Vessel-Source Pollution – Some Key Developments

Ringbom, Henrik

Published in:
Research Handbook on International Marine Environmental Law

Published: 01/01/2023

Document Version
Accepted author manuscript

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PART III

POLLUTION AND THE MARINE ENVIRONMENT

9. Vessel-source pollution – some key developments

Henrik Ringbom

1. INTRODUCTION

Compared to many other marine environmental concerns, ship-source pollution is quite comprehensively regulated at the global level. Firstly, the jurisdictional rules on what actions States can and cannot take to protect the marine environment from ships are set out in considerable detail in the 1982 United Nations Convention on the Law of the Sea (LOSC). These rules lay down the general framework for which rules and measures States or organisations may or may not adopt to address pollution from ships, differentiated for each maritime zone. The LOSC, frequently referred to as the 'Constitution for the Oceans', is today widely ratified worldwide and, as far as its provisions on vessel-source jurisdiction are concerned, generally considered to represent customary international law.[1]

Secondly, technical rules lay down the more detailed standards for ships and their operators, on a variety of matters that affect vessel-source pollution, such as ships' equipment and construction requirements and conditions for discharging substances into the sea. These technical rules are predominantly developed by the International Maritime Organization (IMO) and form a dynamic relationship with the rules of the LOSC through a complex web of references and cross-references. The main treaty on the subject is the 1973/78 International Convention for the Prevention of Pollution from Ships (MARPOL).[2] Many of the key technical rules, including MARPOL, are also widely ratified and moreover include innovative mechanisms to ensure that their standards apply to the entire global commercial fleet.[3]

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[1] By June 2021, the United Nations (UN) Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3 (LOSC) had 168 parties, including the European Union (EU). The United States is not among these but has consistently considered that the LOSC provisions discussed here represent customary international law.

[2] International Convention for the Prevention of Pollution from Ships (as Modified by the Protocol of 1978 Relating Thereto) (adopted 2 November 1973, entered into force 2 October 1983) 1340 UNTS 61 (MARPOL).

[3] For example, by implicitly relying on port State jurisdiction, discussed in Section 2.2 below, many key International Maritime Organization (IMO) conventions establish that there shall be no difference in treatment between ships flying the flag of parties and non-parties to the conventions when visiting ports of States parties. See, eg, MARPOL, Art. 5(4). Moreover, in order to ensure a broad participation in the numerous amendments to the conventions, a specific amendment procedure has been introduced to many conventions, which makes the amendments automatically binding on all parties unless they specifically object to them. See, eg, MARPOL, Art. 16. The precise number of parties to MARPOL Annexes and the percentage of the world fleet that these States represent were as follows as at June 2021: Annexes I (oil) and II (noxious liquid substances in bulk), 160 States representing 99 percent of the world's tonnage; Annex III (harmful substances in packaged form): 150 States, 98 percent; Annex IV (sewage): 146 States, 96 percent; Annex V (garbage): 155 States, 99 percent; and Annex VI (air pollution): 100 States, 97 percent. Two more key environmental IMO conventions adopted in early 2000 have the corre-

In short, it is fair to say that the regulatory situation for vessel-source pollution is both relatively clear and reasonably well settled. As a general rule, little uncertainty exists about what standards apply or where to look for the limits of applicability of national requirements to foreign ships. Yet, the jurisdictional stability in this field does not mean that the matter is legally settled or free from legal controversies. Uncertainties arise at a number of different levels.

To begin with, not all matters are conclusively regulated – or even addressed – in the LOSC. Indeed, much of the unilateral regulatory activity in the field of ship-source pollution over the past decades has taken place in areas where the LOSC provides very little guidance, in particular through the exercise of jurisdiction by port States (Section 2.2 below). Moreover, as technology, scientific knowledge and political priorities relating to the marine environment evolve, new issues keep arising, exposing new legal voids and imperfections that need to be addressed.

Even where rules are in place, the need for their interpretation in specific situations gives rise to legal uncertainties. This challenge is not insignificant, as the LOSC includes numerous deliberately flexible – and vague – provisions, but also establishes a dynamic interplay between the jurisdictional rules and the continuously changing technical (IMO) standards, formed by a number of cross references on both sides. An interpretation issue that has arisen relatively recently, following some recent international cases, relates to non-flag States' jurisdiction on the high seas (Section 2.3).

Finally, at the technical level, significant regulatory voids remain. The most obvious and urgent example of environmental challenges that are not yet subject to comprehensive international rules relates to the reduction of greenhouse gases (GHGs) from ships. This issue is discussed in some detail in Section 3, as it is not only the most important regulatory challenge for the IMO today, but also unusually complex in technical, institutional and political terms.

The present chapter does not, accordingly, seek to provide a full overview of the regulatory picture regarding ship-source pollution today, whether from a jurisdictional or technical perspective.[4] Rather, it highlights some of the legal developments that are of jurisdictional relevance some four decades after the conclusion of the LOSC, and thereby also studies the role and relevance of the convention in this field today.

