UiO : Faculty of Law
University of Oslo

Reduction of CO2 emissions in international shipping

Candidate number: 112

Submission deadline: 1.12.2019

Number of words: 16.173

Acknowledgement

I would like to express my appreciation to my supervisor, Professor Henrik Ringbom, for his valuable comments and patient feedback throughout the writing process.

Table of Contents

Introduction

1.1. Contribution of international shipping to greenhouse gas emissions

Greenhouse gas emissions (GHG) are regarded to be the main contributor to global climate change. [1] Raising seaborne trade together with growing fuel consumption has in consequence significantly increased GHG emissions from international shipping, which according to the *Third IMO Greenhouse gas study 2014* [2], are estimated for approx. 2.2 % of total GHG emissions. Attention should be brought to the significance of these percentages as shipping is the primary carrier of international trade, carrying as much as 90% by volume and consequently providing a vital service to global economic development and wealth.[3] For the purposes of this paper, it should be mentioned that international shipping is defined as shipping between ports of different countries, as opposed to domestic shipping. International shipping excludes military and fishing vessels. [4]

There exists a variety of gases that are emitted by ships. International Maritime Organization (IMO) in its *Second IMO GHG Study 2009* [5] has classified them into four groups: emissions of exhaust gases, emissions of refrigerants, cargo emissions, and other emissions.

In 2007, CO_2 emissions from international shipping accounted for 870 million tonnes, which constitute 2.7 per cent of the global emissions of CO_2. In the same year, CO_2 emission from international aviation accounted for 1.9 % of the global emissions. The average between 2007 and 2012 accounted for 2.6 % CO_2 emissions from the international shipping. Even though these emissions have decreased between 2007 and 2014, which was substantially related to the global financial crisis, it cannot be forgotten that the emissions from international shipping are presumed to rise considerably due to the projected growth in demand for maritime transport services. According to the *Third IMO GHG Study 2014* "by 2050, CO_2 emissions from international shipping could grow by between 50% and 250%, depending on future economic growth and energy developments." [6]

"Excessive GHG emissions from ships may change the composition of the earth's atmosphere, change its climate, and cause negative impacts on the marine environment and

---

[1] Yubing Shi, *Climate Change and International Shipping, The Regulatory Framework for the Reduction of Greenhouse Gas Emissions*, Leiden, 2017, p. 5.

[2] *Third IMO GHG Study 2014*; International Maritime Organization (IMO) London, UK, April 2015; Smith, T. W. P.; Jalkanen, J. P.; Anderson, B. A.; Corbett, J. J.; Faber, J.; Hanayama, S.; o'Keeffe, E.; Parker, S.; Johansson, l.; Aldous, l.; Raucci, C.; Traut, M.; Ettinger, S.; Nelissen, D.; Lee, D. S.; NG, S.; Agrawal, A.; Winebrake, J. J.; Hoen, M.; Chesworth, S.; Pandey, A.

[3] Ibidem, Foreword by the Secretary- General Mr Koji Sekimizu.

[4] Ibidem. This definition is also consistent with the *IPCC Guidelines for National Greenhouse Gas Inventories (2006),* available at https://www.ipcc-nggip.iges.or.jp/public/2006gl/.

[5] ø. Buhaug et al., *Second IMO GHG Study 2009* , International Maritime Organization (IMO), 2009.

[6] *Third IMO GHG Study 2014*..., op. cit.

human health." [7] GHG emissions from international shipping also have an adverse impact on the marine environment. According to the *Fifth Assessment Report* [8] of the Intergovernmental Panel on Climate Change (IPCC), GHG emissions have resulted in warming of the global ocean with the most dramatic rise in temperature near the surface. Increased ocean temperatures can influence species allocation, polar systems as well global and regional weather patterns. [9] GHG emissions from shipping can also directly or indirectly affect human health, as "approximately 70% of the emissions from shipping occur within 400 km of the coastline along the main seaborne trade routes. These emissions may be transported hundreds of kilometres inland, creating serious air quality problems for large segments of the population." [10]

1.2. Regulatory position of international shipping

Up to the present, international regulations regarding greenhouse gases emissions from international shipping have been tackled primarily on the level of the International Maritime Organization. At the beginning, a series of resolutions were adopted by the United Nations General Assembly in the 1980s, which has led eventually to the adoption in 1992 in Rio de Janeiro of *United Nations Framework Convention on Climate Change* [11] (the *UNFCCC*) that addresses climate change generally. [12] Following the *UNFCCC*, the parties have adopted the *Kyoto Protocol* [13], which has introduced the first binding emissions reduction targets for developed states. The *Kyoto Protocol* does not address specifically emissions from international shipping or aviation; however, it was agreed that these emissions shall be handled by specialized UN agencies, which for emissions from shipping is the International Maritime Organization. [14] On the Third *UNFCCC* Conference of the Parties a decision was made to further elaborate on including the emissions from international shipping to individual parties. However, any further attempts initiated by the *UNFCCC* to regulate specifically the issue of emissions from international shipping have not brought any result. [15]

---

[7] Yubing Shi & Warwick Gullett (2018), *International Regulation on Low- Carbon Shipping for Climate Change Mitigation: Development, Challenges, and Prospects, Ocean Development & International Law*, 49:2, 134-156, p.136.

[8] Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014 Synthesis Report: Summary for Policymakers,* available at https://www.ipcc.ch/report/ar5/syr/.

[9] IPCC, 2019: Summary for Policymakers, in: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* [H.- O. Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E. Poloczanska, K. Mintenbeck, M. Nicolai, A. Okem, J. Petzold, B. Rama, N. Weyer (eds.)], available at https://www.ipcc.ch/srocc/home/.

[10] Yubing Shi & Warwick Gullett (2018), *International Regulation*..., op. cit.,p.137.

[11] *United Nations Framework Convention on Climate Change*, opened for signature 9 May 1992, 31 ILM 848 (entered into force 21 March 1994) (UNFCCC).

[12] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change: International Law and Policy Considerations* , Special Report, 2018, p. 9.

[13] *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, opened for signature 16 March 1998, 37 ILM 22 (entered into force 16 February 2005) (*Kyoto Protocol*).

[14] ibidem, Art. 2(2).

[15] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change...,* op. cit., p. 11.

As a body responsible to resolve the problem of GHG emissions from international shipping, in 2011 IMO has adopted technical and operational measures. From now on, GHG emissions from international shipping were governed through amendments to *Annex VI to the International Convention for the Prevention of Pollution from Ships* (MARPOL 73/78).[16] IMO has then developed some technical and operational measures that aim to reduce GHG emissions in the shipping industry, which include obligatory Energy Efficiency Design Index (EEDI) for new ships, as well as the Ship Energy Efficiency Management Plan (SEEMP) for all ships. It was the first ever obligatory global GHG reduction regime for an entire industry sector. Technical and operational measures introduced by the IMO shall be discussed in detail in chapter two. Furthermore, there has been an ongoing debate within the IMO to apply market- based measures (MBMs) as an addition to the operational and technical measures, yet no such scheme has been developed so far.

In April 2018, IMO introduced an *Initial IMO Strategy on Reduction of GHG Emissions from Ships* (IMO Initial Strategy) [17], which sets a very ambitious goal to cut greenhouse gas emissions from international shipping by at least 50 % by 2050.

Due to back then absence of progress within the IMO, in 2015 *Paris Agreement* [18] was adopted, with its aim to hold the increase of global average temperature to well below 2 degree Celsius and pursuit to limit the temperature increase to 1.5 degree Celsius above pre-industrial levels.[19]

Apart from the IMO regime and *Paris Agreement*, it is worth to note other major global regulation in the area of climate change and shipping industry, namely the *United Nations Convention on the Law of the Sea* [20] (UNCLOS) especially with regards to atmospheric emissions from ships. In addition, EU policies play an important role in regulating emissions from international shipping together with its regulation regarding monitoring, reporting and verification of CO_2 emissions from maritime transport, which will be further discussed later in this paper.[21]

The greatest attention should be paid however to the relation between the *Paris Agreement* and the IMO regime. Such relation is further discussed in Chapter Three.

---

[16] *International Convention for the Prevention of Pollution from Ships* (MARPOL 73/78), signed 2 November 1973, 12 I.L.M. 1319, as amended by the 1978 Protocol to the 1973 Convention, 1341 U.N.T.S. 3, 17 I.L.M. 546 (entered into force 2 October 1983).

[17] Annex 11 Resolution MEPC.304(72) (adopted on 13 April 2018), *Initial IMO Strategy on reduction of GHG emissions from ships*.

[18] *Adoption of the Paris Agreement*, 12 December 2015, Dec CP.21, 21st Sess, UN Doc FCCC/ CP/2015/L.9/Rev.1 (entered into force 4 November 2016) (Paris Agreement).

[19] *Paris Agreement* Art. 2(1)(a).

[20] *United Nations Convention on the Law of the Sea*, 10 December 1982, 1833 UNTS 397, 21 ILM 1261 (entered into force 16 November 1994) (*UNCLOS)*.

[21] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change...,* op. cit., p. 5.

1.3. Statement of the problem

Climate change poses a global problem that is interconnected to many different sectors and aspects of the society. It includes social, economic, political and legal issues and perhaps this is why fighting climate change so far has been slow and lengthy and has not resulted in substantial progress. Even after the adoption of the *Paris Agreement* discussions over greenhouse gas emissions targets and on who and how should be responsible for tackling this issue are still the main focus of the international climate change negotiations. The questions of how to distribute emissions and the choice of strategy and legal instruments is still debated. [22]

In order to find a solution to this problem, an international legal regime has been set up. However, climate change includes a variety of different areas of the law, which leads in consequence to overlapping of the climate regime with other regimes. The complex character of the climate change issue and the challenge of allocation of resources has resulted in difficulties for the institutions and procedures created in order to accomplish fast and easy outcomes. [23]

The same applies to the regulation of greenhouse gas emissions from international shipping. While the task of data enhancement and the reporting of national stocktaking has been covered by the *UNFCCC*, the pursuit for regulation to meet emissions reductions is entrusted in the International Maritime Organization. In some way, the allocation of emissions was transferred from the *UNFCCC* to the IMO but has not yet been defined. [24]

Essentially, the link between the climate regime and the one of the IMO is not clear. Moreover, the interactions between these regimes have resulted in variety of disputes, which therefore have impeded progress. Despite other difficult issues, there are four main areas of disagreement. Firstly, there is a question of the competent forum to regulate greenhouse gas emissions from international shipping. Secondly, there exists a dispute over the principles applying to GHG emissions regulation. Specifically, there is a disagreement whether a differentiated treatment should be applied towards the developing countries or should all states by treated in the same manner. Thirdly, there is a disagreement over the emissions reduction target that should be reached, which relies on the objectives established in the constitutive instruments of the IMO regime. Lastly, there is a dispute over the way to meet these reductions, especially, the use of market-based measures. [25]

---

[22] Beatriz Martinez Romera, *Regime Interaction and Climate Change, the case of international aviation and maritime transport*, Routledge Research in Global Environmental Governance, 2018, p. 2.

[23] Ibidem.

[24] Ibidem.

[25] Beatriz Martinez Romera, *The Paris Agreement and the Regulation of International Bunker Fuels*, Review of European Community & International Environmental Law, RECIEL 25 (2) 2016. ISSN 2050-0386, 2016, p. 220.

1.4. Research questions

In view of the above observations, the essential aim of this thesis is to answer the following questions:

1. What is the relation between the *Paris Agreement* and IMO Regime in regulating GHG emissions from international shipping?
2. What are the challenges of regulating GHG emissions from international shipping?
3. What could be the potential legal framework to solve the problem of excessive GHG emissions in international shipping?

