

# Implications of application of the EU Emissions Trading System (ETS) to international shipping, and potential benefits of alternative Market-Based Measures (MBMs)

July 2020

A preliminary study commissioned by the  
European Community Shipowners' Associations (ECSA)  
and the International Chamber of Shipping (ICS)



Prepared by

**Dr Edmund Hughes**

Green Marine Associates Ltd.

# Implications of application of the EU Emissions Trading System (ETS) to international shipping, and potential benefits of alternative Market-Based Measures (MBMs)

Published by

European Community Shipowners' Associations (ECSA)  
Boulevard du Régent/Regentlaan 43-44  
1000 Brussels

Web: [www.ecsa.eu](http://www.ecsa.eu)

International Chamber of Shipping (ICS)  
38 St Mary Axe  
London EC3A 8BH

Web: [www.ics-shipping.org](http://www.ics-shipping.org)

© ECSA and ICS 2020

Prepared by

**Dr Edmund Hughes**  
Green Marine Associates Ltd.



The European Community Shipowners' Associations (ECSA) was founded in 1965 as "Comité des Associations d'Armateurs des Communautés Européennes (CAACE)". ECSA is a trade association representing the national shipowners' associations of the EU and Norway. European shipowners control 40% of the global commercial fleet, contribute 147 billion EUR to the EU's GDP and provide 2.1 million Europeans with careers both onboard and ashore.

ECSA promotes the interests of European shipping so that the industry can best serve European and international trade in a free, competitive, business environment to the benefit of shippers and consumers.



The International Chamber of Shipping (ICS) is the global trade association representing national shipowners' associations from Asia, the Americas and Europe and more than 80% of the world merchant fleet. Established in 1921, ICS is concerned with all aspects of maritime affairs particularly maritime safety, environmental protection, maritime law and employment affairs. ICS enjoys consultative status with the UN International Maritime Organization (IMO).

# Implications of application of the EU Emissions Trading System (ETS) to international shipping, and potential benefits of alternative Market-Based Measures (MBMs)

This study has been prepared at a critical time for international shipping as the global community considers options for additional measures to ensure the ambition set out by the IMO's Initial Strategy on Reduction of GHG Emissions from Ships, adopted in April 2018, can be met. Concurrently the European Union (EU) is considering the application of the EU's Emission Trading System (EU-ETS) to maritime transport. The legal, technical, practical and political implications of application of the EU-ETS to international shipping, and potential benefits of alternative Market-Based Measures (MBMs), are the subject of this report.

*This preliminary and independent report has been commissioned by ECSA and ICS, in order to inform discussion on this critically important topic with policy makers and other stakeholders. The arguments it contains, and the conclusions it reaches, do not necessarily reflect, in every respect, the current views of ECSA, ICS, their member national shipowners' associations, or their existing policies and positions on greenhouse gas emission reduction. These will continue to evolve as the European Commission and the other EU institutions further develop proposals for incorporating international shipping into the EU-ETS.*

## Overview

On 11 December 2019, the European Commission (EC) announced its new European Green Deal. The announcement identified that the EC “propose[s] to extend European emissions trading to the maritime sector”. No timeframe was identified by the EC but as part of the development of the proposal, the EC is expected to prepare an impact assessment for consultation with stakeholders during 2020.

Inclusion of shipping in the EU Emissions Trading System (EU-ETS) could have many legal, technical, practical and political implications for the EU and its Member States, the efficiency of the global maritime transport sector and, most importantly, the authority of the industry’s global regulator, the United Nations International Maritime Organization (IMO).

The following study seeks, in a balanced manner, to explore and address these implications, based on current knowledge, for the benefit of EU policy makers and other stakeholders. In doing so, it identifies possible risks of incorporating international shipping into a regional ETS, and demonstrates why policy instruments such as Market-Based Measures (MBMs) – including alternatives such as a global fuel levy – are already under active consideration at IMO. Furthermore, this study highlights the growing political imperative in support of MBM use to enable governments to stay aligned with the temperature goals of the Paris Agreement.

In particular, the following report suggests that inclusion of shipping in the EU-ETS could potentially have serious implications for progress at IMO with respect to achieving further reductions of the total greenhouse gas (GHG) emissions by the international shipping sector as a whole, on a pathway to total decarbonisation, in line with the ambitious targets that have already been agreed by IMO Member States – including EU States – as part of the *Initial Strategy on Reduction of GHG Emissions from Ships* (the IMO Strategy) adopted by IMO in 2018.

### IMO Initial Strategy on Reduction of GHG Emissions from Ships - Levels of Ambition

.....the Initial Strategy identifies levels of ambition for the international shipping sector noting that technological innovation and the global introduction of alternative fuels and/or energy sources for international shipping will be integral to achieve the overall ambition.....

#### **.1 carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships**

to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type, as appropriate;

#### **.2 carbon intensity of international shipping to decline (for all ships)**

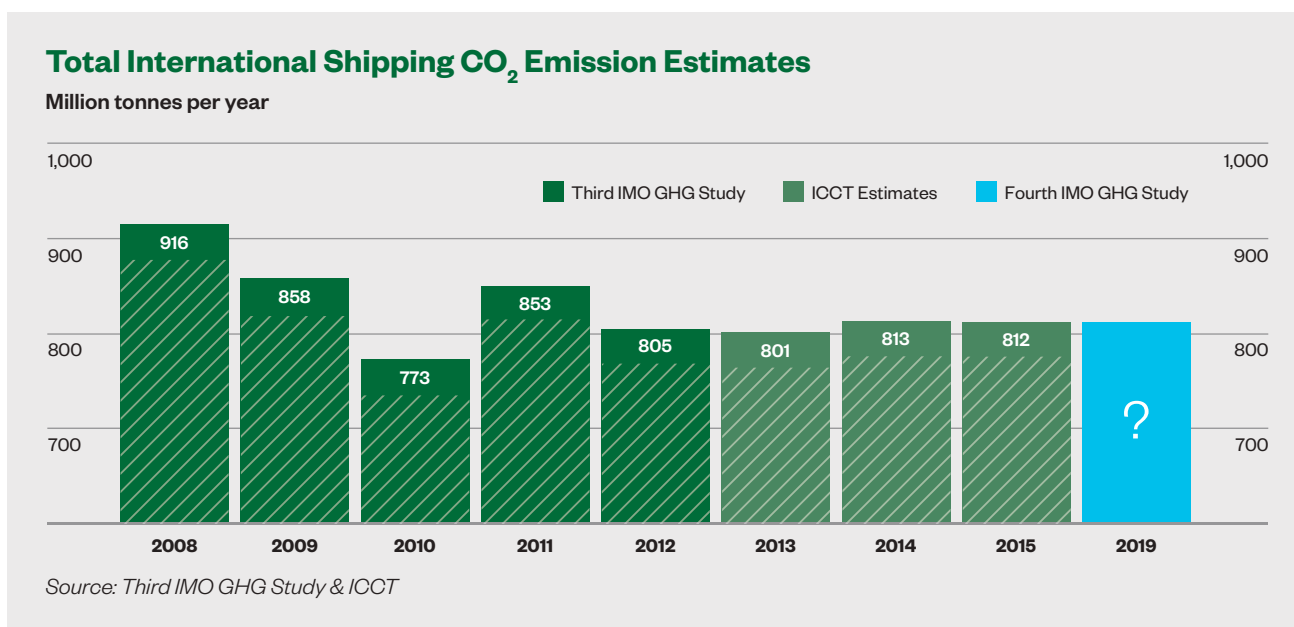
to reduce CO<sub>2</sub> emissions per transport work, as an average across international shipping, by at least 40% by 2030, pursuing efforts towards 70% by 2050, compared to 2008; and

#### **.3 GHG emissions from international shipping to peak and decline**

to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO<sub>2</sub> emissions reduction consistent with the Paris Agreement temperature goals.

Source: IMO, resolution MEPC.304(72), April 2018

The GHG emissions that might be affected by application of the EU-ETS to shipping only represent a relatively small proportion of the global sector’s total emissions, which (before the impact on maritime trade of COVID-19) have already decreased significantly compared to 2008 despite an increase in maritime trade during the same period. Without concerted action at the global level by the IMO, which can continue to enjoy the full support of all IMO Member States, there is potentially a risk that total emissions of the global sector might deviate from their current downward trajectory.



A case might be made for seeking to use the existing EU-ETS to achieve regional emission goals, but if this undermines global efforts to reduce the sector's total emissions then would meeting those regional goals really be considered a success? An important issue that therefore needs to be considered by the EU institutions is the extent to which further progress at IMO might be seriously undermined by inclusion of shipping into the EU-ETS.

It should also be noted that emissions from international shipping are not required to be covered by the Nationally Determined Contributions (NDCs) made by EU Member States under the Paris Agreement within the United Nations Framework Convention on Climate Change (UNFCCC), and inclusion of shipping into the EU-ETS might therefore have little direct impact on the delivery of NDCs of EU States.

The other aspect of inclusion of ships trading internationally into the EU-ETS, or even a decision by the EU to do so, is that it could set a concerning precedent that may see negotiations at IMO delayed, or even derailed, if other governments perceive that the EU has concluded that IMO is unable or unlikely to deliver a coordinated global response to climate change for the shipping industry.

Some non-EU governments may reasonably ask why they should continue to work on an internationally negotiated instrument if EU Member States are actively pursuing their own unilateral measure. The consequences of this could be that other nations/regions decide to develop their own unilateral schemes independently of IMO, or deliberations are moved back under the UNFCCC which is ill-equipped to deliver progress for this international transport sector, which is why this mandate – with the full support of EU States – was given to IMO.

Undermining the progress being made by IMO to reduce global shipping emissions also presents a significant risk for the efficiency of the shipping sector, as a proliferation of regional and national schemes to address GHG emissions from international shipping would in effect create a patchwork quilt of regulations globally, introducing barriers to smooth operation of ships on international voyages and so to international trade. Preventing such an occurrence – and the recognition that shipping is a global industry requiring global rules – is precisely one of the reasons for the establishment by the international community of IMO



and is reflected in the IMO Convention.<sup>1</sup> At this critical time, IMO Member States – including EU States – will presumably wish to continue to ensure that the regulatory framework for international shipping remains cohesive and acceptable to all 174 Member States of IMO.

The extent to which efforts by the IMO to reduce GHG emissions from ships globally might be affected as a consequence of further regional action by the EU is hard to discern at this stage as the scope of the EC's proposed inclusion of shipping in the EU-ETS is unknown. However, whatever the final scope, any decision to include international shipping in a regional measure would almost certainly undermine IMO's authority to implement and undertake work under the IMO Strategy, potentially delaying rather than promoting global action.

This study identifies and explores several of the arguments about whether the EU should or should not include shipping in the EU-ETS. Regardless of these arguments, what is clear is that there is a growing political expectation that some form of global Market-Based Measure (MBM) may be required for shipping to close the competitiveness gap between conventional and zero-carbon fuels and associated infrastructure to encourage mass uptake. However, as this report identifies, a *regional* MBM could present significant risks to the competitiveness and efficiency of ships trading to and from the EU.

Once the scope of an MBM is confirmed, whether global or otherwise, this underlines the importance of a comprehensive impact assessment being conducted, having a particular focus on the different impacts for different sectors of the shipping industry e.g. tramp, short-sea, etc. so that specific risks and their magnitude are identified and mitigated, as appropriate. An ETS, rather than a simple fuel levy, seems more likely to have greater disproportionate impacts, including market distortion, on some shipping sectors than on others. This would require careful examination and analysis, and is beyond the scope of this preliminary study.

The case could be made that unilateral action by the EU might focus minds at IMO, where Member States, including EU Member States, have already identified under the IMO Strategy that MBMs should be a candidate mid-term measure. As indicated in the European Green Deal announced in December 2019, action by the EU should be “coordinated with action at global level”<sup>2</sup>. This suggests that should IMO progress its work on development of a global MBM for international shipping in a reasonable timeframe, then the EU might consider aligning its approach with the IMO scheme to overcome the implementation challenges of pressing ahead with a regional scheme. This could include preventing carbon leakage (action by the EU resulting in absolute carbon emissions from shipping increasing outside the EU) and avoiding straining political relationships with third countries.

However, the economic damage resulting from the COVID-19 crisis has led the European Commission to put forward a proposal for a major recovery plan that identifies the maritime sector as a possible source of funds to support that recovery.<sup>3</sup> The EU therefore needs to decide whether using shipping (including non-EU shipping companies) to support its financial requirements is more important than the environmental goal previously agreed by EU Member States of supporting IMO efforts to successfully decarbonise shipping at the global level.

---

1 Convention on the International Maritime Organization, Article 1(b), IMO, London, 1948.

2 European Commission (2019) The European Green Deal, COM(2019) 640 final, Brussels, 11 December 2019.

3 EC (2020) *Europe's moment: Repair and prepare for the next generation: Factsheet 3 Financing the Recovery Plan*, 27 May 2020 reads as follows: “Possible additional own resources to be added at a later stage of the 2021-2027 financial period: Extension of the Emissions Trading System-based own resources to the maritime and aviation sectors to generate €10 billion per year” [https://ec.europa.eu/info/sites/info/files/factsheet\\_3\\_en.pdf](https://ec.europa.eu/info/sites/info/files/factsheet_3_en.pdf) (retrieved 28 May 2020)



*The UN IMO is the shipping industry's global regulator. The incorporation of international shipping into the EU-ETS could undermine IMO's progress to deliver the ambitious targets it has already adopted – with the agreement of EU States – to eliminate total GHG emissions from the global shipping sector.*

This study seeks to explore both potential advantages and disadvantages for the EU of inclusion into the EU-ETS of ships trading internationally.

#### **Potential advantages of incorporating international shipping into EU-ETS**

- EU-ETS sets a cap on emissions that the sector as a whole and individual emitters are required to achieve, a cap which can be amended to ensure policy goals are achieved;
- EU-ETS already established for several industry sectors with proven mechanisms for allocation of carbon permits and trading platforms;
- Permits both in-sector and out-of-sector emission reduction resulting in flexibility in compliance approaches that can be used, including permitting the use of offsetting;
- As price of carbon is determined by the market, some economists argue that this ensures CO<sub>2</sub> emissions are reduced in the most economical way and potentially allows trading with other carbon markets;
- For emitters to achieve the required carbon emission limits, the EU-ETS can potentially stimulate uptake of alternative fuels and innovative technologies; and
- EU Monitoring, Reporting and Verification (EU-MRV) system for ships trading internationally to and from the EU already implemented and can be used as basis for application of EU-ETS to shipping.

However, this report concludes that, when applied to international shipping, the possible benefits of a regional approach require careful examination and may be significantly outweighed by a number of serious potential disadvantages:

#### **Potential disadvantages of incorporating international shipping into EU-ETS**

- Risk of undermining IMO negotiations to implement the Initial Strategy on Reduction of GHG Emissions from Ships, so setting back global efforts to adopt measures for absolute emissions reduction and provide support programmes to developing countries especially Least Developed Countries (LDCs) and Small Island Developing States (SIDS);
- Risk of increased political tension with third countries that could potentially lead to trade disputes, especially if this is perceived to be more a revenue raising exercise rather than an attempt to reduce emissions from international shipping;
- Greater uncertainty over the price of emitting a tonne of CO<sub>2</sub>, as it depends on supply and demand. If the price drops due to a lower demand there is decreased willingness and ability for companies to invest in CO<sub>2</sub> reducing investments;
- Administrative burden and associated costs in comparison to other MBMs would be significant, especially for Small and Medium sized Enterprises (SMES), which are a particular characteristic, inter alia, of the tramp and short-sea sectors and should be a critical consideration for policy makers;
- The characteristics of the numerous ship types, contractual relationships and operators present a highly complex market that is unlikely to be effectively or appropriately addressed suggesting a pragmatic approach by decision makers is required, as has already being demonstrated by the European Parliament's recommendation to continue leaving road transport outside the scope of EU-ETS;
- Subject to the final scope of application, there is potentially a high risk of carbon leakage, increasing CO<sub>2</sub> emissions from shipping outside the scope of the EU-ETS and leading to market distortion;
- Risk of introducing perverse incentives, e.g. if efficiency improvements are not reflected in legacy allowances;
- Diverting investments from energy efficiency improvements to new ships and the existing fleet to the purchase of allowances, undermining goal-based energy efficiency measures adopted by IMO with EU Member States' support;
- The application of EU-ETS to international aviation (for intra EU flights) has not resulted in any reduction to absolute emissions from this sector, in contrast to shipping whose absolute GHG emissions have reduced significantly throughout the same period; and
- Funds raised from carbon allowances bought by the shipping sector are not retained in the shipping sector for R&D (unlike in the International Maritime Research and Development Board proposal to IMO from the shipping industry, which in turn could form the basis of a global MBM while accelerating the development of zero-carbon technologies and complete decarbonisation).



These issues are explored in more detail throughout this report. When comparing the pros and cons of a regional approach, it must be remembered that shipping is a highly heterogeneous global industry with unique characteristics in terms of the environment it works in, the role it plays in supporting global trade and development, the business models employed within it, and the way it is regulated globally. The diverse and global nature of the international shipping sector is illustrated in the boxes below.

### Key estimates relevant to incorporating international shipping into the EU-ETS

EU-MRV coverage of world fleet of 5,000 GT and above:	38%
EU external trade as percentage of total external trade carried by maritime transport in 2019:	75%
Total global shipping emissions covered:	15%
Number of ships affected:	12,400 to 15,000
Number of companies affected:	2,000 to 2,500
Proportion of affected companies located in third countries:	50%
Proportion of revenue that would be raised by third country voyages:	>60%
Proportion of participating fleet registered in non-EU/EEA flag states:	67%
Third country maritime flag States potentially affected:	> 100
Voyages to be tracked annually outside EU/EEA:	> 16,000

Source: ECSA/ICS based on application being limited to ships of 5,000 GT and above. Minimum estimates derived from *EC 2019 Annual Report on CO<sub>2</sub> Emissions from Maritime Transport*, 19 May 2020, based on implementation of EU MRV Regulation.<sup>4</sup> Maximum estimates assume different ships would make EU/EEA port calls year on year. Third country estimates exclude the United Kingdom.

[https://ec.europa.eu/clima/sites/clima/files/transport/shipping/docs/swd\\_2020\\_82\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/shipping/docs/swd_2020_82_en.pdf)

### Third country trading partners on which incorporating international shipping in EU-ETS may have greatest impact (in alphabetical order):

China (including Chinese Taipei)	Saudi Arabia
India	Singapore
Japan	Turkey
Philippines	UAE
Republic of Korea	United Kingdom
Russian Federation	United States

Source: ECSA/ICS derived from *UNCTAD Review of Maritime Transport 2019*<sup>5</sup> and *EC 2019 Annual Report on CO<sub>2</sub> Emissions from Maritime Transport*, 19 May 2020.<sup>3</sup>

<sup>4</sup> EC(2020) 2019 Annual Report on CO<sub>2</sub> Emissions from Maritime Transport, 19 May 2020.  
[https://ec.europa.eu/clima/sites/clima/files/transport/shipping/docs/swd\\_2020\\_82\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/shipping/docs/swd_2020_82_en.pdf)

<sup>5</sup> UNCTAD (2019) Review of Maritime Transport 2019, 30 October 2019.  
[https://unctad.org/en/PublicationsLibrary/rmt2019\\_en.pdf](https://unctad.org/en/PublicationsLibrary/rmt2019_en.pdf) (retrieved 5 June 2020)

If a global MBM is to be adopted, preferably by IMO, consistent with the IMO Strategy which has already been agreed to by EU Member States, it is suggested that closing the competitiveness gap and incentivising the uptake of zero-carbon fuels and technologies needed by shipping for complete decarbonisation, in the fastest and most straightforward manner possible, should be the primary goal of policy makers. It is suggested that this should be at the forefront of EU thinking when deciding which MBM should be adopted.

**This report concludes that applying an Emissions Trading System to shipping, in particular a regional system, would be unlikely to provide an approach that will positively support decarbonisation by the entire global sector, as envisaged by the IMO Strategy, especially when compared with a global carbon price/levy on the fuel oil purchased for consumption by ships.**

# Table of contents

<b>Overview</b>	<b>4</b>
<b>1 Introduction</b>	<b>13</b>
<b>2 Recent progress to reduce GHG emissions from international shipping and implications resulting from potential EU action</b>	<b>14</b>
IMO action on reduction of GHG emissions from ships .....	14
Initial IMO Strategy on Reduction of GHG Emissions from Ships and follow-up actions up to 2023.....	15
EU approach for inclusion of maritime GHG emissions in its commitments.....	17
The European Green Deal.....	19
European Union's Emission Trading System .....	21
The United Kingdom .....	22
Environmental effectiveness of EU-ETS to date.....	23
Implications for other IMO instruments for the control of emissions from ships.....	25
Implications for the proposal to establish an International Maritime Research and Development Programme .....	27
<b>3 Legal implications and possible conflict with the EU's international obligations</b>	<b>31</b>
EU's relationship to UNCLOS and IMO.....	31
IMO's legal view of GHG emissions from ships.....	33
Enforcement of EU-ETS applied to shipping.....	34
Would the EU-ETS be considered a fiscal measure or not? .....	35
Legal implications – conclusions.....	37
<b>4 Effectiveness (or otherwise) of a regional ETS for reducing emissions from international shipping</b>	<b>38</b>
Geographical scope of application of EU-ETS to shipping.....	38
Trading entity and avoidance .....	40
Carbon pricing schemes for international shipping .....	41
<b>5 Alternative MBMs</b>	<b>45</b>
IMO's previous work on an MBM for international shipping .....	45
Rationale for use of an MBM .....	46
Which MBM, if adopted, for shipping? .....	47
Key differences in application of an MBM to aviation and maritime transport .....	49
Use of offsetting.....	50
Criteria and metrics for selecting an MBM for international shipping.....	52
<b>Summary and conclusions</b>	<b>54</b>
<b>Bibliography</b>	<b>56</b>

**Annex 1**

**Previous consideration by the International Maritime Organization of an MBM for international shipping** 59

**Annex 2**

**Political tensions arising from inclusion of aviation emissions in EU-ETS** 64

**Annex 3**

**Possible categories for regional carbon pricing** 65

**Annex 4**

**United States Congressional Budget Office's Analysis for Reducing CO<sub>2</sub> Emissions** 67

# 1 Introduction

- 1.1 The purpose of this study is to identify and explore various issues in order to help understand the legal, technical, practical and political implications of the request by the European Commission's President, as set out in the new European Green Deal announced on 11 December 2019, to explore the incorporation of the maritime sector into the European Union's Emission Trading System (EU-ETS). Furthermore it should be recalled that in 2017 the European Parliament voted in favour of the inclusion of international shipping in the EU-ETS from 2023<sup>6</sup> which, whilst not included in the final adopted instrument, suggests that political support for this action is already present.<sup>7</sup>
- 1.2 In particular, this work examines how this proposal might affect the European Union's (EU) goal of helping to reduce and eliminate CO<sub>2</sub> emissions from international shipping as soon as possible, as well as examining other political and/or trade implications for its relations with third countries and for progress at the International Maritime Organization (IMO) as it seeks to implement measures identified under the Initial IMO Strategy on Reduction of GHG Emissions from Ships (resolution MEPC.304(72)) adopted in April 2018.
- 1.3 The study also explores alternative options for Market-Based Measures (MBMs) as a policy tool for accelerating the decarbonisation of shipping, taking into account, inter alia, geographical scope of application of the EU-ETS to shipping, trading entity (i.e. who is responsible for the carbon emissions and so its mitigation) and possibilities for avoidance, and options for carbon pricing schemes for international shipping.
- 1.4 Finally, the study briefly considers how the EU-ETS or alternative MBMs might operate in conjunction with existing and proposed policy tools, such as further tightening by IMO of energy efficiency regulations for ships under Chapter 4 of MARPOL Annex VI and the architecture for collecting payments from shipping under the proposal by industry for an International Maritime Research and Development Fund.