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sponding figures: the IMO, International Convention on the Control of Harmful Anti-fouling Systems on Ships (adopted 5 October 2001, entered into force 17 September 2008), IMO Doc AFS/CONF/26 (AFS Convention), 91 States, representing 96 percent of the world tonnage; and the International Convention for the Control and Management of Ships' Ballast Water and Sediments (adopted 13 February 2004, entered into force 8 September 2017) IMO Doc BWM/CONF/36 (BWM Convention), 86 States, representing 91 percent of world tonnage.

[4] A broader overview of the topic is provided in the previous edition of this book, in Henrik Ringbom, 'Vessel-Source Pollution' in Rosemary Rayfuse (ed), *Research Handbook on International Marine Environmental Law* (Edward Elgar 2015) 105.

2. THE JURISDICTIONAL RULES

2.1 General

The provisions on jurisdiction relating to vessel-source pollution are among the most detailed in the entire LOSC; the rights and obligations of flag, coastal and port States are dealt with in considerable detail in several different parts of the convention,[5] which qualify the more general obligations of States to protect the marine environment outlined in the beginning of Part XII of the LOSC.[6] In general, the interests of flag and coastal States are balanced differently for each maritime zone, with different provision made in respect of the jurisdiction to legislate (prescriptive jurisdiction) and the jurisdiction to take measures to enforce those rules. Enforcement jurisdiction is more limited than prescriptive jurisdiction in the sense that the right of a coastal State to regulate a particular matter is not necessarily coupled with a corresponding right to take enforcement measures against ships that fail to comply with the requirement.[7]

Since the adoption of the LOSC, the general direction of legal developments has been towards 'creeping jurisdiction', ie claims subjecting further matters to national jurisdiction at the expense of navigational freedoms.[8] These claims have arisen, in large part, from a widespread lack of trust in flag States' willingness and ability to address maritime safety and environmental protection issues in a satisfactory way due to the often faint link between the flag State and the ownership and operation of the ship, combined with the fact that few ships ever even visit the waters of their own flag States.[9]

In this section, two issues are highlighted, both of which go to the heart of any jurisdictional argument relating to ships, ie the balance of rights and obligations between the flag State and other States. Firstly, the development of port State jurisdiction has played a key role in refining the jurisdictional balance between flag States and other States since the LOSC was adopted. This development has been an incremental one – mostly through State practice, but sometimes manifested in treaties too – and finds its jurisdictional justification beyond the law of the sea, in rules and principles of general international law. Secondly, the rights and obligations of non-flag States with respect to violations committed on the high seas has recently been addressed in international case law and has given rise to a debate on the exclusivity of flag State jurisdiction. The two issues are linked, as port States are likely to be closely involved in the subsequent enforcement of any illicit action by ships on the high seas.

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5 In particular in LOSC, Parts II, III, V and XII.

6 Notably LOSC, Arts 192 and 194.

7 One example is the discrepancy in Part III of the LOSC between coastal States' right to impose legislation with respect to ships exercising their right of innocent passage in their territorial sea, and the limitations linked to enforcing that legislation. See also the differences in this respect between Art. 211 on prescriptive jurisdiction and Art. 220 on enforcement jurisdiction.

8 Tullio Scovazzi, 'The Evolution of International Law of the Sea: New Issues, New Challenges' in *Collected Courses of The Hague Academy of International Law* (No. 286, Brill 2000). See also, Victor Alencar Mayer Feitosa Ventura, *Environmental Jurisdiction in the Law of the Sea: The Brazilian Blue Amazon* (Springer 2020) Ch. 6.

9 See, eg, UNCTAD, *e-Handbook of Statistics 2021* (2021) <https://stats.unctad.org/handbook/MaritimeTransport/MerchantFleet.html>. See also, Doris König 'Flags of Convenience' in *Max Planck Encyclopedia of Public International Law* (OUP 2008).

2.2 Port State Jurisdiction

In contrast to the rigid limitations of coastal State jurisdiction over foreign ships, port States are largely left outside the jurisdictional scheme of the LOSC. Only a few provisions tentatively address the reach of port States' jurisdiction over foreign ships that (voluntarily) enter their ports or internal waters.[10] This shortage of legal provisions has meant that matters of relevance to the extent of port States' jurisdiction are left to be governed by general international law.[11]

Internal waters may, for jurisdictional purposes, be assimilated to the land territory of the State.[12] Ships, through their voluntary presence in the port or internal waters of another State, subject themselves to the territorial jurisdiction of that State. As a starting point, a port State is hence free to impose its national rules on foreign ships and to enforce those rules by (reasonable) means of their choice, at least as far as they do not relate to matters that are completely internal to the ship.[13] It is also widely recognised that ships enjoy no general right of access to foreign ports under international law.[14] This implies, *a fortiori*, a right for the port State to make access to its ports conditional on compliance with specific requirements.[15]

The absence of specific limitations on port State jurisdiction has offered an opportunity for States to strengthen the conditions and requirements that they apply to foreign ships. A gradual recognition of port States' rights to impose conditions and requirements on foreign ships has led to an increasingly widespread use of such measures, both in terms of prescriptive requirements and in terms of the consequences of failing to comply with those requirements. In reality, port State jurisdiction has become the main vehicle for advancing maritime regulation outside the IMO.[16]

Port States' jurisdiction to impose access conditions and other requirements on foreign ships entering their ports is not without limits, however. Limitations include the restraints that may follow from treaty commitments, whether imposed by bilateral or multilateral, maritime, commercial or other treaties, and from principles of general international law, such as the pro-

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[10] Eg, LOSC, Arts 25(2), 211(3) and 255.