1.5. Methodology and structure of the paper

In order to answer the research questions and fulfil the objectives of the thesis this paper primarily takes the theoretical legal research method, focusing on analysing related climate change regime (specifically the *UNFCCC*, the *Kyoto Protocol* and the *Paris Agreement*) and the IMO regime. This paper also analyses reports of an intergovernmental body such as the Intergovernmental Panel on Climate Change as well as legal literature including assessment of principles, concepts and doctrines.

Chapter two of this paper describes the achievements of the IMO and climate change regimes with regards to reduction of ghg emissions in international shipping. It further discusses the interactions between these regimes and deliberates on the source of IMO's mandate to regulate the issue. Furthermore, the general rules of both regimes are presented as well as interactions between them. Chapter three provides a analysis of the relation between the IMO and the *Paris Agreement*. It also deliberates over the issue of "fair share" in international shipping, emissions targets and challenges of regulating GHG emissions from international shipping. Chapter four focuses on regulating international shipping in the future with the analysis of the *IMO Initial Strategy* and future possibilities. It also provides considerations over best next steps for the sectors i.e. whether national or joint sectoral commitment should be applied and considers potential unilateral actions.

International shipping emissions under the International Maritime Organisation's Regime and the Paris Agreement.

2.1. IMO regulations on GHG emissions and its mandate

In the situation where several legal systems address the same problem, as it is in the case of greenhouse gas emissions from shipping, this gives rise to a question of fragmentation and conflict.[26] However, overlapping of regimes does not inevitably effect in this result. Interaction between different regimes may occur in various forms, from conflict to synergic relation between one another. According to Daniel Bodansky, the relationship between the

[26] Jae- Gon Lee, International Regulations of Greenhouse Gas Emissions from International Shipping, Issues and Possible Responses, Asia - Pacific Journal of Ocean Law and Policy, 4 (2019) 53- 78, p. 72.

UNFCCC and the IMO is rather collaborative than conflictive. [27] As it is explained below, each regime has its own legal framework, and neither is hierarchically higher or inferior to the other. Furthermore, each regime could possibly regulate the issue of greenhouse gas emissions from international shipping, the *UNFCCC* due to its general competence to tackle climate change, and the IMO because of its competence to tackle marine pollution from ships.[28] In this light, it should be examined whether this regime overlap generates a risk of a conflict specifically with regard to a competent body to regulate the issue of greenhouse gas emissions. In order to do so the IMO's mandate should be examined, specifically in connection with the climate regime.

The IMO's mandate to regulate the greenhouse gas emissions from international shipping derives from the will of their own members. Such will is primarily embedded in the *Convention on The International Maritime Organization* [29] (*IMO Convention*), *UNCLOS* and particularly MARPOL Resolution 8[30]. It is also expressed in other legal instruments such as the *Kyoto Protocol.*

As mentioned before, emissions from shipping industry were excluded from the *Kyoto Protocol* and the reason for that was the presence of a specialized UN agency which is the International Maritime Organization, that is responsible for coping with international maritime affairs. IMO was therefore viewed as natural platform for negotiation of specified reductions of greenhouse gas emissions from international shipping sector, taking into account its technical expertise and experience in governing other environmental issues. [31]

Article 1 (a) of the IMO Convention sets the IMO's purpose as "to provide machinery for co-operation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning the maritime safety, efficiency of navigation and prevention and control of marine pollution from ships; (…)."[32]A question has arisen as to the IMO's jurisdiction over technical and commercial aspects of shipping regulation. Due to opposition from the maritime states

---

[27] Daniel Bodansky, *Regulating Greenhouse Gas Emissions From Ships: The Role of the International Maritime Organization*, Sandra Day O'Connor College of Law, Arizona State University, Electronic copy available at: https://ssrn.com/abstract=2813785, p. 11.

[28] *Ibidem.*

[29] *Convention on the Inter-Governmental Maritime Consultative Organization*, 6 March 1948, 289 UNTS 3 (entered into force 17 March 1958), as amended and renamed the Convention on the International Maritime Organization (IMO Convention).

[30] IMO, Resolution 8 "CO2 Emissions from Ships" adopted at 1997 Conference of Contracting Governments to MARPOL 73/78 (1997).

[31] Beatriz Martinez Romera, *The Paris Agreement…*,op. cit., p. 118.

[32] *IMO Convention,* Art. 1(a).

towards involvement of inter- governmental organisation in trade and competition, IMO's mandate is restricted to purely advisory and technical matters.[33]

When it comes to *UNCLOS*, it sets IMO as an expert with regards to navigation, including pollution from vessels and by dumping, by the International Maritime Organization. [34] Articles 211(1) and 212(3) of *UNCLOS* request States Parties to establish global rules, standards, and recommended practices and procedures to prevent, reduce and control atmospheric and vessel-source marine pollution. Specifically, these actions should be carried out through diplomatic conferences or a competent international organization (the IMO). Consequently, *UNCLOS* defines flag, coastal and port State jurisdiction, while the IMO specifies how member States authority should be exercised to fulfill IMO safety and shipping anti-pollution regulations. Moreover, *Resolution 8 on CO2 emissions from ships* was adopted by the *MARPOL* Conference of the Parties in 1997. This resolution asked the IMO to begin its work on the reduction of GHG emissions from ships and has therefore been regarded as a key legal document underpinning subsequent regulatory efforts by the IMO.[35]

Kyoto Protocol states in Article 2(2) that "The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively." [36]

It is worth noting that while the International Maritime Organization had acknowledged the issue of climate change prior to the adoption of the *Kyoto Protocol*, it only began to initiate steps towards reduction of greenhouse gas emissions from shipping in response to the *Kyoto Protocol*. This request of the climate change regime towards the IMO to tackle the problem indicate the beginning of the interaction. [37]

Therefore, the IMO Convention and *UNCLOS* gives to the IMO a general competence to govern the issue of GHG emissions from shipping industry, and the *Kyoto Protocol* sets a formal link to the IMO by acknowledging the role of IMO in limiting and reducing GHG emissions from international shipping[38]. However, as stated in section 1.3., besides the link that was provided, the relationship between the climate regime and the IMO remains unclear.

One indication that has been made in this regard is that "the IMO may not be the sole competent international organisation in regulating GHG emissions from ships." [39] The *IMO*

---

[33] Alan Khee-Jin Tan, *Vessel-Source Marine Pollution: the Law and Politics of International Regulation,* Cambridge University Press, 2006, p. 75.

[34] UNCLOS, Annex VIII, Article 2.

[35] Yubing Shi, *Climate Change and International Shipping…*, op.cit., p. 98

[36] *Kyoto Protocol*, Art. 2(2).

[37] Sebastian Oberthür, *Interactions of the Climate Change Regime with ICAO, IMO, and the EU Burden-Sharing Agreement*, 2003, p. 7.

[38] Bernd Hackmann, *Analysis of the governance architecture to regulate GHG emissions from international shipping*, 2011, p. 95.

[39] Yubing Shi, *Climate Change and International Shipping...*, op. cit., 180-181.

Convention envisages IMO`s competence to regulate the technical and operational measures. Also, in practice, worldwide shipping business, including national shipping industries from the *UNFCCC* non-Annex I States, consider the IMO to be the sole capable organisation to manage this issue from a technical and operational point of view. [40] In addition, technical and operational measures were introduced by the IMO under the revised *Annex VI of MARPOL 73-78*. There are voices in the literature stating that considering such competence was designated to the IMO in the *Kyoto Protocol*, it would indicate that the IMO is the only competent international body to govern technical and operational measures to tackle GHG emissions from international shipping. [41]

However, it should be emphasized that IMO's mandate could not come directly from *Kyoto Protocol*, as there is no hierarchy in international law nor between the institutions discussed above, and therefore the *Kyoto Protocol* does not assign exclusive authority for the IMO to govern the issue of emissions from shipping, and thus it does not prevent other actors or institutions from taking measures towards tackling that issue.[42]

Article 2(2) of the *Kyoto Protocol* does not regulate the role of the International Maritime Organization in the regime. Currently, the cooperation between the two regimes takes the form of a mutual exchange of information and participation in relevant meetings. Forums external to the negotiation process, to consider the problems and to share opinions on integration of the two institutions and their relevant knowledge are currently not in place. A prospective regime to govern greenhouse gas emissions from shipping could rely upon the already established relationships between the IMO and the *UNFCCC*, however, governments should come to an agreement on the role of the two institutions within the regime. As stated by Bernd Hackmann "an open exchange of views among regime actors but also with stakeholders from outside the distinct governance arena could help to generate new knowledge on the issue and to integrate diverging views." [43] A greater coordination between the IMO, the *UNFCCC* and their member states and parties could be helpful in finding common ground for the feasible solutions.[44] In this regard, the secretariats of the IMO and the *UNFCCC* could provide guidelines and encourage an integrative process. Right now the governance framework is distinguished by "two loosely integrated core institutions that are slightly competing for a clear hierarchy and authority over the issue. Although the current situation provides possibilities for forum shopping, both institutions are following a similar objective and address GHG emissions from international shipping according to their mandate."[45] A formal relationship between the two institutions already exists, however a

[40] Ibidem.

[41] Ibidem.

[42] Beatriz Martinez Romera, *The Paris Agreement*⋯, op.cit., 225.

[43] Bernd Hackmann, *Analysis of the governance architecture*⋯, op.cit., p. 95.

[44] Wolfgang Obergassel (né Sterk), Christof Arens, Lukas Hermwille, Nico Kreibich, Florian Mersmann, Hermann E Ott and Hanna Wang-Helmreich, *Phoenix from the ashes: an analysis of the Paris Agreement to the United Nations Framework Convention on Climate Change – Part II*, OBERGASSEL ET AL : (2016) 28 ELM, p. 11.

[45] Bernd Hackmann, *Analysis of the governance architecture*⋯, op.cit., p. 95.

stronger integration so far has failed to emerge. According to Hackmann, overlapping of decision- making mechanisms could even contribute to strengthening an efficient regime to regulate greenhouse gas emissions from international shipping rather than prevent its development. Integration of regulatory instruments and various sets of expertise may give rise to generating a particular knowledge which could be essential for the effective regulation of greenhouse gas emissions from international shipping.[46]

As a consequence of their regulatory scope, mandates and missions statements both IMO and the *UNFCCC* could create regulations to resolve the problem of greenhouse gas emissions from international shipping. While the IMO is the UN specialized agency that is responsible for the safety and security of shipping and the prevention of marine pollution by ships, the *UNFCCC* responsibility is to develop an international legal and institutional framework that initiates, coordinates, and regulates global action to mitigate climate change and adapt to its effects across state borders and economic sectors. Even though these two institutions have different targets, they could be complementary to each other and jointly improving while addressing greenhouse gas emissions from international shipping. As a matter of fact, both institutions could address the problem of climate change in a collaborative manner by integrating IMO knowledge on international shipping with the *UNFCCC* knowledge on climate change strategy. As an example "parties to the *UNFCCC* could ensure that any development in this sector is consistent with the global climate change policy and provide guidance to the IMO in this regard (e.g., targets); whereas IMO could develop strategies and policies to implement measures to regulate GHG emissions in this sector." [47]

As opposed to Hackmann, according to Bodansky, there is not even a slight competitive relationship between the two regimes. It should be noted that in article 2.2 of the *Kyoto Protocol*, parties to the *UNFCCC* agreed that the problem should be dealt by the IMO, therefore in fact the International Maritime Organization in addressing the problem of GHG emissions from international shipping is acting in accordance with the overriding objective of the *UNFCCC* rather than undermining it. [48]

The concerns discussed above regarding the regime conflict do not refer to the regimes as whole, but rather to one specific issue which is the relationship between the *UNFCCC*'s principle of *common but differentiated responsibilities and respective capabilities* and the IMO's principle of *no more favourable treatment* [49] - a problem that is further discussed in section 2.3.