---

6 On 15 February 2017, the European Parliament adopted amendments to the Commission's proposal reviewing the EU Emission Trading System post 2020. The Parliament proposed a new chapter to tackle maritime CO<sub>2</sub> emissions: in case of an absence of an agreement at the IMO level, from 2023 these emissions should be accounted for in EU ports and during voyages to and from them. The parliamentarians also proposed to create a maritime climate fund to offset maritime transport CO<sub>2</sub> emissions, improve energy efficiency and encourage investment in technologies cutting CO<sub>2</sub> emissions from the sector, but this was not included in the revised ETS Directive.

<https://www.europarl.europa.eu/legislative-train/theme-resilient-energy-union-with-a-climate-change-policy/file-greenhouse-gas-reduction-targets-for-international-shipping>

(retrieved 29 May 2020)

7 Separate to the EC initiative, on 7 July 2020, the European Parliament's Environment Committee voted in favour of amending the EU Regulation on the Monitoring, Reporting and Verification (MRV) of carbon dioxide emissions from maritime transport, including the extension of the EU-ETS to the shipping sector.



## 2 Recent progress to reduce GHG emissions from international shipping and implications resulting from potential EU action

- 2.1 This section considers the recent work at the International Maritime Organization (IMO) to address greenhouse gas (GHG) emissions from international shipping, the role of the EU in those deliberations, the EU approach for inclusion of maritime GHG emissions in its commitments, and implications of the announcement in December 2019 by the EC of the European Green Deal and the plan to bring forward a proposal for the inclusion of shipping into the EU-ETS. In highlighting the significant and important work undertaken by IMO to date, which has led to a reduction in emissions from ships trading internationally, this section identifies how unilateral EU action may undermine IMO's ongoing work and, in doing so, the EU's own climate change goals.

### IMO action on reduction of GHG emissions from ships

- 2.2 In 2003, the IMO Assembly adopted resolution A.963(23) that urged IMO's Marine Environment Protection Committee (MEPC) to identify and develop the mechanisms needed to achieve the limitation or reduction of GHG emissions from international shipping.<sup>8</sup> The resolution identifies that the MEPC should give priority to the evaluation of technical, operational and market-based solutions.
- 2.3 In 2011, IMO adopted regulations on the energy efficiency for ships, the first ever global agreement for an entire industrial sector to mitigate CO<sub>2</sub> emissions. Phase 0 of the Energy Efficiency Design Index (EEDI) began on 1 January 2013 and required new ships to achieve a baseline figure for energy efficiency. This requirement was subsequently strengthened by 10% on 1 January 2015 (phase 1) and by 20% on 1 January 2020 (phase 2).
- 2.4 In May 2019, MEPC 74 approved, for adoption at its next session in April 2020, draft amendments to MARPOL Annex VI to significantly strengthen the EEDI phase 3 requirements. The draft amendments bring forward the entry into effect date of phase 3 to 2022, from 2025, for several ship types, including containerships, gas carriers, general cargo ships and LNG carriers and, at the same time, raised the EEDI reduction rate for some ship types. This means that new ships of these types, built from 2022, must be significantly more energy efficient than the baseline. For example, for a containership of 200,000 deadweight tonnage (DWT) and above, the EEDI reduction rate is expected to be set at 50% from 2022, instead of 30% from 2025. Furthermore the IMO has adopted for ships of 5,000 gross tonnage and above a data collection system for ship's fuel oil consumption. The first calendar year for this system is 2019 and, it is suggested, this could provide one of the building blocks for a global MBM adopted by IMO. See also paragraphs 2.51 to 2.55 below.
- 2.5 Data provided from shipping industry observers has identified that since 2008, when emissions from international shipping peaked at 916 MT of CO<sub>2</sub><sup>9</sup>, emissions from international shipping have declined to a point where in 2015 CO<sub>2</sub> emissions were reported as being 812 MT.<sup>10</sup> Anecdotal evidence suggests that the emissions from international shipping have not increased since 2015 due to improvements in ship energy efficiency, which have resulted in reduced fuel oil consumption even

8 IMO (2004) *IMO policies and practices related to the limitation or reduction of GHG emissions from international shipping* Assembly resolution A.963(23), p.1(d).

9 IMO (2014) *Third IMO GHG Study 2014*.

10 ICCT (2017) *Study: Global shipping emissions rise as IMO meets to discuss climate action*, 17 October 2017.

though volumes of traded goods and commodities have continued to grow.<sup>11</sup> Indeed some observers suggest that growth in shipping emissions has managed to decouple itself from growth in global GDP but it is difficult to confirm this whilst the shipping market remains depressed.

- 2.6 The above actions by IMO show two important issues that need to be recalled when considering unilateral action at a regional level:
- .1 global action ensures a level playing field is maintained, and so market distortion prevented, in a global sector such as shipping; and
  - .2 agreement by IMO is already leading to effective mitigation of emissions from international shipping.

## Initial IMO Strategy on Reduction of GHG Emissions from Ships and follow-up actions up to 2023

- 2.7 Having already taken action to introduce mandatory technical and operational measures, and following the adoption of the Paris Agreement in December 2015, MEPC 72 in April 2018 adopted resolution MEPC.304(72) on the Initial IMO Strategy on Reduction of GHG Emissions from Ships (the Initial Strategy).<sup>12</sup> This important agreement represents the framework for further action of the MEPC, setting out the future vision for international shipping. At the time of adoption 23 EU Member States were present.<sup>13</sup> On its adoption the EC<sup>14</sup> expressed support with Commissioner Bulc stating: “This was a significant achievement for the EU and its member states, which played an instrumental role in brokering and securing the agreement with international partners”. Four MEPs also supported the EU delegation.<sup>15</sup> As such the EU<sup>16</sup> could be said to have fully supported the Initial Strategy and the identification of an MBM as a candidate mid-term measure.<sup>17</sup>
- 2.8 The GHG reduction targets identified in the Initial Strategy are considered highly ambitious and include the requirement for carbon intensity of the fleet to decline by 70% by 2050. The Initial Strategy also envisages for the first time a reduction in total GHG emissions from international shipping which, it says, should peak as soon as possible, and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008, while, at the same time, pursuing efforts towards phasing them out entirely. IMO Member States agreed to keep this Strategy under review, including adoption of a Revised Strategy in 2023. Noting the forecast growth in trade, particularly between developing countries, such an ambition is considered to need individual ships to reduce their emissions by as much as 85% by 2050.
- 2.9 In October 2018, MEPC 73 approved a *Programme of follow-up actions of the Initial IMO Strategy on*

11 UNCTAD (2019) Review of maritime transport 2019 indicates trade volumes expanded by 2.7% in 2018.

12 Saudi Arabia and the United States reserved their position on adoption of the Initial Strategy.

13 The UK was a Member of the European Union when MEPC 72 took place. EU Member States not present at MEPC 72 were Bulgaria, Hungary, Lithuania and Slovakia.

14 EC (2018) *Commissioners Bulc and Arias Cañete welcome the IMO agreement on CO<sub>2</sub> reductions in the maritime sector*, 13 April 2018 [https://ec.europa.eu/clima/news/commissioners-bulc-and-arias-ca%CA3%Blete-welcome-imo-agreement-co2-reductions-maritime-sector\\_en](https://ec.europa.eu/clima/news/commissioners-bulc-and-arias-ca%CA3%Blete-welcome-imo-agreement-co2-reductions-maritime-sector_en)

15 Bulc, V. (2018) *Shipping is delivering on climate change*, The EU Parliament magazine, 12 July 2018. <https://www.theparliamentmagazine.eu/articles/opinion/shipping-delivering-climate-change>

16 The European Commission is an observer at IMO meetings and coordinates the EU's position and interventions by EU Member States.

17 Resolution MEPC.304(72), paragraph 4.8.3 reads as follows: “new/innovative emission reduction mechanism(s), possibly including Market-based Measures (MBMs), to incentivize GHG emission reduction”.

*Reduction of GHG Emissions from Ships up to 2023*<sup>18</sup>. This document constitutes a planning tool on the work for IMO in meeting the timelines identified in the Initial Strategy, with eight parallel streams of activity and their expected timeframes up to 2023.

- 2.10 The Initial Strategy also identifies that “possible mid-term measures could be measures finalized and agreed by the MEPC between 2023 and 2030”<sup>19</sup> and further notes that “Certain mid- and long-term measures will require work to commence prior to 2023”.<sup>20</sup> For mid-/long term measures the programme of follow-up actions identifies that at MEPC 74 (May 2019) and MEPC 75 (postponed from April 2020) there should be “Consideration of proposals including identification of barriers and action to address”.
- 2.11 Noting the urgency of the matter, the MEPC has since June 2017 approved the holding of intersessional meetings of its working group on the reduction of GHG emissions from ships (ISWG-GHG). This working group then developed the Initial Strategy and programme of follow-up actions and has subsequently provided an opportunity for additional deliberation and consideration of the issues identified by IMO members.
- 2.12 At ISWG-GHG 4, held in October 2018 in the week before MEPC 73, France (ISWG-GHG 4/2/11) proposed to include preparatory work on mid- and long-term measures in the programme of follow-up actions, in particular what Market-Based Measures (MBMs) can bring, as this kind of measure could help create the appropriate economic context and enabling environment to encourage the transition to low-/zero-carbon fuels and technologies that are considered essential to meet the 2050 level of ambition, making some basic suggestions for such a measure and requesting the introduction of a dedicated work stream on this subject in the programme of follow-up actions.
- 2.13 The negotiations on the development of an MBM for international shipping were ongoing at IMO until MEPC 65 in May 2013 suspended discussions on MBMs and related issues to a future session.<sup>21</sup> In particular, reconciling the UNFCCC and IMO principles of Common But Differentiated Responsibility (CBDR) and No More Favourable Treatment (NMFT) respectively proved problematic, especially as what is now the Paris Agreement was being negotiated under the UNFCCC, and IMO Member States wanted to be consistent in their positions irrespective of the body in which negotiations were taking place.
- 2.14 The adoption of the Paris Agreement in December 2015, and the principle of ‘common but differentiated responsibilities and respective capabilities, in the light of different national circumstances’ (CBDR-RC), arguably unblocked negotiations at IMO that led to the adoption of the Initial Strategy. The Initial Strategy whilst being cognizant of CBDR-RC also recognises as a guiding principle “the requirement for all ships to give full and complete effect, regardless of flag, to implementing mandatory measures to ensure the effective implementation of this strategy”.<sup>22</sup> The Initial Strategy also identifies MBMs as one of those measures.

---

18 MEPC 73/19, paragraph 7.9.1 and annex 9.

19 Ibid., paragraph 4.1.2 and 4.1.3.

20 Ibid., paragraph 4.2.

21 MEPC 65/22, paragraph 5.1.

22 MEPC.304(72), p.3.2.2.

## EU approach for inclusion of maritime GHG emissions in its commitments

- 2.15 The EU considers international shipping to be a large and growing source of greenhouse gas (GHG) emissions. The EU supports global action to tackle these emissions and has put in place EU-wide data collection measures. However, although the EU considers that a global approach to address GHG emissions from international shipping, led by IMO, would be the most effective and preferable way to proceed; its perception (fair or otherwise) of the relatively slow progress at IMO has triggered the EU to take action. Furthermore the EC identifies that shipping emissions represent around 13% of the overall EU greenhouse gas emissions from the EU transport sector in 2015.<sup>23</sup>
- 2.16 The EU foresees a gradual approach for the inclusion of maritime GHG emissions in its commitments. Under the gradual approach, three subsequent steps can be considered:
- .1 implementing a system for monitoring, reporting and verification (MRV) of emissions;
  - .2 the definition of reduction targets for the maritime transport sector; and
  - .3 the application of a Market-Based Measure (MBM).<sup>24</sup>
- 2.17 It can be seen that this approach, which has been finessed to identify the application of an MBM in the “medium to long-term”<sup>25</sup>, has up until now been closely aligned with that followed by IMO which has adopted a ship’s fuel oil consumption data collection and reporting system, whilst the Initial Strategy identifies ‘levels of ambition’ as reduction goals for international shipping and a market-based measure as a candidate mid-term measure.
- 2.18 As an envisaged precursor to the inclusion of ships trading internationally into a unilateral Market-Based Measure, the EU has implemented a system for monitoring, reporting and verification (MRV) of emissions from ships.<sup>26</sup> Furthermore paragraph 10 of the preambulatory text for the MRV regulation refers to “alongside emissions from other sectors that are already contributing to that commitment” and is considered to be a clear reference to inclusion in the EU-ETS. Importantly, this view is supported with preambular paragraph 12 referring to “pricing of those emissions at a later stage”.<sup>27</sup>
- 2.19 Establishment and the subsequent operationalization of the EU-MRV for ships trading internationally with the EU has not received any significant objection from third countries. Arguably, therefore, the principle of the EU regulating GHG emissions from internationally trading ships beyond what has been agreed at the IMO has been accepted by third countries. Furthermore it could be considered to have set a precedent under international law for action by the EU to address GHG emissions from ships trading internationally. Whilst this is subject to debate (see Section 3) it may lead to the EU taking the view that the scope of the obligations that have already been applied to internationally trading ships provides the basis for the application of requirements, including limits, on carbon emissions from internationally trading ships that voluntarily enter a port of an EU Member State.

23 EC (2020) *Reducing emissions from the shipping sector* [https://ec.europa.eu/clima/policies/transport/shipping\\_en](https://ec.europa.eu/clima/policies/transport/shipping_en) (retrieved 8 March 2020)

24 European Commission, *Integrating Maritime Transport Emissions in the EU’s Greenhouse Gas Reduction Policies*, COM(2013)479, 28 June 2013, p. 5.

25 EC (2020) *Reducing emissions from the shipping sector* [https://ec.europa.eu/clima/policies/transport/shipping\\_en](https://ec.europa.eu/clima/policies/transport/shipping_en) (retrieved 8 March 2020)

26 Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC, OJ L123/55, preambular paragraph 10 reads as follows: “In order to reduce CO<sub>2</sub> emissions from shipping at Union level, the best possible option remains setting up a system for monitoring, reporting and verification (MRV system) of CO<sub>2</sub> emissions based on the fuel consumption of ships as a first step of a staged approach for the inclusion of maritime transport emissions in the Union’s greenhouse gas reduction commitment, alongside emissions from other sectors that are already contributing to that commitment.”

27 *Ibid.*, preambular paragraph 12 reads as follows: “The results of the stakeholder consultation and discussions with international partners indicate that a staged approach for the inclusion of maritime transport emissions in the Union’s greenhouse gas reduction commitment should be applied with the implementation of a robust MRV system for CO<sub>2</sub> emissions from maritime transport as a first step and the pricing of those emissions at a later stage.”

- 2.20 The EU MRV applies to ships above 5,000 gross tonnage in respect of CO<sub>2</sub> emissions released during their voyages from their last port of call to a port of call under the jurisdiction of an EU Member State and from a port of call under the jurisdiction of a Member State to their next port of call, as well as within ports of call under the jurisdiction of a Member State.
- 2.21 A 'port of call' is defined by the EU MRV Regulation as the port, including non-EU ports, where a ship stops to load or unload cargo or to embark or disembark passengers. However, stops for the sole purposes of refuelling, obtaining supplies, relieving the crew, going into dry-dock or making repairs to the ship and/or its equipment, stops in port because the ship is in need of assistance or in distress, ship-to-ship transfers carried out outside ports, and stops for the sole purpose of taking shelter from adverse weather or rendered necessary by search and rescue activities are excluded<sup>28</sup> and so not regarded as a 'port of call'.
- 2.22 Whilst this definition for 'port of call' is clearly an attempt to limit carbon leakage, in that it includes the whole voyage from the last port of call and not just for the distance the ship transits in EU waters, it remains the case that a ship could call at a port and unload one container or load one container or disembark one passenger or embark one passenger and by this definition would have satisfied the definition of 'port of call'. Such a definition, if employed for implementation of an EU-ETS on ships trading internationally, could therefore have significant consequences on the level of carbon leakage, and thereby lead to distortion of the market. For example, a ship trading across the Atlantic could stop in a non-EU port such as Southampton before sailing to an EU port. Ships coming through the Suez Canal could stop at a port such as Tangiers from where cargo could be transhipped into the EU. Amendment of the definition or a test of scope of the provision in the Courts is always possible but this may have ramifications for the precedence that the EU-MRV scheme has set in its applicability, under international law, to international shipping.
- 2.23 Using data reported under the EU-MRV system, the EC announced on 30 June 2019 that the CO<sub>2</sub> emissions reported in 2018, the first reporting year, by ships over 5,000 gross tonnage when performing maritime transport activities related to the European Economic Area (EEA) represented more than 130 million tonnes of CO<sub>2</sub> emissions.<sup>29</sup> In May 2020, the EC published its first report having analysed fully the data received from the EU-MRV system. This report identifies that ships of 5,000 gross tonnage and above which performed maritime transport activities related to the European Economic Area (EEA) in 2018, added up to over 138 million tonnes of CO<sub>2</sub> emissions in that year, representing 3.7% of total EU CO<sub>2</sub> emissions.<sup>30</sup> This represents 11% of total EU transport emissions in 2018<sup>31</sup>, a lower percentage than the 13% figure provided for 2015 identified in paragraph 2.15 above, but noting that the 2018 figure for CO<sub>2</sub> emissions from the EU-MRV system "covers around 90% of all CO<sub>2</sub> emissions"<sup>32</sup> from ships. At the global level, the reported CO<sub>2</sub> emissions

---

28 Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC, OJ L123/55.

29 EC (2019) Commission publishes information on CO<sub>2</sub> emissions from maritime transport, 1 July 2019  
[https://ec.europa.eu/clima/news/commission-publishes-information-co2-emissions-maritime-transport\\_en](https://ec.europa.eu/clima/news/commission-publishes-information-co2-emissions-maritime-transport_en)

30 Commission publishes first annual EU report on CO<sub>2</sub> emissions from maritime transport  
[https://ec.europa.eu/clima/news/commission-publishes-first-annual-eu-report-co2-emissions-maritime-transport\\_en](https://ec.europa.eu/clima/news/commission-publishes-first-annual-eu-report-co2-emissions-maritime-transport_en) (retrieved 27 May 2020)

31 Greenhouse gas emissions from transport in Europe, European Environment Agency  
<https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases/transport-emissions-of-greenhouse-gases-12> (retrieved 27 May 2020)

32 EC (2020) 2019 Annual Report on CO<sub>2</sub> Emissions from Maritime Transport Brussels, 19 May 2020, C(2020) 3184 final  
[https://ec.europa.eu/clima/sites/clima/files/transport/shipping/docs/c\\_2020\\_3184\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/shipping/docs/c_2020_3184_en.pdf) (retrieved 27 May 2020)



represent around 15% of the total CO<sub>2</sub> emissions emitted by international and domestic shipping.<sup>33</sup> If ships of 5,000 gross tonnage and above performing maritime transport activities related to the European Economic Area emitted 138 million tonnes of CO<sub>2</sub> emissions in 2018, and if this remained the same, then it would represent 15% of the EU target of 929 million tonnes for all transport emissions in 2030.<sup>34</sup>

## The European Green Deal

- 2.24 Noting the ongoing work at IMO, the European Commission's (EC) announcement of its Green Deal in December 2019<sup>35</sup> reflects the need for governments globally to respond pro-actively to the challenge of climate change and introduce meaningful and credible goals that are consistent with the Paris Agreement's 'well below 2°C' temperature goal.
- 2.25 As the EC indicates "Becoming the world's first climate-neutral continent by 2050 is the greatest challenge and opportunity of our times". In meeting that challenge the EC has identified that it "will propose to extend European emissions trading to the maritime sector, and to reduce the EU Emissions Trading System allowances allocated for free to airlines. This will be coordinated with action at global level, notably at the International Civil Aviation Organization and International Maritime Organization".<sup>36</sup> Whilst this might support global efforts to mitigate GHG emissions, should the EU-ETS be extended to ships trading internationally then this action could not be part of the nationally determined contribution (NDC) of individual EU Member States under the UNFCCC.
- 2.26 The use of the term "coordinated with action at global level" would suggest the EC considers there is a need to continue to work at the IMO to seek a global solution for international shipping. In many respects this reflects the difficulties and political tension experienced when the EU sought to include international aviation into the EU-ETS in 2012, for example, the threat by China to cancel aircraft orders with Airbus (see Annex 2). Whilst the EU may consider that there is a political imperative to act, such an action could lead to a straining of political relationships at IMO, not least with IMO Member States that negotiated the Initial Strategy in good faith and made significant efforts to find a balanced solution that could attain a consensus. Such political tension could not only see a delay to the further consideration of an MBM at IMO but it may overspill into deliberations on short-term GHG reduction measures for the existing global fleet, and other important work to enable international shipping to decarbonise including on alternative fuels and innovative technologies. Furthermore the EU position on international shipping may effect progress being made under UNFCCC and so could impact EU objectives in that and in other multilateral negotiations, including potentially on trade, due to the control of a significant number of ships by large trading nations in third countries.

---

33 *ibid.*

34 Greenhouse gas emissions from transport in Europe, European Environment Agency <https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-greenhouse-gases/transport-emissions-of-greenhouse-gases-12> (retrieved 27 May 2020)

35 European Commission (2019) The European Green Deal, COM(2019) 640 final, Brussels, 11 December 2019.

36 *ibid.*

2.27 The European Parliament's response<sup>37</sup> to the EC announcement reads as follows:

"[The European Parliament] welcomes the Commission's intention to include the maritime sector in the ETS; stresses that the EU should defend a high level of ambition for GHG reductions in the maritime sector both at international and EU level, while any new EU measures should not undermine the international competitiveness of EU-flagged ships; believes that EU and international measures should go hand in hand in order to avoid creating double regulations for the industry and that any action, or lack of action, taken at global level should not hinder the EU's ability to take more ambitious action within the Union; furthermore, underlines the need for measures to move away from the use of heavy fuel oil and the need for urgent investments in research into new technologies to decarbonise the shipping sector, and in the development of zero-emission and green ships".