[11] According to the final paragraph of the LOSC, Preamble, 'matters not regulated by this Convention continue to be governed by the rules and principles of general international law'.

[12] LOSC, Art. 8.

[13] See, eg, Robin Churchill and Vaughan Lowe, *The Law of the Sea* (Manchester University Press 1999) 65-69.

[14] *Case Concerning Military and Paramilitary Activities In and Against Nicaragua (Nicaragua v. United States of America)* (Merits) [1986] ICJ Reports 1986, para. 213. See also, AV Lowe, 'The Right of Entry into Maritime Ports in International Law' (1977) 14 *San Diego Law Review* 597; Louise de la Fayette, 'Access to Ports in International Law' (1996) 11(1) *International Journal of Marine and Coastal Law* 1.

[15] See also, to this effect, LOSC, Arts 25(2) and 211(3).

[16] Generally, see, Bevan Marten, *Port State Jurisdiction and the Regulation of International Merchant Shipping* (Springer 2014); Erik Jaap Molenaar, 'Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage' (2007) 38(1-2) *Ocean Development & International Law* 225 ('Port State Jurisdiction'); Henrik Ringbom, *The EU Maritime Safety Policy and International Law* (Brill 2008) (*EU Maritime Safety Policy*); Cedric Ryngaert and Henrik Ringbom, 'Introduction: Port State Jurisdiction: Challenges and Potential' (2016) 31(3) *International Journal of Marine and Coastal Law* 379; Robin Churchill, 'Port State Jurisdiction Relating to the Safety of Shipping and Pollution from Ships—What Degree of Extra-territoriality?' (2016) 31(3) *International Journal of Marine and Coastal Law* 454; Sophia Kopela, 'Port-State Jurisdiction, Extraterritoriality, and the Protection of Global Commons' (2016) 47(2) *Ocean Development & International Law* 89.

hibition of discrimination or of abuse of rights.[17] Proportionality requirements may also place limitations on the enforcement measures that may reasonably be taken against ships that fail to comply with the port State's requirements.[18] This type of limitation is clearly less specific and more dependent on the circumstances of the individual case than the relatively clear-cut, maximum limits imposed on coastal States for regulating passing ships in their maritime zones.

Identifying the precise boundaries of port State jurisdiction is further complicated by the fact that different types of rules raise different jurisdictional questions. Rules relating to 'static' features of ships, such as their design, construction, equipment or manning, 'follow' the ship wherever it is. Well known examples include the US and EU requirements on the double hull constructions of oil tankers.[19] In such cases, the ship either complies with the requirement or not, irrespective of its geographical location. Since a ship operator cannot easily change this type of feature during a voyage, this type of requirement is often considered to be most intrusive with respect to ships' navigational freedom. Paradoxically, however, static port State requirements are easier to justify in jurisdictional terms. If a ship fails to comply with a port State's requirement on static features it will be in violation even while within the port or internal waters of the State, where its prescriptive jurisdiction is uncontested.[20]

Aside from the occasional judgment suggesting differently,[21] it seems widely accepted that port States may impose this type of requirement on foreign ships.[22] Even where the subject matter in question is subject to international rules, port States retain their right to impose additional requirements relating to static features, as long as the international rules in question do

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17 See also, LOSC, Arts 227 and 300.

18 Eg, LOSC, Arts 225 and 232. See also, International Law Association (ILA), Committee on Coastal State Jurisdiction relating to Marine Pollution over Vessel-Source Pollution, 'Final Report' (2000) 456, 495, 497 (ILA Report); Ringbom, *EU Maritime Safety Policy* (n 16) 228-229.

19 The US requirements were introduced in the Oil Pollution Act 1990 (33 USC 2701-2761) in the aftermath of the *Exxon Valdez* oil spill in Alaska in 1989. The EU double hull requirements (EU Regulation (EC) No 417/2002 of the European Parliament and of the Council of 18 February 2002 on the accelerated phasing-in of double hull or equivalent design requirements for single hull oil tankers [2002] OJ L 64, and Regulation (EC) No 1726/2003 of the European Parliament and of the Council of 22 July 2003 amending Regulation (EC) No 417/2002 on the accelerated phasing-in of double-hull or equivalent design requirements for single-hull oil tankers [2003] OJ L 249/1) were based on MARPOL standards but accelerated the timetable, following the sinking of the *Erika* and *Prestige* tankers in European Atlantic waters in 1999 and 2002.