There exists another dispute whether the IMO's mandate envisaged in the IMO Convention and the *UNCLOS* also includes competence to regulate market-based measures. This is due to the fact that some of these measures include global emissions reductions from various sectors

[46] Ibidem., p. 96.
[47] Ibidem.
[48] Daniel Bodansky, *Regulating Greenhouse Gas Emissions From Ships…*, op.cit., p. 11.
[49] Ibidem.

and therefore go outside of the scope of technical issues related to shipping. [50] In theory, such competence for the IMO is envisaged in the *Kyoto Protocol*. Nevertheless, article 2(2) of the *Kyoto Protocol* is very indefinite and does not explicitly describe IMO's competence, nor does it determine the measures that IMO can establish to handle the GHG issue in international shipping. In 2011, the International Chamber of Shipping (ICS) requested at the Durban Climate Change Conference that the IMO should be given a precise mandate to tackle GHG emissions through the MBMs. This request however has brought no result. The *Paris Agreement* from 2015 also hasn't resolved the matter of GHG mandate for the IMO. For that reason, in order to introduce market-based measures involving emissions reduction from the other sectors, it might be needed that IMO cooperates with other international organisations, such as the *UNFCCC* or the World Trade Organization (WTO). [51]

2.1.2. Technical and Operational Measures

International Maritime Organisation have partly regulated the greenhouse gas emissions from international shipping by amending *Annex VI to MARPOL 73/78*. Amended *Annex VI to MARPOL 73/78* regulates only certain types of ships that are present in international shipping which is why it was previously stated that the IMO regulates GHG emissions from international shipping only "partly". [52]

The Progression of the IMO's regime with regards to greenhouse gas emissions has been a long and sporadic process. Within 14 years from September 1997 and July 2011, no binding agreements in relation to GHG emissions from international shipping were achieved within the IMO, and the ones responsible for producing emissions were relieved from liabilities under this regime. [53] Different measures have been widely discussed within the IMO throughout the years, namely technical, operational and market- based measures. At present, technical and operational measures are incorporated in *Annex VI to MARPOL 73/78* in the forms of Energy Efficiency Design Index (EEDI) and the Ship Efficiency Management Plan (SEEMP), while Market Based Measures (MBMs) are still not regulated. [54] The subsections below explain technical and operational measures mentioned above and assesses their advantages and deficiencies.

Technical measures

The main technical measure is the Energy Efficiency Design Index, governed by the revised *Annex VI to MARPOL 73/78*. The Energy Efficiency Design Index was made mandatory for new ships and presents a specific figure accounting for minimum energy efficiency level for certain types of ships and size segments, demonstrated in grams of CO2 per ship's capacity-mile. The lower EEDI shows better energy efficiency of ship design.[55] Regulation 21 to the Annex VI introduces a formula for measurement for the efficiency threshold and

[50] Yubing Shi, *Climate Change and International Shipping...*, op. cit., 182.
[51] Ibidem.
[52] Ibidem.
[53] Ibidem., p.183.
[54] Ibidem., p.194.
[55] Ibidem.

sets different reduction targets for different types of ships. There are currently twelve different types of ships are covered under EEDI requirements set out in the amended *MARPOL Annex VI*.

One of the biggest advantages of EEDI is a "performance- based" non prescriptive measure. When EEDI requirement is satisfied, it is ship designers' and ship builders' choice which most cost-effective solution should be applied in order to meet the regulations. Contrary to that, earlier IMO implementations often dictated particular equipment or technologies. Through such an approach, EEDI gives an incentive for the shipping industry to enhance fuel intake with new technological developments. Ships which do not comply with those regulations may suffer from opportunity costs lowering their competitiveness in the shipping market. [56] What is more is that while in theory EEDI does not apply to ships flying under the flag of a non- party state, amended Annex VI allows port states parties to ensure that all ships coming to their ports have the International Energy Efficiency Certificate. [57]

Operational measures

The Ship Energy Efficiency Management Plan is a measure that was also introduced through the 2011 amendments to *MARPOL Annex VI*. It offers an adaptable mechanism for shipowners and ship operators to control ship and fleet efficiency performance in a cost-efficient manner. [58] The main idea behind SEEMP is to decrease GHG emissions by reducing fuel consumption. In order to satisfy the requirements, shipowners and ship operators may use measures such as engine tuning and monitoring, reduced auxiliary power, slow steaming, weather routing, voyage execution (reducing port times, waiting times), propeller upgrade, and aft body flow devices. [59] The SEEMP applies to all existing and new ships of 400 gross tonnage and above.

Regulation 22 of Annex VI provides that "Each ship shall keep on board a ship specific Ship Energy Efficiency Management Plan (SEEMP). This may form part of the ship's Safety Management System (SMS)." As this regulation is quite vague, the IMO drafted *2012 Guidelines for the Development of a Ship Energy Efficiency Management Plan* (2012 SEEMP Guidelines) "for smooth and uniform implementation of the regulations and to provide sufficient lead time for industry to prepare". [60] SEEMP Guidelines introduced a four- step method, specifically: planning, implementation, monitoring and self- evaluation and improvement. These include guidance for particular procedures and measures at each step.

Unlike EEDI, the SEEMP does not set any objectives for energy efficiency and the SEEMP Guidelines are not legally binding for shipowners and ship operators.

---

[56] Yubing Shi & Warwick Gullett (2018) *International Regulation on Low- Carbon Shipping...*, op. cit., p.138.

[57] *MARPOL 73/78 Annex VI (2011 amendments)* reg 10 (4).

[58] Yubing Shi & Warwick Gullett (2018) *International Regulation on Low- Carbon Shipping...*, op. cit., p. 139.

[59] Ibidem.

[60] Ibidem.

2.1.3. Initial IMO Strategy on reduction of GHG emissions from ships

As mentioned above, the 2018 *IMO Initial Strategy* sets a very ambitious goal "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 CO2 emissions reduction consistent with the Paris Agreement temperature goals." [61] Furthermore, IMO aims for decline of carbon intensity of the ship through implementation of further phases of energy efficiency design index for new ships and consequently decline of carbon intensity of international shipping, by at least 40 % by 2030, pursuing efforts towards 70 % by 2050 compared to 2008.

2.2. *Paris Agreement*

Main components of climate change mitigation under the *Paris Agreement* include common, long-term goals together with mitigation efforts determined nationally; five- year review cycles of progress in enforcing individual efforts toward the common objectives; and a commitment to rise ambition to guarantee that the common objectives are met. [62]

Paris Agreement sets a long-term temperature goal of "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels". [63] This long- term objective sets out the basis for each State's Nationally Determined Contributions (NDCs). *Paris Agreement* however does not specify neither a method to determine the NDCs for the Parties nor does it provide obligation for full implementation and meeting the targets. It is worth noting, that the long- term reduction goals are formed in a technology- neutral language and thus allows the parties to choose how much particular technologies, from renewable energy to carbon capture and storage should lead to achievement of the objective[64] The *Paris Agreement* accepts international emissions trading and other market mechanisms as instruments to achieve the emission reduction. The *Paris Agreement* envisages five- year review cycles and a Global Stocktake process.

2.3 Principles of *Common But Differentiated Responsibilities* and *No More Favourable Treatment*

As noted above there exists a conflict of general norms and principles that govern the two main regimes discussed above. While, the IMO is based on the principle of *no more favourable treatment*, the *UNFCCC* regime is built on the principle of *common but differentiated responsibilities*. IMO regulations apply to all ships regardless the state they are registered in, while regulations under the *UNFCCC* identifies the specific needs and special

[61] *IMO Initial Strategy*, 3.1. point 3.
[62] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change...*, op. cit., p. 12.
[63] *Paris Agreement*, Art. 2(a).
[64] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change...*, op. cit., p. 13.

circumstances of developing countries and thus place the heaviest weight in addressing climate change on industrialized countries.[65]

No More Favourable Treatment

As defined in literature, *the no more favourable treatment,* also called *the equal treatment for all ships principle*, or *universal treatment principle*, refers to port States enforcing applicable standards in a uniform manner to all ships in their ports, regardless of flag. [66] The NMFT principle was expressed in *MARPOL 73/78* in article 5 (4), stating that "with respect to the ship of non-Parties to the Convention, Parties shall apply the requirements of the present Convention as may be necessary to ensure that no more favourable treatment is given to such ships. [67] NMFT principle has been also included in several IMO treaty instruments. [68] However, it should be noted that "it is only a customary rule applicable within the IMO regime. The application of this principle in one of the key features of IMO's efforts in exercising uniform standards around the world, and it has assisted the IMO to fulfil the regulatory purposes of these treaties." [69]

Under this principle all ships coming to a port of a State party are obliged to meet the standards of the IMO treaty. In consequence it is more challenging for a state not to be compliant with the IMO regulations. Moreover, application of the *no more favourable treatment* principle might have a positive impact in a way that it can lead to decreased usage of a so called "flag of convenience". [70] According to the *Second IMO GHG Study*, 75 % of the world shipping tonnage, by deadweight, of all trade ships on international excursions is registered in developing countries. [71] Thus, "it would be ineffective for the IMO to act by means of regulating only 25 per cent of the world's shipping tonnage if the NMFT principle were not in place" [72]

It is noteworthy that the implementation of the NMFT principle is narrowed by the IMO only to treaties regulated by the IMO itself. For example, it is stated in the preamble of amended *Annex VI to MARPOL 73/78* that " Recognizing also that adoption of the amendments to Annex VI in no way prejudges the negotiations held in other international fora, such as the United Nations Framework Convention on Climate Change (UNFCCC), nor affect the positions of the countries that participate in such negotiation." [73] This shows that the IMO's

---

[65] Bernd Hackmann, *Analysis of the governance architecture…*, op.cit., p. 96.
[66] Ibidem, p. 91.
[67] MARPOL 73/78, art. 5(4).
[68] Yubing Shi, *Climate Change and International Shipping...*, op. cit., p. 91.
[69] Ibidem, p. 92.
[70] Flags of conveniance: "flags of certain countries whose laws make it easy and attractive for ships owned by foreign nationals or companies to fly these flags", definition by Andrew Griffin, *MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?,* (1994) 1(2) Indiana Journal of Global Legal Studies 489, p. 506.
[71] *Second IMO GHG Study 2009*, p. 13.
[72] Yubing Shi, *Climate Change and International Shipping...*, op. cit., p. 93.
[73] MARPOL 73/78, Annex VI, preamble.

regime on GHG emissions from ships is independent from the regulations adhered to the *UNFCCC- Kyoto Protocol*. [74]

Depending on the principles that are the basis for the regime that regulates greenhouse gas emissions from international shipping, developing and industrialized states could be treated in a different way in regards to compliance with any future regulations. As stated by Hackmann, "the availability of two different sets of core norms and underlying principles appears to lead to the situation where member-states select the international institution that suites their interests best. "[75]

Many developing states support the view that only the CBDR principle should be applied to the issue of greenhouse gas emissions from shipping stating that the IMO has received its mandate to regulate GHG emissions from international shipping from Article 2(2) of the *Kyoto Protocol* to the *UNFCCC*. [76] Such an interpretation of the IMO's mandate could justify the application of the CBDR principle, which runs through the *UNFCCC* and its *Kyoto Protocol"*. However, as discussed above, this interpretation is not correct.