2.28 This response from the European Parliament in reiterating and emphasizing the political imperative again for the EU to take ambitious action also identifies that there are concerns and a risk of negative impacts for the competitiveness of EU-flagged ships. The introduction of the EU-MRV is already an example of double regulation in shipping with a global system also established. The European Parliament says that "EU and international measures should go hand in hand in order to avoid creating double regulations", and for reasons explained elsewhere, EU-ETS will probably undermine global action.

2.29 Interestingly, the European Parliament in the same response<sup>38</sup> also rejects the extension of the EU-ETS to road transport choosing instead to focus on technical standards as follows:

"Takes note of the Commission's plans to consider extending European emissions trading to emissions from road transport; rejects a direct inclusion in the EU ETS scheme and the setting up of any kind of parallel schemes; strongly underlines that no pricing system should replace or weaken existing or future CO<sub>2</sub> standards for cars and lorries and place any extra burden directly on consumers".

2.30 Again, there appears to be a clear recognition of the limitations of the EU-ETS for certain sectors of the EU economy including in the transport sector<sup>39</sup>. Road transport is already recognised as a significant contributor to EU GHG emissions<sup>40</sup> and even though it is included in the EU's NDC, it is not considered an appropriate sector for inclusion in the EU-ETS. However, there are similarities between road transport companies and shipping companies, many of which are also Small and Medium sized Enterprises (SMEs) for which ETS was never intended. EU-ETS will also likely have an impact on consumers if the cost of compliance is passed on. It could also weaken innovation to achieve IMO technical standards if ships can achieve compliance with EU-ETS through fiscal as opposed to technical means. Finally, increased costs for short-sea shipping, which is already more carbon efficient than road transport<sup>41</sup>, could lead to modal shift that would lead to higher CO<sub>2</sub> emissions for the same cargo transported and also be contrary to other EU objectives such as relieving road congestion.

37 European Parliament resolution on the European Green Deal (2019/2956(RSP)), P9\_TA-PROV(2020)0005, 15 January 2020, paragraph 49.

38 Ibid., paragraph 54.

39 In 2013 emissions from EU transport were 1022 MT CO<sub>2</sub> eq. including aviation, international maritime transport was identified as emitting 140 MT CO<sub>2</sub> eq., 29 June 2016, [https://www.eea.europa.eu/media/infographics/eu-targets-to-reduce-greenhouse/image/image\\_view\\_fullscreen](https://www.eea.europa.eu/media/infographics/eu-targets-to-reduce-greenhouse/image/image_view_fullscreen) (retrieved 8 March 2020).

40 In 2019 the share of EU transport emissions was identified as follows: road transport 71.7%, maritime 13.3% and aviation 13.9%, 29 August 2019, [https://www.eea.europa.eu/data-and-maps/daviz/share-of-transport-ghg-emissions-2#tab-chart\\_1](https://www.eea.europa.eu/data-and-maps/daviz/share-of-transport-ghg-emissions-2#tab-chart_1) (retrieved 8 March 2020)

41 The Second IMO GHG Study 2009 identifies typical ranges of CO<sub>2</sub> efficiencies of ships compared with rail and road transport in grams CO<sub>2</sub>/tonne-kilometre as follows: ships: 2.5 (bulk carrier) to 60.3 (ro-ro), rail: 10 to 119; road: 80 (truck > 40 tonnes) to 181 (truck < 40 tonnes).

- 2.31 Post adoption of the Paris Agreement in December 2015, with IMO's Initial Strategy being adopted in April 2018, and with the discussion of a global MBM for international shipping now being re-started at IMO with European countries taking the lead, it would seem paradoxical for the EU to take a line that saw it develop and implement a regional MBM that was not aligned with an MBM that IMO may develop and implement globally.

## European Union's Emission Trading System

- 2.32 The European Union Emissions Trading System (EU-ETS), was the first large greenhouse gas emissions trading scheme in the world, and remains the biggest. It was launched in 2005 to fight global warming and is a major pillar of EU energy policy. The EU-ETS covers emissions from all EU Member States plus Iceland, Norway, and Liechtenstein.
- 2.33 The EU-ETS works on the principle of 'cap and trade'. Under the 'cap and trade' principle, a maximum (cap) is set on the total amount of greenhouse gases that can be emitted by all participating installations. "Allowances" for emissions are then auctioned off or allocated for free, and can subsequently be traded. Installations must monitor and report their CO<sub>2</sub> emissions, ensuring they hand in enough allowances to the authorities to cover their emissions. If emissions exceed what is permitted by its allowances, an installation must purchase allowances from others. Conversely, if an installation has performed well at reducing its emissions, it can sell its leftover credits. Proponents of ETS argue this can allow the system to find the most cost-effective ways of reducing emissions without significant government intervention.<sup>42</sup> As such, some economists argue – at least for those industries to which ETS currently applies – that it is the most effective overall method of achieving emissions reduction.
- 2.34 As identified above in paragraph 2.30 there are significant challenges to applying the EU-ETS to a sector where many companies operate fewer than ten ships, and so those companies will probably be more restricted and have fewer opportunities to participate in carbon trading and hedging, unlike larger companies, thus finding themselves at a competitive disadvantage. Furthermore such smaller companies will find the financing of carbon credits to meet obligations under an EU-ETS more problematic than under an alternative MBM such as a fuel levy. As such, distortion of competition resulting from a regional measure, in particular an EU-ETS, may present a legitimate legal issue that would not arise as a consequence of a global measure being adopted. Also unlike airlines which operate mainly scheduled services to hubs, most shipping services involved in international trade are unscheduled services operating globally that may only make a small number of port calls in the EU annually, and may not make calls from one year to the next. Inclusion of such ships in the EU-ETS would result in a significant and disproportionate administrative burden for those companies. Presumably, this is one of the reasons the European Parliament has rejected the inclusion of road transport in the EU-ETS.
- 2.35 Furthermore there are thousands of shipping companies many, if not the majority, of which are located outside the EU. How would such companies and, significantly, any monies raised from allowances auctioned under the EU-ETS, be administered by EU Member States and their authorities? Would there be a degree of hypothecation with the funds raised from international shipping, that is the monies raised ring-fenced for the shipping sector, or would, as with aviation and other sectors, the monies go to the EU Member State that administers the allowances for the ship to do with as they choose? If the latter, and the focus is on out-of-sector emissions reduction, then the

---

42 European Union Emission Trading Scheme [https://en.wikipedia.org/wiki/European\\_Union\\_Emission\\_Trading\\_Scheme](https://en.wikipedia.org/wiki/European_Union_Emission_Trading_Scheme) (retrieved 20 February 2020).

opportunity to reduce not just CO<sub>2</sub> emissions from international shipping but also other air pollutants such as SO<sub>x</sub> and NO<sub>x</sub> may be lost as the focus for ship operators could be on achieving their carbon allowance through offsetting rather than absolute emission reductions.

- 2.36 From 2013 to 2015, EU Member States auctioned almost 2 billion allowances amounting to EUR 11.7 billion in revenues.<sup>43</sup> EU Member States agreed that at least half of these revenues should be used for climate action inside or outside the EU. They can decide whether they allocate the revenues from auctioning of allowances directly to a fund or support programme, a process known as earmarking, or count the auctioning revenues as an additional income stream to the state budget. Earmarking has the advantage of providing a transparent and consistent form of using auctioning revenues for climate finance.
- 2.37 On average, EU Member States report to have spent 85% of the total auctioning revenues for climate purposes over the period 2013 to 2015. Of this money, the majority was allocated to domestic actions amounting to EUR 8,691 million (82%), whilst less than 9% was spent on international climate actions, amounting to EUR 1,048 million.<sup>44</sup> It is evident that there is no certainty that monies raised from ships trading internationally and included in the EU-ETS would be used to mitigate emissions from the maritime sector.

## The United Kingdom

- 2.38 Subsequent to its leaving the EU on 31 January 2020 the UK remains part of the EU-ETS. However, this is only for the transition period that is due to end on 31 December 2020. The UK has indicated that “Any future system will be at least as ambitious as the EU-ETS.”<sup>45</sup> And “the UK would be open to considering a link between any future UK Emissions Trading System (ETS) and the EU-ETS (as Switzerland has done with its ETS), if it suited both sides’ interests.”<sup>46</sup> Indeed a draft negotiating document published on 19 May 2020 includes a placeholder for carbon pricing indicating that the UK may link to the EU-ETS and a note that “Additional legal provisions on carbon pricing may be inserted following further discussions.”<sup>47</sup> On 1 June 2020 the UK announced that it intends to establish a UK Emissions Trading System (UK-ETS) with Phase I running from January 2021 to 2030, which could operate as either a linked system (e.g. to EU-ETS) or a standalone system, and which

43 Ecologic Institute (2016) *Smart cash for the climate: Maximising auctioning revenues from the EU Emissions Trading System. Full report: An analysis of current reporting by Member States and options for improvement*, December 2016, p.3

44 *ibid*, Over 80% of the money so far spent on climate action – most of it in the EU, p.3

45 UK Government Guidance on *Meeting climate change requirements from 1 January 2021*, November 2019, Department for Business, Energy and Industrial Strategy reads as follows: “The UK government issued a consultation on the Future of UK Carbon Pricing in May 2019. A government response to the consultation will be published in due course. The UK government and the devolved administrations are firmly committed to carbon pricing as an effective tool for achieving our carbon emissions reductions targets for net zero. Any future system will be at least as ambitious as the EU ETS. Leaving the EU will not affect our statutory commitments under the UK’s Climate Change Act, which is domestic legislation. The UK will also remain a Party to international climate change agreements, including the Paris Agreement. Its commitment to them will remain as strong as ever and will be unaffected by leaving the EU.”

46 UK Government, *The Future Relationship with the EU: The UK’s Approach to Negotiations*, CP 211, 27 February 2020. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/868874/The\\_Future\\_Relationship\\_with\\_the\\_EU.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/868874/The_Future_Relationship_with_the_EU.pdf) (retrieved 28 February 2020).

47 UK Government, *Draft Energy Agreement*, 19 May 2020. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/886014/DRAFT\\_Energy\\_Agreement.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/886014/DRAFT_Energy_Agreement.pdf) (retrieved 21 May 2020).

will apply to aviation. Furthermore, as announced in the UK's Budget 2020, the UK Government will publish a consultation later this year on the design of a Carbon Emission Tax as an alternative to a UK-ETS, to ensure a carbon price remains in place in all scenarios.<sup>48</sup>

- 2.39 It is evident that the implications of any future policy decision made by the UK could have a significant consequence on the effectiveness of the EU-ETS were it to be applied to shipping, especially if the chosen parameter by the EU for calculating the scope of emissions to be included is the 'last port of call'.<sup>49</sup> For example, ships crossing the Atlantic Ocean could go to Southampton or Felixstowe and then either go onto Rotterdam making the emissions covered by the EU-ETS to be from the UK port to Rotterdam rather than from North America. Alternatively cargoes bound for the EU could be offloaded in a UK port and transhipped either by a feeder service or via rail or road via the Channel Tunnel. Furthermore, strategic ports such as Gibraltar could provide additional scope for ships to avoid the EU-ETS. Such avoidance could damage the interests of EU ports and may well lead to market distortion.
- 2.40 Whatever the UK decides about EU-ETS in general, there is no certainty that the UK would elect to join the EU-ETS and include shipping as it might have economic and political interest in refusing to do so. The lack of certainty on this matter is an important consideration as it is likely to impact the effectiveness of the EU-ETS to reduce emissions from ships trading internationally. The effectiveness of the EU-ETS to date is discussed below.

## Environmental effectiveness of EU-ETS to date

- 2.41 One of the key questions asked is how effective would be the inclusion of a sector such as shipping in the EU Emissions Trading System (EU-ETS)? As currently there are no schemes in the world that include emissions from international shipping in an emissions trading system there is no clear evidence as to the effectiveness were ships trading to and from the EU to third countries (non-EU Member States) to be included in the EU-ETS. However, this section examines the impact of the effectiveness of the EU-ETS to date to reduce emissions.
- 2.42 An obvious comparator is the aviation sector and its inclusion in the EU-ETS. Current evidence suggests that the inclusion of 'domestic' aviation only, that is flights within the EEA air space, has not led to emissions reduction for that sector. Emissions from airlines covered by the EU-ETS rose by 4.9% in 2018 while all other European industrial and power sectors fell in 2018.<sup>50</sup> CO<sub>2</sub> emissions from intra-EEA flights covered by the EU-ETS have risen by 26% since 2012, while other sectors have fallen. Some EU governments are pressing for harmonised EU-wide taxes on airline tickets or kerosene to stem the growth.

48 UK Government, *The future of UK carbon pricing*, 1 June 2020.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/889037/Government\\_Response\\_to\\_Consultation\\_on\\_Future\\_of\\_UK\\_Carbon\\_Pricing.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/889037/Government_Response_to_Consultation_on_Future_of_UK_Carbon_Pricing.pdf) (retrieved 2 June 2020)

49 The risk of carbon leakage is also the case for any other third country especially those in close geographic proximity to the EU, for example, North African coastal States.

50 <https://sandbag.org.uk/project/ets-emissions-2018/> (retrieved 20 February 2020). Emissions logged by nearly 500 aircraft operators in the EU-ETS registry totalled 67.56 million tonnes (MT) in 2018, up from 64.39 MT in 2017 (+4.9%). These operators were entitled to "free allowances" totalling 31.20 MT, so were required to purchase and surrender allowances covering the remaining 36.36 MT. At a price of €20/tonne (\$22.50/T) – the current price is around €23/tonne today – compliance with the EU-ETS is estimated to have cost the sector up to €727 million (\$816 million) in 2018.



- 2.43 Transport & Environment (T&E)<sup>51</sup> have said that emissions from flights within Europe accounted for only 40% of European aviation's "runaway emissions" and aviation regulators had consistently underestimated the extent of emissions growth in their planning forecasts. The European Aviation Safety Agency (EASA) had anticipated a 3.3% increase in carbon emissions on intra-European flights in 2018 but the EU-ETS data had shown a 4.9% increase, or 1.1 MT of CO<sub>2</sub> more than expected. "Airlines' emissions are booming and not just on cheap flights" commented Andrew Murphy, Aviation Manager at T&E. It is hard to imagine that the view of environmental NGOs will be any different were emissions from ships to be included in the EU-ETS and found to be growing and not declining even if trade volumes were increasing.
- 2.44 By contrast, for other sectors in the EU-ETS, since 2012 there has been a reduction of emissions albeit marginal for some sectors. Much of this is put down to the fact that the EU-ETS has been weakened by a surplus of allowances and subsequently low prices. As a result, it has been argued that it is failing to provide the appropriate signals either for emissions reductions now, or long term investment towards a low carbon economy. Achieving a more appropriate, tighter, level of allowance supply is considered an imperative to improve the functioning of the EU carbon market so that it leads to a price adequate to incentivise different behaviours. To some degree this has been addressed with reform of the EU-ETS in 2018<sup>52</sup> that has already led to a price increase in the allowances being traded. However, the price level attained remains relatively low and without further such changes it again raises the question how inclusion of ships trading internationally into the EU-ETS would in the near term stimulate the behaviours needed to achieve absolute emissions reduction in the shipping sector in-line with the ambition in the IMO Initial Strategy. This is especially true, given that unlike most other sectors covered by the EU-ETS, shipping is currently fossil fuel captive, and zero-carbon technologies do not yet exist in a scale or form applicable to ocean-going ships. It is therefore hard to see how immediate inclusion within the EU-ETS is likely to incentivize any change in behaviour.
- 2.45 Preamble paragraph 13 of the EU MRV regulation<sup>53</sup> reads as follows:

"Given the international nature of shipping, the preferred and most effective method of reducing greenhouse gas emissions in international maritime transport would be by global agreement."

- 2.46 It is difficult to disagree with the EU's own view that addressing GHG emissions from international shipping would be most effective by a global agreement. Indeed, whilst inclusion in the EU-ETS of international shipping emissions to the extent covered by the scope of the EU-MRV system may currently appear to be a clear option for EU decision makers, it is suggested that not only could such a scheme be subject to significant carbon leakage unless carefully designed, and so at best not optimal and at worst liable to distort the shipping market with consequences on trade, but more importantly, may lead to significant political discord between the EU and third countries as was seen with the attempt to include international aviation outside the EEA into the EU-ETS in 2012.

51 <https://www.transportenvironment.org/press/ryanair-biggest-not-fastest-growing-airline-polluter-%E2%80%93-climate-problem-spans-aviation-sector>, 3 April 2019, (retrieved 20 February 2020).

52 In July 2015, the European Commission presented a legislative proposal to revise the EU Emissions Trading System (EU-ETS) for the period after 2020. After extensive negotiations, the European Parliament and the Council formally supported the revision in February 2018. The revised EU-ETS Directive (Directive (EU) 2018/410) entered into force on 8 April 2018.

53 Regulation (EU) 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC, OJ L123/55.

- 2.47 Legal opinion identifies that EU Member States need to agree by unanimity<sup>54</sup> to the proposal expected to be put forward by the European Commission and endorsed by the European Parliament. However, it is important to note that the EC is likely to have a contrary view as to whether such a proposal constitutes a fiscal measure (this difference in views is discussed in detail in paragraph 3.18). EU Member States have to weigh up those risks to their diplomatic relations with third countries and significant trading partners. Those risks can only be assessed once the scope of application is known. However, as has been demonstrated for aviation, a limited scope of application might well reduce the risks to diplomatic relations with third countries, and also the potential for derailing ongoing work at IMO, but could prove to be ineffective in reducing emissions from ships, leading to the question whether the effort is worthwhile.
- 2.48 Assuming that doing nothing is not an option politically acceptable to the EU and its institutions, this further enhances the support for an alternative approach or measure that can achieve meaningful and rapid absolute GHG emission reduction in the shipping sector. Which MBM and whether its application would be most effective at a regional or global level is discussed under Sections 4 and 5 of this report.

## Implications for other IMO instruments for the control of emissions from ships

- 2.49 The 1997 Protocol of the International Convention for the Prevention of Pollution from Ships (MARPOL Annex VI) is the most important instrument for controlling emissions from international shipping. This is clearly demonstrated with the entry into effect on 1 January 2020 of the 0.50% sulphur limit for fuel oil used on board a ship operating outside an IMO emission control area (where the sulphur limit is required to be 0.10%). The impacts of this rule change are both environmental/health and economic.
- 2.50 The IMO identifies that the new rule is likely to bring a 77% drop in overall sulphur oxide (SO<sub>x</sub>) emissions from ships equating to an annual reduction of approximately 8.5 million metric tonnes of SO<sub>x</sub>.<sup>55</sup> Of more relevance, in light of a discussion about market-based instruments to control CO<sub>2</sub> emissions from ships, is that this new rule has been estimated to increase annual fuel oil costs for international shipping by between US\$30 to US\$60 billion (increased cost of US\$100 to US\$200 per tonne of fuel oil). The impacts of this price signal on international shipping e.g. adoption of more energy efficient technologies or operational practices such as speed optimisation, are yet to be assessed.
- 2.51 In 2011, measures to improve energy efficiency of international shipping were adopted by Parties to MARPOL Annex VI as a new chapter 4 in MARPOL Annex VI that entered into force on 1 January 2013. The *Regulations for energy efficiency of ships* apply to ships engaged in international voyages of 400 gross tonnage and above, and make mandatory the:
- .1 Energy Efficiency Design Index (EEDI) for new ships; and
  - .2 Ship Energy Efficiency Management Plan (SEEMP) for new and existing ships.

54 Jessen (2016).

55 IMO (2020) *Sulphur 2020 – cutting sulphur oxide emissions*, <http://www.imo.org/en/MediaCentre/HotTopics/Pages/Sulphur-2020.aspx> (retrieved 20 February 2020)

- 2.52 The EEDI is a performance based mechanism that leaves the choice of technologies to be employed to the shipowner. So long as the required energy efficiency level is attained, ship designers and builders are free to use the most cost efficient solutions for the ship to comply with the regulations. EEDI requirements are increasingly strict over time.
- 2.53 MEPC 74 approved, for adoption at MEPC 75 in April 2020, draft amendments to MARPOL Annex VI to significantly strengthen the EEDI phase 3 requirements. The draft amendments bring forward the entry into effect date of phase 3 to 2022, from 2025, for several ship types, including containerships, gas carriers, general cargo ships and LNG carriers and, at the same time, raised the EEDI reduction rate for some ship types. This means that new ships built from that date must be significantly more energy efficient than the baseline. For example, for a containership of 200,000 deadweight tonnage and above, the EEDI reduction rate is expected to be set at 50% from 2022, instead of 30% from 2025.
- 2.54 Each ship of 400 gross tonnage and above engaged in an international voyage is required also to keep on board a ship-specific SEEMP which establishes a mechanism for operators to improve the energy efficiency of the ship. This should be achieved by monitoring the energy efficiency performance of a ship's transportation work and at, regular intervals, considering new technologies and practices to improve energy efficiency.
- 2.55 Following the entry into force on 1 March 2018 of amendments to MARPOL Annex VI, it is mandatory for ships to collect and report ship fuel oil consumption data. Since 1 January 2019, ships of 5,000 gross tonnage and above (representing approximately 85% of the total CO<sub>2</sub> emissions from international shipping) are required to collect consumption data for each type of fuel oil they use, as well as additional specified data including deadweight as proxy for "transport work". The data primarily collected by the flag States is subsequently transferred to the IMO Ship Fuel Oil Consumption Database. The first report analysing and summarizing the data collected in 2019 will be presented to the MEPC in 2021. This mechanism is expected to provide robust data on international shipping's fuel consumption and GHG emissions so as to inform the MEPC's decision making. Furthermore the IMO DCS could provide the basis for an MBM applied globally.
- 2.56 MARPOL Annex VI is an example of the international system that successfully and meaningfully regulates international maritime transport and of how an environmental issue is integrated within this framework. Indeed, a legislative intervention to control air emissions from international maritime transport must be integrated into a complex international regulatory system that governs this sector.<sup>56</sup>
- 2.57 The inclusion of ships trading internationally into the EU-ETS would need to be considered carefully to ensure that the proposed scheme does not lead to perverse incentives. On the one hand there could be a dis-incentivizing effect for newer ships in the fleet from trading to the EU as improvements made in their design energy efficiency are not appropriately reflected in legacy allowances. Alternatively, with IMO considering mandatory goal based operational energy efficiency measures for the existing fleet, a regional measure could see investment otherwise used on existing ships having to be utilized on carbon allowances in the EU-ETS with no guarantee that funds raised in that scheme would go to enhancing the energy efficiency of the existing fleet. This might have the consequence of 'capturing carbon' in an aging global fleet so suppressing efforts to reduce the carbon intensity of the global fleet.

---

<sup>56</sup> Miola et al. (2010), p.33.

