

Fragmentation of Global Environmental Maritime Policies – The case of GHG emission reduction in the international shipping sector.

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Introduction

International shipping has been the lynchpin of international trade and thus could be considered a driving element behind global economic globalization. It were in the end ships that crossed the oceans to deliver the cotton to England, enabling the emergence of the industrial revolution. An industrial revolution that is also at the heart of the historic path of fossil fuel based industrial development of which one unintended side effect has been the emissions of greenhouse gasses (GHG), causing current climate change.

International maritime transport however is not just the historic enabler of GHG emission, now causing adverse impacts to natural and social systems. Ships also considerably emit GHG themselves. According to the Second IMO GHG study 2009 (IMO, 2009a), total shipping emitted 1,046 million tonnes of CO₂, and international shipping emitted 843 million tonnes of CO₂ in 2007. Thus, total shipping accounted for approximately 3.3% and international shipping accounted for approximately 2.7% of the globally emitted CO₂ emissions. To illustrate this amount of emissions, it can be noted that international shipping emissions of 2007 ranked between the 2005 national emissions of India and Germany (Christ, 2009).

Moreover, international shipping emissions are increasing. The IMO (2009) study identifies that, for the time period from 2007 – 2050, due to expected continuous growth in shipping, an annual growth in CO₂ emissions from shipping is estimated to range between 1.1% - 3.4%. Thus, emissions scenarios show that, by 2050, in the absence of regulative policies, emissions from shipping may grow by 150% to 250% (compared to the emissions in 2007).

Remarkably, despite the substantial, and likely strongly increasing contribution of GHG emissions from international shipping and the related adverse impacts on global climate change, GHG emissions from international shipping are neither regulated by the Kyoto Protocol, nor through any other legally binding, internationally accepted regulation (IMO, 2009a; Kageson, 2007).

This paper aims at analysing the current architecture of climate change governance that could have validity for a global policy to regulate GHG emissions from international shipping. First, an analytical tool is applied that has been developed by Biermann et al. (2009) to assess the degree of fragmentation of a given governance structure. We follow the hypothesis of Biermann et al. (2009) that the degree and the characteristics of governance fragmentation can have a crucial impact on the efficiency and performance of a governance system. Second, by using the analytical tool, this paper will analyze to which extent the assessed type of fragmentation influences the climate change governance architecture of international shipping and if the degree of fragmentation might be a crucial reason for the current non-governance of climate change within this sector.

The paper is structured as follows:

Section 2 will provide the analytical foundation for the conceptual framework to assess the degree of fragmentation of the climate change governance architecture of international shipping that is subsequently presented in section 3 and section 4. Section 5 focuses on the analysis of the climate change governance architecture of international shipping, regarding its degree of fragmentation. Finally, in section 6, we assess the degree of fragmentation of the analysed governance architecture and discuss how an efficient climate regime for international shipping could best be established.

Conceptualizing the Typology of Fragmentation of Governance Architecture

Global environmental politics and its governance architectures are characterised by the involvement of an increasing number of institutions, both public, and private on the global, international, regional, national and local level (see Andresen, 2007; Chambers and Green, 2005; Gupta, 2005). Moreover, the involved institutions vary in their character, scope, focus and legal situation (Biermann, 2004; Speth and Haas, 2006). Thus, in order to analyse the performance of spatial and functional architectures within environmental governance structures, it is necessary to analyse the performance of single involved institutions, but also the institutional interplay and the institutional interaction of regime clusters within that governance architecture (Gehring and Oberthür, 2009).

More recently, the aspect of “fragmentation” of governance architectures is turning into the focus of scholars and policy-makers. It is argued that the degree of fragmentation within global governance architectures might play a crucial role in the performance and efficiency of governance architecture in global politics (Biermann et al., 2009; Andresen, 2007). Depending on the academic field of research, the impact of fragmentation of the governance architecture on its performance and efficiency varies from a positive to a rather negative one (see Biermann et al., 2007).

Although, the concept of fragmentation is applied in various scientific fields, for instance within the field of international relations (see Bernstein and Ivanova, 2007) and within the field of international law (see Koskenniemi and Laino, 2002), for this work we apply a definition of the comparatively new approach to fragmentation of global governance architectures according to Biermann et al. (2009): [Fragmentation of global governance architectures is the] “overall institutional setting in which distinct institutions exist and interact”.

Biermann et al. (2007 and 2009) identify three different types of fragmentation, related to a differentiated degree of fragmentation within global governance architectures. Accordingly, the structural characteristic of global governance architecture can either show synergistic or cooperative or conflictive situations of fragmentation. Biermann et al. (2009) conclude, that a cooperative degree of

fragmentation could promote significant benefits but also costs within governance architecture systems, whereas, conflictive constellations are generally been expected to adversely affect the performance and efficiency of a regime cluster. A synergistic degree of fragmentation might even improve the performance of a given governance architecture. However, since these differentiated degrees of fragmentation are derived as ideal types and conceptual tools from a theoretical conceptualisation, real-life governance architectures are unlikely to clearly classify as one ideal type of fragmentation.¹ Thus, boundaries between the three different types of fragmentation are seamless and no clear-cut can easily be identified.

To assess a given governance architecture in order to derive the fragmentation typology within this governance architecture, Biermann et al. (2009) use three major criteria of assessment: 1. The degree of institutional nesting and degree of overlaps between decision-making systems; 2. The existence and degree of norm conflicts; 3. The type of actor constellations. This constellation of three different types of fragmentation and three major criteria results in a matrix, applicable as conceptual tool to help assessing the degree of fragmentation of governance architectures (see Table 1).