This view has also been opposed by the Sub- Division for Legal Affairs of the IMO that has confirmed that the IMO did not obtain its mandate from the *Kyoto Protocol* and that this article should not be interpreted as meaning that non-Annex I States are exempt from any obligation. Rather, it should be understood as that the reduction of GHG emissions from international shipping is "a task which is properly within the purview of IMO", and "only Annex I countries should be involved in the negotiations within IMO". [77]

However, as pointed out by Yubing Shi, in compliance with these rules, specifically, based on the ordinary meaning of the regulations together with the context of negotiations of the *Kyoto Protocol*, article 2(2) could be understood as implying that only Annex I States are obliged to make reductions in international shipping, which is consistent with the rest of the *Kyoto Protocol* where the CBDR principle has been fully incorporated. At the same time, this understanding could only be logical if IMO received its mandate to regulate greenhouse gas emissions from shipping from this provision. However, the IMO has denied this possibility.[78]

Another view presented by some scholars and by the Sub- Division for Legal Affairs of the IMO is the one that supports the sole application of the NMFT rule. [79] Supporters of this

---

[74] Yubing Shi, *Climate Change and International Shipping...*, op. cit., p. 93.
[75] Bernd Hackmann, *Analysis of the governance architecture*⋯, op.cit., p. 96- 97.
[76] Yubing Shi, *Climate Change and International Shipping...*, op. cit., p. 94.
[77] *Legal Aspects of the Organization's Work on Greenhouse Gas Emissions in the Context of the Kyoto Protocol*, note by the Secretariat, IMO Doc MEPC 58/4/20 (1 August 2008).
[78] Yubing Shi, *Climate Change and International Shipping...*, op. cit., p. 96.
[79] e.g., International Maritime Organisation (IMO), Main Events in IMO's Work on Limitation and Reduction of Greenhouse Gas Emissions from International Shipping (2011) available at http://www.imo.org/en/OurWork/Environment/PollutionPrevention/AirPollution/Documents/Main%20events%20IMO%20GHG%20work%20-%20October%202011%20final.pdf, p. 28; Sebastian Oberthür, *Institutional Interaction to Address Greenhouse Gas Emissions from International Transport: ICAO, IMO and the Kyoto Protocol*, (2003) 3(3) *Climate Policy* 191, p. 195.

approach indicate that the IMO has been the primary international organization addressing reduction of greenhouse gas emissions from international shipping since 1997 and therefore there should be no doubt that the NMFT principle applies to this issue. Moreover, it has been pointed out that the NMFT principle has been applied to many IMO treaties and therefore has become a standard practice within the IMO regime. In addition, the reduction of GHG emissions from ships has been partially regulated in the form of amendments of *Annex VI to MARPOL 73/78* in 2011 and 2014 respectively.

It has also been indicated that since the NMFT principle is clearly provided in Article 5(4) of MARPOL 73/78, it follows that the regime of GHG emission reductions from ships in Annex VI is subject to this article. In this view, the principle of NMFT should apply to greenhouse gas emissions from international shipping. Moreover, an argument against application of the CBDR principle is the fact that the IMO's mandate derives from the IMO Convention, UNCLOS and IMO Regulation 8. [80]

Another, compromised option would be to apply both the CBDR and the NMFT principle to the issue of emissions from international shipping and it could be achieved through market-based mechanisms. [81]

However, while reconciliation of both principles can be difficult, it is possible. Any compromise method to harmonize two sets of fundamental principles necessitates innovative thinking and political leadership from all involved actors and has to be based on the principle that industrialized states are required to take the lead in reducing emissions, while developing states need the support to participate in mitigation actions.[82] A form of such compromise was introduced in the new *IMO Initial Strategy*, which is further discussed in section 4.1.

Common but Differentiated Responsibilities

Common but differentiated responsibilities principle has its origins in the idea of common heritage of mankind. At the *UN General Assembly Resolution 43/53* in 1988, climate change was recognised as "a common concern of mankind since climate is an essential condition which sustains life on earth". [83] This common concern should be therefore resolved by allocating responsibilities to the States. To answer a question of which States should bear such responsibility, the principle of *common but differentiated responsibilities* came into light [84] The CBDR principle was first incorporated in an explicit manner in *Rio Declaration*, stating that "states shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated

[80] Yubing Shi, *Climate Change and International Shipping...*, op. cit., p. 96.
[81] Ibidem. p. 97.
[82] Bernd Hackmann, *Analysis of the governance architecture*…, op.cit., p. 96- 97.
[83] *Protection of Global Climate for Present and Future Generations of Mankind*, GA/Res 43/53, 43rd sess, 70th plenary meeting,, UN Doc A/RES/43/53 (6 December 1988) art. 1.
[84] Paul Harris, *Common but Differentiated Responsibility: the Kyoto Protocol and United States Policy*, (1999) 27(7) N.Y.U. Environmental Law Journal, p. 28-29.

responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."[85] Despite criticism expressed against this provision from both developed and developing States, the CBDR principle has been approved in several conventions and treaties along with 1992 *UNFCCC* and its *Kyoto Protocol* and *Paris Agreement*. [86] Based on this formulation, the CBDR principle consists of two elements. One is the establishment of the common responsibility of States to protect the global environment. The other is the acknowledgement by all States that differentiated responsibilities should be allocated to different States due to their different contributions to a particular environmental problem and their differing capacities to take remedial measures. [87]

Paris Agreement has implemented the CBDR rule through a concept of Nationally Determined Contributions (NDCs), which set reduction targets for each state that should reflect its common but differentiated responsibilities and respective capabilities, in the light of different national circumstances (CBDR – RCNC). It is worth noting, that the CBDR principle expressed in the *Paris Agreement* is much less strict, than the one expressed in the *Kyoto Protocol*.[88] Article 11(2) of *Kyoto Protocol* comes forward with the "appropriate burden sharing" mechanism to guide the future negotiation of financial commitments between developed States while its Annex B lists the individual reduction commitment of different developed States. [89]

The *Paris Agreement* on the other hand, requires parties to "pursue domestic mitigation measures, with the aim of achieving the objective of contributions" [90]. It moves away from the categorical approach of differentiation presented in the *Kyoto Protocol*. Potentially, most prominent change is that the *Paris Agreement* does not incorporate any reference to the annex structure of the *UNFCCC*, making an end to the division between Annex I and non-Annex I states. Instead, it takes different approach, representing the principle of common but differentiated responsibilities and respective capabilities (CBDR- RC) with its different elements. The procedural commitments relating to NDCs are, in general, common (with some flexibility given to least developed and small island states), and all countries over time are to move towards economy-wide absolute emission reduction targets. [91]The transparency framework takes account of parties' different capacities by providing "built-in flexibility" to "those developing country Parties that need it," rather than to developing countries as a class

[85] Rio Declaration on Environment and Development, adopted by the United Nations Conference on Environment and Development on 14 June 1992.
[86] *UNFCCC* Art. 3–4; *Kyoto Protocol* Art. 10; *Paris Agreement* preamble, Arts. 2(2), 4(3)(4)(19).
[87] Yubing Shi, *Climate Change and International Shipping...*, op. cit., p.84.
[88] Lavanya Rajamani, Ambition and differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics, available at https://www.cambridge.org/core/terms. , p. 505.
[89] The *Kyoto Protocol*, Art. 11(2b).
[90] The *Paris Agreement*, Art. 4(2).
[91] Daniel Bodansky, T*he Paris Climate Change Agreement: A New Hope?*, in: The American Journal of International Law, Vol. 110:269, p.300.

[92] Moreover, rules on finance, technology, and capacity-building, as well as some hortatory provisions relating to NDCs are further distinguished on a more explicit basis, between developed and developing countries, whereas "since the categories "developed" and "developing" countries are left undefined, they are less rigid than the *UNFCCC* and *Kyoto Protocol's* annexes." [93]

As was stated in previous subsection, industrialized countries insist on application of the NMFT principle, while applying the principle of CBDR is highly supported by many developing countries. The first group points at the complexity of the sector stating that the emissions from international shipping are of a specific kind, in the sense that they cannot be attributed to a particular territory. Addressing these emissions on the basis of principle different than equal treatment creates a possibility of loopholes for the ships to avoid complying with relevant regulations. As international shipping is a highly globalized and mobile sector, such approach could sabotage successful actions to reduce and regulate global climate change and could result in competitive distortion. Countries that support the CBDR principle and emphasise the significance of recognition of the differences in contributions of developing and industrialized states are of the view that these principles represent cornerstones of the *UNFCCC*, and also reflect a consensus of the international community when addressing global climate change. Regulating GHG emissions from international shipping forms one part of this global approach and should therefore be addressed under the *UNFCCC*. [94]

Several countries also provide an argument that regulation of greenhouse gas emissions from international shipping could potentially give rise to increase of the price of transport and therefore may lead to reduced imports and exports. Absence of recognition of specific needs and special circumstances of developing states could lead to additional burden on their process towards sustainable economic growth and mightresult economic and social disadvantages. [95]

Assessment

A future regime for reduction of greenhouse gas emissions from international shipping could base on the existing knowledge of the International Maritime Organization and further develop, implement and monitor regulations for international shipping as well as on the knowledge of the *UNFCCC* regime to address global climate change. A major driver for the future regime should be cooperation of the two institutions, governments and the shipping industry itself. Emphasis should be put on reaching a consensus on the appropriate approach.

These two general principles are not fundamentally exclusive. A reconciliation, especially with regards to market- based measures can be possible. Therefore, state authorities should endeavor to create a compromise solution that incorporates the views of a broad range of

[92] The *Paris Agreement* , Arts. 13(1), 13(2).
[93] Daniel Bodansky, *The Paris Climate Change Agreement*⋯, op. cit., p.300.
[94] Bernd Hackmann, *Analysis of the governance architecture*⋯, op.cit., p. 97.
[95]Ibidem., p. 98.

stakeholders, considers a differentiation between developing and developed countries, takes into account possible socio-economic consequences and is environmentally effective. [96]

Relation between the IMO Regime and the *Paris Agreement* and challenges ahead

The *Paris Agreement* provides basis for the enactment of national contributions determined at the national level, sets up the collective goals and assesses their progress through five- year review cycles. [97] The IMO, on the other hand expects that the contribution from the shipping industry will be resolved at the intergovernmental organisation level due to industry's globalisation and transnationalism. These two regimes are based on two different principles that form contributions concerned, i.e., *common but differentiated responsibilities* under *UNFCCC*, with addition of "in the light of the different national circumstances" in the *Paris Agreement*, and *No More Favourable Treatment* under the IMO Conventions. Despite those differences in approach, *Paris Agreement* and the IMO GHG emissions reduction regime are very much linked to each other. Contrary to *Kyoto Protocol*, the *Paris Agreement* does not indicate the IMO as the one responsible to tackle the issue of GHG emissions from international shipping. Looking at the *Paris Agreement*, there exists an uncertainty about the legal status of *Kyoto Protocol* together with its article 2(2) That consequently brings a question about possible impact for the IMO's role in the event of formal and complete replacement of the *Kyoto Protocol* by the *Paris Agreement*. [98]

3.1. IMO and *Paris Agreement* – how are they related?

While the *Paris Agreement* does not include emissions from international shipping and the IMO continues its attempts to introduce a strategy to address them, such lack of any reference to this mandate in the *Paris Agreement* may potentially push the UN climate regime to go forward. It is important to mention, that even though *Paris Agreement* does not explicitly mention the greenhouse gas emissions from international shipping, it does provide some valuable implications in that matter. At the Geneva Climate Change Conference in February 2015, the "Negotiating Text" for the Paris Climate Agreement was agreed upon. It states in paragraph 17 that "23bis. [In meeting the 2°C objective, Parties agree on the need for global sectoral emission reduction targets for international aviation and maritime transport and on the need for all Parties to work through the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) to develop global policy frameworks to achieve these targets]." [99] Therefore, IMO should indeed play a central role in achieving the reduction of CO2 emissions from international shipping. According to Aldo Chircop, Meinhard Doelle and Ryan Gauvin "the international expectation is that the IMO will

[96] Ibidem., p. 100-101.