## Implications for the proposal to establish an International Maritime Research and Development Programme

- 2.58 A proposal to establish an International Maritime Research and Development Board (IMRB) and Fund (IMRF) to oversee an International Maritime Research and Development Programme has been submitted to MEPC 75 due to place in March/April 2020 by ICS, BIMCO, CLIA, INTERCARGO, INTERFERRY, INTERTANKO, IPTA, and WSC.<sup>57</sup> The proposal seeks the establishment of a programme to accelerate the introduction of low-carbon and zero-carbon technologies and fuels as identified in paragraph 4.7.9 of the IMO Initial Strategy on the Reduction of GHG Emissions from Ships. The proposed action is considered critical to achieving the levels of ambition for 2050 and beyond set forth in the IMO Initial GHG Strategy.
- 2.59 The co-sponsors do not consider the proposed IMRB concept to be a Market-Based Measure (MBM). Neither is this proposal intended to frustrate or delay the development of an MBM should there be consensus for this among IMO Member States. The intention is simply to accelerate development of low-carbon and zero carbon technologies and fuels for use in the commercial maritime sector. However, if this IMRB concept is taken forward by the IMO, it could potentially provide some of the architecture for the possible future development of a levy-based MBM for shipping, in a manner that would reduce the possibility of market distortion.
- 2.60 The proposal co-sponsors identify that core funding would be provided via a mandatory R&D contribution of US\$2 per tonne of fuel oil purchased for consumption, which will be necessary to maintain an appropriate level of annual funding (approximately US\$500 million) and to maintain fair competition between shipping companies. This would generate core funding of approximately five billion US dollars over the life of the ten year programme and would fundamentally alter the current level of investment in maritime R&D focused on the development of low-carbon and zero-carbon technologies for international shipping. An effort of this scale is expected to be successful in identifying one or more technical pathways that can lead to the introduction of zero-emission ships across the maritime sector by 2030 and beyond.
- 2.61 The industry proposal identifies that monies will be collected in a manner that would avoid market distortion using the IMO data collection system (DCS) for enforcement. Furthermore if the IMRB was used to establish a levy-based MBM, arguably the only real difference would be the quantum of the levy and the purpose for which the money is collected and used – e.g. to improve bunkering infrastructure that will be needed for zero-carbon fuels.
- 2.62 The inclusion of ships trading internationally into the EU-ETS raises several important questions with regard to the use of the funds raised and identifies a clear disadvantage if funds are primarily retained within EU Member States and so likely to pass out of the international shipping sector. If the industry proposal for an IMRB/IMRF was not taken forward via IMO, would the expected US\$5 billion to be generated by this proposal to accelerate R&D be matched by monies from the EU-ETS

<sup>57</sup> MEPC 75/7/4 Proposal to establish an International Maritime Research and Development Board ICS, BIMCO, CLIA, INTERCARGO, INTERFERRY, INTERTANKO, IPTA, and WSC, Dec 2019.

dedicated to R&D? For example, is the EU's Innovation Fund,<sup>58</sup> with an expected funding of €10 billion disbursed across multiple sectors for the period 2021 to 2030, likely to enable the same acceleration of R&D as a global fund dedicated to shipping? Furthermore would the governments of non-EU States be happy for their shipping companies to contribute to an EU fund if the recipients of monies were exclusively located in the EU?

- 2.63 Until these questions are answered to the satisfaction of the global shipping community it will remain the case that inclusion of ships trading internationally in the EU-ETS may well be considered more a revenue raising exercise rather than an attempt to reduce emissions from international shipping, the latter being considered a secondary goal. This view is supported with the recent announcement by the EC that to address the economic damage resulting from the COVID-19 crisis, a major recovery plan is proposed that identifies the maritime sector as a source of funds to support that recovery.<sup>59</sup> Furthermore the perception of third countries could mean these nations potentially consider the application of EU-ETS to ships trading internationally as a tax on trade.
- 2.64 The extent to which, or whether, the International Maritime Research and Development Fund (IMRF) being considered by IMO could sit alongside the inclusion of ships trading internationally into the EU-ETS would depend on the design of the scheme under the EU. Ships trading to the EU could be subject to both schemes but their contributions to the IMRF could be formally recognized and excluded from allowances required to be submitted under the EU-ETS thus avoiding double counting, that is the contribution to the IMRF could be considered a 'carbon credit'.
- 2.65 Alternatively, ships trading to the EU might have to contribute to the IMRF but also submit allowances under the EU-ETS. In this scenario, the disbursement of funds from the EU-ETS could be seen as supplementary to the IMRF funding of R&D but it would be important to ensure there was some strategic alignment between the schemes. This latter point is important when considering the coordination of activities under the IMO Initial Strategy, as this provides the framework for action that is agreeable to all countries globally, and reflects the collective political will of IMO Member States.
- 2.66 Ring fencing some of the monies raised by the EU-ETS to be used for R&D in the shipping sector could be used to demonstrate that the EU policy goals are aligned with IMO's Initial Strategy. However, establishment and operationalization of the EU-ETS for ships trading internationally is unlikely to begin before 2023 and, by the time the EU has negotiated with third countries, could well be later, meaning that funds are collected and ready to be disbursed only by 2025. This could mean that the R&D projects would be identified and awarded the funds by 2026. Some might question whether this would be too late especially for an industry that is already seeking to build "zero-carbon" ships from 2030.

58 EC (2019) *Innovation Fund Delegated Regulation - Frequently Asked Questions*, 26 February 2019. The EU Innovation Fund is established by the EU Emission Trading System (EU-ETS) Directive for the period 2021 to 2030 and is expected to provide €10 billion of funding depending on the carbon price. The Fund will focus on highly innovative technologies with European added value that can bring on significant emission reductions in multiple sectors and unleash further low-carbon investments in all EU Member States. At the same time, the projects need to be sufficiently mature in terms of planning, business model, financial and legal structure. The Innovation Fund aims to finance a broad variety of projects achieving an optimal balance of a wide range of innovative technologies in all eligible sectors (energy intensive industries including transport, renewable energy, energy storage, CCS and CCU) and Member States. It is important that the projects financed by the Fund are at an advanced technology readiness levels so the Innovation Fund helps them reach the market with a competitive advantage and viability. The Fund is also aiming to support cross-cutting projects bringing innovative low-carbon solutions leading to emission reductions in multiple sectors, for example through industrial symbiosis or business model innovation. (retrieved 5 June 2020)

[https://ec.europa.eu/commission/presscorner/detail/en/MEMO\\_19\\_1416](https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1416)

59 EC (2020) *Europe's moment: Repair and prepare for the next generation: Factsheet 3 Financing the Recovery Plan*, 27 May 2020 reads as follows: "Possible additional own resources to be added at a later stage of the 2021-2027 financial period: Extension of the Emissions Trading System - based own resources to the maritime and aviation sectors to generate €10 billion per year" [https://ec.europa.eu/info/sites/info/files/factsheet\\_3\\_en.pdf](https://ec.europa.eu/info/sites/info/files/factsheet_3_en.pdf) (retrieved 28 May 2020)



- 2.67 Of course, the most significant uncertainty is the price of a single carbon allowance. The volatility of this price means that the funds raised for R&D are unknown at the beginning of implementation and could be subject to significant variation. Whilst there is uncertainty in the funds raised under the IMRB, due to the quantity of fuel oil supplied in the calendar year being an unknown from year to year, the estimates of funds to be raised can be more accurately predicted based upon the estimates from the forthcoming Fourth IMO GHG Study 2020 and data from the IMO DCS, the first report for which is due to be provided to MEPC in 2021.
- 2.68 A summary of the potential advantages and disadvantages of inclusion into the EU-ETS of ships trading internationally is provided below:

#### **Potential advantages of incorporating international shipping into EU-ETS**

- EU-ETS sets a cap on emissions that the sector as a whole and individual emitters are required to achieve, a cap which can be amended to ensure policy goals are achieved;
- EU-ETS already established for several industry sectors with proven mechanisms for allocation of carbon permits and trading platforms;
- Permits both in-sector and out-of-sector emission reduction resulting in flexibility in compliance approaches that can be used, including permitting the use of offsetting;
- As price of carbon is determined by the market, some economists argue that this ensures CO<sub>2</sub> emissions are reduced in the most economical way and potentially allows trading with other carbon markets;
- For emitters to achieve the required carbon emission limits, the EU-ETS can potentially stimulate uptake of alternative fuels and innovative technologies; and
- EU Monitoring, Reporting and Verification (EU-MRV) system for ships trading internationally to and from the EU already implemented and can be used as basis for application of EU-ETS to shipping.

**Potential disadvantages of incorporating international shipping into EU-ETS**

- Risk of undermining IMO negotiations to implement the Initial Strategy on Reduction of GHG Emissions from Ships, so setting back global efforts to adopt measures for absolute emissions reduction and provide support programmes to developing countries especially Least Developed Countries (LDCs) and Small Island Developing States (SIDS);
- Risk of increased political tension with third countries that could potentially lead to trade disputes, especially if this is perceived to be more a revenue raising exercise rather than an attempt to reduce emissions from international shipping;
- Greater uncertainty over the price of emitting a tonne of CO<sub>2</sub>, as it depends on supply and demand. If the price drops due to a lower demand there is decreased willingness and ability for companies to invest in CO<sub>2</sub> reducing investments;
- Administrative burden and associated costs in comparison to other MBMs would be significant, especially for Small and Medium sized Enterprises (SMES), which are a particular characteristic, inter alia, of the tramp and short-sea sectors and should be a critical consideration for policy makers;
- The characteristics of the numerous ship types, contractual relationships and operators present a highly complex market that is unlikely to be effectively or appropriately addressed suggesting a pragmatic approach by decision makers is required, as has already being demonstrated by the European Parliament's recommendation to continue leaving road transport outside the scope of EU-ETS;
- Subject to the final scope of application, there is potentially a high risk of carbon leakage, increasing CO<sub>2</sub> emissions from shipping outside the scope of the EU-ETS and leading to market distortion;
- Risk of introducing perverse incentives, e.g. if efficiency improvements are not reflected in legacy allowances;
- Diverting investments from energy efficiency improvements to new ships and the existing fleet to the purchase of allowances, undermining goal-based energy efficiency measures adopted by IMO with EU Member States' support;
- The application of EU-ETS to international aviation (for intra EU flights) has not resulted in any reduction to absolute emissions from this sector, in contrast to shipping whose absolute GHG emissions have reduced significantly throughout the same period; and
- Funds raised from carbon allowances bought by the shipping sector are not retained in the shipping sector for R&D (unlike in the International Maritime Research and Development Board proposal to IMO from the shipping industry, which in turn could form the basis of a global MBM while accelerating the development of zero-carbon technologies and complete decarbonisation).

### 3 Legal implications and possible conflict with the EU's international obligations

- 3.1 This section examines the legal implications of including shipping in the EU-ETS, as well as the possible conflict with the EU's international obligations. However, it should be noted that, irrespective of legal precedent and even international law, it is clear that political will is the most important factor in the shaping and implementation of measures to address climate change. As such, whilst the findings of this section are important, it is arguable that they may not be the defining matter in action taken by the EU.

#### EU's relationship to UNCLOS and IMO

- 3.2 The EU is an independent contracting party to UNCLOS. This is important as it obligates the EU always to adhere to the principles of UNCLOS when adopting EU legislation.<sup>60</sup> This is unlike IMO instruments which the EU is not party to, rather it is for individual EU Member States to contract to IMO instruments.<sup>61</sup> However, the EC has competency for enacting IMO instruments into EU law and also for proposing the strengthening of the global requirements to align with EU policy. For example, the EU has strengthened the sulphur requirements in the EU Sulphur Directive compared to those found in MARPOL Annex VI<sup>62</sup>, such as requiring ships at berth for over two hours to use fuel oil with a sulphur content not exceeding 0.10%.
- 3.3 It is argued that an extension of the EU-ETS to international shipping could be consistent with this approach. The following section considers the provisions of UNCLOS, consistency of including emissions from ships trading internationally into the EU-ETS and also implications for enforcement.
- 3.4 Article 218(1) of UNCLOS on *Enforcement by port States* reads as follows:

“1. When a vessel is voluntarily within a port or at an off-shore terminal of a State, that State may undertake investigations and, where the evidence so warrants, institute proceedings in respect of any discharge from that vessel outside the internal waters, territorial sea or exclusive economic zone of that State in violation of applicable international rules and standards established through the competent international organization or general diplomatic conference.”

- 3.5 Article 218(1) provides powers for an EU port State to investigate and institute proceedings but would appear to be applicable only to “international rules and standards established through the competent international organization or general diplomatic conference”. As such this raises the question as to whether regional rules adopted by the EU were enforceable by port States under

60 The European Court of Justice has reaffirmed that EU legislation must adhere to – and be enforced by the EU Member States in accordance with – UNCLOS in three different cases:

a) The Intertanko case (*Case C-308/06, Intertanko, Intercargo, Greek Shipping Co-operation Committee, Lloyd's Register, International Salvage Union v Secretary of State for Transport, ECLI:EU:C:2008:312*),  
 b) The Manzi case (*Case C-537/11, Manzi and Compagnia Naviera Orchestra, ECLI:EU:C:2014:19*), and  
 c) The Bosphorus Queen case (*Case C-15/17, Bosphorus Queen Shipping Ltd Corp v Rajavartiolaivos, ECLI:EU:C:2018:557*)

61 A noted exception is the Athens Convention relating to the *Carriage of Passengers and their Luggage by Sea, 1974 and the Protocol of 2002 to the Convention* which includes “Article 19 Regional economic integration organizations”, that requires that the Regional Economic Integration Organization shall make a declaration to the IMO Secretary-General specifying the matters governed by this Protocol in respect of which competence has been transferred to that Organization by its Member States which are signatories or Parties to this Protocol and any other relevant restrictions as to the scope of that competence.

62 Twenty-five EU Member States are Contracting Parties to MARPOL Annex VI. Source: Status of Conventions, IMO, 12 February 2020; <http://www.imo.org/en/About/Conventions/StatusOfConventions/Documents/Status%20-%202020.pdf> (retrieved 20 February 2020).

UNCLOS. Indeed Fanø argues<sup>63</sup> that port States can assert jurisdiction over violations when they occur outside their territory, for example on the high seas, in accordance with article 218(1) of UNCLOS, however, this is in the context of a theoretical fossil fuel ban enacted by IMO.

3.6 Article 220(1) of UNCLOS on *Enforcement by coastal States* reads as follows:

“1. When a vessel is voluntarily within a port or at an off-shore terminal of a State, that State may, subject to Section 7, institute proceedings in respect of any violation of its laws and regulations adopted in accordance with this Convention or applicable international rules and standards for the prevention, reduction and control of pollution from vessels when the violation has occurred within the territorial sea or the exclusive economic zone of that State.”

3.7 Article 220(1) of UNCLOS provides power to EU coastal States to “institute proceedings in respect of any violation of its laws and regulations adopted in accordance with this Convention”. This provision arguably provides greater scope for EU Member States to enforce EU rules against ships trading internationally.

3.8 Such rules could be developed under Article 212 *Pollution from or through the atmosphere* that reads as follows:

“1. States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment from or through the atmosphere, applicable to the air space under their sovereignty and to vessels flying their flag or vessels or aircraft of their registry, taking into account internationally agreed rules, standards and recommended practices and procedures and the safety of air navigation.

2. States shall take other measures as may be necessary to prevent, reduce and control such pollution.

3. States, acting especially through competent international organizations or diplomatic conference, shall endeavour to establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control such pollution.”

3.9 So for emissions to the air that are polluting<sup>64</sup> from internationally trading ships Article 212(1) provides scope for individual States to establish their rules, Article 212(2) provides for “other measures”, that is measures to prevent, reduce and control such pollution presumably in addition to international rules, and Article 212(3) affirms with the use of the term “especially” that such rules do not necessarily have to be developed through a competent international organization or diplomatic conference.

63 Fanø, J. J. *Enforcing international maritime legislation on air pollution through UNCLOS*, Hart Publishing, ISBN: 9781509927784, November 2019, p.322.

64 Several jurisdictions consider GHG emissions to be pollutants, for example, in 2007 US Supreme Court declared that carbon dioxide and other greenhouse gases were air pollutants under the Clean Air Act and in the UK, for example, <https://naei.beis.gov.uk/overview/ghg-overview> However, no legal definition appears to be prevalent in the EU or indeed under international climate change instruments including UNFCCC, its Kyoto Protocol or the Paris Agreement.

## IMO's legal view of GHG emissions from ships

- 3.10 The specific legal question over whether GHG emissions from ships trading internationally should be considered under UNCLOS Article 212 as *Pollution from or through the atmosphere* was addressed obliquely when IMO's Marine Environment Protection Committee considered whether it would be legally consistent to amend MARPOL Annex VI *Regulations on the prevention of air pollution from ships* to include provisions to address the improvement of energy efficiency of ships to reduce greenhouse gas (GHG) emissions (as proposed in document MEPC 60/4/35<sup>65</sup>).
- 3.11 The IMO Legal Office provided the following opinion<sup>66</sup>:

“The basic amendment procedures are set out in article 16 of MARPOL 1973 (extended by article VI of the 1978 Protocol). Article 16(2)(iii) allows for tacit acceptance of amendments to an Annex adopted after consideration by the Organization.

The 1997 Protocol added Annex VI to the MARPOL Convention and provided, in article 4, that “In applying article 16 of the Convention to an amendment to Annex VI and its appendices, the reference to ‘a Party to the Convention’ shall be deemed to mean the reference to a Party bound by that Annex”.

The Convention (in paragraph 7 of article 16) provides its own two-part test for assessing a proposed amendment: any amendment to a Protocol or to an Annex shall (a) relate to the substance of that Protocol or Annex and (b) shall be consistent with the articles of the present Convention.

Taking into account the fact that Assembly resolution A.963(23) noted that resolution 8 of the 1997 Air Pollution Conference “invited the MEPC to consider what CO<sub>2</sub> reduction strategies may be feasible given the relationship between CO<sub>2</sub> and atmospheric pollutants, especially NO<sub>x</sub>, since NO<sub>x</sub> emissions may exhibit an inverse relationship to CO<sub>2</sub> reductions”, a sound substantial relationship would appear to be established between the proposal and the current Annex VI. This can be said to meet part (a) of the test under paragraph (7) of article 16.

Part (b) of the two-part test under article 16(7) concerns consistency in terms of the objects and purposes of the MARPOL Convention as measured by such elements as the definitions. For example, article 2 of the Convention defines “Discharge” as meaning “any release howsoever caused from a ship and includes any escape, disposal, spilling, leaking, pumping, emitting or emptying”. Emissions from inefficient ships' engines burning low grade fuel would appear to fall squarely within this definition.

As a further example, the term “Harmful substance” is defined in the Convention as meaning “any substance which, if introduced into the sea, is liable to create hazards to human health, to harm living resources and marine life”, etc. It may be recalled that resolution 8 of the 1997 Air Pollution Conference recognized that “CO<sub>2</sub> emissions, being greenhouse gases, have an adverse effect on the environment”. Therefore, the harmful impact, as required under MARPOL, would appear to be an accepted fact for purposes of the present discussion.

<sup>65</sup> MEPC 60/4/35, Japan, Norway and the United States, Mandatory EEDI requirements - Draft text for adding a new part to *MARPOL Annex VI for regulation of the energy efficiency of ships*, paragraphs 6 and 7, 15 January 2010.

<sup>66</sup> MEPC 60/22, paragraph 4.33.

Furthermore, the fact that the MARPOL definition refers to substances “introduced into the sea” could have been used to prevent Annex VI itself from being adopted in 1997; the fact that the definition was not used in this way means that the Annex is its own precedent for using MARPOL to develop the current proposals.

The Legal Office also examined the 1969 Vienna Convention on the Law of Treaties for provisions that might be helpful in determining the issue. That Convention does not have any provision which prevents Parties from amending a treaty to expand its scope in a way that is acceptable to the Parties concerned. Such questions are therefore left for the Parties themselves to determine.

Accordingly, in the view of the Legal Office, there is no legal barrier to the Parties to Annex VI agreeing to expand the scope of the Annex as proposed.”

- 3.12 MEPC agreed by majority<sup>67</sup> that MARPOL Annex VI was the appropriate vehicle for enacting energy efficiency requirements for ships and that the proposed measures were commensurate, timely and would assist the IMO in maintaining its leading position as the relevant body to regulate all aspects of international shipping, including emission control, and that the working group should be instructed accordingly.<sup>68</sup>

## Enforcement of EU-ETS applied to shipping

- 3.13 Whilst there would appear no legal impediment to the EU developing and applying “other measures” under Article 212(2), where EU coastal or port States may have difficulty is with enforcement for ships trading internationally that do not call at an EU port.
- 3.14 Coastal States can take measures against violations in all parts of their national waters (including Exclusive Economic Zone (EEZ)) if the violating ship afterwards voluntarily goes into port (Article 220(1) of UNCLOS). However, coastal States will not be able to stop ships transiting the EEZ or an international strait as Article 220(5), Article 220(6) and Article 233 (pursuant to Article 42(1)(b)) are not applicable.<sup>69</sup>
- 3.15 The World Bank<sup>70</sup> in its review and consideration of the existing literature recognizes various ways of establishing jurisdiction over emissions released in international waters, but none of these options is uncontested and, apart from “the effect principle”<sup>71</sup>, each of them could potentially apply only to a

67 The delegations of Brazil, China, India, Peru and Saudi Arabia reserved their position on the proposed inclusion of mandatory technical and operational energy efficiency regulations in MARPOL Annex VI, MEPC 60/22, paragraph 4.36.

68 MEPC 60/22, paragraph 4.34.

69 Fanø, J. J. *Enforcing International Maritime Legislation on Air Pollution through UNCLOS*, Hart Publishing, ISBN: 9781509927784, November 2019, p.322.

70 World Bank (2018), *Regional Carbon Pricing for International Maritime Transport: Challenges and Opportunities for Global Geographical Coverage*, G. Dominioni, D. Heine and B. M. Romera, World Bank Group Policy Research Working Paper 8319, January 2018.