Biermann et al. (2009) identify a set of indicators to apply when analyzing the degree of fragmentation along the analytical matrix of three fragmentation types and three major criteria. These indicators are:

A single core institution, regulating the governance performance within one regime cluster can be seen as an indicator for a synergistic degree of fragmentation. Moreover, in a synergistic situation of fragmentation, all involved actors are closely integrated and support the core institution unitarily.

Indicators for a cooperative degree of fragmentation can be found in loosely integrated core institutions within one regime cluster while other key actors remain outside the major institutions. Further, institutional norms and principles may be ambiguous however, their relationship is not conflicting. Pivotal for the cooperative

¹ For the conceptualization of fragmentation of global governance architectures Biermann et al. (2009) highlight three main criteria: 1. Fragmentation is applied as a relative concept. 2. Fragmentation is applied as a value free concept. 3. Fragmentation is evident in more narrowly defined governance architectures.

degree of fragmentation is the categorical willingness of all involved actors and institutions to develop an integrated and cooperative solution within the defined governance architecture.

A governance architecture characterized by different, largely unrelated institutions is a main indicator for a conflictive degree of fragmentation. The institutional landscape in a conflictive situation of fragmentation applies different, even conflicting sets of norms and principles and thus, the key actors in this political area support either one or another institution. Integrated solutions, based on consensus are difficult and almost impossible to reach within this regime cluster.

Table 1: Typology of Fragmentation of Governance Architecture derived from Biermann et al. (2009).

	Synergistic	Cooperative	Conflictive
Institutional Nesting	One core institution, with other institutions being closely integrated	Core institutions with other institutions that are loosely integrated	Different, largely unrelated institutions
Norm Conflicts	Core norms of institutions are integrated	Core norms are not conflicting	Core norms conflict
Actor Constellation	All relevant actors support the same institution	Some actors remain outside main institutions, but maintain cooperation	Major actors support different institutions

This concept of fragmentation is a comparatively new approach. In order to gain more insights on the differentiated degrees of fragmentation of global governance architectures and to provide theory-driven clarification for governance issues due to fragmentation, further empirical studies of fragmentation in policy domains are necessary.

A policy area where policy-makers have recently become more concerned about fragmentation is the field of climate change regulations for the international shipping sector.² The issue of climate change regulations within the international shipping sector is characterized by a high degree of fragmentation and a patchwork of international institutions, treaties and actors (Oberthür, 2003).

² See for example: Roe, 2007; Hackmann, 2009

The following analysis of GHG emissions regulations in the international shipping sector will first introduce the international shipping sector and subsequently assesses the degree and type of fragmentation within this narrowly defined governance architecture applying the concept outlined above. The analysis towards a typology of fragmentation will focus in particular on the three major criteria that for applied to the issue area of international shipping are:

- The degree of institutional nesting and overlaps between decision making systems within the climate governance architecture of the political area of international shipping.
- The existence and degree of norm conflicts within the climate governance architecture of the political area of international shipping.
- The type of actor constellation within the climate governance architecture of the political area of international shipping.

The Governance Architecture of the International Shipping Sector

Since centuries international maritime transport³ has been the lynchpin of international trade and over the past decades international shipping evolved to one of the main drivers of economic globalization and is meanwhile by far the largest means of transport. In 2007, about 80% of the worldwide traded goods in terms of tonnage were carried by vessels (IMO, 2007).

International Shipping - A Globalized Sector

The world's merchant fleet, with its about 100.000 vessels of 100 GT and above, is estimated to have a total volume of about 1.04 billion deadweight tons (dwt) (UNCTAD, 2007). Currently, from its 100.000 vessels about 50.000 vessels are assumed to be trading internationally (The Round Table of international shipping associations, 2008).

³ In this paper the definition of 'international shipping' and 'domestic shipping' that are applied by the IMO for their 'Second IMO GHG Study 2009' and that are consistent with the IPCC guidelines (IPCC, 2006) are used.

International shipping is defined as shipping activities between ports of different countries, whereas military and fishing vessels are excluded (IMO, 2009a).

Domestic shipping is defined as shipping activities between ports of the same country, whereas military and fishing vessels are excluded (IMO, 2009a).

In its latest report 'Review of Maritime Transport 2008' the United Nations Conference on Trade and Development (UNCTAD) describes the international shipping sector and its belonging logistic industries as sectors with favourable perspectives for development, since present progressive globalization processes, that come along with significant reduction in trade barriers and trade tariffs will promote a constant or even increasing future demand for maritime transportation services (UNCTAD, 2008). Accordingly, Grossmann et al. (2007) expect the international shipping sector to grow constantly until the year 2030. Due to a strong correlation of the growth of the world gross domestic product (GDP) and the growth rate of international shipping, Corbett et al. (2007) calculate that international maritime transport will grow with an average growth rate of 4.1% per year until 2030 and thus international shipping activities are expected to double from 2002 by 2030. Although the global economic recession in 2009-2010 affects present shipping activities, it is not expected to have a significant impact on the long-term growth development of the international shipping sector (Christ, 2009).