[97] *Paris Agreemen*t, supra note 8, Arts 4, 7, 9, 10, 11, 13, 14.2

[98] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 16

[99] *Outcomes of the United Nations Climate Change Conferences held in Lima in December 2014 and in Geneva in February 2015*, Note by the Secretariat, MEPC 68th Session, Agenda Item 5, IMO Doc MEPC 68/5 (18 February 2015) para. 17.

facilitate the determination of the shipping industry's fair contribution consistently with the spirit of the Paris Agreement." [100] If the *Paris Agreement* had indeed made a special reference to the IMO in its text, it could have had an effect of discouraging the parties to the UN climate regime from taking the responsibility for international shipping emissions.[101] As a result of *Paris Agreement's* silence with regards to the IMO, it remains unclear exactly to what extent UN climate regime can support the mandate of the IMO. Therefore," pressure to act will remain on parties to the UN climate regime, who are also IMO member states, in case of inadequate progress at the IMO as it continues work on the strategy." [102]

Furthermore, adoption of the *Paris Agreement* gives rise to another debate among the numerous stakeholders, such as the "fair share" of the international shipping industry in reduction of greenhouse gas emissions globally. It also directs rules for the IMO regulation of GHG emissions from shipping, as well as the role of the EU in regulating this issue. The "fair share" of international shipping in reducing greenhouse gas emissions also referred as "levels of ambition" or "reduction target" has been broadly discussed under the IMO, especially with regards to the adoption of the *Paris Agreement*. Also, in the new *IMO Initial Strategy,* IMO sets the levels of ambition, reflecting in this way the interaction between the *Paris Agreement* and the IMO GHG Regime. [103]

Furthermore, the long-term goal to stabilize the climate together with the global stocktake presented in the *Paris Agreement* demonstrates that all sectors, including international shipping industry, are required to decrease GHG emissions in line with The *Paris Agreement*. Article 2.1 of the *Paris Agreement* aims to strengthen the "global response" to the threat of climate change by holding the increase in the "global average temperature" to well below 2°C and to pursue a 1.5°C stabilization above pre-industrial levels.[104] As stated by Yubing Shi, "the terms "global response" and "global average temperature" reveal that the international shipping sector should be included in this long-term mitigation objective. " [105]

What is more, the *Paris Agreement* in Article 14 provides that:

> "1. The Conference of the Parties serving as the meeting of the Parties to this Agreement shall periodically take stock of the implementation of this Agreement to assess the collective progress towards achieving the purpose of this Agreement and its

[100] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 16
[101] Meinhard Doelle, Aldo Chircop, Decarbonizing International Shipping: Potential Roles of the IMO's Initial Strategy and the UN Climate Regime,Electronic copy available at: https://ssrn.com/abstract=3275574, p. 3
[102] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 16

[103] Yubing Shi, The Implications of the Paris Agreement for the Regulation of Greenhouse Gas Emissions from International Shipping, *Ocean Yearbook* 32: 528–555, 2018, p. 538
[104] Ibidem.
[105]Ibidem.

long-term goals (referred to as the 'global stocktake'). It shall do so in a comprehensive and facilitative manner, considering mitigation, adaptation and the

means of implementation and support, and in the light of equity and the best available science.

...

3. The outcome of the global stocktake shall inform Parties in updating and enhancing in a nationally determined manner, their actions and support in accordance with the relevant provisions of this Agreement, as well as in enhancing international cooperation for climate action."

Article 14 creates a system of global stocktake and lays down its goal under the *Paris Agreement*. The global stocktake referral to global emissions incorporates emissions from international shipping. Therefore, global stocktake under Article 14 should also include GHG emissions from international shipping. [106]

While the *Paris Agreement* does not explicitly mention the GHG emissions from international shipping, GHG emissions are still referred to in Article 4(1) of the *UNFCCC* and Article 2.2 of the *Kyoto Protocol*. By this reference, parties could decide that GHG emissions from international shipping should be regulated under the *UNFCCC*, through the Subsidiary Body for Scientific and Technological Advice (SBSTA). [107] Therefore, it is possible that GHG emissions from international shipping could be addressed in the COPs serving as the meeting of the parties to the *Paris Agreement* (CMAs) if the IMO fails to reach sufficient progress in this matter. With this regard, it is important that the level of ambition for international shipping industry is addressed in light of the *Paris Agreement*. [108]

Another possibility has been raised within the literature, specifically with reference to the NDCs under *Paris Agreement*, as parties can choose to include domestic shipping in their NDCS. Moreover, parties could also decide to set up measures such as emissions trading system or a tax for maritime transport.

It is quite frequently mentioned that the *Paris Agreement* objective is to reduce the GHG emissions through the NDCs. Nevertheless, studies have shown that "full implementation of the NDCs submitted as of 1 November 2016 would put the world on a pathway to 2.5–2.8°C above pre-industrial levels. Therefore, there is a gap between the current level of ambition by

---

[106] M. Doelle, *GHG Emissions from International Shipping and Aviation: Status after Paris?*, 2016, available online at: https://blogs.dal.ca/melaw/2016/07/05/ghg-emissions-from-international-shipping-and-aviation-status-after-paris/

[107] in 1995 the Conference of the Parties requested SBSTA to address the allocation and control of emissions from international aviation and maritime transport – Decision 4/CP.1. *Methodological issues*, April 7 1995, and Regina Asariotis, Hassiba Benamara, *Maritime Transport and the Climate Change Challenge*, 2012, p. 66

[108] Yubing Shi, *The Implications*⋯, op. cit., p. 539

States Parties and the overall objective of reduction." [109] This situation could be enhanced through strengthening of the NDCs and/or through regulatory proposals from international shipping sectors that are not covered by the *Paris Agreement*. Therefore, the best solution would be to encourage reduction of GHG emissions from shipping through further regulations under the IMO. [110] It is important to note, that members of the IMO are by and large also parties to the *Paris Agreement*. Therefore, a discussion on the levels of ambition for the international shipping sector within the IMO, should be addressed in accordance with the *Paris Agreement*. [111]

To summarize the discussion provided above, it should be said that as a consequence of omission of greenhouse gas emissions from ships in the *Paris Agreemen*t the IMO's position as a multilateral forum for the regulation of that issue has been strengthened and therefore it is expected to entrench the industry action. [112] To ensure that also the international shipping sector does its part in this process and contributes to its fair share of the global effort, there is a need for a full transparency. A crucial role in achieving that goal will be played by the global stocktake under the *Paris Agreement*. Member States could act through the IMO, or parties to the Paris Agreement through their NDC submissions could lead the way to report on emissions from the sector as part of the global stocktake. [113]

3.2. The challenge of regulating GHG emissions from international shipping

In order to answer a question of why it is so challenging to regulate the greenhouse gas emissions from international shipping, a different question must be asked first, namely why and how is regulation of international shipping different from other industries? An answer to this question also explains why emissions from shipping were not directly addressed in the *Paris Agreement* and referred to the International Maritime Organization as the competent authority.

Commercial and operational life of the ship

As there exists a variety of actors involved in the operational life of a ship it is challenging to distribute the load of emissions reduction. [114] Moreover, all ships cannot be regulated in the same way. There is a range of different classes of ships to serve different specialized industries or to carry out specialized functions and services. Each ship belongs to its class, and while there exists overall safety and environmental rules, there are also special requirements for specific ships and their operations. For example, not all ships are able to perform safely and as intended simply by reducing speed or changing fuel. A ship needs to maintain a minimum speed, depending on its class, purpose and navigational conditions, to ensure manoeuvrability, engine considerations and safe operation." [115] As long as low speed

[109] Ibidem.
[110] Ibidem.
[111] Ibidem.
[112] Beatriz Martinez Romera, *The Paris Agreement*⋯, op.cit., p. 224.
[113] Meinhard Doelle, Aldo Chircop, *Decarbonizing International Shipping*⋯, op. cit., p. 9.
[114] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 27
[115] special raport p. 28

leads to lower emissions per ton mile, in result the voyages take more time and more ships or more voyages by the same ship have to be performed to transport the cargo. [116] Furthermore, slow speed under a charter party might negatively influence early arrivals in ports and potential waiting times for berth. The carrier is under obligation to arrive and discharge the cargo in specified time (lay time) and exceeding that time leads to damages. [117]

Moreover, it is not always up to the owner to control the emissions. It must be kept in mind, that the ship can be operated by a management company as well as it can be chartered and further sub- chartered. For the charterer it is most important to take maximum economic advantage of the ship therefore to contract as many voyages as possible. Speed is thus a very important factor.[118]

As mentioned above, not all ships are being used in maritime trade or carriage of passengers. It must be borne in mind that different classes of ships also include vessels engaged in specialized services for example aquaculture, the offshore oil and gas industry or wind farms. These ships may exhaust more fuel per mile. Furthermore, "while ships provide trade and specialized services, they also receive a range of other services from supporting vessels and ports. Some of these vessels may not be engaged in international shipping. Thus, there is a wide range of international and domestic shipping emission sources." [119]

It is also important to note that "the average life of a ship is approximately 25 years, which means that a substantial part of current ships will still be in operation by 2035. Even if from now on all ship owners would acquire zero-emissions ships, there would still be a substantial part of vessels that would not be zero-carbon. Decarbonization of the sector, to a significant extent will depend on the level of fleet renewal which depends on the scale of scrappage of old ships and the capacity to upgrade existing vessels. This leads to a significant sunk cost. "The potential for fleet renewal is larger if maritime trade is expanding and could also be subject to policy interventions to speed up the process and mitigate excessive economic harm that sudden changes could cause." [120]

Mobility of ships

While the IMO is the main organization competent to regulate international shipping, it is important to keep in mind ship's mobility. As was mentioned above a vessel can be owned by several actors and its nationality can be changed, by use of flags of convenience. [121]

---

[116] Jasper Faber et al, *Regulated Slow Steaming in Maritime Transport: An Assessment of Options, Costs and Benefits* (Delft: CE Delft, 2012), available online at: https://www.cedelft.eu/publicatie/regulated_slow_steaming_in_maritime_transport/1224

[117] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 28

[118]Ibidem.

[119]Ibidem.

[120] Ronald A. Halim, Lucie Kirstein, Olaf Merk and Luis M. Martinez, *Decarbonization Pathways for International Maritime Transport: A Model-Based Policy Impact Assessment,* Sustainability 2018, *10*, 2243; doi:10.3390/su10072243, p. 22.

[121]Basil Ugochukwu, Understanding the Challenges of Climate Change Regulation in International Shipping, Conference Report- Halifax, Nova Scotia, March 6, 2017, p. 3.