20 This is different with respect to passing ships. Coastal States' jurisdiction to regulate static features of foreign ships passing through the territorial sea is specifically limited in LOSC, Art. 21(2) to 'generally accepted international rules or standards'. On the interpretation of this phrase, see, eg, ILA Report (n 18) 473-481.

21 See, notably, *Sellers v. Maritime Safety Inspector* [1999] 2 NZLR 44 (CA) (NZ).

22 See, eg, sources referred to in n 16.

not specifically exclude such complementary standards.[23] The existence of such residual jurisdiction of port States is explicitly recognised in the text of some recent maritime conventions.[24]

The jurisdictional setting is somewhat different with respect to rules that are not static in the above sense. Here, the scope of port State rules that relate to specific conduct (or other operational conditions) needs to be determined in geographical terms, and it cannot be assumed that the violation has necessarily (also) taken place within the port State's own waters. In case the port State seeks to regulate conduct that takes place beyond the areas over which it has explicit prescriptive jurisdiction (under the coastal State jurisdiction provisions of the LOSC), the requirement has clear extra-territorial features, and the jurisdictional foundation for the requirement may be doubted.[25] Well-known examples of this type of requirement have been provided in Australian domestic legislation,[26] and, to some extent, in EU law.[27]

However, even for such cases, it is conceivable that the required (prescriptive) jurisdictional basis for port State requirements could be found outside the realm of the LOSC, notably in the principles of extra-territorial jurisdiction under general international law.[28] In addition, the jurisdictional acceptability of the port State requirement depends on the enforcement measure taken. Enforcement measures that are unproblematic from a point of view of international law, such as denying the non-complying ship the right to certain services in port, or perhaps even access to port, may be justified even if the prescriptive basis for extra-territoriality is weak;

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[23] See also, to this effect, Ted L McDorman, 'Port State Enforcement: A Comment on Article 218 of the 1982 Law of the Sea Convention' (1997) 28(2) *Journal of Maritime Law and Commerce* 314; Erik Jaap Molenaar, 'Residual Jurisdiction under IMO Regulatory Conventions' in Henrik Ringbom (ed), *Competing Norms in the Law of Marine Environmental Protection, Focus on Ship Safety and Pollution Prevention* (Kluwer 1997) 201-216; Lindy S. Johnson, *Coastal State Regulation of International Shipping* (Oceana Publications, 2004) 40; Alan Boyle, 'EU Unilateralism and the Law of the Sea' (2006) 21(1) *International Journal of Marine and Coastal Law* 24; Swedish Case No. M 8471-03, Svea Court of Appeal, Environmental Court of Appeal (Miljööverdomstolen), Judgment of 24 May 2006.

[24] See, eg, AFS Convention, Art. 1(3); BWM Convention, Art. 2(3); MARPOL, Reg. I/21(8)(2). See also, FAO, Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (adopted 22 November 2009, entered into force 5 June 2016) [2016] ATS 21, Art. 4(1)(b).

[25] In the specific context of vessel-source pollution, it could also be argued that LOSC, Art. 218 (referred to in Section 2.1 above) *a contrario* suggests that there is no such extra-territorial port State jurisdiction in this field.

[26] Eg*, Great Barrier Reef Marine Park Act 1975* (Cth), s 59C, under which the punishable offence is 'to enter an Australian port after navigating without a pilot if (a) a regulated ship navigates without a pilot in the compulsory pilotage area; and (b) the ship enters an Australian port under the command of the master who was in command of the ship during the navigation referred to in paragraph (a).' Another example is the (now removed) Australian rule from 2001 obliging ships to exchange ballast water on the high seas before entering Australian ports. That rule was modified in 2015 to align with international rules that had become applicable in the meantime.

[27] See, eg, the reporting and notification requirements of the Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 establishing a Community vessel traffic monitoring and information system [2002] OJ L 208/10; and Regulation 2015/757 of the European Parliament and of the Council of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport [2015] OJ L 123/55. See also, Bevan Marten, 'Port State Jurisdiction over Vessel Information: Territoriality, Extra-Territoriality and the Future of Shipping Regulation' (2016) 31(3) *International Journal of Marine and Coastal Law* 470; Kopela (n 16) 96-102.

[28] The most widely recognised principles are: active personality principle; the passive personality principle; the protective principle and the universality principle. See, eg, Cedric Ryngaert, *Jurisdiction in International Law* (2nd ed, OUP 2015).

while punitive measures, such as sanctions, require a firmer prescriptive jurisdictional basis.[29] With regard to enforcement, any measures taken by port and coastal States are also subject to certain important 'safeguards' as listed in Section 7 of Part XII of the LOSC.[30]

2.3 Jurisdiction of Non-Flag States on the High Seas

On the high seas all States enjoy the freedom of the seas, including the freedom of navigation.[31] No State may subject any part of the high seas to its sovereignty.[32] As a corollary of this, ships are subject to the exclusive jurisdiction of the flag State in the high seas 'save in exceptional cases expressly provided for in international treaties or in [the LOSC]'[33] Two such express exceptions in the LOSC specifically deal with vessel-source pollution.