Governance Architecture in International Shipping

However, maritime transportation is not only a main accelerator of the globalized economy it is also a highly internationalized industry, acting in an increasingly globalized environment (UNCTAD, 2009). Nowadays, the international maritime transportation sector is characterised by highly global operating activities and a mobility of capital, labour and infrastructure (Roe, 2007). As a truly globalized sector, international shipping is not only operating across geographical borders but also across sectoral boundaries. Shipping is dealing with transportation, economic, environmental, safety and climate change aspects within different layers of jurisdiction. A large number of international institutions, treaties and conventions, national legal systems and jurisdictions, as well as a high number of international and national organizations, agencies and actors regulate the various aspects of international shipping and thus create the sum of formal and informal rule systems that govern all issues of the international shipping sector (Hackmann, 2009)⁴, that is, the architecture of international shipping.⁵ This complexity and the globalized character of the international shipping sector as well as the various institutions and

4 An overview of the complexity of international shipping is given by Ehlers, P. and Lagoni, R. (2008): Maritime Policy of the European Union and The Law of the Sea. Lit Verlag, Hamburg.

5 An overview of the complexity of international shipping is given by Ehlers, P. and Lagoni, R. (2008): Maritime Policy of the European Union and The Law of the Sea. Lit Verlag, Hamburg.

actors involved in the governance process cause in some cases serious legal obstacles that influence an efficient governance performance (Roe, 2007; Oberthür, 2003).

At an international level, most aspects of governance and use of international waters⁶ are regulated under the 'umbrella treaty' United Nations Convention on the Law of the Sea (UNCLOS)⁷. UNCLOS establishes laws and regulations and sets guidelines for the marine environment, marine businesses, and the management of natural marine resources. The management of the ocean's use and the management of its resources are based on the establishment of territorial limits and jurisdiction of coastal states (UNCLOS, 1982). Therefore, regional and national regulations can be applied within areas of jurisdiction by each coastal state. Thus, UNCLOS regulates the affairs between states (coastal state and/or flag state) but does not apply directly to individual ships.

Whereas, the International Maritime Organization (IMO) is the United Nations (UN) specialized agency responsible for shipping safety and prevention of marine pollution from ships.⁸ Its major task is to develop and maintain a comprehensive regulatory framework for shipping.⁹ Hence, IMO is responsible for almost all issues of international shipping, which include safety and environmental concerns, legal matters, technical co-operation, maritime security, the efficiency of shipping as well as climate change regulations (IMO, 2009b). Currently, the legislative framework for international shipping consists of 50 conventions and protocols set up by the IMO (IMO, 2009a). Due to the globalized character of international shipping, IMO was established as a multi-issue organization to adopt legislation, valid for the entire shipping sector also in order to minimize conflicts between national laws and to avoid tensions between nations (IMO, 2009a). IMO develops and maintains a comprehensive regulatory framework that has to be implemented through the national governments of the member states. By this means, for a vessel taking part in

6 The main features of the convention are: the setting of territorial limits, navigation issues, economic jurisdiction, legal situation of resources and its management in international waters, the protection of the marine environment, a universally valid marine research regulation, and a binding procedure for settlement of disputes between States (UNCLOS, 1998).

7 The Convention entered into force on November 16 in 1994 and up to now (as at 1st October 2009) 159 countries and the European Community have ratified the Convention.

8 The Convention on the 'International Maritime Organization' entered into force on March 17 in 1958 and up to now (as at 31st October 2009) 169 countries and the European Community have ratified it. Thus 97.2% of the world shipping tonnage is subject to the convention (Lloyd's Register, 2007).

9 All administrative and legal matters related to shipping activities as well as the removal of discriminatory restrictions in shipping to promote the availability of shipping services to the commerce of the world without discrimination are subject of the IMO's area of responsibility (IMO Convention, Article 1).

international shipping, the flag state is obliged to ensure that its vessel complies with international conventions and agreements to which the flag state is party (IMO, 2009a). Moreover, as soon as a country ratifies an IMO instrument, regulations can not only be applied to the vessels under their national flags but also to vessels entering the ports under their jurisdiction (IMO, 2009b). By giving enforcement power to both, the flag-states and the port states, IMO makes sure that one of its leading principle, namely 'no more favourable treatment' can be applied and that all vessels regardless of their flags have to comply with international IMO regulations (Convention of the International Maritime Organization, Article 1 : IMO, 2009b).

However, IMO neither has a sanctioning mechanism nor does it use its authority to enforce its regulations (Campe, 2009). Especially when it comes to problems where multiple (conflicting) principles are involved and conflicts of interests exist, this lack of authority can result in sub-optimal use of scarce resources and solutions and thus in less efficient governance processes.

Having a glance at the international legal frameworks that are set up to govern the international shipping sector, it becomes apparent that nation states remain central to shipping policy, both, through their role at IMO and UNCLOS and through their role as main enforcement and implementation bodies for maritime regulations. While UNCLOS and IMO develop a regulatory framework for international shipping, the regularly control and the legal jurisdiction over a commercial vessel is connected to the country the ship is registered in. The maritime law (UNCLOS) and the IMO ensure every state the exclusive legislative and enforcement jurisdictions over its vessels, as well as its ports and coastal waters (UNCLOS, Part VII, Article 90, 91).¹⁰

The global character, the multitude of involved issues, and the cross-border operations – both geographical and sectoral - make international shipping a truly globalized activity. However, the fact that the activity is complex, multi-layered and cross-boundary, while legally regulated mainly intergovernmental between states and by states only, leads to arising conflicts of interests between involved parties due to new dependences of once separated, territorially defined national actors and national sectors (Campe, 2009). Thus, in international shipping, governance architectures are

¹⁰ According to the conventions a flag state has to ensure and enforce safety at sea, with regard to the vessels construction, its maintenance and seaworthiness as well as with regard to its crew, manning and, general labour conditions (UNCLOS, Part VII, Article 94). Furthermore, a flag state has to establish and enforce international regulations to prevent, reduce, and control pollution of the marine environment (UNCLOS, Part VII, Article 211, 217).

needed that mirror and respond to the complexity and globalized character of this sector and create new interdependencies not just between nation states but between all involved actors on an international level (Roe, 2007). Therefore, international shipping appears to be a policy area where new governance concepts could be successfully applied in order to regulate all issues of this sector. Concepts like the new paradigm of earth system governance (Biermann, 2004; Biermann et. al. 2009).

The problem with non-efficient legal frameworks becomes particularly apparent when it comes to the environmental impact, mainly the contribution to climate change of international shipping. Although, the sector contributes to global warming through the emission of greenhouse gas (GHG) (IMO, 2009), no consistent legal framework regulates fuel consumption or carbon emissions from international shipping (see Kageson, 2007; Oberthür, 2003).

The following section identifies the core institutions within the narrowly defined governance arena for climate change policy for the international shipping sector and shows how the interplay and constellation of these institutions is supposed to regulate the release of GHG emissions in international shipping.

Climate Change Regime of International Shipping

This paper looks into international shipping and its governance architecture for climate change policy. Since international shipping is, as shown before, a truly globalized sector, we define the governance arena to develop and establish efficient climate change policies for this sector as the one on a global scale. Thus, in order to assess the degree of fragmentation, this paper analysis the institutional interplay of the institutions involved in governance at the global level. The two key institutions dominating this governance architecture are the United Nations Framework Convention on Climate Change (UNFCCC) and its belonging secretariat as well as the IMO.

United Nations Framework Convention on Climate Change

The UNFCCC¹¹, its secretariat and all its related legal instruments were set up in order to regulate global GHG emissions and to lead and organize global climate

¹¹ As of 16 October 2009 the Convention on Climate Change is ratified by 194 governments.

change policies (For an overview see Depledge, 2005; Busch, 2009). By its very definition the major objective of the UNFCCC, its secretariat and all its related legal instruments is “[...] to achieve [...] stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” (UNFCCC, 1992, Art. 2). Thus, the international climate regime is not only performing within the environmental sector, its regulations have significant impact on trade, energy and economic issues (Andresen, 2007). Consequently, the UNFCCC and its secretariat play a crucial role within the climate governance architecture of international shipping. In the text of the Kyoto Protocol (KP)¹² the GHG emissions of international shipping are recognized in Article 2.2. It states that “[...] Annex I [countries] 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” (UNFCCC, 1998). Currently, the issue of global sectoral approaches (including international transport) as a framework to regulate GHG emissions that can not be attributed to any particular economy and thus, the regulation of GHG emissions from international bunker fuels¹³ for the time beyond 2012 is addressed by the Ad Hoc Working Group on Long-term Cooperative Action under the Convention (AWG-LCA), a subsidiary body under the Convention (UNFCCC, 2009a, §135 - §138).

By this means, the UNFCCC recognizes GHG emissions from international shipping and its own crucial role in this issue. Certainly, the GHG emissions of international shipping are not part of the national inventories under the Kyoto Protocol and therefore not subject to binding emission reduction targets agreed in the Kyoto Protocol (Oberthür and Ott, 1999). Hence, by shifting the authority to regulate the GHG emissions from international shipping to the IMO, the institution responsible for maritime transport, the UNFCCC establishes a formal link between the two dominant institutions within this governance area. Since, the climate regime could not determine a clear hierarchy amongst the core institutions within the climate governance architecture for international shipping, a regulatory competition between UNFCCC and IMO could arise (Oberthür, 2003).

¹² As of 6 November 2009, the Kyoto Protocol is ratified by 190 governments.

¹³ Emissions from international bunker fuels comprise GHG emissions from international maritime transport and international aviation.

International Maritime Organization

Although IMO was set up to improve safety and efficiency of navigation the prevention of vessel-based pollution of the maritime environment is one of IMO's the major concerns. As stated in Article 1 of the Convention of the International Maritime Organisation¹⁴, the IMO should "[...] encourage the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships; and [...] deal with administrative and legal matters related to the purposes set out in this Article" (IMO, 2009b). The IMO 'International Convention for the Prevention of Pollution of the Sea (MARPOL 73/78)'¹⁵¹⁶ covers the prevention of pollution of the marine environment by ships from operational or accidental causes. 'Annex VI on Prevention of Air Pollution from Ships'¹⁷ to the convention entered into force in May 2005 and was set up in order to deal among others with climate change issues and the regulation of GHG emissions of international shipping. However, no measures and instruments to reduce GHG emissions have been yet included under MARPOL 73/78 Annex VI (IMO, 2009b). As with other IMO conventions and regulations, MARPOL 73/78 addresses all vessels of states that signed and ratified the convention. In order to deal with all environmental issues related to the prevention and control of pollution from ships, the IMO established the Marine Environment Protection Committee (MEPC) which received its full constitutional status in 1985. The MEPC is responsible for the adoption and amendment of conventions and other regulations and measures to protect the maritime environment (Oberthür, 2003). This includes the responsibility of the MEPC for the regulation of GHG emissions by international shipping. This is stressed by the IMO's Assembly resolution A.963 (23) on 'IMO Policies and Practices Related to the Reduction of Greenhouse Gas Emissions from Ships' (IMO, 2003). At their latest session in July 2009 (MEPC 59), the MEPC agreed to "disseminate a package of interim and voluntary technical and operational measures to reduce greenhouse gas (GHG) emissions from international shipping; and also agreed a work plan for further consideration, at future meetings, of proposed market-based instruments to provide incentives for the shipping industry" (IMO, 2009c).

14 As of 31 October 2009 the Convention of the International Maritime Organization is ratified by 168 governments (97.22% of the world's tonnage) (IMO, 2009b).

15 International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), entered into force 2 October 1983 (IMO, 2009b).

16 As of 31 October 2009 the MARPOL 73/78 Annex I+II is ratified by 150 governments (99.14% of the world's tonnage) (IMO, 2009b).

17 MARPOL 73/78 Annex VI is ratified by 57 governments (83.59% of the world's tonnage) (IMO, 2009b).

Although, economics and marine environmental protection, as two areas of the shipping sector, often evoke conflicts of interests, the IMO is, due to its convention, obliged to treat both issues in the same manner. However, IMO was established to support governmental regulation relating to technical matters and to foster international trade without discrimination (IMO, 2009b). Therefore, a sufficient network with contacts to the entire shipping industry as well as to political decision makers was established. This matured network with its excellent contacts to the shipping industry are still of outstanding importance for the IMO. These network can be considered denser than the network and contacts between IMO and environmental non-governmental organizations (Campe, 2009). Moreover, Campe (2009) emphasizes that IMO secretariat works indeed efficient when it comes to maritime safety or technical issues, but it has yet not been a very active player in the environmental discussion. Oberthür (2003) even stresses, that IMO should not be necessarily expected to initiate action on climate change of their own accord. Further, Oberthür (2009) states that action on GHG emissions and climate change issues within the IMO have only been encouraged in response to the Kyoto Protocol. Thus, IMO's organizational structure and its operative strategy are yet not designed to protect and prevent the maritime environment sufficiently.

Analyzing the Climate Change Governance Architecture in the International Shipping Sector

Methodology

To qualitatively analysis the degree of fragmentation in climate governance of the international shipping sector, primary sources, such as published documents of the UNFCCC Secretariat and the IMO, the institutions' websites as well as secondary sources, such as academic studies were examined. In addition to the desktop study a series of interviews was conducted (The interviews are not authorized yet). The qualitative interviews were held with experts from international organizations, national administration, and representatives of the shipping industry¹⁸. The interviews were addressing the issue of fragmentation in general, how the degree of fragmentation could develop, and whether this fragmentation could be considered a limitation to

¹⁸ Due to reasons of anonymity, names and positions of the interviewed experts are not shown.

effectively constrain GHG-emissions from international shipping by an international binding policy. In order to be able to use the results of this analysis in a future conceptual framework and to compare the findings with climate change architectures and their degrees of fragmentation in different fields of governance, half-standardized interviews were used. The expert interviews were conducted personally with only one person interviewed at a time.

Complementary to the desktop study and the interviews participatory observation was conducted by the author, to gain insights in the decision making structure of the analyzed institutions by participation in climate change negotiations, and experiencing daily business procedures. Most valuable background knowledge of the analyzed contexts could be gained this way.

Assessing the degree of fragmentation within the climate governance architecture of international shipping

When analysing the climate change architecture of international shipping regarding its *degree of institutional nesting and overlaps between decision-making systems* it becomes apparent, that two major institutions dominate this regime, namely IMO and UNFCCC climate regime. The regulation of GHG emissions from international shipping falls within the scope of both the conventions underlying UNFCCC and IMO (Oberthür, 2003). The relationship and the institutional interplay between both key institutions are regulated (unilaterally) in the Kyoto Protocol (KP). By asking the IMO to regulate GHG emissions from international shipping, the KP shifts the responsibility as well as the jurisdiction to the IMO (KP §2.2). However, IMO started to consider effective actions to regulate GHG emissions only in response to the Kyoto Protocol (Oberthür, 2003) and a proactive acting throughout the last years could not be noticed.¹⁹ However, the link through the KP does not establish a strict hierarchy between the two institutions, particularly since a successor agreement to the KP needs to be negotiated for post 2012 and the issue of GHG emissions from international bunker fuels is already part of the discussions under the AWG-LCA (UNFCCC, 2009a). Thus, neither the IMO nor the UNFCCC climate regime possesses an absolute authority to regulate the GHG emissions from international shipping.²⁰ Current discussions show (at MEPC and AWG-LCA) that, both institutions

¹⁹ Author's interview within the responsible institution, not authorized yet.

²⁰ Author's interview within the responsible institution, not authorized yet.

claim the solely authority to regulate GHG emissions from international shipping.²¹ Due to its convention and its global mandate, IMO claims to be the solely institution responsible for regulations of GHG emissions from international shipping (IMO, 2009a). The latest discussions during MEPC 59²² show that many member states agree that IMO should be the responsible institutions but decisions on GHG regulations should be in line with the UNFCCC regime.²³ Whereas, latest discussions at AWG-LCA (UNFCCC, 2009b) show that the opinion of proposing parties vary from: IMO being solely responsible for GHG emissions from international shipping; to UNFCCC regime encourages IMO to establish long-term reduction goals and apply suitable measures; IMO should be reporting to and guided by the UNFCCC regime; to UNFCCC regime sets global emission reduction targets for international shipping whereas IMO is responsible to provide and regulate the application of suitable measures.²⁴

The analysis of the climate change governance architecture of international shipping regarding its degree of institutional nesting shows that the situation can be best described as cooperative. There are two loosely integrated core institutions within one governance architecture that are slightly competing for a clear hierarchy and authority over the issue. Depending on the outcome of the current discussions a tendency towards a synergetic degree of fragmentation with only one core institution is possible.

Analysing the governance architecture of international shipping regarding the existence and *degree of norm conflicts* it becomes apparent that the two key institutions apply two conflicting sets of core principles. While the UNFCCC climate regime is based on the core norm of 'common but differentiated responsibilities' (CBDR), the IMO applies its major principle which is commonly referred to as 'no favourable treatment'. According to the climate change convention's article 3.1 (UNFCCC, 1992), the UNFCCC regime's major principle recognizes the differences in the contributions of developed and developing countries in addressing global environmental issues (See: Depledge, 2005; Busch, 2009). Whereas, the UNFCCC

21 Author's interview within the responsible institution, not authorized yet.

22 Details on the MEPC 59 agenda and papers for the MEPC 59 available on: www.imo.org (01.11.09)

23 Consider e.g. MEPC 59/4; MEPC 59/4/5; MEPC 59/4/16; MEPC 59/4/17; MEPC 59/4/18; MEPC 59/4/25; MEPC 59/4/26; MEPC 59/4/34; MEPC 59/4/35

24 Author's interview within the responsible institution, not authorized yet.

regime differentiates between the obligations of its member countries, the IMO, in order to prevent loopholes and an undermining of its globally applied regulations, applies all regulations equally, according to article 1 of the Convention of the International Maritime Organization (IMO, 2009b). The existence of these two leading but conflicting core norms of the major international institutions in the climate change governance architecture of international shipping lead to a deadlock on regulating GHG emissions of this sector efficiently.²⁵ The situation in terms of fragmentation based on the major indicator of norms and principles can thus best be described as conflictive, as two institutions apply two conflicting sets of core principles.

Analysing the governance architecture of international shipping regarding its *type of actor constellation* it is obvious that besides the two key actors, the UNFCCC and the IMO, member states are additional actors. Interestingly, most states are signatories to both the IMO and the UNFCCC,²⁶ But do not act consistent in their positions within each institution.²⁷ The current discussions at MEPC 59²⁸ and AWG-LCA (UNFCCC, 2009b) show this deadlock. A number of countries argue that due to the global mandate of IMO, a regulatory framework on GHG emissions of international shipping should be applicable to all ships, irrespective of the flags they fly. Whereas, some national delegations have expressed the opinion that any measures to reduce GHG emissions of international shipping to be adopted by IMO should only be applicable to Annex I parties to the UNFCCC and its Kyoto Protocol, in accordance with the principle of "common but differentiated responsibility" (IMO, 2009a; UNFCCC, 2009b). While other delegations express the view that reduction of emissions related to international shipping should be either regulated solely through the IMO or solely through the UNFCCC regime.²⁹ Since, the different regulatory frameworks were set up independently, an integration of the major principles and thus an integration of all actors towards a unified climate change governance structure of international shipping could not be established (Oberthür, 2003).³⁰ However, the willingness to

25 Author's interview within the responsible institution, not authorized yet.

26 The Convention on Climate Change is ratified by 194 governments and the European Commission (as of 16 October 2009) and the Kyoto Protocol is ratified by 190 governments and the European Commission (as of 6 November 2009). As of 31st October 2009 the Convention on the International Maritime Organization is ratified by 168 countries and the European Commission (97.2% of the world shipping tonnage), MARPOL 73/78 Annex I+II is ratified by 150 governments and the European Commission (99.14% of the world's tonnage) and MARPOL 73/78 Annex VI is ratified by 57 governments and the European Commission (83.59% of the world's tonnage).

27 Author's interview within the responsible institution, not authorized yet.

28 Details on the MEPC 59 agenda and papers for the MEPC 59 available on: www.imo.org (01.11.09)

29 Author's interview within the responsible institution, not authorized yet.

30 Author's interview within the responsible institution, not authorized yet.

reach a common solution and set up an efficient climate change regime for international shipping can be sensed in the ongoing discussions at MEPC 59³¹ and AWG-LCA (UNFCCC, 2009b). In regard to fragmentation, the above reveals that the situation can neither be described as cooperative only, nor as just conflictive. The governance architecture is characterized by an actor constellation on one hand shows indications of a cooperative degree of fragmentation, such as the general acceptance of the climate change issue and the willingness to establish an integrated climate change regime. On the other hand it shows characteristics of conflictive degree of fragmentation, such as that actors support different core principles and thus favour different institutions.

Degree of fragmentation of the global climate governance architecture of international shipping

The application of the tool Biermann et al. (2009) provide to assess the degree of fragmentation of a given global governance architecture on the governance structure of international shipping shows, that a definite categorization is not possible. The governance architecture of international shipping shows indicators of a cooperative type of fragmentation as well as indicators of a conflictive type of fragmentation. Provided that during future discussions on the responsible institution and thus the leading principle at both the MEPC and the AWG-LCA, a clear arrangement is set and a hierarchy is developed, the type of fragmentation could even tend more towards a synergetic degree of fragmentation.

Conclusion and Future Challenges

The governance architecture of international shipping shows a cooperative and a conflictive type of fragmentation, nonetheless, the overall architecture of climate governance for international shipping, at present, can be best characterized as conflictive fragmentation. The climate change issue is a major concern for the majority of all actors, including the industry.³² The barrier for integrated climate change regulations can be seen in the conflicting core principles of the two major institutions, UNFCCC and IMO.

³¹ Details on the MEPC 59 agenda and papers for the MEPC 59 available on: www.imo.org (01.11.09)

³² Author's interview within the responsible institution, not authorized yet.

In line with Biermann et al. (2009), the predominant conflictive degree of fragmentation within the climate change governance architecture of international shipping adversely affects the performance and efficiency of the regime cluster and thus constraints an integrated regulation of GHG emissions from international shipping.

The analysis as well as the interviews with representatives of involved institutions show, that the degree of fragmentation arose due to different, conflicting core principles of the two involved institutions. Reason for this situation can be found in a deep-rooted conflict of interests due to the originally intended purpose of the involved institutions (Oberthür, 2003; Campe, 2009; Busch, 2009). Whereas, the UNFCCC regime was set up to regulate global GHG emissions and to lead and organize global climate change policies (UNFCCC, 1992) the IMO was established to support governmental regulation relating to technical matters and to foster international trade without discrimination (IMO, 2009b).

Since, both leading conventions were set up independently, in succession and not integrated, in order to generate an integrated institutional interplay, co-ordination between the UNFCCC regime and the IMO is strongly needed (Oberthür, 2003, Campe, 2009)³³. At present, the co-operation between the two institutions only exists in reciprocal exchange of information and a reciprocal participation in relevant meetings. The exchange of information is not regulated through any institutional measure and occurs not proactive but only on demand.³⁴ A co-ordinating committee or inter-institutional working group consisting of delegates of the UNFCCC regime, the IMO and other core actors, such as the shipping industry, NGO's and state unions could serve as an institutional mechanism to integrate both leading institutions and all involved core actors towards an efficient governance architecture to regulate climate change issues of international shipping.³⁵

Moreover, further institutional work and research should focus on how to integrate different sets of leading principles of international institutions towards integrated approaches. Therefore, focussing on the integration of climate change governance

³³ Author's interview within the responsible institution, not authorized yet.

³⁴ Author's interview within the responsible institution, not authorized yet.

³⁵ Author's interview within the responsible institution, not authorized yet.

architecture in international shipping, could function as a role model since, a solution needs to be tailored for a global environmental problem within a truly globalized economic sector. Thus, intensified research on the described issue, the integration of international environmental institutions and regimes as well as the international institutional interplay can benefit.

Acronyms

AWG-LCA	Ad Hoc Working Group on Long-term Cooperative Action
BMVBS	German Federal Ministry of Transport
CBDR	Common But Differentiated Responsibilities
Dwt	Deadweight tonnage
EC	European Commission
EU	European Union
FoC	Flag of Convenience
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GT	Gross Tonnage
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
MARPOL 73/78	International Convention for the Prevention of Pollution of the Sea
MEPC	Marine Environment Protection Committee
OECD	Organisation for Economic Co-operation and Development
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNFCCC	United Nations Framework Convention on Climate Change

References:

Andresen, S. (2007): The effectiveness of UN environmental institutions. *International Environmental Agreements*, No 7, p. 317-336, Springer, Berlin.

Bernstein, S./ Ivanova, M. (2007): Institutional Fragmentation and Normative Compromise in Global Environmental Governance: What Prospects for Re-embedding? In: Bernstein, S./ Pauly, L.W. (eds.) (2007): *Global Liberalism and Political Order: Towards a New Grand Compromise?*. P. 161-185. State University of New York Press, New York.

Biermann, F./ Pattberg, P./ Asselt von, H./ Zelli, F. (2009): The Fragmentation of Global Governance Architectures: A Framework for Analysis. Forthcoming in: *Global Environmental Politics*, Volume 9, number 4, MIT Press, Cambridge.

Biermann, F./ Siebenhuener, B. (2009): *Managers of Global Change - The Influence of International Environmental Bureaucracies*. The MIT Press, Cambridge.

Biermann, F./ Pattberg, P./ Asselt von, H./ Zelli, F. (2007): The Fragmentation of Global Governance Architectures: The case of Climate Policy. *Global Governance Working Paper 34*, Amsterdam.

Biermann, F. (2007): Earth system Governance as a crosscutting theme of global change research. *Global Environmental Change*, Volume 17, Page 326 – 337, Elsevier.

Biermann, F. (2004): *Global Environmental Governance. Conceptualization and Examples*. *Global Governance Working Paper 12*, Amsterdam, Berlin, Oldenburg, Potsdam: The Global Governance Project. Available at: www.glogov.org.

Busch, P. O. (2009): The Climate Secretariat: Making a Living in a Straitjacket. In: Biermann, F./ Siebenhuener, B. (2009): *Managers of Global Change - The Influence of International Environmental Bureaucracies*. The MIT Press, Cambridge.

Campe, S. (2009): The Secretariat of the International Maritime Organization: A Tanker for Tankers. In: Biermann, F./ Siebenhuener, B. (2009): *Managers of Global Change - The Influence of International Environmental Bureaucracies*. The MIT Press, Cambridge.

Carlin, E. M. (2001): Oil Pollution from Ships at Sea: The Ability of Nations to Protect a Blue Planet. In: Miles, E. L./ Underdal, A./ Steinar, A/ Wettestad, J./ Skjærseth, J. B./ Carlin, E. M. (2001): *Environmental Regime Effectiveness - Confronting Theory with Evidence*. The MIT Press, Cambridge.

Chambers, W. B./ Green, J. (eds.) (2005): *Reforming International Environmental Governance: From Institutional Limits to Innovative Reforms*. UN University Press, Tokyo.

Corbett, J. J./ Wang, C./ Winebreak, J. J./ Green, E. (2007): Allocation and Forecasting of Global Ship Emissions. Prepared for the Clean Air Task Force, Boston.

Corbett, J. J./ Winebrake, J. J./ Green, E. H./ Kasibhatla, P./ Eyring, V./ Lauer, A. (2007): Mortality from Ship Emissions: A Global Assessment, *Environmental Science and Technology*, No. 41, doi: 10.1021/es071686z.

Christ, P. (2009): Greenhouse Gas Emission Reduction Potential from International Shipping. OECD/ITF Joint Transport Research Centre Discussion Papers, 2009/11, OECD Publishing.

Depledge, J. (2005): *The Organization of Global Negotiations: Constructing the Climate Change Regime*. Earthscan, London.

EDGAR (2008): MNP / Emission database for global atmospheric research. On: www.mnp.nl/edgar/.

Ehlers, P. and Lagoni, R. (2008): *Maritime Policy of the European Union and The Law of the Sea*. Lit Verlag, Hamburg.

Eyring, V./ Koehler, H. W./ van Aardenne, J./ Lauer, A. (2005): Emissions from international shipping: 1. The last 50 years, *J. Geophys. Res.*, No. 110,

Eyring, V./ Corbett, J. J./ Lee, D. S./ Winebrake, J. J. (2007): Brief summary of the impact of ship emissions on atmospheric composition, climate, and human health. Document submitted to the Health and Environment sub-group of the International Maritime Organization on 6 November 2007.

Gehring, T./ Oberthür, S. (2009): Interplay: Exploring Institutional Interaction. In: Young, O.R./ King, L.A./ Schroeder, H. (eds.) (2009): *Institutions and Environmental Change: Principal Findings, Applications, and Research Frontiers*. p. 187-224. MIT Press, Cambridge.

Grossmann, H./ Otto, A./ Stiller, S./ Wedemeier, J. (2007): *Growth Potential for Maritime Trade and Ports in Europe*. *Intereconomics* 4, Springer, Heidelberg/ Berlin.

Gupta, J. (2005): Global Environmental Governance: Challenges for the South from a Theoretical Perspective. In: Biermann, F./Bauer, S. (eds.) (2005): *A World Environment Organization: Solution or Threat for Effective International Environmental Governance?*. p. 57-83, Ashgate Publishing, Hants and Burlington.

Hackmann, B. (2009): *The Maritime Transportation Sector – A Sectoral Analysis*. In: Hackmann, B. (2009): *International experience on tradable permit systems in the transportation sector*. European Commission, Joint Research Center, Office for Official Publications of the European Communities, Luxembourg.

Koskenniemi, M./ Leino, P. (2002): Fragmentation of International Law? Postmodern Anxieties. P. 553–579, *Journal of International Law* 15(3), Leiden
Impact of fragmentation

Lloyd's Register (2007): World Fleet Statistics. Fairplay Publishers, London, UK.

Psarafitis, H. N./ Kontovas, C. A. (2009): Co2 Statistics for the World Commercial Fleet. WMU Journal of Maritime Affairs, Forthcoming, World Maritime University.

IMO (2009a): Second IMO GHG Study 2009, International Maritime Organization, London.

IMO (2009b): IMO – Conventions. On:
http://www.imo.org/Conventions/mainframe.asp?topic_id=148 (01.11.2009).

IMO (2009c): IMO - Greenhouse Gas Emissions. On:
http://www.imo.org/Environment/mainframe.asp?topic_id=1737 (01.11.2009).

IMO (2007): International Shipping and World Trade – Facts and Figures. IMO Library Services, London.

IMO (2000): IMO Study on Greenhouse Gas Emissions from Ships, International Maritime Organization, London.

IMO (2003): IMO Policies and Practices Related to the Reduction of Greenhouse Gas Emissions from Ships. Assembly Resolution A.963(23), International Maritime Organization, London.

IPCC (2006): Guidelines for National Greenhouse Gas Inventories Volume 2: Energy. IPCC National Greenhouse Gas Inventories Programme, Technical Support Unit, Institute for Global Environmental Strategies, Japan.

Kågeson, P. (2007): Linking CO2 Emissions from International Shipping to the EU ETS. Commissioned by the Federal Environment Agency Germany, Stockholm.

Oberthür, S. (2003): Institutional interaction to address greenhouse gas emissions from international transport: ICAO, IMO and the Kyoto Protocol. Climate Policy, Volume 3, Page 191 – 205, Elsevier.

Oberthür, S./ Ott, H.E. (1999): The Kyoto Protocol. International Climate Policy for the 21st Century. Springer, Berlin.

Roe, M. (2007): Shipping, Policy and Multi-Level Governance. Maritime Economics and Logistics, Volume 9, Page 84 – 103, Palgrave.

Speth, J. G./ Haas, P.M. (2006): Global Environmental Governance. Island Press, Washington, D.C.

The Round Table of international shipping associations (2008): Shipping and World Trade. Available on www.marisec.org/shippingfacts

TRT Trasporti e Territorio Srl (2007): External Costs of Maritime Transport. Prepared for the European Parliament's Committee on Transport and Tourism, European Parliament, Brussels.

UNCLOS (1998): United Nations Convention on the Law of the Sea – A historic perspective. On: www.un.org/Depts/los/convention_agreements/convention_historical_perspective.htm.

UNCLOS (1982): United Nations Convention on the Law of the Sea. United Nations, Geneva, Switzerland.

UNCTAD (2008): Review of Maritime Transport 2008. United Nations Publication, New York/ Geneva.

UNCTAD (2007): Review of Maritime Transport 2007. United Nations Publication, New York/ Geneva.

UNFCCC (1992): United Nations Framework Convention on Climate Change, United Nations, Geneva.

UNFCCC (1998): The Kyoto Protocol to the United Nations Framework Convention on Climate Change, United Nations, Bonn.

UNFCCC (2009a): Revised Negotiation text. III. Enhanced action on mitigation, §135 - §138, International bunker fuels. United Nations, Bonn.

UNFCCC (2009b): Cooperative sectoral approaches and sector-specific actions. AWG-LCA, Non-paper No 49, Draft text proposed by the facilitator (06/11/09), United Nations, Bonn.