Therefore, a vessel can be owned by dividends in one or more countries, use another country as a base or operates from it, and perform the trade of other countries around the world without even calling into the ports of its registry. [122]

Generally, international regulations adopted by the IMO are relevant for ships on international excursions. The challenge of regulating greenhouse gas emissions in that field is that vessels are also used in purely domestic trade, where the port of departure and disembarkation are in the same country. It is relevant as nationally determined contributions under the *Paris Agreement* relate to latter but not to the first one. Consequently, not all emissions from ships will be regulated by the IMO. [123]

Regulating international shipping in the future

The focus is currently put on the IMO to implement its initial strategy and to find ways to persuade its member States to raise the ambition of the collective effort to meet the goals set out in the *Paris Agreement*.It is therefore important to discuss what next steps should be undertaken under the IMO. It is also important to keep in mind that the shift of focus towards the IMO does not mean that it cannot be subject to a change. Thus it should be also considered what are the other future possibilities outside of the IMO regime.

4.1. IMO Initial Strategy and future possibilities

In April 2018, the International Maritime Organization adopted the *Initial IMO Strategy* on Reduction of GHG Emissions from Ships which represents the IMO's initial contribution to the global objectives set out in the *Paris Agreement* adopted in December 2015 to respond to climate change by maintaining global average temperature increase to well below 2 degrees centigrade above pre-industrial levels and to strive for 1.5 degrees. The IMO Initial Strategy seeks to solve the issue of the greenhouse gas emissions from the international shipping industry.

Before starting the analysis of the strategy, it is important to note that the *IMO Initial Strategy* is a political declaration rather than a legally binding document, therefore none of its targets, commitments or obligations are binding on States or industry actors. Therefore, the impact of the strategy will have to be evaluated to a large extent in view of the actions that IMO and its member States shall take in order to implement the strategy rather than just by its ambitious targets. [124]

Two reports published in 2018 [125] indicate that " the emission scenarios, as well as the level of ambition and effort in the *Paris Agreement* (and by extension the IMO GHG Strategy), are

[122] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 30.
[123]Ibidem., p. 33.
[124] Meinhard Doelle, Aldo Chircop, Decarbonizing International Shipping⋯, op. cit., p. 6
[125] An IPCC 2018 Special Report on *Global Warming of 1.5oC,* available at https://www.ipcc.ch/sr15/ and *Emissions Gap Report 2018* (UNEP, Nairobi, 2018) available at https://www.unenvironment.org/resources/emissions-gap-report-2018

likely to be insufficient to meet the *Paris Agreement* stated goal."[126] Without a considerable raise of ambitions, the goal set in the *Paris Agreement* may be very difficult to meet. As stated in the IPCC's report, *Global Warming of 1.5oC,* the NDCs ambition undertakings "would not limit global warming to 1.5°C, even if supplemented by very challenging increases in the scale and ambition of emissions reductions after 2030 (high confidence). Avoiding overshoot and reliance on future large-scale deployment of carbon dioxide removal (CDR) can only be achieved if global CO2 emissions start to decline well before 2030 (high confidence)". [127] Moreover, the *Emissions Gap Report 2018* prepared by the United Nations Environment Programme (UNEP) states that "current commitments expressed in the NDCs are inadequate to bridge the emissions gap in 2030. Technically, it is still possible to bridge the gap to ensure global warming stays well below 2°C and 1.5°C, but if NDC ambitions are not increased before 2030, exceeding the 1.5°C goal can no longer be avoided. Now more than ever, unprecedented and urgent action is required by all nations. The assessment of actions by the G20 countries indicates that this is yet to happen; in fact, global CO2 emissions increased in 2017 after three years of stagnation. [128]

Objectives

The Strategy represents a substantial difference on levels of ambition in comparison to the *Paris Agreement*. Firstly, the expectation is that the carbon intensity of ships would decline as a result of ratcheting up the EEDI for new ships. Second, the carbon intensity of shipping would decline to reduce average carbon emissions across the transport industry by at least 40 percent by 2030 and aiming for 70 percent by 2050, compared to the 2008 base year. Third, GHG emissions would peak and decline to reduce annual GHG emissions by at least 50 percent by 2050 compared to 2008, while pursuing further efforts consistent with the *Paris Agreement* goals. [129] Some of these goals cover total emissions from the international shipping which then raises an issue of fair share which is discussed further in the text.

The *IMO Initial Strategy* includes short-term measures for the period of 2018–2023, followed by medium-term measures in 2023–2030 and long-term measures after 2030. The Strategy provides a non- exhaustive list of measures, with some based on enhancing the already existing regulation and practice (for example, ratcheting up of the EEDI and SEEMP, other technical and operational energy efficiency measures, existing fleet improvement, speed management, and management of methane and volatile organic compound emissions). The industry is already familiar with such measures, thereby they are more likely to be implemented in the short term. Other short-term measures are more of a facilitating character with a purpose of enhancing the infrastructure and capacity to enable GHG emissions reductions (for example, development of national action plans, technical cooperation, port measures, R&D, incentives for first movers, GHG/ carbon intensity guidelines, undertaking

[126] Aldo Chircop, *The IMO Initial Strategy for the Reduction of GHGs from International Shipping: A Commentary*, The International Journal of Marine and Coastal Law 34 (2019) 482–512, p. 490.
[127] An IPCC 2018 Special Report on *Global Warming of 1.5oC*, op. cit.
[128] *Emissions Gap Report 2018* (UNEP, Nairobi, 2018), op.cit.
[129] The IMO Initial Strategy, para 3.1.

of studies and better presentation of the IMO and its work on this subject)[130] The medium- and long-term measures include low-carbon and zero carbon fuels and "new/innovative emission reduction mechanism(s), possibly including Market-based Measures (MBMs), to incentivize GHG emission reduction."[131]

The revised strategy that shall be adopted in 2023 will be subject to periodic review every five years after adoption. Preferably, such reviews should correspond with the global stocktake in order to synchronise actions taken under the IMO and the climate regime. [132]

Fair share issue

It seems that the 2030 and 2050 emission reduction targets presented in the *IMO Initial Strategy* are based on what the member States of the IMO currently consider to be possible. There is no evidence that those targets are based on an objective analysis of what would be a fair contribution to the global endeavour, rather than on practical and political considerations. It is difficult to perceive how full decarbonization well after 2050 can be considered a fair contribution to the long - term goals of the *Paris Agreement*, which eventually requests actions to keep global average temperature increases to within 1.5°C of pre - industrial levels. In the view of intrinsically global character of the shipping industry, the fair share should be determined in accordance with the average global effort required by these long - term goals. Considering that the *IMO Initial Strategy* is non- binding, together with its targets, it is unsatisfactory that the targets are based on what appears achievable rather than on what would constitute a 'fair contribution'. The consequence is that an apparent target for the industry is still missing, and the targets that have been agreed upon will have to be revised in the future. This is a significant derogation from the approach presented in the *Paris Agreement*, which determines clear collective targets in addition to individual commitments and actions that shall be reviewed over time to reduce the ambition differences between individual commitments and the collective goal. [133]

Despite that, the objectives set out in the *IMO Initial Strategy* are still significant, specifically while taking into consideration the complexity of this global and transnational industry.

Stating that decarbonization should be achieved as soon as possible is indeed encouraging and includes a clarity on the primary objective. What is unsatisfactory is the pace of decarbonization set until 2050, specifically with the view of report which demonstrate that full decarbonization is possible before 2050.[134] Moreover, a research carried out by the Organisation for Economic Co - operation and Development (OECD) in early 2018 stated that shipping industry could substantially decarbonize by 2035. [135]

---

[130] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change⋯*, op. cit., p. 47.
[131] The IMO Initial Strategy, para 4.8.
[132] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change⋯*, op. cit.,p. 48
[133] Meinhard Doelle, Aldo Chircop, *Decarbonizing International Shipping⋯*, op. cit., p. 6.
[134] An IPCC 2018 Special Report on *Global Warming of 1.5oC*, op. cit.
[135] Meinhard Doelle, Aldo Chircop, *Decarbonizing International Shipping⋯*, op. cit., p. 6.

In the view of the IPCC 1.5°C report together with the conclusions of the 2018 Talanoa Dialogue under the UN climate regime, IMO should seriously reconsider the sufficiency of the targets and look more ambitiously at the measures in time for the revised strategy in 2023. An ambitious full decarbonization goal combined with binding shorter - term steps could possibly provide the best solution in view of the long - term goal needed from the sector. It is essential for the strategy to be flexible towards the modifying understanding of the character of the GHG reduction challenge and rising urgency for decarbonization [136]

In order to achieve a fair contribution of the international shipping sector to the long-term goals specified by the *Paris Agreement*, the IMO member states will have to face number of challenges.

Firstly, it would be beneficial if the IMO clarified the underlying long- term goal for international shipping. As Aldo Chircop states it would be also important "to be clear at the outset about the factors that would warrant adjustments to the long-term goal, and the process involved." [137] It is worth to note other important elements that needs to be regulated, namely the rate of reduction from peak emissions to full decarbonization or emission neutrality. Such estimation for the shipping industry "could then be regularly revised and updated as agreement is reached on the elements to be considered and as more detailed information is available on the chosen elements." [138]

Moreover, after clarifying the long-term goal and a process for updating and revising it, the IMO should therefore focus on developing measures towards meeting this goal.

The essential aspects for the *IMO Initial Strategy* and its revision and adoption by 2023 are specifically commitment to a straightforward and fair long- term goal with a transparent procedure for revising it together with medium- term goals that provide a reasonable path towards the long-term goal. Additionally, there is a need for reasonable and transparent process for revising the progress towards the long- term and medium-term goals and a commitment and effective approach towards the implementation and adjusting technical and operational measures essential for meeting the long- term goal. What is more, specific binding measures should be incorporated in order to promote research and development and to implement and constantly enhance best available technologies and operational practices to reduce emissions in the short and medium term, with an initial focus on operational measures that are available for prompt implementation. As mentioned earlier, progressive development within technical and operational measures should be provided, particularly through the EEDI and fuel measures, together with other measures assisted by new technological developments. [139]

[136] Ibidem., p. 7

[137] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 70.

[138] Ibidem.

[139] Ibidem.

It is feasible, that with technological development, technical (ship design, propulsion technology, and so forth), operational and fuel measures could be satisfactory for the effort of decarbonizing the shipping industry. As to the market- based measures, they are included in the *IMO Initial Strategy* as a potential medium- term measure. According to the *IMO's Second GHG Study* it is recommended to commit to introduce an effective market- based measure as part of the revised strategy in 2023 with a commitment to develop and implement an instrument to achieve the long-term and medium-term goals and revise it periodically.

Moreover, a process of revising and adjusting of the *Initial Strategy* and revised Strategy together with its implementation should be harmonized with the global stocktake of the *Paris Agreement*, to ensure that information about progress in this field can contribute to the five-year review cycles under articles 13–15 of the *Paris Agreement.*[140]

When it comes to the choice of instruments, up to date, in order to regulate GHG emissions IMO was operating on *MARPOL Annex VI*. Alternatively, IMO could adopt new annex or a separate convention, which would provide the advantage with a dedicated treatment to a specifically complex issue that may necessitate more than technical and operational measures. As Aldo Chircop points out "the development of a convention or protocol or a new annex would have been a lengthy, multi-year process leading to adoption at a diplomatic conference. In contrast, amending an existing annex could be undertaken using the much faster tacit acceptance process. In addition, a new annex would have had to be optional and would have necessitated years to secure broad support by a sufficient number of state parties representing the bulk of global tonnage." [141] Another argument in favour of Annex VI as a regulatory mean is aspiration toward unity and coherence of the pollution prevention system.