First, Article 221 grants specific jurisdiction to coastal States in case of 'maritime casualties' or related acts that may reasonably be expected to result in major harmful consequences for the State. In such cases, the coastal State may 'take and enforce measures beyond the territorial sea proportionate to the actual or threatened damage to protect their coastline or related interests, including fishing, from pollution or threat of pollution'. This rule, which represents a maritime application of the doctrine of necessity and is based on the 1969 Intervention Convention,[34] accordingly sets aside the general jurisdictional regime in cases of pollution of a given severity and provides a more extensive jurisdiction to coastal States to protect their interests, including in the EEZ and on the high seas.[35]

Second, Article 218 permits port States to take enforcement measures against foreign ships for violations of international discharge standards, even if the discharge took place on the high seas or in other States' coastal waters. This provision departs from theories of jurisdiction prevailing at the time of the adoption of the LOSC as it does not condition the enforcement actions on the effect of the pollution on the enforcing (port) State. Although sparingly used

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[29] See, Molenaar, 'Port State Jurisdiction' (n 16); Erik J Molenaar, 'Port and Coastal States' in Donald R Rothwell and others (eds), *The Oxford Handbook of the Law of the Sea* (OUP 2015) 280.

[30] In particular LOSC, Arts 226, 228 and 230, which provide for limitations on the inspections of ships in ports and on the penalties to be employed, but also establish a requirement to not unnecessarily delay ships in ports, and a possibility for the flag State, under certain conditions, to take over the proceedings instituted by the port State.

[31] LOSC, Art. 87(1).

[32] LOSC, Art. 89.

[33] LOSC, Art. 92(1).

[34] International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (adopted 29 November 1969, entered into force 6 May 1975) 970 UNTS 212 (Intervention Convention).

[35] While the Intervention Convention only referred to the high seas, it seems accepted that Art. 221 also encompasses enforcement measures in the EEZ. See, eg, IMO Secretariat, Implications of the United Nations Convention on the Law of the Sea for the International Maritime Organization, IMO Doc LEG/MISC.8, 30 January 2014, 70; Erik Jaap Molenaar, *Coastal State Jurisdiction over Vessel-Source Pollution* (Kluwer 1998) 388. In such cases, Art. 221 presumably overrules Art. 220(6), which lays down a seemingly more restrictive enforcement regime in respect of the same types of incidents. See also, Aage Thor Falkanger, *Maritime Casualties and Intervention: Coastal State Measures When Casualties Pose the Threat of Pollution* (Fagbokforlaget 2011).

in practice, Article 218 gained renewed prominence through its collective application by EU Member States pursuant to Directive 2005/35 on ship-source pollution.[36]

Beyond such explicit treaty-based exceptions, the jurisdiction of non-flag States to take measures against ships for breaching environmental requirements on the high seas has recently been the subject of some controversy. In the *Norstar* case, decided by the International Tribunal for the Law of the Sea (ITLOS) in 2018,[37] a key question was whether the exclusivity of the flag State jurisdiction as referred to in Article 92(1) of the LOSC extended to prescriptive jurisdiction or whether it is limited to at-sea enforcement jurisdiction against ships (on the high seas).[38] While the minority favoured the latter position, the majority favoured the former, whereby the exclusivity of flag State jurisdiction would rule out subsequent enforcement by other States, for example in port or by means of judicial proceedings. The practical relevance of the question is amplified given the increasing technological possibilities to monitor ships' activities on the high seas without being physically present, for example through satellite technology.

Indeed, it is undisputed both in theory and in practice that nothing prevents a non-flag State from enforcing its laws against its own nationals even if the violation in question has taken place on a foreign ship on the high seas. The high seas are therefore not a zone of lawlessness even in the absence of flag State enforcement. Rather, a State's jurisdiction to take (subsequent) enforcement measures in respect of violations that have occurred on the high seas, for example when a ship enters a port after the violation, depends on whether (prescriptive) jurisdiction for the violation in question can be based on any of the recognised jurisdictional bases for extra-territorial jurisdiction under international law. The difficulty here is that, aside from jurisdiction based on the nationality principle (of persons or corporations), the status of the other extra-territorial jurisdictional principles is fairly unsettled in international law.[39]

Moreover, the narrower interpretation, supporting the limitation of exclusive flag State jurisdiction to (at-sea) enforcement measures, also appears to find support in State practice. Exceptions to at-sea enforcement jurisdiction on the high seas have tended to be addressed through treaty development, whereas the extra-territorial reach of subsequent enforcement measures has developed through national and regional legislation without any foundation in

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[36] Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 on ship-source pollution and on the introduction of penalties for infringements [2005] OJ L 255, 11.

[37] *M/V 'Norstar' Case (Panama v Italy)* (Judgment of 10 April 2019) ITLOS Case No 25 (*Norstar*, Judgment).