71 *Ibid.* According to “the effect principle” a state has jurisdiction over acts that, while taking place outside its territory, nevertheless have an impact on it (Bauerle et al. (2010), pp 85–86). In the context of carbon pricing in the maritime sector, the effect principle could provide a legitimate basis for jurisdiction because mitigating climate change is a primary interest of single States and the international community as a whole. The effect principle could provide a legitimate basis for both port State jurisdiction over ships and jurisdiction over consignees/consignors, regardless of whether the accounting unit is the cargo or the ship. However, it remains a contested issue whether the effect principle could provide a basis for port State jurisdiction over emissions released beyond territorial waters, but the limitation of the price of carbon to the harm suffered by the State that imposes the measure is likely to strengthen its jurisdictional claim (Heine et al. 2017), p.39.



sub-set of the carbon pricing measures they have considered. However, without taking a position on which (if any) of these approaches would be more legitimate, the World Bank highlights that, historically, regional action has served as a basis for the expansion of States' jurisdiction under maritime law.<sup>72</sup>

## Would the EU-ETS be considered a fiscal measure or not?

- 3.16 Rodriguez (2012) argues that that it should not be the legal aspects of implementation which deter the EU from including maritime transport under the EU-ETS.<sup>73</sup> Firstly, the enforcement of international provisions is extremely difficult. The European Court of Justice has proved itself to be very restrictive when it comes to analysing the legality of an EU measure in the light of public international law.<sup>74</sup> Moreover, the lack of efficient international mechanisms for solving international disputes (UNCLOS, Kyoto Protocol, UNFCCC, MARPOL) or the impossibility of reaching international agreements on material provisions (shipping regulation in WTO) mean that a legal international solution is highly improbable. Secondly, even if the problem of enforcement can be overcome, the inclusion of shipping emissions in the EU-ETS does not appear directly to clash with any of the international agreements the EU has ratified. The UNFCCC and Kyoto Protocol are not only respected by the EU-ETS, they are reinforced by such determined compliance with the reduction objectives the EU has committed to. The MARPOL Convention only sets minimum standards, and UNCLOS does not prohibit the regulation of emissions by ships and in fact Article 212(2) supports the taking of "other measures as may be necessary to prevent, reduce and control such pollution". Furthermore, GATS does not apply to shipping transport yet.
- 3.17 The three most problematic international provisions are GATT, bilateral agreements with no discrimination clauses and the principle of sovereignty over maritime areas. Nevertheless, it is postulated by Rodriguez<sup>75</sup> that none of the GATT provisions would be violated, since the inclusion of ships under the EU-ETS constitutes an internal non-fiscal measure that does not discriminate against foreign products. This non-discrimination reasoning is also useful to demonstrate that bilateral agreements have not been breached. As far as the principle of sovereignty is concerned, it seems that there is a sufficient link between the regulated situation and the territory of the EU. Whilst all the above arguments may hold true, and it remains the case that they could be challenged under one, if not several, international instruments, there is uncertainty over legal interpretation that could leave it open for the EU to propose inclusion of ships trading internationally in the EU-ETS. Whilst third countries may not see that as complying with the spirit as much as the letter of international agreements, it would be for these nations to test. This uncertainty is discussed using the case study of the EU Ship Recycling Licence (SRL).
- 3.18 Consideration of the proposal for an EU SRL demonstrates that there is no clear legal view on what constitutes an "internal non-fiscal measure". The legal opinion<sup>76</sup> prepared on the SRL identifies this as a "primary fiscal measure", and suggests that the EU would have no competence to administer an EU

72 Boyle, A. (2006), EU Unilateralism and the Law of the Sea. *The International Journal of Marine and Coastal Law*, 21(1), 15, p.17.

73 Rodriguez, DP. (2012), *The Inclusion of Shipping in the EU Emission Trading Scheme: A Legal Analysis in the Light of International Law*, Revista Catalana de Dret Ambiental, Vol.3, pp.1-55.

74 European Court of Justice, Case C-366/10, *Air Transport Association of America and Others v Secretary of State for Energy and Climate Change*, Judgement of 21 December 2011.

75 Rodriguez (2012).

76 Jessen (2016).

ship recycling scheme and infers an incompatibility with the UN Law of the Sea Convention (UNCLOS), with World Trade Organisation rules and the Principle of Common but Differentiated Responsibilities. However, the EC's own conclusion on SRL provides a contrary view. The EC<sup>77</sup> referring to a study<sup>78</sup> it commissioned identifies that the measure is not a fiscal measure and so is subject to their competency under EU law noting their view is supported as follows:

“Annexes B (“WTO compliance”) and C (“Extraterritoriality and the SRL”) of the 2016 study underline that (a) there is a clear legal case not to identify the SRL with a “fiscal measure”, (b) the EU would be acting within the remit of its competence, (c) the SRL precisely avoids discriminating against ships flying under the flag of third countries and (d) case law points to the strong likelihood of compatibility with WTO rules.”

3.19 For the inclusion of shipping into the EU-ETS and the question as to whether the EU Council is required to agree unanimously, or if not then by qualified majority voting, depends on interpretation as to whether this would constitute provisions primarily of a fiscal nature. For the inclusion of aviation in the EU-ETS the Council voted unanimously to include aviation emissions in the EU Emissions Trading Scheme (ETS)<sup>79,80</sup> the Council's common position<sup>81</sup> being accepted by the EC.<sup>82</sup> However, this does not clarify if unanimity was legally required only that it was attained for that decision. This though could be considered as setting a legal precedent for a future decision about the inclusion of shipping emissions in the EU-ETS, that is, unanimity is required by the EU Council. However, the EC is likely to take the view that it would not be a fiscal measure and qualified majority voting could apply. This is a view further supported by Ismer and Haussner (2015)<sup>83</sup> who concluded that the inclusion of consumption in the EU-ETS would be considered part of EU environmental regulation and as such would require qualified majority rather than unanimity voting in the Council under Article 192.2(a) TFEU, as it would not constitute a measure of a primarily fiscal nature.

77 EC (2017), footnote 20, p. 6.

78 Ecorys, DNV-GL, Erasmus School of Law (2016).

79 GreenAirOnline.com *EU environment ministers unanimously vote to include aviation emissions in EU ETS from 2012*, 20 December 2007 <https://www.greenaironline.com/news.php?viewStory=65> (retrieved 29 May 2020)

80 Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community - Political agreement, Brussels, 21 December 2007 Interinstitutional File: 2006/0304 (COD), 16855/07 <https://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2016855%202007%20INIT>

81 Common position adopted by the Council on 18 April 2008 with a view to the adoption of a directive of the European Parliament and of the Council amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community [https://ec.europa.eu/clima/sites/clima/files/transport/aviation/docs/council\\_common\\_position\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/aviation/docs/council_common_position_en.pdf)

82 Communication from the Commission to the European Parliament, “Commission can accept the common position” Brussels, 22 April 2008, COM(2008) 221 final, 2006/0304 (COD) [https://ec.europa.eu/clima/sites/clima/files/transport/aviation/docs/com\\_common\\_position08\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/transport/aviation/docs/com_common_position08_en.pdf)

83 Ismer and Haussner (2015) Inclusion of Consumption into the EU ETS: The Legal Basis under European Union Law, Review of European Community & International Environmental Law, RECIEL 25 (1) 2016, pp. 69-80. ISSN 2050-0386 <https://climatestrategies.org/wp-content/uploads/2015/03/5-loC-Legal-analysis-in-EU-context.pdf>  
The authors provide a detailed in-depth discussion of the legal issues when considering the inclusion of consumption into emissions trading schemes. In doing so, they argue that Article 192 of the Treaty on the Functioning of the European Union (TFEU) in conjunction with Article 191 TFEU would constitute the right legal basis. More specifically, Article 192.1 TFEU establishes an ordinary legislative procedure for environmental policy measures, whereas Article 192.2 TFEU requires unanimity in the Council for ‘provisions primarily of a fiscal nature’. They contend that Article 192.1 TFEU is the proper basis because the measure is not to be seen as based on ‘provisions primarily of a fiscal nature’ for two reasons: first, since the inclusion of consumption would form an integral part of the EU ETS, it would, just as the EU-ETS generally, not be based on ‘provisions primarily of a fiscal nature’. And, second, even if the inclusion of consumption could not be considered an integral part of the EU-ETS, Article 192.2(a) TFEU would not apply, as the pertinent provisions still would not be, or at least not primarily be, of a fiscal nature.

## Legal implications – conclusions

- 3.20 There is a view that emissions from international shipping should not be included in the EU-ETS on the grounds that these emissions are already covered by international law concerning emissions from ships (UNCLOS, Kyoto Protocol, MARPOL) and that this international law limits the powers of the EU over ships operating in EU waters only and voluntarily entering an EU port where provisions can be enforced. Furthermore the EU acting beyond such limits may be in breach of rules and provisions covering trading arrangements.
- 3.21 Others have postulated that there are no clear legal implications preventing the EC from proposing a measure that it sees as a necessary policy action to reduce GHG emissions from ships trading internationally. In part this is due to the fact that when the legal implications have been examined there would appear to be contradictory resulting legal opinion.
- 3.22 An alternative view may not only be more compelling but, and this is key, more readily underpins action that reflects the political perspective. Emissions from ships trading internationally and transporting cargoes to and from the European Union are contributing to anthropogenic climate change. Arguably those emissions are impacting on the EU, and the collective scientific view is that without action that impact will become more acute during this century. As such the right of the EU to protect its citizens becomes politically more paramount, a position that has been supported by the European Court of Justice with regard to international aviation and is likely to be again should consideration be given by the Court to emissions from ships trading internationally. Presuming otherwise would be injudicious. Indeed, what may be more of an issue is to consider the effectiveness of the system were it to be applied to ships trading internationally and this is covered in the next section.

## 4 Effectiveness (or otherwise) of a regional ETS for reducing emissions from international shipping

- 4.1 As indicated under Section 2 above on recent progress to reduce GHG emissions from international shipping and implications resulting from potential EU action, appraisal of the impacts of a regional ETS for ships trading internationally is contingent on the design of the scheme. Furthermore, irrespective of the effectiveness, or otherwise, of the EU-ETS to deliver emissions reductions from international shipping, it needs to be recalled that the most important impact could be whether this will undermine progress and action by IMO to deliver further global emission reductions. However, specific factors impacting effectiveness of a regional ETS are identified and discussed in this section and include:
- .1 geographical scope of application of EU-ETS to shipping;
  - .2 trading entity<sup>84</sup> and avoidance; and
  - .3 carbon pricing schemes for international shipping.

### Geographical scope of application of EU-ETS to shipping

- 4.2 The geographical scope of application determines the amount of emissions under the scheme and thus its environmental effectiveness in the context of reducing emissions regionally as opposed to globally. As ships are moveable objects, the quantity of emissions covered under the scheme can be limited if a ship can avoid the defined geographic scope of the scheme, thereby reducing the environmental impact. Moreover, there are legal and practical considerations in setting the scope. The environmental effectiveness would be significant when emissions on voyages to EU ports are included in the scheme.<sup>85</sup>
- 4.3 Which ships on which voyages to include in EU-ETS presents several policy options (and challenges) and the following four are considered the most important<sup>86</sup>:
- .1 only intra EU shipping;
  - .2 all shipping in EU territorial waters;
  - .3 all shipping to and from EU ports; and
  - .4 all shipping to or from EU ports.
- 4.4 Inclusion of **only intra EU shipping** (ships sailing from one port inside the EU to another port inside the EU) has, comparable to other options, the least environmental impact but would probably be the most politically acceptable as was demonstrated with aviation. Additionally the complexity of implementing such a scheme should not be underestimated as limiting the scope would mean that ships potentially could be subject to the scheme during some voyages and not subject during other voyages. Whilst only a small part of global emissions would be liable to the scheme it could stimulate the adoption of alternative fuels and innovative technologies and support policy actions to decarbonize other sectors, especially transport, in the EU. Furthermore, the possibilities for avoidance could be relatively large in some areas bordering non-EU States<sup>87</sup>,

<sup>84</sup> The trading entity should have control over emission reduction measures, otherwise inclusion in EU-ETS will have a limited effect. Furthermore, the port State authorities should be able to force the trading entity to surrender allowances. Based on these considerations, the ship operator is considered the best option as trading entity, Faber (2006) p.101.

<sup>85</sup> Faber (2009), p.15.

<sup>86</sup> Faber et al. (2006), pp.100-101.

<sup>87</sup> From 1 January 2021 this could include the United Kingdom and its waters.

such as the Mediterranean and the Baltic Sea. It would also be likely to have a disproportionate impact on the competitiveness of European shipping, which would need to be carefully analyzed by the EC. Therefore, if inclusion of shipping is deemed to be of paramount political importance, this should probably only be considered a fall back option, in case other options fail. In that case, the possibilities for avoidance should be assessed more thoroughly.

- 4.5 Inclusion of **all shipping in EU territorial waters** would be hard to enforce. It would be problematic to force ships that pass through EU waters on a trip between two non-EU ports to surrender emission allowances. Moreover, monitoring based on actual fuel use would be complicated.
- 4.6 Inclusion of **all shipping to and from EU ports** would potentially have the largest environmental effect – although as discussed elsewhere this is likely to create political difficulties with non-EU States. There could also be a problem in that it is not uncommon that ships change their destination while at sea. The reason may be that the cargo is sold to another entity, or that the owner of the cargo needs it at another location. This option may lead to evasive behaviour depending on which emissions precisely are included. For example, including all emissions between the last port call before the EU and up to the first call after calling at a EU port, may induce additional calls at ports close to the EU<sup>88</sup>. This would minimise the emissions under the scope of the EU-ETS. For these reasons, inclusion of shipping from EU ports would not be straightforward.
- 4.7 With regard to the inclusion of all shipping to EU ports in the EU-ETS, for ships that arrive at EU ports, it can clearly be established what their point of departure was. For ships that pass several ports on their way to the EU, it will have to be decided how to deal with this. The last port before the EU can be used as a departure point, but this may lead to evasive behaviour by ships making an additional intermediate stop. An alternative solution that may be considered is to use the port that is farthest away, or the port where most cargo has been loaded. This does highlight the legal and political issues of addressing emissions from one non-EU port to another non-EU port for cargoes destined for the EU and another option could be to tax cargoes destined for the EU rather than taxing the ship. Such a ‘border carbon tax’ was advocated by President Macron of France<sup>89</sup> and subsequently has been included in the EU Green Deal as a ‘carbon border adjustment mechanism’ (CBA).<sup>90</sup>

88 From 1 January 2021 this could include the United Kingdom and its waters.

89 EU Observer *Macron's carbon border tax - why hasn't he done anything?* <https://euobserver.com/environment/145311>, 4 July 2019, (retrieved 22 February 2020)

90 EC (2020) *European Green Deal: what role can taxation play?*

“The CBA will aim to ensure that the price of imports reflect more accurately their carbon content. It should reduce the risk of carbon leakage. Carbon leakage refers to the situation that may occur if, for reasons of costs related to climate policies, businesses were to transfer production to other countries with laxer emission constraints. The CBA should apply to selected industries at risk of carbon leakage. The precise design of the measure is yet to be defined. It would be an alternative to the measures that address the risk of carbon leakage in the EU’s ETS. All possible options will have to factor in the carbon price of the EU ETS.” [https://ec.europa.eu/taxation\\_customs/european-green-deal-taxation-customs\\_en](https://ec.europa.eu/taxation_customs/european-green-deal-taxation-customs_en) (retrieved 5 June 2020)

## Trading entity and avoidance

- 4.8 Identifying the responsible entity for the emissions from the ship will be a necessary element of scoping the application of an ETS to ships trading internationally and another potential complication to ensuring a level playing field. The trading entity, however it is defined, needs to have control over emission reduction measures, otherwise inclusion in the EU-ETS will have a limited effect. Furthermore, the port State authorities should be able to force the trading entity to surrender allowances. Based on these considerations, the shipping company<sup>91</sup> is considered the most appropriate option as trading entity.<sup>92</sup>
- 4.9 Under the EU-MRV regulation 2015/757 responsibility for reporting emissions rests with the shipping 'company'. This aligns with the definition of company in paragraph 1.1.2 of the IMO International Management Code for the Safe Operation of Ships and Pollution Prevention (ISM Code). Article 3(d) of the EU-MRV regulation reads as follows:

“(d) ‘company’ means the shipowner or any other organisation or person, such as the manager or the bareboat charterer, which has assumed the responsibility for the operation of the ship from the shipowner”.

- 4.10 The responsible entity for surrendering allowances in an emissions trading scheme for maritime transport should therefore be the shipping company which can take action to improve the technical and operational efficiency of the ship. Companies, via their IMO ISM Code certification, can be unequivocally identified and are already liable for other forms of pollution, such as oil spills. If the company is the registered owner, however, a disadvantage of making it the responsible entity would be that the company is sometimes a special purpose vehicle with no other assets and no real independence – if the ship is sold, action against that entity to recover the allowances may be complex. Therefore, it is necessary that the system allows for action against the direct source of emissions, i.e. the ship. Hence, a shipping company would be required to report emissions and surrender allowances for each ship they own, with enforcement able to target both the shipping company and the ship.<sup>93</sup>
- 4.11 ‘Avoidance’ is a rather nebulous term that includes several mechanisms by which a negative impact on the ship due to the scheme could be mitigated as follows:
- .1 alteration of routes either through addition of port calls, ship-to-ship transfers or modal shift;
  - .2 change in composition of the EU shipping fleet by a transfer of less efficient ships on routes non related to the EU; and
  - .3 relocation of manufacturing industry at the border of the EU which leads to a decrease of the trade activity of the EU and the increase of importation of high value goods.<sup>94</sup>

91 The terms 'company', 'ship operator' and 'shipowner' are all used in the literature, often synonymously. However, it would appear that in the context of emissions reporting and control these terms are used to refer primarily to the entity with direct control over the ship's operation, including which voyage the ship undertakes, rather than the design of the ship.

92 Faber et al. (2006), p.101.

93 Faber et al. (2009), p.18.

94 Kollamthodi et al. (2013), Technical Annex, p.87.



- 4.12 In all cases, the incentives for avoidance are highest when:
- .1 the voyage distance is long;
  - .2 the carbon price is high;
  - .3 the benefits<sup>95</sup> (e.g. fuel cost savings) from participating in the measure are low; and
  - .4 the freight rates are low.
- 4.13 Avoidance by making an additional port call becomes prohibitively expensive for ships with a single bill of lading when a voyage is defined as the route from the port of loading to the port of discharge. For ships with multiple bills of lading (containerships, general cargo ships), it is not possible to unequivocally determine a port of loading. Hence, for these ships, some avoidance will inevitably occur. In summary, Faber et al. (2009) note that the geographical scope should include all voyages to EU ports, starting from the port of loading for ships with a single bill of lading and the last port call for ships with multiple bills of lading or non-cargo ships.<sup>96</sup>
- 4.14 Avoidance/evasion is further discussed below as part of the consideration of three options for carbon pricing identified by the World Bank.<sup>97</sup> Additionally a further function open to shipping that could lead to potential carbon leakage is that of 'ship-to-ship' transfer. For example, tankers might anchor outside port limits to undertake the transfer and so would be outside the scope of application of the ETS were it to be defined in terms of 'port call'.

## Carbon pricing schemes for international shipping

- 4.15 The World Bank<sup>98</sup> has identified that an economically efficient solution to mitigating GHG emissions from international shipping would require carbon pricing to be part of the policy package, and that the most efficient application of carbon pricing would be through a global measure that prices GHG emissions at the rate of the social cost of carbon.<sup>99</sup> The literature often refers to the terms "tax" and "levy" synonymously. For this report both terms are used according to the original use by the authors that are referenced. Both terms are considered as forms of carbon pricing noting that there is no precedent for an 'international tax'.
- 4.16 Significant economic analysis has been undertaken of carbon pricing of international shipping and is extensively reported in the literature.<sup>100 101 102</sup> The World Bank has reviewed the existing literature that discusses a number of carbon pricing schemes for emissions from the maritime transport

95 'Benefits' from compliance should include a reduced risk of enforcement action being taken which is a key consideration for internationally trading ships as commercial risks e.g. reputational damage, charter party disputes, etc., can be of greater consideration than cost of compliance.

96 Faber et al. (2009), p.18.

97 World Bank (2018), Section 1, p.2.

98 Ibid.

99 Price R., Thornton S., Nelson S., (2007) The social cost of carbon and the shadow price of carbon: What they are, and how to use them in economic appraisal in the UK. Department for Environment, Food and Rural Affairs (DEFRA), London, December 2007.

100 Faber J, Boon B, Berk M, Den Elzen M, Olivier J, Lee D (2007) Aviation and maritime transport in a post 2012 climate policy regime. Netherlands Environmental Assessment Agency, April 2007.

101 Kågeson P (2011) The financial implications of a Levy & GHG Fund. Centre for Transport Studies, Royal Institute of Technology (KTH), Stockholm. <http://vti.diva-portal.org/smash/get/diva2:669341/FULLTEXT01.pdf>

102 Kollamthodi S, Pueyo A, Gibson G, Narkeviciute R, Hawkes A, Cesbron S, Milnes R, Harries J, Zamparutti T, Hernandez G, Kaltsouni S, Vancauwenbergh S, Goldenman G, Pålsson C, Bengtsson N, Rydbergh T, Nilsson L, Krantz A, Weber K, Scarbrough T, Whall C, Green C, Hill J, Lee J, Noden R, Grebot B, Lindstad H (2013) Support for the impact assessment of a proposal to address maritime transport greenhouse gas emissions. Ricardo-AEA, Oxford.

sector.<sup>103</sup> The most efficient and effective option among these alternatives remains a fuel tax or levy applied through a global scheme,<sup>104</sup> with a tax rate set equal to the climate and public health costs of combusting bunker fuels.<sup>105</sup> According to the World Bank, regional carbon pricing is a second best option that might be considered if a globally adopted scheme became unattainable – although as discussed elsewhere, this risks reducing the chances of progress at IMO to develop other global measures to eradicate all CO<sub>2</sub> emissions from shipping.<sup>106</sup>

- 4.17 Heine and Gade (2018) identify several constraints to providing the needed mitigation incentives: maritime emissions would need to be priced, but the introduction of such emissions pricing is plagued by problems of tax competition, legal constraints on extraterritorial policy action, data unavailability over emissions, and concerns for competitiveness and distortions of trade patterns. The authors conclude that given these constraints, the predominant view in the literature is that the introduction of emissions taxation in the maritime sector would require a unanimous international agreement.<sup>107</sup>
- 4.18 Arguably the simplest means of achieving such an agreement would be via the development at IMO of a global fuel levy per tonne of fuel purchased for consumption by the ship, for which the industry has expressed a clear preference if a global MBM is to be developed. Furthermore it is important to note that a global fuel levy should not be considered a tax as monies raised do not go to the governments directly, rather the funds are controlled and disbursed at the global level.
- 4.19 Having noted that regional carbon pricing is a second best option, due to more limited environmental effectiveness and greater potential for avoidance strategies, the World Bank identifies three designs for regional carbon pricing.<sup>108</sup> Theoretically, carbon pricing in the maritime sector could take place through an emissions trading scheme (ETS) or a tax, levy or fee<sup>109</sup> on either the emissions or the fuel. Under a fuel tax, emissions are priced upstream, at the point of sale to the ship, based on the carbon content of the fuel. Crucially, for the maritime transport sector, a fuel tax would have to be applied globally to be effective.<sup>110</sup> This is because the effectiveness of a sub-global fuel tax depends on the cross-price elasticity of the demand between maritime fuel subject to the tax regime and fuel outside the regime. This elasticity is very high for the maritime sector, since vessels can avoid the tax by refuelling either in jurisdictions that do not apply the tax or from tankers or platforms on the high seas.<sup>111</sup>

103 Faber et al. (2009); Bäuerle et al. (2010); Kågeson (2011); Kollamthodi et al. (2013); Heine et al. (2017); Heine and Gäde (2018).