Implementation

In order to fully decarbonize the shipping industry a combination of improvements in technical and operational efficiencies and fuel switching is required. The main tool to continue the improvement of energy efficiency of ships is already existing in the form of EEDI, but the *IMO Initial Strategy* does not provide specific measures to strengthen the EEDI and expand it to cover more categories of vessels, and, more importantly, there are no particular measures to promote switching to non carbon - based fuels. [142]

It is also important to note, that "for an industry that operates on long-term investment cycles, the three-stage approach of short-, medium- and long-term actions is vital." [143] Nevertheless, inadequate long- term objectives and absence of specified measures at this stage may lead to less certainty than required in order to make sure that adequate investment decisions are made to assist full decarbonization of the industry. Nonetheless,

[140] Ibidem., p. 71.
[141] Ibidem., p. 72
[142] Meinhard Doelle, Aldo Chircop, *Decarbonizing International Shipping*⋯, op. cit., p. 7.
[143] Ibidem.

there is still an expectancy that the *IMO Initial Strategy* indicates clearly enough the need for full decarbonization, that will result in meeting the goals set out in the *Paris Agreement*.

Conclusively, the *IMO Initial Strategy* is lacking specific measures that would provide the implementation of its objectives. However, it must be borne in mind, that specific measures are expected to be adopted in the next few years in the process of revising the Strategy and adopting the Revised Strategy in 2023. [144] While the Strategy represents promptness of the IMO to mitigation as matter of urgency, it establishes a practical and gradual approach towards decarbonization of the shipping industry. It does not include new binding measures, therefore its actual impact on the industry shall be evaluated with time.

Differentiation

What is more, the Strategy has also resolved the conflict over guiding principles by making sure that the Initial Strategy reflects both IMO and *UNFCCC* principles. As mentioned above, the Strategy includes both non-discrimination and NMFT regardless of flag in the IMO conventions and CBDR-RCNC in the climate regime. [145] IMO initial strategy underlines the need to balance the principles of NMFT for industry actors with the need to take into account the effect of the implementation of the strategy on developing states, specifically least developed states (LDCs) and small island developing states (SIDS) through the application of CBDR. [146]

This has shown that a consensus between the two general principles is possible. Now a serious effort is needed to address the impact of full decarbonisation for the LDCs and SIDS, while maintaining the *no more favourable treatment* for the industry actors. An action is also needed to develop and implement "an effective carbon pricing mechanism, as it has the greatest potential to combines creating adequate incentives to reduce emissions with the ability to address legitimate equity concerns of LDCs and SIDS, and the ability to incentivize innovations that will lead to the technology innovations needed to ensure the full decarbonization of the sector."[147]

Assessment

As Aldo Chircop says: "although not yet a regulatory achievement, the initial IMO strategy sets out a framework for a provisional pathway for potential future regulation." [148] The new *IMO Initial Strategy* provides a framework for action, however in order to introduce a maritime regulation IMO through its member states will have to specify its commitments. IMO needs to provide "dynamic and complex application of the multi-disciplinary strategy that will provide directions for the organization, its membership and the international maritime community to adapt to a new energy environment — and consequently a new

[144] Ibidem.
[145] The IMO Initial Strategy, supra note 20 at para 3.2.
[146] Meinhard Doelle, Aldo Chircop, *Decarbonizing International Shipping*⋯, op. cit., p. 9.
[147] Ibidem., p. 15
[148] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 48.

business environment in search of constant innovation." [149] In order to achieve this goal, IMO needs to work not only through its traditional method to develop technical and operational measures. IMO should therefore implement an ambitious, comprehensive, systematic and reviewable approach towards the greenhouse gas regulation as a long- run learning process in the strategy together with a periodic review to take stock (and thus be part of global GHG stocktake under the *Paris Agreement*) and take advantage from it by adapting its ambitions and method. Moreover, IMO will need not only to operate within its own regime but cooperate with other international regimes. Furthermore, there is a need for a consensus-based, determined mandatory rules and standards synchronised with efforts to tackle the issue of climate change under other regimes. [150]

IMO stands upon a challenge of creating a comprehensive view across various economic sectors at national, regional and global level and specifying roles of member states and private industry actors in reaching emission reductions in international shipping industry. [151]

The action that needs to be taken by the global community in order to address the climate change is directed by the long-term temperature goal in the *Paris Agreement*. The agreement requires state parties to "strive to formulate (…) long-term low greenhouse gas emission development strategies" and to communicate them to the Secretariat of the *UNFCCC*. [152]

As mentioned above, the goal of the *IMO Initial Strategy* was to introduce international shipping industry contribution to the reduction target as set in the *Paris Agreement*. In order to achieve that IMO will have to present a significant commitment in the implementation of the *IMO Initial Strategy*, "not only to reducing emissions significantly in the short and medium term, even as global trade may continue to grow, but also to pursue R&D and employ technologies that will place the industry on the path to eventual complete decarbonization."[153] At present, the *IMO Initial Strategy* is very general, it does not provide targets nor specific measures or related timelines. Therefore, it is needed that IMO provides further definition and specific metrics to facilitate implementation, monitoring and progress evaluation. [154]

IMO can look upon the *Paris Agreement* for a guidance with regards to setting targets, the relationship between collective and individual targets, and the process for reviewing progress and ensuring compliance. While doing so, it is yet important to note that the *Paris Agreement* is a treaty between states, and it sets up responsibilities for states for reduction of GHG emissions within those states. IMO on the other hand, doe does not provide legally binding requirements and focuses only on one sector, and therefore shall set targets more directly. [155]

---

[149] Ibidem., p. 67.
[150]Ibidem., p. 68.
[151]Ibidem.
[152] The *Paris Agreement* Art. 4(19).
[153] Aldo Chircop, Meinhard Doelle and Ryan Gauvin, *Shipping and Climate Change*⋯, op. cit., p. 48.
[154] Ibidem.
[155]Ibidem.

4.2. Potential Legal Framework

Aside from the commitments that the IMO has taken on, the pressure to provide substantial outcomes with regards to specific emission reduction requirements is still put on the organization by different actors. "Those pressures range from implicit or explicit policy pressures and legal challenges by other intergovernmental institutions to commercial pressure by progressive industry parties." [156]

4.2.1 Possible action under the *UNFCCC*

Notwithstanding the common consideration that the solution provided in the *Paris Agreement* strengthens the position of the IMO as a competent body for addressing the issue of greenhouse gas emissions from shipping, there is no official assertion of such opinion.

As stated before in section 2.1, the fact that there is no hierarchy in international law creates a difficulty of assigning mandates between regimes and institutions. Furthermore, taking into account the fact that the *Paris Agreement* does not refer to GHG emissions from ships there are no provisions that could preclude the *UNFCCC* from re committing itself to addressing this problem if the IMO is unsuccessful in delivering an effective scheme within reasonable time. Therefore a corresponding regime within the *UNFCCC* could be established on the ground of the existing regulations and it would not necessitate an amendment of its existing mandate. [157]

The *UNFCCC* continues to be the primary regulation responsible for the issue of climate change and it's competent to address "all greenhouse gases not controlled by the Montreal Protocol" coming from "all economic sectors". Moreover, as discussed above, the *Kyoto Protocol* reference to the IMO did not have a result in IMO being the sole competent institution to regulate the issue of GHG emissions from international shipping. Furthermore, the fact that *Paris Agreement* is silent with that regard only indicates that the responsibility for this issue is shared between the two regimes. [158]

Above all, it should be reminded that the goals of the *Paris Agreement* is for the Parties to "reach global peaking of greenhouse gas emissions as soon as possible (…) so as to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century". [159] As stated by Henrik Ringbom "it seems clear that allowing the emissions of shipping to increase by a factor of two or more until 2050[82] would jeopardize the climate goals set by the Paris Agreement and therefore would not be consistent with the agreement." [160]

Currently it is generally acknowledged, also by the climate change regime that the International Maritime Organization is the most suitable institution for tackling greenhouse

[156] Henrik Ringbom, *Regulating Greenhouse Gases from Ships - Some Light at the End of the Funnel?*; 2019, on lie with author, p. 17.
[157] Ibidem., p. 18.
[158] Ibidem.
[159] The *Paris Agreement* Art. 4(1).
[160] Henrik Ringbom, *Regulating Greenhouse Gases from Ships*…, op.cit.,p. 18

gas emissions from international shipping. Measures adopted so far by the IMO (such as EEDI or data collection system) have enhanced organization's position. It seems that the controversy has subsided in relation to the appropriate regulatory body, however maintenance of the general understanding relies upon the future results provided by the IMO with regards to specific reductions of greenhouse gas emissions from the shipping industry.[161]

4.2.2. Unilateral action

Besides global climate regime, also individual actors such as states can develop policies on GHG emissions to urge the adoption of regulation by the IMO and affect specific aspects of their regulation. As Romera points out "such unilateral approaches might increase if significant action at the multilateral level remains out of reach." [162]

Such political approaches also called in the literature as "autonomous interaction management" [163] have two main features with reference to the omission of the GHG emissions from shipping. Firstly, states' activity differs from applications of international mechanisms, since the goal is not to apply international requirements but to address the consequences of coinciding regimes. Secondly, actions taken by the countries are different from their role in participation in negotiations and law-making procedures. [164]

Following the opinion of Romera, as there is no reference to the GHG emissions from shipping in the *Paris Agreement* independent actions can serve the goal of solving conflictive situations between the climate regime and the IMO and encourage action. Such examples already exist, specifically within the environmental field it is worth to note the Canadian Arctic Water Prevention Pollution Act, inciting the adoption of Article 234 of the Law of the Sea Convention or the EU double-hull regulation, which advanced the introduction of double- hull requirements in MARPOL. [165] On the other hand, in some instances as for example the regulation of ballast water discharges, unilateralism can damage the progress in the negotiations because of the related threats and uncertainty.

On the regional level, the European Union (EU) has expressed its concerns with regards to the lack of emissions reduction rules as well as the tempo of progress on IMO's side. The Eu has therefore stated that it may adopt regulations with this regard, if IMO fails to establish

[161] Ibidem.

[162] Beatriz Martinez Romera, *The Paris Agreement*…, op. cit., p. 225.

[163] Sebastian Oberthür, Thomas Gehring, *Institutional Interaction: Ten Years of Scholarly Development*, in: *Managing Institutional Complexity: Regime Interplay and Global Environmental Change.* ed. / Sebastian Oberthür; Olav Schram Stokke. MIT Press, 2011. p. 25-58.; Sebastian Oberthür, *Interplay Management: Enhancing Environmental Policy Integration among International Institutions*, 9:4 International Environmental Agreements: Politics, Law and Economics (2009), p. 371; Harro van Asselt, *The Fragmentation of Global Climate Governance: Consequences and Management of Regime Interactions* (Edward Elgar, 2014).

[164] Beatriz Martinez Romera, *The Paris Agreement*…, op. cit., p. 225.