[38] In *Norstar*, Judgment, the former view prevailed. See, in particular, para. 225, where the Tribunal found that 'the principle of exclusive flag State jurisdiction is an inherent component of the freedom of navigation ... [which] ... prohibits not only the exercise of enforcement jurisdiction on the high seas by States other than the flag State but also the extension of their prescriptive jurisdiction to lawful activities conducted by foreign ships on the high seas.' This passage has since been reiterated and endorsed in '*Enrica Lexie' (Italy v. India)* (Award of the Arbitral Tribunal of 2 July 2020) PCA Case No 2015-28, para. 527 (*Enrica Lexie*, Award).

[39] See, eg, Ryngaert (n 28) Ch. 4.

treaties.[40] The narrower interpretation is also the preferred interpretation by most academics who have explored the matter.[41]

It is accordingly difficult to agree with the very extensive interpretation of the reach of exclusive flag State jurisdiction adopted by the majority in the *Norstar* judgment.[42] Other States are not prevented from exercising subsequent (enforcement or adjudicative) jurisdiction against foreign ships for violations on the high seas, provided that a basis for that jurisdiction can be found in the principles of jurisdiction accepted under general international law.

2.4 Assessment

Some four decades after the adoption of the LOSC, the convention's jurisdictional regime still stands firm. The authority of the 'Constitution for the Oceans', including its detailed provisions on vessel-source pollution that feature in several parts of the convention, is by and large intact. Somewhat paradoxically, though, it is equally clear that since the time when the LOSC was being negotiated, there has been a shift in the balance between navigational and environmental interests, towards coastal (environmental) interests, at the expense of navigational rights and the exclusive authority of the flag State. This paradox represents a reflection of the ingenuity of the convention, having managed to keep up with societal developments without losing its status as the undisputed authority for rights and obligations relating to ocean usage.

A key reason behind this regulatory feat is that the main jurisdictional developments in this field have taken place in areas that are not subject to detailed regulation in the LOSC. In particular, as the LOSC regime places important limitations on coastal States' opportunities to regulate foreign ships, the absence of similar restraints on port States has been used to develop the regulatory toolkit against foreign ships. Port State jurisdiction has gradually and discretely evolved into an accepted jurisdictional basis for both prescribing and enforcing rules that go beyond the internationally agreed ones, applied to any ship visiting ports of the regulating State or region.

Such requirements have usually been introduced by larger port States or regions that are less exposed to the commercial risk that ships avoid their requirements by diverting to a neighbouring port. However, the practical relevance of the option to introduce such requirements

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[40] For some more examples, see, Henrik Ringbom 'Ships in ABNJ - Broadening Jurisdictional Opportunities for Non-Flag States' in Vito de Lucia, Lan Nguyen and Alex G Oude Elferink (eds), *International Law and Marine Areas beyond National Jurisdiction: Current Status and Future Trends,* (Brill 2022, forthcoming). A seven-judge strong minority in *Norstar*, Judgment similarly held that 'nothing in the text of the Convention, in its *travaux préparatoires*, in other international treaties, in customary international law, or in the practice of States suggests that art. 87 and its corollary art. 92 altogether excludes the right of non-flag States to exercise their prescriptive criminal jurisdiction with respect to activities on the high seas.' *Norstar*, Judgment (n 37) Joint Dissenting Opinion Judges Cot, Pawlak, Yanai, Hoffmann, Kolodkin and Lijnzaad and Judge *ad hoc* Treves, para. 19.

[41] For an overview of academic opinions on this matter, see, Aaron N Honniball, 'The Exclusive Jurisdiction of Flag States: A Limitation on Pro-active Port States?' (2016) 31(3) *International Journal of Marine and Coastal Law* 499, 504-509, 519-525.

[42] The passage in *Norstar,* Judgment quoted in (n 38) has since been reiterated and endorsed in *Enrica Lexie*, Award (n 38) para. 527, which is even less explicit on the reasons for taking this view. See, Aaron Honniball, 'The "*Enrica Lexie*" Incident Award and Exclusive Flag State Jurisdiction' (*Centre for International Law National University of Singapore*, 10 August 2020) <https://cil.nus.edu.sg/the-enrica-lexie-incident-award-and-exclusive-flag-state-jurisdiction-by-arron-n-honniball/>.

goes beyond the concrete cases where such measures have actually been introduced. The mere availability of the option has come to play an important role in the negotiation of international shipping standards. By raising the possibility of introducing unilateral measures, States are placing pressure on the IMO to advance their efforts at technical regulation. The IMO, for its part, wishes to maintain global harmonisation in shipping standards, and carefully listens to States that indicate they may break from the global consensus if their desire is not accepted at the global level. This practice also points to one of the other main reasons for the stability of the existing regulatory regime for vessel-source pollution: the readiness of the IMO to respond to regulatory demands, by adopting new standards to meet the environmental concerns of its membership, which is studied more closely in the next section.