104 World Bank and IMF (2012); Keen et al. (2013).

105 Parry et al. (2014).

106 World Bank (2018), Section 2, p.3.

107 Heine, D, Gäde, S (2018), p.542.

108 World Bank (2018), Section 2, p. 4.

109 World Bank (2018), footnote 26, p. 4, "Taxes and fees differ in the flexibility of their revenue uses, but can have similar incentive effects. The term 'levy' has no precise economic definition and is only mentioned here due to its frequent use in policy discussions."

110 Mishra and Yeh (2011); World Bank and IMF (2012).

111 World Bank (2018), Section 2, p. 4.

- 4.20 The World Bank<sup>112</sup> identifies that most of the existing proposals for regional carbon pricing cluster around the following three broad categories:
- .1 carbon pricing for ships on the last/first leg of the cargo's voyage;<sup>113</sup>
  - .2 carbon pricing for ships over a certain period of time to/from a port;<sup>114</sup> and
  - .3 carbon pricing for cargo on its whole voyage to/from a State's port.<sup>115</sup>
- 4.21 The World Bank argues<sup>116</sup> that a *holistic route cargo measure* (category 4.20.3 above) limits the potential for avoidance when compared with *first/last vessel* (category 4.20.1) or a *time-based measure* (category 4.20.2). These categories are discussed further in Annex 3.
- 4.22 For example, the World Bank notes that for the first/last vessel category of carbon pricing could provide incentives to implement speed reduction in the period covered by the measure and increase it outside its scope<sup>117</sup>, whether this would occur in a particular setting remains an empirical question. Existing empirical research on the effect of the introduction of more stringent sulphur regulation in emission control areas (ECAs) on vessels' speed indicates that this avoidance strategy is not necessarily economically viable on a large scale.<sup>118</sup> These studies found that the introduction of ECAs did not trigger statistically significant behavioural changes in vessel speed.<sup>119</sup> This literature provides some hints that this avoidance strategy would not be widely implemented under a *first/last vessel measure* or a *time-based measure*.
- 4.23 Many of the avoidance strategies available under a *first/last vessel measure* would also be available under a *time-based measure*.<sup>120</sup> Under this scheme, carbon price avoidance could take place through:
- .1 falsification of documents;
  - .2 relocation of vessels such that the less polluting ships call at ports in the implementing State, while the overall stock of ships remains unchanged;<sup>121</sup>
  - .3 changes in speed inside and outside the covered areas;<sup>122</sup> and
  - .4 reduction of number of vessels calling at ports that impose the measure. Note that the economic feasibility of this last strategy depends on the costs of (re)loading cargoes.

---

112 *ibid.*

113 Faber et al. (2009); Kågeson (2011); Kollamthodi et al. (2013)

114 Faber et al. (2009); Bäuerle et al. (2010); Kollamthodi et al. (2013).

115 Bäuerle et al. (2010); Kollamthodi et al. (2013); Heine et al. (2017); Heine and Gäde (2018).

116 World Bank (2018), paragraph 3.3, p. 11.

117 Kollamthodi et al. (2013); p.52.

118 Schaumeier, et al. (2015); Adland et al. (2017).

119 Schaumeier et al. (2015), p.14; Adland et al. (2017), p.45.

120 Kollamthodi et al. (2013), p. 52.

121 Bäuerle et al. (2010), pp. 56-57.

122 Kollamthodi et al. (2013), p. 52.

- 4.24 Most of the avoidance strategies described here would not be available under a *holistic route cargo measure*. For this type of measure, avoidance strategies are confined mainly to falsification of documents<sup>123</sup> and, for outbound voyages, making changes to cargo consignees en route. As above, possible ways to obtain data on changes in cargo consignees for ships that repeatedly call at the ports of the implementing State are: i) AIS data; and ii) a top-down MRV system that requires ships to report changes to cargo consignees on previous voyages.<sup>124</sup>
- 4.25 It is evident that all approaches to regional carbon pricing, whilst offering some advantages and disadvantages, are potentially complex to implement and enforce. As the discussion on avoidance illustrates, there is a significant risk to the ongoing effectiveness of a regional carbon pricing scheme and so the potential for distorting the market is considerable. Furthermore it is clear that none of the schemes are as straightforward to implement and enforce as a global fuel levy.

---

<sup>123</sup> Bäuerle et al. (2010), p. 61.

<sup>124</sup> World Bank (2018), paragraph 3.3, p.13.

## 5 Alternative MBMs

“The regulation needs to provide the right incentive to drive the change needed”<sup>125</sup>

### IMO’s previous work on an MBM for international shipping

- 5.1 In 2003, the IMO Assembly adopted resolution A.963(23) which urged the MEPC to identify and develop the mechanism or mechanisms needed to achieve the limitation or reduction of GHG emissions from international shipping and, in doing so, to prioritise the evaluation of, inter alia, “Market Based solutions”<sup>126</sup>.
- 5.2 IMO’s extensive consideration to date of MBMs is set out in Annex 1 of this report and only a summary is set out below. It is mainly inconclusive on identification of the most appropriate MBM for international shipping but does provide an indication of the criteria and principles likely to be considered by IMO Member States going forward. The consideration to date includes a range of MBM proposals submitted to IMO that were assessed, using criteria agreed by a majority of IMO’s Marine Environment Protection Committee (MEPC), by an Expert Group on Feasibility Study and Impact Assessment of Possible Market-Based Measures (the Expert Group) that subsequently reported to the MEPC in 2010.<sup>127</sup> (See also discussion “Which MBM, if adopted, for shipping?” from paragraph 5.11 below).
- 5.3 Following further consideration by subsequent MEPC meetings, in May 2013 MEPC 65<sup>128</sup>, in noting several submissions on this matter, agreed to suspend discussions on MBMs and related issues to a future session. In particular, reconciling the UNFCCC and IMO principles of Common But Differentiated Responsibility and Respective Capabilities (CBDR)<sup>129</sup> and No More Favourable Treatment (NMFT)<sup>130</sup> respectively proved problematic, especially as what is now the Paris Agreement was under negotiation by Member States. The adoption of the Paris Agreement in December 2015, and the principle of ‘common but differentiated responsibilities and respective capabilities, in the light of different national circumstances’ (CBDR-RC), arguably unblocked negotiations at IMO that led to the adoption of the Initial Strategy. The Initial Strategy whilst being cognizant of CBDR-RC also recognises as a guiding principle “the requirement for all ships to give full and complete effect, regardless of flag, to implementing mandatory measures to ensure the effective implementation of this strategy”.<sup>131</sup> The Initial Strategy also identifies MBMs as one of those measures and so suggests further progress can be made at IMO. However, this is likely to be one of the important issues that would be subject to further consideration should the EU decide to include ships from third countries into the EU-ETS.
- 5.4 Following suspension of discussion on MBMs, work at IMO focused on technical and operational energy efficiency measures. This has seen the introduction from 1 January 2013 of the Energy

<sup>125</sup> Lloyd’s Register and Shipping in Changing Climates (2016) *Low carbon pathways 2050*, Lloyd’s Register/UMAS, p.17.

<sup>126</sup> IMO (2004) *IMO policies and practices related to the limitation or reduction of GHG emissions from international shipping* Assembly resolution A.963(23).

<sup>127</sup> MEPC 61/INF.2.

<sup>128</sup> MEPC 65/22, paragraph 5.1, 24 May 2013.

<sup>129</sup> The CBDR principle is mentioned in UNFCCC Art. 3(1) as “common but differentiated responsibility and respective capabilities”, and in the Kyoto Protocol, Art.10 as “common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances”. In the Paris Agreement, Art.2(2), the principle is nuanced further to read “common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”.

<sup>130</sup> MARPOL Art.5(4), SOLAS Art. 1(3).

<sup>131</sup> MEPC.304(72), p.3.2.2.

Efficiency Design Index (EEDI) for new ships and the Ship Energy Efficiency Management Plan (SEEMP) for all ships of 400 gross tonnage and above. The EEDI has subsequently been strengthened to the point that phase 2 entered into effect on 1 January 2020.<sup>132</sup> Furthermore IMO has introduced, for ships of 5,000 gross tonnage and above, a data collection system for ship's fuel oil consumption, with the first calendar year of implementation, 2019, being reported to IMO in 2020. Further detail on these energy efficiency measures, including the IMO DCS that could provide the basis for a levy based MBM, is provided in paragraphs 2.51 to 2.55 of this report above.

- 5.5 Recently, and since the adoption of the Initial Strategy in April 2018 that identifies MBMs as a mid-term candidate measure, the development of an MBM for international shipping has been re-instigated.<sup>133</sup> Importantly, as part of the IMO's earlier consideration of an MBM for international shipping the MEPC identified nine criteria for their assessment.<sup>134</sup> (See also paragraph 7 of Annex 1 to this document).

## Rationale for use of an MBM

- 5.6 The common point of MBMs is to put a price on carbon, primarily as carbon dioxide emissions, and can serve the following purposes:
- .1 providing an economic incentive for a specific sector to reduce its carbon footprint by investing in more efficient technologies or by operating in a more energy efficient manner (in-sector reductions);
  - .2 offsetting of emissions generated in a specific sector in other sectors (out-of-sector reductions) where the reduction of emissions is more economic (see also paragraphs 5.27 to 5.30); and
  - .3 generating funds that could be used for different climate related purposes, such as R&D, adaptation and transfer of technology, or developing zero-carbon bunkering infrastructure.<sup>135</sup>
- 5.7 There is currently no MBM that applies worldwide and sector wide but 51 national or regional carbon pricing initiatives already exist (e.g. the EU Emission Trading System (ETS) and various national carbon levies), or are scheduled. Between 2010 and 2018, coverage of explicit carbon pricing policies rose to about 15% of global GHG emissions. If China implements carbon pricing as announced (already working in some limited sectors), coverage would rise to about 20% of global GHG emissions.<sup>136</sup>

132 EEDI Phase 0 (1 January 2013 to 31 December 2014), EEDI Phase 1 (1 January 2015 to 31 December 2019), see Table 1, regulation 21 of Chapter 4 of MARPOL Annex VI.

133 Documents have been submitted by France to ISWG-GHG 4 held in October 2018 and by the UK to ISWG-GHG 7 to be held in March 2020.

134 MEPC 60/22, annex 8, paragraph 5.

135 UMAS and Energy Transitions Commission (2020) *The scale of investment needed to decarbonize international shipping*, 20 January 2020. The study finds that the cumulative investment needed between 2030 and 2050 to achieve the IMO target of reducing carbon emissions from shipping by at least 50% by 2050, is approximately USD 0.8-1.2 trillion.  
<https://u-mas.co.uk/Latest/Post/419/New-study-by-UMAS-shows-that-decarbonisation-of-the-shipping-sector-is-a-whole-system-challenge-and-not-something-just-for-shipping> (Retrieved 8 March 2020).

136 UNEP (2018) *UN Environment Emissions Gap Report 2018*.



- 5.8 The idea of carbon pricing is currently spreading as a tool to address climate change. The *UN Environment Emissions Gap Report 2018* published by UNEP in November 2018<sup>137</sup> focuses on revenue raising from carbon pricing fiscal policies as one of the main climate mitigation measures.
- 5.9 In addition to arguing for the phase out of fossil fuel subsidies by 2030 which UNEP identify would reduce global carbon emissions by about 10%, UNEP also identifies that for carbon pricing to be accepted, there is a need for embedding carbon pricing in fiscal reform packages that are progressive, equitable and socially acceptable, and incentivizing investment in new and job-creating industries is essential. It is instructive for policymakers to reflect on experience with other environmental fiscal reforms, where positively worded narratives, transparent communication, engagement with stakeholders and appropriate compensation have often helped overcome political and popular resistance to policies that increase fossil energy prices.
- 5.10 As identified in Section 4 of this report it is evident that if carbon pricing is to be applied to ships trading internationally then it should be designed to be applied globally. A piecemeal approach to the introduction of such schemes would result in barriers to trade and ultimately would most likely fail to achieve the policy objective of reducing global GHG emissions from international shipping. As with other mandatory requirements that have been successfully applied to international shipping the appropriate forum to develop and adopt those regulations is the IMO.

## Which MBM, if adopted, for shipping?

- 5.11 The original request by the IMO Assembly to evaluate MBMs as a measure to reduce GHG emissions from international shipping resulted in a significant amount of work being undertaken by the MEPC. In many respects the policy objectives for the development of an MBM for shipping have now been superseded with the adoption by IMO of its Initial Strategy in April 2018 and the subsequent adoption of a programme of follow-up actions in October 2018.
- 5.12 Importantly, the Initial Strategy includes levels of ambition that include an absolute GHG emission reduction from the shipping sector of “at least 50%” compared to a 2008 baseline. With no reference to ‘net’ emissions reductions it means there is no expectation that an MBM should provide an option for offsetting emissions by the shipping sector. Furthermore, the Initial Strategy identifies that “new/innovative emission reduction mechanism(s), possibly including Market-Based Measures (MBMs), to incentivize GHG emission reduction” are a candidate mid-term measure that could be finalized and agreed by the MEPC between 2023 and 2030. There is a clear intention therefore that an MBM should be considered by IMO Member States and, due to a growing expectation, likely be adopted for international shipping in the near future.
- 5.13 The IMO Expert Group established in 2010 by MEPC 60 did not conclude on which MBM was most appropriate for international shipping, rather it identified that the implications of implementing the different MBM proposals are directly related to the stringency of the proposed measure. Irrespective of this, the Expert Group concluded that all proposals could be implemented notwithstanding the challenges associated with the introduction of new measures. The Expert Group noted that it had reached its conclusions by consensus apart from a few instances where the evaluation of legal or administrative aspects led to different views as captured in the report.<sup>138</sup>

---

<sup>137</sup> UNEP (2018) *UN Environment Emissions Gap Report 2018*.

<sup>138</sup> MEPC 61/INF.2, paragraphs 1.61 and 1.56.

- 5.14 Whilst the IMO Expert Group was inconclusive, the ‘legal and administrative’ issues where a consensus could not be reached indicate clear sensitivities over the political and complexity aspects with application of an MBM to ships trading internationally. When seeking to develop an MBM for the shipping sector it is suggested that the principles identified by UNEP (paragraph 5.9) need to be taken into account and furthermore indicate that a tax/levy is likely to be more acceptable than an ETS.
- 5.15 This view is supported by the literature. For example, the United States Congressional Budget Office (CBO) study “Policy Options for reducing CO<sub>2</sub> emissions” identifies that incentive-based approaches can reduce emissions at a lower cost than more restrictive command-and-control approaches because they provide more flexibility about where and how emission reductions are achieved.<sup>139</sup>
- 5.16 One such policy option is that policymakers would levy a fee for each tonne of CO<sub>2</sub> emitted or for each tonne of carbon contained in fossil fuels, although a levy per tonne of marine fuel would have the same effect (with there being about 3.18 tonnes of CO<sub>2</sub> emitted by every tonne of marine fuel consumed). The levy would motivate entities to cut back on their emissions if the cost of doing so was less than the cost of paying the levy. As a result, the levy would place an upper limit on the cost of reducing emissions, but the total amount of CO<sub>2</sub> that would be emitted in any given year would be uncertain.
- 5.17 In contrast, under a cap and trade programme, policymakers would set a limit on total emissions for a period of time and would require regulated entities to hold rights, or allowances, to the emissions permitted under that cap. (Each allowance would entitle companies to emit one tonne of CO<sub>2</sub> or to have one tonne of carbon in the fuel that they sold.) After the allowances for a given period were distributed, entities would be free to buy and sell the allowances among themselves. Unlike a marine fuel levy, a cap and trade programme would place an upper limit on the amount of emissions, but the cost of purchasing allowances would vary on the basis of fluctuations in energy market, and on the technologies available for reducing emissions. If moreover, due to changes in the supply or demand for maritime transport in particular trades, there is a significant reduction in the transport work performed by individual ships, meeting the cap may be achieved by such ships without any corresponding efficiency improvement.
- 5.18 The US CBO concludes that given the gradual nature of climate change, the uncertainty that exists about the cost of reducing emissions, and the potential variability of the cost of meeting a particular cap on emissions at different points in time, a levy could offer significant advantages. If policymakers chose to specify a long-term target for cutting emissions, a levy could be set at a rate that could meet that target at a lower cost than a comparable cap. In addition, if policymakers set the levy/ tax rate at a level that reflected the expected benefits of reducing a tonne of emissions (which would rise over time), a levy would keep the costs of emission reductions in balance with the anticipated benefits, whereas a cap would not. The CBO’s conclusions are set out in Annex 4.
- 5.19 The World Bank and IMF<sup>140</sup> note that a fuel tax gives price certainty, and so more stability for making transport decisions and developing long-lived emissions saving technology. However, depending on design, it may also provide, unlike an ETS which sets a cap on emissions in the scheme, greater uncertainty in achieving annual emissions reductions and so potential for greater political cost. Conversely tax schemes can lose sight of their environmental objective if the tax level is not set appropriately and an ETS can provide scope for greater political momentum due to the self-interest

---

139 United States Congressional Budget Office (2008) *Policy Options for Reducing CO<sub>2</sub> Emissions*, February 2008, The Congress of the United States, Pub. No. 2930.

140 World Bank and IMF (2012).

of participating entities looking to the future. Recognising that both schemes provide uncertainty in revenues, they conclude that a tax-based approach to carbon pricing is the “most appealing in principle”.

- 5.20 Hemmings (2011) when considering a regional MBM for shipping identifies that an upstream CO<sub>2</sub> tax on bunker fuel sales for intra-EU, coastal and inland shipping would be an “administratively simple and environmentally effective way” to address the climate costs of a large number of ships operating in EU waters. In suggesting that it would need to operate as a complement to a more complicated scheme covering ocean-going vessels, Hemmings concludes that fuel taxation is not a complete option for addressing all EU shipping emissions because of leakage issues, but it could cover a large number of ships in a way which is administratively far simpler than other options while at the same time being environmentally effective.<sup>141</sup>
- 5.21 Finally a recent study by Chai et al. (2019)<sup>142</sup> using multi-criteria analysis finds that a bunker levy, regardless of its levy collection approach, is more suitable as an MBM for international shipping since it is more effective in encouraging the adoption of technology with high Technology Readiness (TRL), stimulating R&D investment into low TRL technologies (both of which are favourable with greater carbon price stability) and in generating funds. Furthermore, an ETS is harder to operationalise as the large number of ships trading internationally could require a significant amount of time to set up, operate and review the system, and a high variability in each ship’s fuel consumption makes it difficult to allocate credits to ships accurately. In an ideal world an ETS with full auctioning of credits would render ETS comparable with a bunker levy in the amount of funds generated and recognition of prior fuel-saving investments. In view of the need for the sector to conduct R&D, Chai et al. propose that a bunker levy is more suitable than ETS for international shipping, but identify that an MBM needs to fit the context in which it will be deployed. Given the right context, they conclude both types of MBMs, either an ETS or a bunker levy could be appropriate. However, in the current context of international shipping – characterised by large number of ships, high variability of each ship’s fuel consumption and the importance of R&D for innovation of low TRL low-carbon technologies – they suggest a bunker levy seems to be more suitable.

## Key differences in application of an MBM to aviation and maritime transport

- 5.22 It may be tempting to use the model the EU has developed for the aviation sector also for the inclusion of emissions from international shipping. However, before deciding on that matter it is essential to consider some important differences between aviation and maritime transport.
- 5.23 For many years, aircraft operations have been closely monitored, albeit not globally, and the companies and relevant authorities have had access to reliable fuel and emissions data, not least for safety reasons. In international shipping estimates of fuel oil consumption have increasingly been more accurately made as part of studies undertaken by the IMO allowing CO<sub>2</sub> emissions to be tracked for the sector. Going forward, estimates will be complemented with actual fuel oil consumption data for ships of 5,000 gross tonnage and above through the implementation of the IMO Data Collection System. Whereas aviation is predominantly used for scheduled passenger services, international shipping is mainly occupied with freight transport. Ferries are different as they

<sup>141</sup> Hemmings (2011) p.7

<sup>142</sup> Chai, K-H., Xin Ni, L., Gaudin, A. (2019). *A Systems Perspective to Market – Based Mechanisms (MBM) Comparison for International Shipping*. 10.2139/ssrn.3347448. Subsequently re-issued as: *A Multi-Criteria Analysis of Market-Based Mechanisms for CO<sub>2</sub> mitigation in International Shipping*, Working Paper, 24 February 2020, National University of Singapore.

often carry both cargo and passengers. Aircraft used by commercial airlines are produced in large series by a few manufacturers. There are also far more shipping companies engaged in international shipping, most of which are SMEs with much lower levels of market concentration.

- 5.24 Commercial ships can be divided into several major categories, most of them representing ships of a large variety of sizes, with several sub-categories. For example, regulation 21 of MARPOL Annex VI identifies 12 ship types for which a “required EEDI” is mandatory. These ships types exclude many service ships or ships utilising innovative propulsion. Ships are often built individually, and where more than one is manufactured, the series is often short. While aircraft make trips that seldom take more than 10 to 12 hours, voyages in transoceanic shipping may take weeks. As payload weight is so critical aircraft avoid carrying more fuel than needed for safety. Large ships, on the other hand, can bunker large quantities of fuel oil without having to compromise their cargo carrying capacity or safety.
- 5.25 An additional issue in the maritime sector is that ships may be operated by the owner, a hired operator or a charterer, and in many cases the legal responsibility for paying for the cost of fuel changes hands. The same is true for the choice of flag State. Some ships are used in scheduled liner services, while others customarily change operational routes especially in the bulk trades. These circumstances make the appropriate allocation of allowances and liability more complicated in the maritime sector than in aviation.
- 5.26 In the case of linking maritime emissions to the EU-ETS, the least complicated and most feasible allocation principle appears to be based on voyages arriving in EU ports.<sup>143</sup> In this case a ship would be liable for its emissions only for journeys ending in a port of the European Union. The model would require the operator to monitor fuel oil consumption in order to be able to split bunker oil used for voyages to EU ports and other destinations. Such a system is already enacted through the EU-MRV. However, it was identified that this approach would leave the system vulnerable to avoidance (see also discussion under Section 4). According to Faber et al, “In order to minimise the number of CO<sub>2</sub> allowances that would have to be surrendered, this principle of allocation might cause a ship on a long distance voyage to call at a port just outside the EU before proceeding to its final destination”.<sup>144</sup> This situation arising has become more likely with the UK leaving the EU (see paragraph 2.20) and the close proximity to the EU of several other third countries as port States.

## Use of offsetting

- 5.27 The use of offsetting to achieve ‘net’ reductions in GHG emissions is a recognized policy option especially in the absence of new alternative fuels and/or innovative technologies in the near future. This provides a mechanism for emission reductions outside the sector in which emission reductions are being sought. Offsetting has been proposed as part of consideration of an MBM for international shipping (see Annex 1) and it is already being employed as part of action to achieve ‘net zero’ emission reductions in other sectors.

