Marine Pollution Bulletin 113 (2016) 187–192

Contents lists available at ScienceDirect

Marine Pollution Bulletin

journal homepage: www.elsevier.com/locate/marpolbul

Are greenhouse gas emissions from international shipping a type of marine pollution?

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ARTICLE INFO

Article history:
Received 30 May 2016
Received in revised form 29 August 2016
Accepted 6 September 2016

Keywords:
Greenhouse gas
CO_2
International shipping
Marine pollution

ABSTRACT

Whether greenhouse gas emissions from international shipping are a type of marine pollution is a controversial issue and is currently open to debate. This article examines the current treaty definitions of marine pollution, and applies them to greenhouse gas emissions from ships. Based on the legal analysis of treaty definitions and relevant international and national regulation on this issue, this article asserts that greenhouse gas emissions from international shipping are a type of 'conditional' marine pollution.

1. Introduction

Urgently combating climate change and its impacts is one of the goals set by the 2030 Agenda for Sustainable Development (UNGA, 2015). To limit climate change requires 'substantial and sustained reduction of greenhouse gas emissions' (GHGs) (IPCC, 2013). International shipping is the backbone of global trade and a driving force of economic globalisation (Buhaug et al., 2009; UNCTAD, 2012). Although often recognised as a comparatively environmentally sound method of transportation (e.g., Pisani, 2002), international shipping makes a significant and growing contribution to climate change (Buhaug et al., 2009). In 2007, CO_2 emissions from international shipping reached 870 million tonnes, 2.7% of global CO_2 emissions (Buhaug et al., 2009). Although this percentage has declined to 2.2% following the global financial crisis in 2008, it is projected by the 'Third IMO GHG Study 2014' that shipping CO_2 emissions will increase significantly in the coming decades and improving energy efficiency of shipping is thus vital in addressing this problem (Smith et al., 2014). Given the urgency of emissions reduction and the global nature of the shipping industry, the international community has responded to this imperative and begun to develop a regulatory framework.

The question of whether GHG emissions from international shipping are a type of marine pollution is controversial and fiercely debated. It is also important to identify the nature of shipping GHG emissions so as to narrow the current divergences on this issue. Furthermore, GHG emissions, if treated or regulated as a type of marine pollution, may trigger the application of many pollution-related treaties to the reduction of GHG emissions from ships. This article first introduces some background on negotiations on GHG emissions from ships, and then examines the treaty definitions of marine pollution. It then applies these definitions to GHG emissions from international shipping, and draws a conclusion after investigating national legislation on this issue.

2. Background on negotiations on GHG emissions from ships

To date the United Nations Framework Convention on Climate Change (UNFCCC, 1992) and the International Maritime Organization (IMO) have been the main bodies working on the regulation of GHG emissions from international shipping. The UNFCCC process mainly discusses the regulatory principles of regulating this GHG emissions issue. From 1995 to 1996 the UNFCCC's Subsidiary Body on Scientific and Technological Advice (SBSTA) discussed the allocation of emissions from marine bunker fuels to countries, which aimed to include the GHG emissions from international shipping into the State-based Kyoto Protocol (Kyoto Protocol, 1998; Oberthür, 2003). This effort failed in reaching consensus among States. From 2008 to 2012, the Ad-Hoc Working Group on Long-term Cooperative Action (AWG-LCA) discussed regulatory principles of reducing emissions from international bunker fuels. However, nothing was achieved in this time frame. After that the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) under the UNFCCC worked on negotiating the global climate change agreement that would be adopted by December 2015 and would enter into force from 2020. To that end, at the Geneva Climate Change Conference in February 2015, States agreed on the 'Negotiating Text' for the Paris Climate Agreement (Nov/Dec 2015). The text endorsed the setting of reduction targets and the establishment of a levy scheme for the international shipping sector (Lima Outcomes,

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http://dx.doi.org/10.1016/j.marpolbul.2016.09.014
0025-326X/

2015). However, these contents were eventually deleted from the 'Negotiating Text' and the Paris Agreement adopted on 12 December 2015 does not include the reduction of GHG emissions from international shipping.

The IMO has been working on the regulation of this issue from three routes, namely technical, operational and market-based approaches (Kyoto Protocol, 1998; IMO, 2011b). After lengthy deadlock of negotiations on shipping GHG emissions within the IMO, shipping GHG emissions were partially regulated by technical and operational measures on 15 July 2011. This regulation takes the form of amended Annex VI to the International Convention for the Prevention of Pollution from Ships (MARPOL, 1973, 1978). By adding a new Chapter 4 to Annex VI on the regulation on energy efficiency for ships, this amendment makes mandatory the Energy Efficiency Design Index (EEDI) for new ships, and the Ship Energy Efficiency Management Plan (SEEMP) for all ships. As the main technical measure, the EEDI provides a specific figure representing a minimum energy efficiency level or technological threshold for certain ship types and size segments. Ship designers and shipbuilders are free to choose the most cost-efficient technological solutions for the ship once the minimum energy efficiency level required by the EEDI is achieved. The SEEMP is an operational measure. As a ship-specific energy management plan, the SEEMP provides a flexible mechanism for shipowners and ship operators to monitor ship and fleet efficiency performance over time in a cost-effective manner. The Energy Efficiency Operational Indicator (EEOI) is often used as a monitoring tool and to establish benchmarks related to ships' energy efficiency. Since this regulation was adopted by a majority voting rather than a consensus, it is predicted that the future enforcement of this regulation will face certain challenges and uncertainties (e.g., Harrison, 2012; Karim and Saiful, 2011; Shi, 2014). The lack of a consensus on reaching this amendment could be attributed to many factors, but whether GHG emissions from international shipping should be regarded as a type of pollution was one of them.