Port State jurisdiction over matters occurring beyond national jurisdiction also lies at the heart of ongoing controversy related to the interpretation of the long-standing principle that ships are subject to the exclusive jurisdiction of their flag States on the high seas. Is this, as is suggested by ITLOS in the *Norstar* case, to be understood as including *subsequent* enforcement measures, for example by port States, or is it limited to actual enforcement measures taken at sea? A discrepancy seems to be developing between, on the one hand, academic opinion and the developments in practice on jurisdiction over ships and, on the other hand, recent international case law on this matter. In particular, two recent judgments on the matter, the *Norstar* and *Enrica Lexie*, have emphasised the exclusive nature of flag States' jurisdiction over their ships for acts taking place beyond other States' jurisdiction. However, these cases are unlikely to alter the general trend of development, as both judgments include too many question marks in respect of their reasoning to be authoritative beyond the confines of those cases.

In conclusion, port State jurisdiction offers a powerful tool for non-flag States that wish to make use of jurisdictional bases outside the immediate law of the sea framework for regulating foreign ships, in excess of what existing international standards provide for. So far, such requirements have tended to focus on static requirements, hence emphasising the territorial presence of the foreign ship in the port State, but nothing excludes the possibility that other prescriptive bases, such as that of nationality (of the persons or of the operating company) could be similarly used as a ground for the port State to exercise (adjudicative) enforcement jurisdiction against non-complying ships.

The ongoing negotiations on an agreement on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (BBNJ)[43] would have provided a good opportunity for the world community to specify the extent of non-flag States' jurisdiction over matters taking place on the high seas, and hence to clarify some of the confusion introduced by the *Norstar* and *Enrica Lexie* judgments. However, that opportunity does not seem to have been seized,[44] which leaves the matter to be regulated by general international

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[43] UN, Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction, 'Intergovernmental Conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (General Assembly resolution 72/249)'. Information on the status of the negotiations is available at <https://www.un.org/bbnj/>.

[44] The (heavily bracketed) draft text of 18 November 2019 does not include a role for non-flag States in implementing and enforcing the obligations. UNGA, Revised Draft Text of an Agreement under the UN LOSC on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, UN Doc A/CONF.232/2020/3, 18 November 2019.

law and advanced by State practice. As far as State practice is concerned, there are no signs that the tendency towards increasing acceptance of jurisdiction by port States will go away, whether for high seas violations or otherwise. On the contrary, technical developments permitting monitoring of ships without physical presence at sea is likely to increase the demand for subsequent enforcement measures by non-flag States. The introduction of unilateral measures by a State or region is always controversial in shipping and involves certain political and commercial risks. Legally, however, port State jurisdiction is less objectionable and the 'latent' jurisdiction it offers has proven to be an important safety valve for States that consider that the prevailing international safety or environmental standards offer insufficient protection for their needs, hence also allowing the jurisdictional balance between flag States and other States to develop over time.

3. THE TECHNICAL RULES: REGULATING GHG EMISSIONS FROM SHIPS[45]

3.1 General Starting Point

The IMO has played a central role in developing the international regulatory regime for shipping. Out of the 50 or so conventions adopted by the organisation, roughly half deal with environmental protection. These conventions cover a broad range of issues, including rules for ship construction and equipment, operational and management standards for marine pollution and air emissions, pollution response activities and civil liability rules.[46]

However, the regulatory task of minimising the environmental impact of shipping is not complete. One of the key contemporary regulatory challenges for the IMO relates to climate change and the reduction of GHG emissions from ships. This matter is the key environmental issue currently on the IMO's agenda[47] and presents an unusually complex mix of regulatory, policy and technical challenges. It also aptly illustrates the dynamism between the LOSC, the IMO and general international law, as well as the various pressures that underlie the work of the IMO. Two quite basic regulatory questions aptly highlight those complexities.

The first question is which institution should be in charge of regulating this matter. Should it be the IMO, or should it be the global framework for regulating climate change? Is the question, in other words, to be regarded as a shipping matter or a measure akin to other (national) measures aimed at mitigating climate change. This discussion has existed from the outset and is still not entirely resolved.

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[45] This text is inspired by, and to some extent reproduces, parts of Henrik Ringbom, 'Regulating Greenhouse Gases from Ships - Some Light at the End of the Funnel?' in Elise Johansen, Signe Veierud Busch and Ingvild Ulrikke Jakobsen (eds), *The Law of the Sea and Climate Change: Solutions and Constraints* (CUP 2020) 129.

[46] For a fuller overview, see, Ringbom 'Vessel-Source Pollution' (n 4).

[47] International maritime transport contributes, mainly through burning fossil fuels, some 2-3 percent of the total anthropogenic emissions of carbon dioxide (CO_2), and this share is widely expected to grow. See, eg, Marine Environment Protection Committee (MEPC), Fourth IMO Greenhouse Gas Study 2020: Final Report, MEPC Doc 75/7/15, 29 July 2020 (Fourth IMO Study). Another issue that remains unregulated is ships' underwater noise.