[165] Ibidem., p. 226.

adequate global standards. Warnings have sometimes been made that specific EU rules may be introduced in this area, if satisfactory global rules cannot be established at IMO.[166]

Up to now, the EU has adopted a three-phased approach for the reduction of GHG emissions from ships: (i) implementing a system for monitoring, reporting and verification of emissions; (ii) the definition of reduction targets for the maritime transport sector; and (iii) the application of a market-based measure in the medium to long term[167]

Worth noting in this regard is adoption by the EU of a monitoring, reporting and verification mechanism for shipping sector [168] that can be perceived not only as means to satisfy the climate obligations, but also to lead to the interaction between the climate regime and the IMO. Similarly, an example could be taken from the aviation sector. Due to the incorporation of aviation in the EU ETS, the ICAO has been encouraged to take initiatives such as the removal of a mutual consent clause and the elaboration of a list of principles that a potential MBM should conform to. It has also motivated the 38th ICAO Assembly to agree to on an MBM to be adopted by 2016. Similarly, adoption of MRV and verification measure in maritime industry has led the IMO towards introducing its own data collection measures as a way to enhance energy efficiency measures in October 2016. Moreover, as mentioned above IMO has also presented the Initial Strategy together with its levels of ambition and a list of short-, mid-, and long-term further measures. [169]

Unilateral actions undertaken by the EU, such as including aviation in the European Trading System and MRV system for shipping industry have of course its advantages and disadvantages. Within the framework of GHG emissions from shipping, unilateral actions provided by the EU can achieve its obligations and press the IMO to act. Nevertheless, unilateral acts will result in burden for the shipping industry as it has to deal with diverse rules around the world.

The EU has proposed to coordinate the two systems, however even it was accepted, "it would not amount to full harmonization between the regional and global regimes." [170]

The main interest of the EU at the moment are the reduction measures. Even though, the EU has been only reviewing the possibility of market- based measures, later it has pointed out the significance of enhancing the requirements connected to the EEDI and SEEMP for example rising of the reduction targets. However, those steps have to be

[166] Henrik Ringbom, *Regulating Greenhouse Gases from Ships…*, op.cit.,p. 21.
[167] COM (2013) 479 final.; Yasuomi Tanaka, *Regulation of greenhouse gas emissions from international shipping and jurisdiction of states*, Review of European Community & International Environmental Law 25, no. 3 (2016): 333–346 p. 343.
[168] Regulation 2015/757/EU of 29 April 2015 on the Monitoring, Reporting and Verification of Carbon Dioxide Emissions from Maritime Transport, and Amending Directive 2009/16/EC, [2015] L123/55.
[169] Beatriz Martinez Romera, *The Paris Agreement…*, op. cit., p. 226.
[170] Henrik Ringbom, *Regulating Greenhouse Gases from Ships…*, op.cit.,p. 23.

taken by the IMO, as no regional alternative is in place, even if the IMO cannot ensure such measures by 2023. [171]

On the other hand, with regards to the market based measures, the EU has presented willingness to develop such mechanism on the regional level.[172]

Eventually, it should be noted that "it is beyond doubt that the EU has certainly been a significant driver in this field at global level to date and a power behind many of the actions at IMO. It has been more vocal than any other source of pressure and has had a major role in advancing the global data collection system at IMO " [173]

Conclusions

Global climate change regime together with the IMO regime have achieved some progress in tackling the issue of greenhouse gas emissions from international shipping. Adopting the Paris Agreement in 2015 constitute a considerable success and the new IMO Initial Strategy sets very ambitious goals for fighting the emissions from international shipping .

However, when several regimes address the same issue, as it is in the case of greenhouse gas emissions from ships, it can give raise to a concern of a conflict between them. This overlap has therefore led to a question of a competent forum to regulate greenhouse gas emissions from international shipping, as well as of principles applying to this issue and emissions reduction target.

Since the omission of greenhouse gas emissions from ships in the Paris Agreement a pressure and expectation of further action from the actors involved has been put on the International Maritime Organization. Through the Initial IMO Strategy, the organisation has taken up that responsibility. IMO is therefore expected to facilitate the determination of the shipping industry's fair contribution consistently with the spirit of the Paris Agreement. If, however IMO fails to develop a substantial regulatory outcome,it shall open the possibilities for an action to be taken by other actors involved.

As to the general rules that should govern the regulation of greenhouse gas emissions from shipping the new IMO Initial Strategy has proved that it is indeed possible to reconcile both the *no more favourable treatment* principle and the *common but differentiated responsibilities* principle. Any further compromise in that matter will require developed countries to take the lead in reducing the emissions and from the developing countries it will require a participation in mitigation actions. That should be represented by incorporating the perspectives of various stakeholders and political leadership.

As for the reduction targets, it is a challenge for the IMO now to set them in line with the Paris Agreement. The IMO Initial Strategy lays down a framework for a provisional pathway

[171] Ibidem.
[172] Ibidem.
[173] Ibidem., p. 24.

for potential future regulation. IMO still needs to specify its commitments and thus therefore implement an ambitious, comprehensive, systematic and reviewable approach towards the greenhouse gas regulation as a long- run learning process in the strategy together with a periodic review to take stock.

While the attention has clearly shifted to the IMO, the process of reducing greenhouse gas emissions from shipping is far from over. A full transparency throughout the global stocktake will be essential to make sure that the sector participates in the fair share of the global action. As the most States that are parties to the climate regime are also member states to the IMO, the could advantage from exploring the possibility to use institutions and tools under the Paris Agreement for market mechanisms, finance and technology to assist with swift and efficient implementation of measures negotiated under the IMO.

In the short and medium term, until technology advance makes it economically feasible for a clear zero- emissions, in order to participate in fair share, the sector has to take further action towards efficiency measures and stimulation of technology development.

Bibliography

Literature

Asariotis Regina, Benamara Hassiba, (2012), *Maritime Transport and the Climate Change Challenge;*

Bodansky Daniel, (2016), *Regulating Greenhouse Gas Emissions From Ships: The Role of the International Maritime Organization;*

Bodansky Daniel, (2016), *The Paris Climate Change Agreement:A New Hope?;*

Chircop Aldo, (2019), *The IMO Initial Strategy for the Reduction of GHGs from International Shipping: A Commentary;*

Chircop Aldo, Doelle Meinhard, (2019), *Decarbonizing International Shipping: Potential Roles of the IMO's Initial Strategy and the UN Climate Regime;*

Chircop Aldo, Doelle Meinhard and Gauvin Ryan, (2018) *Shipping and Climate Change: International Law and Policy Considerations , Special Report,*

Doelle Meinhard, (2016), *GHG Emissions from International Shipping and Aviation: Status after Paris?;*

Faber Jasper, (2012), *Regulated Slow Steaming in Maritime Transport: An Assessment of Options, Costs and Benefits;*

Griffin Andrew, (1994), *MARPOL 73/78 and Vessel Pollution: A Glass Half Full or Half Empty?*

Hackmann Bernd, (2011), *Analysis of the governance architecture to regulate GHG emissions from international shipping;*

Halim Ronald, Kirstein Lucie and Martinez Luis, (2018), *Decarbonization Pathways for International Maritime Transport: A Model-Based Policy Impact Assessment;*

Harris Paul, (1999), *Common but Differentiated Responsibility: the Kyoto Protocol and United States Policy*

Khee- Jin Tan Alan, (2006), *Vessel-Source Marine Pollution: the Law and Politics of International Regulation*

Lee Jae-Gon, (2019), *International Regulations of Greenhouse Gas Emissions from International Shipping, Issues and Possible Responses;*

Martinez Romera Beatriz, (2018), *Regime Interaction and Climate Change, the case of international aviation and maritime transport,*

Martinez Romera Beatriz, (2016), *The Paris Agreement and the Regulation of International Bunker Fuels;*

Oberthür Sebastian, (2003) *Institutional Interaction to Address Greenhouse Gas Emissions from International Transport: ICAO, IMO and the Kyoto Protocol;*

Oberthür Sebastian, (2003), *Interactions of the Climate Change Regime with ICAO, IMO, and the EU Burden-Sharing Agreement,*

Oberthür Sebastian, (2009), *Interplay Management: Enhancing Environmental Policy Integration among International Institutions;*

Oberthür Sebastian, Gehring Thomas, (2011), *Institutional Interaction: Ten Years of Scholarly Development;*

Rajamani Lavanya, (2016), *Ambition and differentiation in the 2015 Paris Agreement: Interpretative Possibilities and Underlying Politics;*

Ringbom Henrik, (2019) on line with author, *Regulating Greenhouse Gases from Ships - Some Light at the End of the Funnel?;*

Shi Yubing (2017) *Climate Change and International Shipping, The Regulatory Framework for the Reduction of Greenhouse Gas Emissions;*

Shi Yubing, Gullett Warwick (2018), *International Regulation on Low- Carbon Shipping for Climate Change Mitigation: Development, Challenges, and Prospects, Ocean Development & International Law*;

Shi Yubing, (2018), *The Implications of the Paris Agreement for the Regulation of Greenhouse Gas Emissions from International Shipping;*

Tanaka Yasuomi, (2016), *Regulation of greenhouse gas emissions from international shipping and jurisdiction of states;*

Ugochukwu Basil, (2017), *Understanding the Challenges of Climate Change Regulation in International Shipping, Conference Report- Halifax, Nova Scotia, March 6, 2017;*

Van Asselt Harro, (2014), *The Fragmentation of Global Climate Governance: Consequences and Management of Regime Interactions*;

Laws and Regulations

Convention on the Inter-Governmental Maritime Consultative Organization, 6 March 1948, entered into force 17 March 1958, as amended and renamed the *Convention on the International Maritime Organization;*

International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), signed 2 November 1973, as amended by the 1978 Protocol to the 1973 Convention, entered into force 2 October 1983;

Kyoto Protocol to the United Nations Framework Convention on Climate Change, opened for signature 16 March 1998, entered into force 16 February 2005;

Paris Agreement, 12 December 2015, entered into force 4 November 2016;

Rio Declaration on Environment and Development, adopted by the United Nations Conference on Environment and Development on 14 June 1992;

United Nations Convention on the Law of the Sea, 10 December 1982, entered into force 16 November 1994;

United Nations Framework Convention on Climate Change, opened for signature 9 May 1992, entered into force 21 March 1994;

Annex 11 Resolution MEPC.304(72), adopted on 13 April 2018, *Initial IMO Strategy on reduction of GHG emissions from ships*;

IMO Resolution Adopted at 1997 Conference of Contracting Governments to MARPOL 73/78 (1997). Resolution 8 "CO2 Emissions from Ships" adopted at 1997 Conference of Contracting Governments to MARPOL 73/78 (1997);

IMO Resolution A.963(23), Adopted on 5 December 2003), IMO Policies and Practices Related to the Regulation of Greenhouse Gas Emissions From Ships, supra note 239 at para 1(d);

Decision 4/CP.1. Methodological issues, The Conference of the Parties, April 7 1995;

Outcomes of the United Nations Climate Change Conferences held in Lima in December 2014 and in Geneva in February 2015, Note by the Secretariat, MEPC 68th Session, Agenda Item 5, IMO Doc MEPC 68/5 (18 February 2015) para. 17.;

Legal Aspects of the Organization's Work on Greenhouse Gas Emissions in the Context of the Kyoto Protocol, note by the Secretariat, IMO Doc MEPC 58/4/20 (1 August 2008);

IMO Secretariat, International Maritime Organisation (IMO), *Main Events in IMO's Work on Limitation and Reduction of Greenhouse Gas Emissions from International Shipping* (2011);

Reports and Studies

Climate Change 2014 Synthesis Report: Summary for Policymakers, Intergovernmental Panel on Climate Change;

IPCC Guidelines for National Greenhouse Gas Inventories (2006), Intergovernmental Panel on Climate Change;

IPCC, 2019: Summary for Policymakers, *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate*.

Second IMO GHG Study, (2009), International Maritime Organization;

Third IMO GHG Study, (2014), International Maritime Organization.