Three options were available to the IMO's Marine Environment Protection Committee (MEPC) with regard to the form of the instrument to be adopted for regulating GHG emissions from international shipping by means of technical and operational measures. They were an amendment to Annex VI of MARPOL 73/78, Annex VII to MARPOL 73/78, and a new international convention (IMO, 2008). Among many countries, large developing countries, such as China, Saudi Arabia and South Africa, strongly opposed an amendment to MARPOL Annex VI as the legal format for regulating this GHG issue. They argued that CO_2 is not a pollutant and should not be included in the Annex of MARPOL 73/78 where severe air pollutants are addressed (IMO, 2010a). Besides, CO_2 is a GHG with cumulative effects, which does not match the definition of 'harmful instances' as indicated in Article 1 of the MARPOL 73/78 (IMO, 2011a). In other words, regulating this GHG issue within the MARPOL Annex VI is inconsistent with MARPOL 73/78′s objectives (MARPOL, 1973, 1978). Furthermore, regulating the energy efficiency measures in MARPOL Annex VI would cause 'tremendous domestic legal obstacles' for some countries, and make their future implementation and enforcement questionable (IMO, 2010b).

Concerning the form of the instrument to be adopted for regulating shipping GHG emissions, Japan insisted that these measures should be adopted as a new part to MARPOL Annex VI (Japan, Norway and the United States, 2010). It explained that MARPOL Annex VI can provide a similar legal basis for the mandatory EEDI scheme with its 'well-established and workable practices'; and it is also the quickest way to make the mechanism work due to the tacit acceptance procedure (MARPOL, 1973, 1978). Japan's view on this matter has been supported by some developed countries such as Denmark, Norway and the US (e.g., IMO, 2010c). However, the United Kingdom, another UNFCCC Annex I State, disagreed with Japan. Rather, it suggested developing an independent convention under the auspices of the IMO (IMO, 2008). From the UK's perspective, GHG is not a pollutant 'in the same sense as those emissions currently governed by MARPOL 73/78' and it has 'a global rather than local/regional impact' (IMO, 2008). This view is consistent with China's position on the legal from to be adopted to regulate energy efficiency measures.

3. The concepts of 'pollution' and 'marine pollution'

There is no uniform definition of 'pollution' in international law (Russell, 1974; Sullivan, 1984). The term 'pollution' is used with different meanings depending on differing contexts and purposes (Birnie et al., 2009). It commonly refers to 'the environmental damage caused by wastes discharged into the sea', or 'the occurrence of wastes in the sea', or 'the wastes themselves' (Clark, 2001). There are different categories of pollution, such as air pollution, water pollution and soil pollution. Regarding GHG emissions from international shipping, the most relevant concepts are marine pollution and air pollution which will be examined in this section.

Annex VI to MARPOL 73/78 provides that '*[e]mission* means any release of substances subject to control by this Annex from ships into the atmosphere or sea' (MARPOL, 1973, 1978). According to this definition, GHG emissions from international shipping, as a type of substances, may be emitted into the atmosphere or/and sea. Two scenarios exist. In the first scenario, GHG emissions, once emitted into the atmosphere, may pollute the air and become air pollutants. In the second scenario, GHG emissions may cause ocean acidification and influence marine ecosystems negatively. Given the ocean's role as a carbon sink, growing CO_2 levels from ships leads to enhanced absorption of CO_2 into the surface water of the ocean. As the CO_2 dissolves into the seawater and acts as a weak acid, the carbonates in the ocean are reduced (Currie and Wowk, 2009). This chemical process is known as ocean acidification. The impacts of ocean acidification on marine ecosystems and biodiversity are profound (Logan, 2010), based on which GHG emissions from ships may be regarded as a type of marine pollution. For the purpose of this article, only the second scenario is examined.

Treaty definitions of 'marine pollution' have expanded over time. Among various definitions, two typically reflect a change of views over time by the international community. One example is the narrow definition of 'marine pollution' initially adopted by the Joint Group of Experts on Scientific Aspects of Marine Pollution (GESAMP) in 1969. Under the GESAMP definition, 'marine pollution' means

'the introduction by man, directly or indirectly, of substances into the marine environment (including estuaries) *resulting in* such deleterious effects as *harm to living resources*, hazards to human health, hindrance to *marine activities including fishing*, impairment of quality for use of sea water and reduction of amenities.' (GESAMP, 1969) [emphasis added]

This definition was adopted by the 1972 Stockholm United Nations Conference on the Human Environment and the 1976 Barcelona Convention for the Protection of the Mediterranean Sea against Pollution but added the words 'or energy' after the word 'substances' (CPMSAP, 1976; See Hassan, 2006). The 1974 Paris Convention on Prevention of Marine Pollution from Land-based Sources developed this definition by expanding the scope of harms to 'marine ecosystems and other legitimate uses of the sea' (CPMPLS, 1974). Generally the definitions of pollution in the above conventions encompass a comparatively narrow scope of harms to the marine environment.

Subsequently, a broader definition of pollution was adopted by treaties such as the 1979 Geneva Convention on Long-Range Transboundary Air Pollution (CLRTAP, 1979), and the 1982 United Nations Convention on the Law of the Sea (LOSC, 1982). Under this later definition, 'pollution (of the marine environment)' refers to

'the introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which *results or is likely to result in* such deleterious effects as *harm to living resources and marine life*, hazards to human health, hindrance to *marine activities, including fishing and other legitimate uses of the sea*, impairment of quality for use of sea water and reduction of amenities.'(LOSC, 1982) [emphasis added]