The question of competent institution has important substantive implications and has, in particular, been linked to the question of what principle should guide the responsibility for taking the necessary measures. In the climate change framework, the principle of 'common but differentiated responsibility' (CBDR) has been the guiding principle from the outset,[48] whereas the IMO has traditionally relied on the principle that all ships should be treated in the same way.[49]

Transport is far from excluded from the global climate change regime.[50] The Paris Agreement includes all GHG emissions within its long-term mitigation aims. Its aim is 'to strengthen the global response to the threat of climate change' by containing the increase of temperature within the limits referred to in Article 2(1)(a).[51] In order to achieve those goals 'Parties aim 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'.[52] As a minimum, it therefore seems clear that allowing the emissions of shipping to increase by a factor of two or more until 2050[53] would jeopardise the climate goals set in the Paris Agreement and therefore would not be consistent with the agreement.

A climate regime for shipping within the UNFCCC could thus, in theory, be developed on the basis of existing provisions and would not require an amendment of its existing mandate.[54] Nor would the reference in the LOSC to a single 'competent international organization' when it comes to ship-source pollution constitute a limit in this regard. The reference is commonly understood as referring to the IMO, but there is no limitation to that effect in the LOSC itself.[55] The climate change regime could very well be the organisation competent for regulating GHG

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[48] UN Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107 (UNFCCC), Art. 3(1). In the Kyoto Protocol to the UNFCCC, 2303 UNTS 148, 10 December 1997 (Kyoto Protocol), the main part of the obligations was limited to (developed) States listed in Annex 1. In the Paris Agreement to the UNFCCC (adopted 12 December 2015, entered into force 4 November 2016) 55(4) ILM 740 (Paris Agreement), the CBDR principle features in Arts 2(2) and 4, but is moderated as the Agreement includes all States in mitigation efforts.

[49] See, eg, the examples given in n 3.

[50] UNFCCC refers to contribution by 'all economic sectors', and even includes certain references to transport in some of the key provisions (Arts 3 and 4(1)(c)). In Art. 2(2) of the Kyoto Protocol, matters relating to bunker fuel from shipping and aviation was specifically left for the IMO and the International Civil Aviation Organization (ICAO) to regulate, but such a provision no longer features in the Paris Agreement.

[51] Paris Agreement, Art. 2(1).

[52] Paris Agreement, Art. 4(1).

[53] See, Joanne Scott and others, 'The Promise and Limits of Private Standards in Reducing Greenhouse Gas Emissions from Shipping' (2017) 29(2) *Journal of Environmental Law* 231, 235.

[54] See also, Aoife O'Leary and Jennifer Brown, 'Legal bases for IMO Climate Measures' (Environmental Defense Fund, Sabin Center for Climate Change Law, Columbia Law School, 2018) <http://columbiaclimatelaw.com/files/2018/06/OLeary-and-Brown-2018-06-IMO-Climate-Measures.pdf>.

[55] The use of the word 'organization' in the singular in some parts of LOSC that deal with ship-source pollution (eg, Art. 211(1)), does not preclude that several organizations are competent for different aspects of the topic (note eg, the division of competence between the IMO and ILO on different aspects of regulation of seafarers). It is also to be noted that the reference is frequently coupled with the phrase 'or general diplomatic conference' (eg, Art. 211(2)). This addition was originally made to the LOSC precisely to preclude a monopoly for a single organization. See, eg, Daniel Bodansky, 'Protecting the Marine Environment from Vessel-Source Pollution' (1991) 18(4) *Ecology Law Quarterly* 719, 772.

emissions from shipping, in view of its better understanding of the global challenge underlying the need for regulation. Nor is there anything in the LOSC precluding a sharing of the competence for a topic between two or more international organisations.

In more practical terms, however, a shift of the regulatory initiative to the UNFCCC would involve some challenges. The mitigation tools offered by the Paris Agreement, ie the national reduction pledges, are not well suited for emissions caused by international shipping. Moreover, the UNFCCC framework offers fewer opportunities for the speedy adoption of globally applicable amendments than does the IMO's procedures.[56] The UNFCCC framework also includes no tools for ensuring a workable monitoring and enforcement regime for internationally movable objects like ships.

For the moment, it seems widely accepted, also within the global climate change framework, that the IMO is the most suitable body for addressing GHG emissions from ships.[57] Regulatory measures and implementation tools, discussed in Section 4.2 below, have strengthened the IMO's position in this respect in the past years. Nevertheless, while the debate as to the appropriate regulatory forum is more settled than it has been for decades, a continued consensus on the matter is dependent on results by the IMO in terms of concrete emissions reductions from the shipping sector in coming years.

A second key question is what can reasonably be asked from shipping in terms of emission reductions. To achieve a contribution equal to that of other sectors in achieving the climate goals (50 percent probability of attaining the 2 degrees limit to global temperature rise), shipping emissions must be reduced by 50 percent from 2012 levels by 2050 and reach zero emissions by 2080.[58] Yet, even dramatic improvements in fuel efficiency of ships would not achieve overall reductions in the cumulative emissions from ships. