fund’s ‘initial resource mobilisation period’ to run between 2015 and 2018. Pledges from the conference fell just short of that goal, totalling $9.3 billion. For example, the US pledged $3 billion over four years, Japan offered the second largest amount of $1.5 billion and both France and Germany pledged around $1 billion each.

Of the money raised through the GCF, half will go to funding adaptation measures in developing countries, such as better flood defences, drought monitoring schemes, and water management systems. The other half of the GCF’s money is reported to be going towards helping developing countries curb their emissions, by decarbonising their energy and transport infrastructure.

Most recently at UNFCCC talks in Geneva in February 2015, within the negotiating text for the Paris Climate Agreement which covers finance, both IMO and the International Civil Aviation Organization (ICAO) are encouraged to develop a levy scheme to provide financial support for an adaptation scheme.

**GSF comment**

GSF recognises the need for a Green Climate Fund to assist developing countries to adapt to the impacts of climate change, especially given disasters, and notes the need to raise significant funds. However, there is concern that like aviation, shipping as a global industry is being singled out as a contributor to the fund when in the main, countries are targeted for funding rather than individual industries. GSF’s concern is that the potential introduction of a levy scheme serves only to increase costs to the shipper as the fee will naturally be passed along the supply chain. This will not help to actually decarbonise the industry, instead the most efficient way for shipping to reduce emissions is for any funds from an MBM to be invested back into industry to adopt new operational and technological measures. As the UNFCCC progresses towards a climate agreement, GSF is concerned that industry is at risk of becoming a cash cow.
How is the shipping industry decarbonising?

The shipping industry is already a highly efficient mode of transport compared to road and rail. Shipowners are using a variety of technological and operational methods to improve ship efficiency and thus reduce ghg emissions. Technology advancements to improve ship efficiency such as advanced engine design, improved waste heat recovery and advanced propeller design are being implemented. There is also ship resistance technology which includes, but is not limited to, optimisation of hull shape and structure, application of low friction coatings, and use of stern fins or ducts. Many shipowners are also implementing speed reductions, weather routeing and improved cargo management to maximise cargo carrying capacity. The most economical speed for container ships is 10 to 15 knots, therefore a number of shipping companies have reduced their speed from the standard 25 knots over the last few years.

According to the European Commission, research shows that shipowners or operators are more likely to take measures to improve their vessel’s energy efficiency if these are based on accurate information provided by monitoring and reporting schemes. Moreover, reliable information on the effectiveness of technologies in improving energy efficiency also reduces the financial risk for investors.

The 10 most effective existing technical and operational measures to reduce carbon emissions from shipping

<table>
<thead>
<tr>
<th>Solution</th>
<th>Relative CO₂ savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed reduction</td>
<td>17-34%</td>
</tr>
<tr>
<td>Propeller and rudder upgrade</td>
<td>3-4%</td>
</tr>
<tr>
<td>Hull coating</td>
<td>2-5%</td>
</tr>
<tr>
<td>Waste heat recovery</td>
<td>2-6%</td>
</tr>
<tr>
<td>Optimisation of trim and ballast</td>
<td>1-3%</td>
</tr>
<tr>
<td>Propeller polishing</td>
<td>1-3%</td>
</tr>
<tr>
<td>Hull clearing</td>
<td>1-5%</td>
</tr>
<tr>
<td>Main engine tuning</td>
<td>1-3%</td>
</tr>
<tr>
<td>Autopilot upgrade</td>
<td>1-1.5%</td>
</tr>
<tr>
<td>Weather routeing</td>
<td>1-4%</td>
</tr>
</tbody>
</table>

Source: Maddox 2012 CO₂ savings and costs compared to ‘business as usual’ in 2020

Energy Efficiency Design Index (EEDI)

In July 2011, the IMO adopted the Energy Efficiency Design Index (EEDI) as a metric which sets a minimum energy efficiency standard for ships to reduce ghg emissions. Ships built between 2015 and 2019 will need to improve their efficiency by 10 per cent, rising to 20 per cent between 2020 and 2024 and 30 per cent for ships delivered after 2024. The EEDI is non-prescriptive and leaves the choice of technologies to use in a specific ship design to industry. The regulations came into force on 1 January 2013.