---

<sup>143</sup> Faber et al. (2006).

<sup>144</sup> *ibid*

- 5.28 For example, in the aviation sector, ICAO has adopted in 2016 the *Carbon Offsetting and Reduction Scheme for International Aviation* (CORSIA), in order to offset annual increases in CO<sub>2</sub> emissions from international civil aviation above 2020 levels. It is planned to work on a three-year compliance cycle, from 2021 (and on a voluntary basis up to 2026), following this process:
- .1 each operator will have to report its emissions data to a national authority, which will then report to ICAO;
  - .2 ICAO will then calculate the sectoral growth factor for aviation emissions against the 2020 emission level baseline;
  - .3 each operator will then have to offset an amount of emissions through the purchase of carbon credits from other industries and projects that limit GHG emissions.
- 5.29 CORSIA is identified by ICAO as the main tool to stabilize international aviation CO<sub>2</sub> emissions, along with aircraft technology improvements, air traffic management and operational improvements, and development of sustainable aviation fuels (SAF). ICAO has only a 'net' emission target (no net growth after 2020), and has not even begun to consider an absolute reduction target for international aviation, unlike IMO which has adopted an absolute reduction target.
- 5.30 However, UNEP in June 2019 has challenged the use of offsets claiming that they are not the 'silver bullet' to address climate change and with the danger that over reliance could lead to complacency on taking action to reduce, in absolute terms, emissions.<sup>145</sup> The implication of this intervention is significant as it indicates that use of offsets is more likely to be acceptable to policy makers only for sectors where alternative approaches for achieving absolute emission reductions are not possible and, importantly, in sectors where those alternatives need to be incentivised. As discussed above, IMO's Initial Strategy indicates that absolute rather than 'net' GHG emission reductions are required by shipping, meaning the adoption of a mechanism to reduce GHG emissions from international shipping should not be designed to require the use offsets to meet the agreed reduction goal.
- 5.31 A further significant concern with offsetting is that funds used to purchase offsets would be transferred out of the shipping sector. This would diminish funds available for investment in technologies and fuels that could enable the shipping sector to achieve absolute emission reductions. Furthermore Smith et al.<sup>146</sup> observed that whilst offsets purchased at an estimated 'global carbon price' might appear in earlier decades (2020s and 2030s) to be a cost-effective means to manage shipping's carbon emissions, they become more expensive with time (as the low-hanging fruit for decarbonising the wider economy is used up) and in later years offsets in many scenarios give way to increasing amounts of CO<sub>2</sub> emission reduction within shipping. This indicates it could be dangerous to assume that shipping's decarbonisation can be managed wholly using CO<sub>2</sub> emission offsetting.

---

145 UNEP, 2019. *Carbon offsets are not our get-out-of-jail free card*, <https://www.unenvironment.org/news-and-stories/story/carbon-offsets-are-not-our-get-out-jail-free-card>

146 Smith, T., Raucci, C., Haji Hosseinloo S., Rojon I., Calleya J., Suárez de la Fuente S., Wu P., Palmer K. CO<sub>2</sub> emissions from international shipping. Possible reduction targets and their associated pathways. UMAS, 21 October 2016, London, p.9, (retrieved 28 May 2020). <https://u-mas.co.uk/LinkClick.aspx?fileticket=na3ZeJ8Vp1Y%3D&portalid=0>

## Criteria and metrics for selecting an MBM for international shipping

- 5.32 Noting that the IMO Initial Strategy identifies that “the global introduction of alternative fuels and/or energy sources for international shipping will be integral to achieve the overall ambition”<sup>147</sup> it is suggested that the importance of encouraging the adoption of technology and investment in R&D should be reflected in any criteria used for selecting an MBM for international shipping. Such a conclusion is clearly supported following the proposal by the shipping industry for the International Maritime Research and Development Board (IMRB)<sup>148</sup> discussed previously in paragraphs 2.58 to 2.66, and a study by Ricardo<sup>149</sup> that suggests how the proposed IMRB could make a significant contribution towards accelerating the deployment of zero-carbon propulsion systems and the achievement of GHG reduction targets for 2050 set by IMO.
- 5.33 Chai et al. (2019) from their study identify eight criteria, four linked to a policy goal, including adoption and investment in technology, and four other key common criteria identified from literature<sup>150</sup> as follows:
- .1 effectiveness in reducing emissions (for CO<sub>2</sub> reduction);
  - .2 effectiveness in encouraging adoption of high TRL<sup>151</sup> technologies (for adoption of high TRL technologies);
  - .3 effectiveness in investing in R&D of low TRL technologies (for R&D in low TRL technologies);
  - .4 effectiveness in generating funds (for financial resources).
  - .5 cost-effectiveness;
  - .6 ease of implementation;
  - .7 avoidance of evasion and carbon leakage; and
  - .8 recognition of early actions.
- 5.34 These are consolidated, and to avoid ambiguity and possible misinterpretation of the criteria, are converted into eight single-dimensional measurable metrics, listed in Table 1 below.
- 5.35 Whilst it is not suggested that the above criteria be utilised formally to identify the most appropriate MBM, it is suggested that they represent the current imperatives that an MBM is required to achieve and also possible metrics by which to consider them. Such criteria could be a basis for acceptance globally of what imperatives the MBM needs to ensure, so providing a pathway to adoption of an MBM for international shipping.
- 5.36 Based on the criteria it is evident that the simplest option for raising funds to support R&D in the shipping sector whilst also providing an incentive to reduce GHG emissions is a global levy scheme. Acceptance of a global levy scheme is therefore most likely to gain acceptance by IMO Member States especially if the industry IMRF/IMRB proposal is taken forward. Indeed the aforementioned Ricardo (2019) study reflects the criteria proposed by Chai et al. (2019), by concluding that “The

147 IMO resolution MEPC.304(72), paragraph 3.1.

148 MEPC 75/7/4 *Proposal to establish an International Maritime Research and Development Board* (IMRB) ICS, BIMCO, CLIA, INTERCARGO, INTERFERRY, INTERTANKO, IPTA, and WSC, 18 December 2019.

149 Ricardo (2019) *Zero carbon fuels acceleration*. 7 October 2019. Report for ICS et al (MEPC 75/INF5).

150 Goulder, L. H., and Schein, A. R. (2013); Psaraftis, H. N. (2012); IMO (2010).

151 Mankins (1995) and Mankins (2009). New green technology needs to be developed through conscious R&D effort. Developing low Technology Readiness Level (TRL) technologies into high TRL technologies requires time and resources. Likewise, adoption of high TRL technologies takes time before substantial CO<sub>2</sub> reduction may occur.



[IMRB/IMRF] could support the development of new transoceanic technologies through TRL 4 to 9. Approximately 200 technologies could be supported through TRLs 4 and 5, which would be expected to reduce to approximately 20 on-vessel demonstration projects as the technologies advance into systems in TRLs 8 and 9.”

**Table 1 Criteria and single-dimensional metrics for selecting an MBM<sup>152</sup>**

Criteria		Single-dimensional metrics
1	Effectiveness in reducing emissions	Probability of absolute CO <sub>2</sub> reduced
2	Effectiveness in encouraging adoption of high TRL technologies	Number of high TRL technologies adopted
3	Effectiveness in investing in R&D of low TRL technologies	Number of patents or papers published
4	Effectiveness in generating funds	4a. Amount of funds generated
		4b. Certainty of funds generated
5	Cost-effectiveness	Tonne CO <sub>2</sub> abated/total costs
6	Ease of implementation	Time needed to implement the system
7	Avoidance of evasion and carbon leakage	Probability of deterring evasion and leakage with MRV
8	Recognition of early actions	Recognition of prior fuel-saving investments

152 Chai et al. (2019).

## Summary and conclusions

- 6.1 There is a view that emissions from international shipping should not be included in the EU-ETS on the grounds that these emissions are covered by international law (UNCLOS, Kyoto Protocol, MARPOL, etc.). However, the political perspective within at least some of the EU institutions suggests that an alternative view, underpinning regional action, is likely to be more compelling.
- 6.2 Emissions from ships trading internationally and transporting cargoes to and from the European Union are contributing to anthropogenic climate change. As such those emissions are impacting on the EU and so the right to protect its citizens becomes politically more paramount, a view that has been supported by the European Court of Justice.
- 6.3 This report identifies that such action would have significant consequences for the shipping sector but, importantly, may not lead to effective reduction of GHG emissions from shipping either at the regional level or globally. Rather, it is clear that regional action risks potential high levels of carbon leakage, whereby action by the EU results in absolute carbon emissions increasing outside the EU, in part because whatever the final scope of the scheme is, it will provide opportunities to avoid participation. Furthermore the United Kingdom's decision to leave the EU on 31 January 2020 makes those opportunities more apparent.
- 6.4 IMO continues to demonstrate the advantages of taking action at the global level. The introduction of mandatory energy efficiency regulations for ships and the entry into effect of the 0.50% sulphur limit for ships operating outside emission control areas from 1 January 2020 are tangible examples of the international community working together to address and succeed in reducing the environmental impacts of international shipping. Any unilateral action taken by the EU to include emissions from ships trading internationally in the EU-ETS would undermine the authority of IMO. Having made such significant progress multilaterally, at a time when multilateralism is under significant pressure in many global institutions, it would indeed be regrettable if regional policy should undermine global efforts to reduce GHG emissions from international shipping with the risk that it could impede progress at IMO which has adopted a strategy with ambitious goals and a defined programme of follow-up action.
- 6.5 Inclusion of ships trading internationally in the EU-ETS would result in significant challenges and potential to distort the shipping market. Those challenges have already been experienced by the aviation sector which, until the scope and resulting environmental effectiveness were diminished, led to significant political tensions and potentially damaging disputes with several significant trading nations. Furthermore the nature of shipping activity and size of many shipping companies means that the challenges, including significant administrative burden, are arguably the same, if not more acute, for shipping. The need for a pragmatic approach for some sectors has been recognized by the European Parliament which has rejected inclusion of road transport in the EU-ETS.
- 6.6 In 2012 the World Bank and IMF identified that tax and emissions trading policies, applied to the same base, and equivalently scaled, have about the same effect on fuel prices, emissions and - so long as emission rights are auctioned - revenue. However, certainty as to the emissions price is needed to provide a stable framework for transport decisions and developing long-lived, emissions-saving technologies. This certainty is provided only through a "fixed price" based measure such as a tax/levy or the provision of price stability measures which make an ETS behave more like a tax.
- 6.7 More recently, in 2018, the World Bank undertook a further analysis and confirmed that the existing literature identifies a fuel levy imposed by means of a global agreement as the most efficient policy for carbon pricing in the maritime sector. Noting the debate about the possible introduction of a regional measure were a global agreement not agreed, they find that, if carefully designed, a cargo-based

measure that covers the emissions released throughout the whole voyage to the cargo destination presents various advantages compared with other carbon pricing schemes. However, it is evident that all approaches to regional carbon pricing, whilst offering some advantages and disadvantages, are potentially complex to implement and enforce. As the discussion on avoidance in Section 4 of this report illustrates there is a significant risk to a regional carbon pricing scheme remaining effective and so the potential for distorting the market is considerable. Furthermore it is clear that none of the proposed carbon pricing schemes are as straightforward to implement and enforce as a global fuel levy.

- 6.8 Offsetting as a policy option for international shipping would appear to be increasingly diminishing as countries around the world sign themselves up to 'net-zero' goals and the UN Environment Program questions the widespread use of offsets as a policy tool in a 'well below 2°C' temperature scenario. The consequence is that the design of an MBM for shipping, and the fact that IMO's Initial Strategy indicates absolute GHG emission reductions are required by international shipping, should not require the use of offsets to meet the reduction goal.
- 6.9 To achieve global ambitions, let alone regional ones, to reduce GHG emissions from international shipping, there is an imperative to explore policy instruments and Market-Based Measures that close the competitiveness gap between conventional and zero emission fuels and associated infrastructure to encourage mass uptake. It is clear that to achieve those global ambitions it would be best to work through the global regulator, IMO, for such an inherently global sector as international shipping.
- 6.10 Criteria utilised to identify the most appropriate MBM for international shipping should represent the current imperatives that an MBM is required to ensure. One of those is that an MBM is effective in incentivising adoption of technologies and investment in R&D. The criteria identified in this report could be a basis for acceptance globally of what those imperatives are, so providing a pathway to adoption of an MBM for international shipping. Furthermore, based on the criteria identified, it is evident that the simplest option for raising funds to support R&D in the shipping sector whilst also providing an incentive to reduce GHG emissions is a global levy scheme.
- 6.11 The proposal by the shipping industry to establish an International Maritime Research and Development Board (IMRB/IMRF) is already identified as a short-term candidate measure in the IMO Initial Strategy, and provides a sound approach for addressing both a lack of funds to invest in much needed research and development for shipping and the architecture for collecting those funds. Furthermore the architecture could be used as a basis to develop a global levy-based MBM for international shipping where funds raised could be disbursed for a wider set of outcomes including supporting developing countries, especially SIDS and LDCs. Acceptance of a global levy MBM scheme is therefore most likely to gain acceptance by IMO Member States especially if the industry IMRB proposal is taken forward.
- 6.12 Shipping is a highly heterogeneous industry with unique characteristics in terms of the environment it works in, the role it plays in global trade, the business models employed and the way it is regulated globally. In many respects a global MBM, were one to be adopted, that offers to close the competitiveness gap for the fuels and technologies needed by shipping for decarbonisation, in the fastest and most straightforward manner possible, should be the MBM adopted. It is difficult to argue that an Emission Trading System, in particular a regional one, would provide such an approach, especially when compared with a global carbon price/levy on fuel oil purchased for consumption by ships.

## Bibliography

Ådland, R.O., Fonnes, G., Jai, H., Daae Lampe, O. and Strandenes, S.P. (2017). The impact of regional environmental regulations on empirical vessel speeds. *Transportation Research Part D: Transport and Environment*, Volume 53, June 2017, pp. 37-49.

Bäuerle, T., Graichen, J., Meyer, K., Seum, S. (2010) *Integration of marine transport into the European emissions trading system*. Tech. rep., Federal Ministry for the Environment Nature Conservation. Building and Nuclear Safety, Dessau

Chai, K-H., Xin Ni, L., Gaudin, A. (2019). *A Systems Perspective to Market – Based Mechanisms (MBM) Comparison for International Shipping*. 10.2139/ssrn.3347448. Subsequently re-issued as: *A Multi-Criteria Analysis of Market-Based Mechanisms for CO<sub>2</sub> mitigation in International Shipping*, Working Paper, 24 February 2020, National University of Singapore.

Ecorys, DNV-GL, Erasmus School of Law, (2016) *Financial instrument to facilitate safe and sound ship recycling*, June 2016. European Commission.  
[http://ec.europa.eu/environment/waste/ships/pdf/financial\\_instrument\\_ship\\_recycling.pdf](http://ec.europa.eu/environment/waste/ships/pdf/financial_instrument_ship_recycling.pdf)

EC (2017) *Report from the Commission to the European Parliament and the Council on the feasibility of a financial instrument that would facilitate safe and sound ship recycling*, COM(2017)420 final, European Commission, Brussels, 8 August 2017.

Faber J, Boon B, Berk M, den Elzen M, Olivier J, Lee D (2006) *Aviation and maritime transport in a post 2012 climate policy regime*, OE Delft

Faber, J., Markowska, A., Nelissen, D., Davidson, M., Eyring, V., Cionni, I., Selstad, E., Kågeson, P., Lee, D., Buhaug, Ø., Lindtsad, H., Roche, P., Humpries, E., Rose, N., Graichen, J., Cames, M., Schwarz, W. (2009) *Technical support for European action to reducing Greenhouse Gas Emissions from international maritime transport*. OE Delft.

Fanø, J. J., *Enforcing international maritime legislation on air pollution through UNCLOS*, Hart Publishing, ISBN: 9781509927784, November 2019, p.322.

Goulder, L. H., & Schein, A. R. (2013). Carbon taxes versus cap and trade: a critical review. *Climate Change Economics*, 4(03), 1350010.

Heine, D., Gäde, S., Dominioni, G., Martinez Romera, B., Pieters, A. (2017) *A regional solution for a transnational problem? - A mechanism to unilaterally tax maritime emissions while satisfying extraterritoriality, tax competition and political constraints*. Rotterdam Institute of Law and Economics (RILE) Working Paper Series. <https://ssrn.com/abstract=2512747>

Heine, D., Gäde, S. (2018). Unilaterally removing implicit subsidies for maritime fuels. *International Economics and Economic Policy*, 15, 523–545. <https://doi.org/10.1007/s10368-017-0410-6>, 2 February 2018.

Hemmings, B. (2011) The CO<sub>2</sub> taxation option for an EU shipping measure. ECCP WG Ships meeting 2, 22-23 June 2011. [https://ec.europa.eu/clima/sites/clima/files/docs/0036/taxation\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/0036/taxation_en.pdf)

ICS, BIMCO, CLIA, INTERCARGO, INTERFERRY, INTERTANKO, IPTA, and WSC (2019) *Proposal to establish an International Maritime Research and Development Board (IMRB)*, 18 December 2019, IMO document MEPC 75/7/4, IMO, London.

IMO. (2010). *Full report of the work undertaken by the Expert Group on Feasibility Study and Impact Assessment of possible Market-based Measures*. MEPC 61/INF.2

Ismer, R. and Haussner, M. (2015) Inclusion of Consumption into the EU ETS: The Legal Basis under European Union Law, *Review of European Community & International Environmental Law*, RECIEL 25 (1) 2016, pp. 69-80. ISSN 2050-0386

Jessen, H. (2016) *The EU Ship Recycling Financial Incentive – Legal opinion on the option under consideration by the European Commission of a combination of a permit for ships calling at EU ports and a public fund*, Institute for Maritime Law and the Law of the Sea, University of Hamburg.

Kågeson, P. (2011) The financial implications of a Levy & GHG Fund. Tech. rep., Centre for Transport Studies, Royal Institute of Technology (KTH), Stockholm. <http://vti.diva-portal.org/smash/get/diva2:669341/FULLTEXT01.pdf>

Keen, M., Parry, I., Strand, J. (2013) Planes, ships and taxes: charging for international aviation and maritime emissions. *ECON POLICY* 28(76): 701-749

Kollamthodi, S., Pueyo, A., Gibson, G., Narkeviciute, R., Hawkes, A., Cesbron, S., Milnes, R., Harries, J., Zamparutti, T., Hernandez, G., Kaltsouni, S., Vancauwenbergh, S., Goldenman, G., Pålsson, C., Bengtsson, N., Rydbergh, T., Nilsson, L., Krantz, A., Weber, K., Scarbrough, T., Whall, C., Green, C., Hill, J., Lee, J., Noden, R., Grebot, B., Lindstad, H. (2013) *Support for the impact assessment of a proposal to address maritime transport greenhouse gas emissions*. Ricardo-AEA, Oxford. [http://ec.europa.eu/clima/policies/transport/shipping/docs/ghg\\_maritime\\_report\\_en.pdf](http://ec.europa.eu/clima/policies/transport/shipping/docs/ghg_maritime_report_en.pdf)

Lloyd's Register and Shipping in Changing Climates (2016) *Low Carbon Pathways 2050*, LR/UMAS, London, October 2016.

Mankins, J.C. (1995) *Technology Readiness Levels: A White Paper*, NASA.

Mankins, J.C. (2009) *Technology readiness assessments: A retrospective*. *Acta Astronautica* 65, pp. 1216-1223, 18 April 2009.

Miola, A., Marra, M., Ciuffo, B. (2011) Designing a climate change policy for the international maritime transport sector: Market-based measures and technological options for global and regional policy actions, *Energy Policy*, 39, pp.5490-5498.

Miola, A., Ciuffo, B., Giovine, E., Marra, M. (2010). *Regulating air emissions from ships: The state of the art on methodologies, technologies and policy options*. JRC Reference Reports. Office for Official Publications of the European Communities: Luxembourg. ISBN 978-92-79-17733-0.

Mishra, G.S., Yeh, S. (2011) *Inclusion of marine bunker fuels in a national Low Carbon Fuel Standard (LCFS) scheme*. Research Report – UCD-ITS-RR-11-16, University of California, Davis, US.

Parry, I., Heine, D., Lis, E., Li, S. (2014). *Getting energy prices right: from principle to practice*. Washington DC: International Monetary Fund;

Price, R., Thornton, S., Nelson, S. (2007) *The social cost of carbon and the shadow price of carbon: What they are, and how to use them in economic appraisal in the UK*. Tech. Rep. December, Department for Environment, Food and Rural Affairs, London. [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/243825/background.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/243825/background.pdf)

Psaraftis, H. N. (2012). Market-based measures for greenhouse gas emissions from ships: a review. *WMU Journal of Maritime Affairs*, 11(2), 211-232. doi:10.1007/s13437-012-0030-5.

Ricardo (2019) *Zero carbon fuels acceleration*. 7 October 2019. Report for ICS et al (MEPC 75/INF5).

Schaumeier, J., Alegre, R., Smith, T., Hetherington, J. (2015). Investigating shipping behaviour in emission control areas: a visual approach to data analysis. *Shipping in Changing Climates*. UCL, London.

Smith, T., Raucci, C., Haji Hosseinloo S., Rojon I., Calleya J., Suárez de la Fuente S., Wu P., Palmer K. *CO<sub>2</sub> emissions from international shipping. Possible reduction targets and their associated pathways*. UMAS, 21 October 2016, London.

UMAS and Energy Transitions Commission (2020) *The scale of investment needed to decarbonize international shipping*, 20 January 2020.

United States Congressional Budget Office (2008) *Policy Options for Reducing CO<sub>2</sub> Emissions*, February 2008, The Congress of the United States, Pub. No. 2930.

World Bank and International Monetary Fund (2012) *Market-based instruments for international aviation and shipping as a source of climate finance*. Keen, M., Parry, I., Strand, J. (January 2012) World Bank policy research working paper series (WPS) No. 5950, Washington, DC: World Bank.  
<http://documents.worldbank.org/curated/en/678661468155734989/Market-based-instruments-for-international-aviation-and-shipping-as-a-source-of-climate-finance>

World Bank (2018) *Regional Carbon Pricing for International Maritime Transport: Challenges and Opportunities for Global Geographical Coverage*, G. Dominioni, D. Heine and B. M. Romera, World Bank Group Policy Research Working Paper 8319, January 2018.



# Annex 1

## Previous consideration by the International Maritime Organization of an MBM for international shipping

- 1 The MEPC started to work actively on MBMs from 2006 (MEPC 55) to 2009 (MEPC 59), on the basis of a work plan to identify and develop the mechanisms needed to achieve reduction of GHG emissions.
- 2 To provide a coherent and comprehensive framework for considering its future work on reduction of GHG emissions from ships, MEPC 57 held in April 2008 identified nine fundamental principles (MEPC 57/21, paragraph 4.73) as follows:
  - .1 effective in contributing to the reduction of total global greenhouse gas emissions;
  - .2 binding and equally applicable to all flag States<sup>153</sup> in order to avoid evasion;
  - .3 cost-effective;
  - .4 able to limit, or at least, effectively minimize competitive distortion;
  - .5 based on sustainable environmental development without penalizing global trade and growth;
  - .6 based on a goal-based approach and not prescribe specific methods;
  - .7 supportive of promoting and facilitating technical innovation and R&D in the entire shipping sector;
  - .8 accommodating to leading technologies in the field of energy efficiency; and
  - .9 practical, transparent, fraud free and easy to administer.
- 3 MEPC 57 decided by an overwhelming majority<sup>154</sup> to take the aforementioned principles as its reference for further debate on GHG emissions from international shipping and also for further reflection when the nature and form of the measures to be taken were clearer (MEPC 57/21, paragraph 4.77).
- 4 After in-depth discussion on this matter, MEPC 59 agreed that an MBM was needed as part of a comprehensive package of measures, with some delegations considering that the necessary emission reductions could not be derived from technical and operational measures alone, but that it was premature to define and agree on realistic limits. Therefore, the Committee adopted a work plan for further consideration of MBMs (MEPC 59/24, paragraph 1.134), from 2009 (MEPC 59) to 2011 (MEPC 62).

---

<sup>153</sup> The MEPC Chairman, in an attempt to reach consensus offered to modify principle .2 as follows: "binding and equally applicable to all ships in order to avoid evasion".

<sup>154</sup> Brazil and China reserved their position on the principles.

- 5 The main proposals for MBMs made by Member States and observer organizations during this second period are listed as follows.

#### **MBMs based on trading/offsetting schemes:**

- **Ship Efficiency and Credit Trading (SECT)**  
The United States proposed in document MEPC 60/4/12 to subject all ships to mandatory energy efficiency standards and to establish an efficiency-credit trading programme as one means of complying with the standard. These standards would become more stringent over time;
- **Global Emission Trading System (ETS) for international shipping**  
Norway proposed in document MEPC 61/4/22 to set a cap on net emissions from international shipping. A number of allowances (Ship Emission Units) corresponding to the cap would be released into the market each year via a global auctioning process. The units could then be traded;
- **Global Emissions Trading System (ETS) for international shipping**  
The United Kingdom proposed in document MEPC 60/4/26 a similar system to the Norwegian proposal yet differing in two aspects: the method of allocating emissions allowances (national instead of global auctioning) and the approach for setting the emissions cap (set with a long term declining trajectory);
- **Emissions Trading System (ETS) for International Shipping**  
France proposed in document MEPC 60/4/41 a similar system to the Norwegian proposal, including additional details on auction design under a shipping ETS;
- **International Fund for GHG emissions from ships (GHG Fund)**  
Cyprus, Denmark, the Marshall Islands, Nigeria and IPTA proposed in document MEPC 60/4/8 to establish a global reduction target for international shipping, set by either UNFCCC or IMO. Emissions above the target line would be offset largely by purchasing approved emission reduction credits. The offsetting activities would be financed by a contribution paid by ships on every tonne of bunker fuel purchased;
- **Leveraged Incentive Scheme (LIS)**  
Japan proposed in document MEPC 60/4/37 to collect GHG Fund contributions on marine bunker. Part thereof would be refunded to ships meeting or exceeding agreed efficiency benchmarks and labelled as “good performance ships”.

#### **MBMs based on regulatory pricing:**

- **Port State Levy**  
Jamaica proposed in document MEPC 60/4/40 to levy a uniform emissions charge on all vessels calling at their respective ports based on the amount of fuel consumed by the respective vessel on its voyage to that port;
- **Vessel Efficiency System (VES)**  
The World Shipping Council proposed in document MEPC 60/4/39 to establish mandatory efficiency standards for new and existing ships. Each vessel would be judged against a requirement to improve its efficiency by a certain percentage below the average efficiency (baseline) for the specific vessel class and size. Standards would be tiered over time with increasing stringency. Existing ships failing to meet the required standard through technical modifications would be subject to a fee applied to each tonne of fuel consumed.

- 6 A key stage of this consideration was a decision by MEPC 60 in 2010 to undertake a feasibility study and impact assessment of the Market-Based Measure (MBM) proposals submitted in accordance with the work plan for further consideration of Market-Based Measures.
- 7 In order to undertake this study, the Secretary-General established an Expert Group on Feasibility Study and Impact Assessment of Possible Market-Based Measures (the Expert Group). The Expert Group was made up of experts nominated by Member Governments and organizations, but each expert served in their own personal capacity. Consistent with the terms of reference given by the Committee<sup>155</sup>, the experts were to evaluate the various proposals with the aim of assessing the extent to which they could assist in reducing GHG emissions from international shipping. To guide its analysis, the Expert Group was given the following nine criteria<sup>156</sup>:
- .1 the environmental effectiveness, e.g., the extent to which the proposed MBM is effective in contributing to the reduction of greenhouse gas (GHG) emissions from international shipping;
  - .2 the cost-effectiveness of the proposed MBM and its potential impact(s) on trade and sustainable development;
  - .3 the proposed MBM's potential to provide incentives to technological change and innovation – and the accommodation of current emission reduction and energy efficiency technologies;
  - .4 the practical feasibility of implementing the proposed MBM;
  - .5 the need for technology transfer to, and capacity building within, developing countries, in particular the least developed countries (LDCs) and the small island development states (SIDS), in relation to implementation and enforcement of the proposed MBM, including the potential to mobilize climate change finance for mitigation and adaptation actions;
  - .6 the MBM proposal's relation with other relevant conventions such as the UNFCCC, Kyoto Protocol, and WTO, as well its compatibility with customary international law, as depicted in UNCLOS;
  - .7 the potential additional administrative burden, and the legal aspects for National Administrations by implementing and enforcing the proposed MBM;
  - .8 the potential additional workload, economic burden, and operational impact for individual ships, the shipping industry and the maritime sector as a whole, of implementing the proposed MBM; and
  - .9 the MBM's compatibility with the existing enforcement and control provisions under the IMO legal framework.
- 8 The IMO Expert Group considered both a contribution paid by ships on every tonne of bunker fuel purchased to support an *International Fund for Greenhouse Gas emissions from ships* and a *Global Emission Trading System for international shipping*. Other proposals, as set out in paragraph 5 above, were considered but for this report the focus is on these two proposals only.

155 MEPC 60/22, paragraph 4.82 and annex 8. The terms of reference for the Expert Group were agreed by majority. The delegations of Brazil, China, India, Saudi Arabia and the Bolivarian Republic of Venezuela could not agree to the terms of reference for the Expert Group and reserved their positions (MEPC 60/22, paragraph 4.81).

156 MEPC 60/22, annex 8, paragraph 5.

- 9 An *International Fund for Greenhouse Gas emissions from ships* (GHG Fund) would establish a global reduction target for international shipping, set by either UNFCCC or IMO.<sup>157</sup> Emissions above the target line would be offset largely by purchasing approved emission reduction credits. The offsetting activities would be financed by a contribution paid by ships on every tonne of bunker fuel purchased. It is envisaged that contributions would be collected through bunker fuel suppliers or via direct payment from shipowners. The contribution rate would be adjusted at regular intervals to ensure that sufficient funds are available to purchase project credits to achieve the agreed target line. Any additional funds remaining would be available for adaptation and mitigation activities via the UNFCCC and R&D and technical co-operation within the IMO framework.<sup>158</sup>
- 10 The proposal for a *Global Emission Trading System for international shipping* indicated that a sector-wide cap on net emissions from international shipping would be set and a trading mechanism established to facilitate the necessary emission reductions, be they in-sector or out-of-sector. It was argued that the use of out-of-sector credits allows for further growth of the shipping sector beyond the cap. In addition the auction revenue would be used to provide for adaptation and mitigation (additional emission reductions) through UNFCCC processes and R&D of clean technologies within the maritime sector. A number of allowances (Ship Emission Units) corresponding to the cap would be released into the market each year.<sup>159</sup> It is proposed that the units would be released via a global auctioning process. Ships would be required to surrender one Ship Emission Unit, or one recognized out-of-sector allowance or one recognized out-of-sector project credit, for each tonne of CO<sub>2</sub> they emit. The ETS would apply to all CO<sub>2</sub> emissions from the use of fossil fuels by ships engaged in international trade above a certain size threshold. The proposal also indicates that limited exemptions could be provided for specific voyages to Small Island Developing States.<sup>160</sup>
- 11 Following further consideration by MEPC 61, the Committee noted the proposed measures would require further elaboration and development to enable a full assessment of all possible impacts in a comparable analysis.<sup>161</sup> MEPC 61 agreed that an intersessional working group meeting should be held with the task to provide the Committee with clear advice as to what market-based mechanism to bring forward as a possible mandatory IMO instrument, and developed and agreed Terms of Reference for the third intersessional meeting of the Working Group on GHG Emissions from Ships (GHG-WG 3).<sup>162</sup>
- 12 Due to time constraints and divergences among the delegations, the consideration of MBMs were postponed to MEPC 63, which agreed on the need to undertake an impact assessment of the MBM proposals with focus on possible impacts on consumers and industries in developing countries, and considered in detail the methodology and criteria it should be based on.

157 The proposal identifies either UNFCCC or IMO setting a global reduction target for international shipping but this was before the Paris Agreement (shipping is not explicitly identified) and the IMO Initial Strategy were adopted in 2015 and 2018 respectively. Presumably the levels of ambition in the IMO Initial Strategy would now provide the basis for a global reduction target.

158 MEPC 61/INF.2, paragraphs 1.9.1.

159 An alternative proposal suggested that allowances could be allocated to national governments for auctioning. It also suggests the net emission cap would be set with a long term declining trajectory with discrete phases (for example, five to eight years) with an initial introductory or transitional phase of one to two years (MEPC 61/INF.2, paragraphs 1.9.7). Another proposal provided additional detail on allowance auction design (MEPC 61/INF.2, paragraphs 1.9.8).

160 MEPC 61/INF.2, paragraphs 1.9.6.

161 MEPC 61/24, paragraph 5.76.4.

162 MEPC 61/24, paragraphs 5.83 and 5.84, and annex 7.

- 13 The report of the third Intersessional Meeting of the Working Group on GHG emissions from ships, considered by MEPC 63 in March 2012, provides a detailed overview of the MBM proposals submitted to IMO.<sup>163</sup> This included a debate on strengths and weaknesses for the MBM proposals identified under each group, that had been identified and listed by the proponents (MEPC 62/5/1, annex 4) and that other delegations which were not proponents of MBMs identified additional weaknesses for all the MBM proposals (MEPC 62/5/1, annex 5).<sup>164</sup> The discussions revealed contrasting points of view on the following issues, inter alia:
- .1 the demonstration of a “compelling need” for an MBM under IMO;
  - .2 the choice to put certainty either on emission reductions or on price (future cost to the shipping industry);
  - .3 the use of possible revenues;
  - .4 incentives for new technology and operational changes;
  - .5 out-of-sector emission reductions (offsetting); and
  - .6 establishment of a rebate mechanism to compensate developing countries for the financial impact of a MBM (as proposed by IUCN in document MEPC 60/4/55).
- 14 Discussion was continued at MEPC 64 in October 2012 but due to time constraints and a focus on preparing the draft Resolution on Promotion of Technical Co-operation and Transfer of Technology relating to the improvement of energy efficiency of ships for adoption at MEPC 65<sup>165</sup> progress was measured.
- 15 MEPC 65<sup>166</sup> in May 2013, in noting several submissions on this matter, agreed to suspend discussions on MBMs and related issues to a future session. In particular, reconciling the UNFCCC and IMO principles of Common But Differentiated Responsibility and Respective Capabilities (CBDR)<sup>167</sup> and No More Favourable Treatment (NMFT)<sup>168</sup> respectively proved problematic, especially as what is now the Paris Agreement was under negotiation by Member States.

---

163 MEPC 62/5/1, in particular paragraphs 3.11 to 3.27, IMO, 8 April 2011.

164 MEPC 63/23, paragraph 5.7.5.

165 IMO resolution MEPC.229(65) *Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships*. 17 May 2013.

166 MEPC 65/22, paragraph 5.1, IMO, 24 May 2013.

167 The CBDR principle is mentioned in UNFCCC Art. 3(1) as “common but differentiated responsibility and respective capabilities”, and in the Kyoto Protocol, Art.10 as “common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances”. In the Paris Agreement, Art.2(2), the principle is nuanced further to read “common but differentiated responsibilities and respective capabilities, in the light of different national circumstances”.

168 MARPOL Art.5(4), SOLAS Art.1(3).

## Annex 2

### Political tensions arising from inclusion of aviation emissions in EU-ETS

- 1 International aviation emissions were to be included in the EU-ETS from 2012. The airline industry and other countries including China, India, Russia, and the United States reacted adversely to the inclusion of the aviation sector.<sup>169</sup> The United States and other countries argued that the EU did not have jurisdiction to regulate flights when they were not in European skies; China and the United States threatened to ban their national carriers from complying with the scheme. On 27 November 2012 the United States went as far as enacting the European Union Emissions Trading Scheme Prohibition Act of 2011 which prohibits U.S. carriers from participating in the European Union Emission Trading Scheme. China threatened to withhold \$60 billion in outstanding orders from Airbus, which in turn led to France pressuring the EU to freeze the scheme. It was reported that Britain, France and Germany were pushing to abandon the inclusion of aviation altogether.<sup>170</sup>
- 2 The EU insisted that the regulation should be applied equally to all carriers, and that it did not contravene international regulations. In the absence of a global agreement on airline emissions, the EU argued that it was forced to go ahead with its own scheme. But only flights within the EEA are covered; international flights are not.<sup>171</sup>
- 3 In light of the adoption of a Resolution by the 2016 ICAO Assembly on a global measure to offset carbon emissions from international aviation (CORSIA), the EU decided to maintain the geographic scope of the EU ETS limited to intra-EEA flights from 2017 onwards. The EU-ETS for aviation will be subject to a new review in the light of the international developments related to the operationalisation of CORSIA. The next EU review should consider how to implement the global measure in EU law through a revision of the EU ETS legislation. In the absence of a new amendment, the EU-ETS would revert back to its original full scope from 2024.<sup>172</sup>

---

169 [“Trouble in the air, double on the ground”](#). The Economist. 11 February 2012. (Retrieved 20 February 2020).

170 Lewis, Barbara (10 December 2012). [“Insight: U.S., China turned EU powers against airline pollution law”](#). Reuters. (Retrieved 20 February 2020).

171 European Union Emission Trading Scheme [https://en.wikipedia.org/wiki/European\\_Union\\_Emission\\_Trading\\_Scheme](https://en.wikipedia.org/wiki/European_Union_Emission_Trading_Scheme) (Retrieved 20 February 2020).

172 Reducing emissions from aviation, EC Climate Action [https://ec.europa.eu/clima/policies/transport/aviation\\_en](https://ec.europa.eu/clima/policies/transport/aviation_en) (Retrieved 20 February 2020).



## Annex 3

### Possible categories for regional carbon pricing

- 1 The World Bank<sup>173</sup> identifies that most of the existing proposals for regional carbon pricing cluster around the following three broad categories:
  - .1 carbon pricing for ships on the last/first leg of the cargo's voyage;<sup>174</sup>
  - .2 carbon pricing for ships over a certain period of time to/from a port;<sup>175</sup> and
  - .3 carbon pricing for cargo on its whole voyage to/from a State's port.<sup>176</sup>
- 2 The World Bank argues<sup>177</sup> that a *holistic route cargo measure* (category 4.20.3 above) offers the potential for tax avoidance that is limited in form compared to a *first/last vessel* (category 4.20.1) or a *time-based measure* (category 4.20.2).
- 3 A major difference between a *holistic route cargo measure* and the other two suggested regional measures is that the scope of the emissions covered by the former is closely linked to the share of global maritime trade of the implementing State. This is because, under the other two regimes, coverage could be extended to emissions released while shipping cargoes not destined to the port of the implementing State, and a proportion of the emissions released in transporting cargoes to this port state would not be covered. The question concerning which of the three measures has the greater environmental effectiveness would therefore also depend on the share of the maritime trade of the implementing country. For countries whose market share is large, a *holistic cargo route measure* could have a substantial environmental impact.
- 4 The environmental effectiveness of a measure is also dependent on its potential for tax avoidance. In this regard, since it is based on cargo, a *holistic cargo route measure* is subject to a lower number of forms of tax avoidance than *first/last vessel* or *time-based measures*. The World Bank claims that tax avoidance is not necessarily less problematic under a *holistic cargo route measure*. However, to the extent that the availability of more forms of tax avoidance yields greater avoidance, it is more plausible that a *holistic cargo route measure* would generate less avoidance than the other measures.
- 5 A *first/last vessel measure* charged per ship leaves room for tax avoidance in various ways. One evasion strategy is to under-report the distance covered from/to ports that impose carbon pricing<sup>178</sup>, although this would be more difficult now with AIS tracking of ships, through trans-shipment<sup>179</sup> or the falsification of documents<sup>180</sup>. The effectiveness of this evasion strategy will therefore depend

<sup>173</sup> World Bank (2018), Section 2, p.4.

<sup>174</sup> Faber et al. (2009); Kågeson (2011); Kollamthodi et al. (2013)

<sup>175</sup> Faber et al. (2009); Bäuerle et al. (2010); Kollamthodi et al. (2013).

<sup>176</sup> Bäuerle et al. (2010); Kollamthodi et al. (2013); Heine et al. (2017); Heine and Gäde (2018).

<sup>177</sup> World Bank (2018), paragraph 3.3, p. 11.

<sup>178</sup> Bäuerle T, Graichen J, Meyer K, Seum S (2010).

<sup>179</sup> Heine et al. (2017); Heine and Gäde (2018).

<sup>180</sup> Bäuerle T, Graichen J, Meyer K, Seum S (2010).

on the distance between ports that impose carbon pricing and the closest available port that does not.<sup>181</sup> A *first/last vessel measure* thus creates incentives for non-participating ports to increase their capacity for trans-shipment and transit.<sup>182</sup>

- 6 An alternative strategy to avoid carbon pricing is to make changes en route to port destinations for outbound voyages.<sup>183</sup> However, such changes of consignees are a viable strategy only if states that implement carbon pricing cannot obtain data regarding them. Thus, this evasion strategy could be made less effective if implementing states have access to AIS data to track the movements of outgoing vessels.<sup>184</sup> Note that this avoidance strategy could also be controlled by means of a top-down MRV system that requires vessels to report information about previous voyages. If such a system was effectively implemented, evasion could occur only after the cargo has been re-loaded (at sea) on to another ship.
- 7 In addition, carbon price avoidance could be put into practice by using the most fuel-efficient (newer) ships to call at ports that implement carbon pricing and moving the less performing ones on to other routes.<sup>185 186</sup> However, this risk is limited because the fuel efficiency of vessels is linked to their size and capacity.<sup>187</sup>
- 8 Lastly, another possibility for avoiding carbon pricing under a *first/last vessel measure* is to reduce speed in the period covered by the measure and increase it outside its scope.<sup>188</sup>

---

181 A significant factor for the effectiveness of application of the EU-ETS to international shipping could be the decision by the United Kingdom to leave the EU on 31 January 2020. A future trade agreement between the UK and the EU may include a reference to climate change policy remaining aligned. Failure to achieve such alignment could lead to a repeat of calls by President Macron of France for “a European border carbon tax; it is crucial” in September 2017 and again in April 2019. This repeated a similar call by his predecessor “I will fight for a carbon tax levied on EU borders,” then French president Nicolas Sarkozy said. However, and this may resonate with the proposal to include international shipping in the EU-ETS, the then EU trade commissioner Karel De Gucht ruled out such a tax, saying “it will ...lead to an escalating trade war on a global level.” EU Observer *Macron’s carbon border tax - why hasn’t he done anything?* <https://euobserver.com/environment/145311>, 4 July 2019, (retrieved 22 February 2020)

182 Miola et al. (2011), p.5494.

183 Kollamthodi et al. (2013), p.53.

184 Kollamthodi et al. (2013), p.53.

185 Bäuerle et al. (2010), p.59.

186 There is anecdotal evidence that the converse behaviour was observed on introduction of the Tier III NOX limit for new ships operating into the North American Emission Control Area, with ships constructed before 1 January 2016 being scheduled for voyages to North America and new ships not able to comply with the Tier III limit scheduled for voyages outside the ECA.

187 Bäuerle et al. (2010), p.59.

188 Kollamthodi et al. (2013), p.52.

## Annex 4

### United States Congressional Budget Office's Analysis for Reducing CO<sub>2</sub> Emissions<sup>189</sup>

“The policy options described above differ in their potential to reduce emissions efficiently, to be implemented with relatively low administrative costs, and to create incentives for emission reductions that are consistent with incentives in other countries. CBO draws the following conclusions:

- A tax on emissions would be the most efficient incentive-based option for reducing emissions and could be relatively easy to implement. If it was coordinated among major emitting countries, it would help minimize the cost of achieving a global target for emissions by providing consistent incentives for reducing emissions around the world. If other major nations used cap-and-trade programs rather than taxes on emissions, a U.S. tax could still provide roughly comparable incentives for emission reductions if the tax rate each year was set to equal the expected price of allowances under those programs. (See Summary Table 1 for a qualitative comparison of selected policies.)
- An inflexible annual cap (one whose level was not affected by the price of emission allowances and under which firms would not be allowed to bank or borrow allowances) would be the least efficient option among those considered here, although it could be relatively easy to implement, depending on key design features. Linking the cap-and-trade programs of various countries could create significant concerns, however: Nations would give up sovereignty over the price of the allowances traded in their programs and the extent to which emissions were reduced in ways that met their programs' criteria.
- A cap-and-trade program that included a price ceiling (safety valve) and either a price floor or banking provisions could be significantly more efficient than an inflexible cap, although somewhat less efficient than a tax. It might also be relatively easy to implement, depending on specific design decisions. If major emitting countries agreed to establish such programs—and to set their safety valves at roughly the same level—they could create similar incentives to reduce emissions without formally linking their cap-and-trade programs. Alternatively, if other developed countries taxed CO<sub>2</sub> emissions, a safety valve in a U.S. cap-and-trade program could be set at a level consistent with that tax.
- Moderating the price of allowances by altering the stringency of a cap—or the extent to which firms could use banked and borrowed allowances—would be considerably more difficult to implement than setting a price floor or ceiling directly. Price volatility in the allowance market could make it difficult for policymakers to know when to alter the supply of allowances and would mean that no particular price outcome could be guaranteed. One particular form of price-sensitive cap—a cap-and-trade program with a circuit breaker—could be more efficient than an inflexible cap. However, such a program would be less efficient than the other policy options that CBO examined.”

<sup>189</sup> United States Congressional Budget Office (2008) *Policy Options for Reducing CO<sub>2</sub> Emissions*, February 2008, The Congress of the United States, Pub. No. 2930, Summary, p. VIII