Ship Energy Efficiency Management Plan (SEEMP)

The IMO has adopted a mechanism to help ship operators to improve the energy efficiency of existing ships known as the Ship Energy Efficiency Management Plan (SEEMP). The SEEMP provides an approach for monitoring ship and fleet efficiency performance over time using an Energy Efficiency Operational Indicator (EEOI) as a monitoring and benchmarking tool. The SEEMP urges shipowners and operators to consider new technologies and practices such as speed optimisation, weather routeing, hull maintenance and improved voyage planning when seeking to optimise the performance of a ship. SEEMPs were mandatory for all ships from January 2013.

GSF comment

GSF welcomes operational and technical measures to help decarbonise the maritime sector. Rather than just relying on the IMO to achieve a global agreement, shipowners are taking action now to improve efficiency. Slow steaming has created better predictability within the supply chain, whilst the EEDI and SEEMP are helping to drive change towards increased efficiency.
There is an increasing need for shippers to be able to calculate accurately the carbon footprint of their supply chain in response to environmental pressure from customers, investors and regulators. Initiatives have been developed to capture data and to also establish how shippers can influence the industry.

**Shippers’ Decarbonisation Scheme**

In 2011, the UK Freight Transport Association (FTA) collaborated with Heriot-Watt University in Edinburgh to develop a broad range of measures to reduce the carbon intensity of supply chains containing a deep-sea movement, including focusing on port-centric logistics. The project focused on the shipper as they are under pressure to take responsibility for Scope 3 emissions rather than the shipowner. It had the backing of the Global Shippers’ Forum and the Clean Cargo Working Group. A report titled *A Supply Chain Perspective on the Decarbonisation of Deep-sea Container Movements* was published as an output of this project. The report focuses on the role of the shipper rather than the shipping line to improve efficiency, and presented eight key parameters to show how the decisions made by shippers can decouple the volume of containerised trade from supply chain related CO₂ emissions. An overall assessment is made of the extent to which shippers can influence the carbon footprint of deep-sea container supply chains.

**Key parameters**

- Choice of transport mode
- Choice of carrier and port
- Average handling factor
- Average length of haul
- Container utilisation
- Repositioning of empty containers
- Energy efficiency
- Carbon intensity of energy used – out of shippers’ control

**Examples of decarbonisation options identified**

- Switch to lower carbon transport modes for feeder services
- Switch to carriers with lower carbon-intensity values on feeder and deep-sea services
- Improve container loading both on export and import consignments
- Reroute containers to minimise CO₂ emissions from feeder services, deep-sea leg and port operations
- Reconfigure supply chains to exploit container backloading opportunities

GSF members can download the report from [www.globalshippersforum.com](http://www.globalshippersforum.com)

**Clean Cargo Working Group (CCWG)**

The Clean Cargo Working Group (CCWG) helps ocean freight carriers report their environmental performance to customers in a standard format, to review and compare carriers’ environmental performance in order to allow more informed buying decisions. It was initially set up in 2001 by BSR (Business for Social Responsibility) as a business-to-business collaboration between leading shippers, global ocean carriers and logistics providers dedicated to environmental performance improvement in marine container transport through measurement, evaluation and reporting. CCWG identified the metrics and qualitative factors to track and has developed tools to report on environmental performance. Global ocean carriers such as Hapag-Lloyd, Maersk and NYK Line participate in the initiative. Shipper members include large multinational brands such as Electrolux, IKEA, Marks and Spencer and NIKE plus major third party logistics companies including DHL and Kuehne+Nagel. The carriers in the group represent more than 85 per cent of global container capacity, around 3,000 vessels.

The CCWG annual data collection process requires carriers to report on over 32 metrics, including primary data for each vessel on the following criteria that allows for carbon, sulphur oxide and nitrous oxide emissions factors to be derived.

- Nominal capacity (in TEU)
- Number of reefer plugs
The shippers’ role continued

- Distance sailed
- Fuel consumed (heavy fuel oil and marine diesel oil/marine gas oil reported separately)
- Time frame of data

CCWG also has its own verification protocol. The performance data is reported to shipping customers via individualised carrier scorecards. The group also reviews aggregate trends annually and publishes aggregate trade lane emissions factors. For five years, CCWG has published an Emissions Factors report, which has revealed that cargo transport providers have reduced carbon emissions by up to 22 per cent in that time.

At the time of writing, CCWG was considering a merger with the Clean Shipping Initiative that, if successful, will launch a single industrywide platform for environmental performance measurement and reporting across more ocean goods such as oil, commodities and finished vehicles.

How does CCWG help shippers?

- Enables shippers to compare ocean freight with other modes – shippers want to measure, evaluate and report the carbon impact of global goods transportation
- Encourages collaboration between shippers, ocean carriers and logistics providers
- Enables measurement, evaluation and reporting of carbon data
- Standardises reporting of carbon data
- Shippers are able to review and compare environmental performance to make informed buying decisions (via individual scorecards)
- Shippers can use ocean data from CCWG’s annually reported dataset for carriers and trade lanes that are relevant to their business to assess environmental performance

Clean Shipping Index (CSI)

Clean Shipping Network is a group of cargo owners who joined together to initiate the Clean Shipping Index (CSI). Members include H&M, Philips, Scania, Skanska and Volvo. The CSI is considered an easy to use, transparent tool which can be used by cargo owners to evaluate the environmental performance of their providers of sea transport. The index takes into account different areas of environmental impact – carbon, sulphur oxide, particulate matter, nitrous oxide, chemical products and water/waste. CSI is considered suitable for all the main types of cargo ships.

To be included in the CSI, shipowners are required to complete a questionnaire consisting of 20 aspects of a vessel’s operational impact. The information is entered on a ship-by-ship basis but is also added to a total carrier fleet score for an overall ranking. Scores can only be obtained for measures that go beyond existing regulations. Based on the scores, a ship is ranked as having ‘low’, ‘medium’ or ‘good’ performance. Two ways of submitting carbon data are accepted, either carbon emissions in grams/tonne per nautical mile calculated according to the EEDI or carbon emissions in grams/TEU-km according to the CCWG calculation formula. Calculations cover a period of one calendar year.

Members joining the CSI require their shipping suppliers to submit their environmental performances and the data is often used as
criteria in sea transport procurement. The data is also a base from which to be able to follow up improvements amongst suppliers, as well as for calculations of Scope 3 environmental footprints for both internal and external publication.

The Carbon War Room (CWR)

The Carbon War Room (CWR) was founded by a group of entrepreneurs including Sir Richard Branson and Boudewijn Poelmann and is a not-for-profit organisation which focuses on the carbon reduction benefits of incorporating corporate and social responsibility into company business models. CWR originally focused on shipping efficiency but has expanded to provide expertise across sectors such as agriculture, energy, forestry, buildings and road transport. For shipping, CWR reports that improving fuel efficiency across the global fleet could save the industry up to $50bn a year in fuel costs. It launched a website initiative (www.shippingefficiency.org) to increase information flows around international shipping's energy efficiency and ultimately to help reduce the environmental impacts. Around 70,000 existing ships including the majority of the world’s container ships, tankers, bulk carriers, cargo ships, cruise ships and ferries are already captured within the project and have been given a rating between A and G. The ratings use the EEDI as a methodology and data from the world's largest ship registry, IHS Fairplay. Shipowners and operators are encouraged to update their records in the Carbon War Room when efficiency improvements to their vessels have been implemented.

According to CWR, measuring and disseminating the fuel efficiency of vessels will incentivise the retrofitting of efficiency technologies to ships – increasing investment and job growth while reducing maritime ghg emissions by up to 30 per cent. The project helps charterers to select the most efficient ship to carry goods which, in turn, creates demand for fuel efficient vessels and subsequent technological improvements.

As of April 2014, 22 charterers, who between them represent 23 per cent of global non-containerized trade, factor energy efficiency into the vessel selection process. This represents around 22,000 vessel movements a year. Feedback from the early adopters suggests this framework has not only helped to reduce shipping costs, but has publicly demonstrated commitment towards corporate social responsibility.

RightShip

Alongside the Carbon War Room, RightShip has developed the Existing Vessel Design Index (EVDI™) and ghg emissions rating as a systematic and transparent framework for comparing the relative efficiency of the world's existing shipping fleet. The EVDI™ estimates the theoretical amount of carbon emitted per tonne nautical mile travelled, based on the engine and design characteristics of the ship at the time of build. While IMO's Energy Efficiency Design Index (EEDI) applies to new ships, the EVDI™ can be used for the existing fleet.

EVDI™ values are calculated from ship-sourced data as well as RightShip's Ship Vetting Information System (SVIS™), IHS Fairplay, and yard and classification societies. RightShip works closely with shipowners to validate the data used across their fleet lists.

Using vessel design data the ghg emissions rating uses a logarithmic transformation of calculated EVDI™ values to provide each ship with a relative efficiency rating compared to peer vessels (vessels of similar type and size).

RightShip has partnered with Carbon War Room, to provide elements of the EVDI™ and ghg emissions rating data free-of-charge on www.shippingefficiency.org (see above).

Sustainable Shipping Initiative (SSI)

The Sustainable Shipping Initiative (SSI) is formed of leading shipping companies across the world to plan how shipping can contribute and thrive in the future. It is facilitated by Forum for the Future in conjunction with the WWF (World Wide Fund for Nature). Members include shipowners, charterers and operators such as Bunge, Cargill and Maersk. Shippers are represented by Akzo Nobel and Unilever. In May 2011, the group launched the Case for Action, identifying the principle global trends that will affect the maritime sector over the next 30 years. This was recently updated in September 2013. The work has led to the creation of a shared Vision for 2040, backed by a series of specific actions to ensure that shipping has a sustainable and yet profitable future. On the issue
The shippers’ role

of rising GHG emissions, the vision recognizes that the industry must:

- pioneer/implement improvements in energy efficiency in new ship designs, retrofitting and operations
- actively seek renewable sources to encourage a step-change in shipping’s energy portfolio to achieve significantly reduced GHG intensity
- pioneer methods for shipping’s stakeholders to compare sustainability performance in order to drive improvement
- support coordinated and progressive legislation aimed at significantly improving sustainability across the shipping industry

In its most recent report, Driving Transformational Change through the Value Chain (November 2014), SSI notes that companies are beginning to recognize the important role that shipping has in creating sustainable supply chains. Procurement behavior and policies can help towards a more sustainable shipping industry. SSI believes that there is low awareness of the existence of rating schemes and understanding how to use them. Increasing standardisation across ship ratings’ schemes and measurement could help to drive greater transparency, efficiency and more consistent benchmarking for future improvements. For more information, visit www.ssi2040.org

GSF comment

The above initiatives and projects indicate the heightened interest of shippers in reducing the environmental impact of maritime emissions as they strive to reduce carbon in supply chains. The shipping industry can no longer ignore the needs of shippers to improve efficiency and reduce carbon emissions. In particular, the Clean Cargo Working Group is a successful collaboration between shipowners and shippers to monitor emissions. The development of such programmes also taps into both the IMO and European Commission work to be able to accurately measure maritime emissions. GSF would urge IMO to consider the role of existing voluntary initiatives to help develop the IMO data collection for fuel consumption of ships. Shippers should be at the forefront of these policy discussions as highlighted in the Shippers’ Decarbonisation Scheme.
Conclusion

Key messages

- IMO has a significant challenge in securing emission reductions in the maritime sector. The many different trades and vessel types such as cargo, containers and tankers also further complicate policy.

- GSF welcomes IMO’s focus on technical and operational measures to reduce maritime emissions rather than simply introducing an MBM which will ultimately lead to financial cost for shippers without necessarily improving efficiency.

- GSF welcomes the European Commission’s proposals for the MRV system to develop a workable framework for carbon data collection from ships. However, a global solution is ultimately sought from the IMO.

- The drive towards data collection will enable IMO to more accurately assess maritime emissions and help industry to identify where the most practical carbon savings can be made.

- Progress in the Commission’s development of the MRV system has initiated a move away from financial market-based measures such as the bunker levy or an emissions trading system.

- Voluntary initiatives provide examples where energy efficiency metrics can be successfully applied and are already being utilised by shipowners, charters and shippers.

- GSF will continue to profile the benefits of data collection to help decarbonise the maritime sector and assist shippers in making carbon efficient supply chain decisions.

- Shippers should be at the forefront of the maritime policy debate at a global and regional level.

There is emerging consensus around the strength of monitoring, verification and report schemes, as an MBM for maritime emissions is unlikely to be agreed in the short-term. GSF believes that although progress is slow, clearly being able to successfully record and report accurate maritime emissions is a positive step for the maritime sector. GSF’s goals in IMO are twofold: first, to ensure that any international agreement on reducing shipping emissions does not result in possible climate change charges being directly passed on to shippers, in the form of a carbon tax or emissions surcharges; second, that any data collection scheme agreed by IMO contains energy efficiency metrics which will allow shippers to compare and benchmark the environmental performance of shipping lines. Ultimately, shippers must be central to on-going negotiations to ensure that the whole supply chain is fully represented in eventual decisions on maritime emissions.

Further information can be found in the Maritime Emissions Policy Briefing – March 2014 and Maritime Emissions Briefing Note edition 2 – October 2012. GSF members can download them from www.globalshippersforum.com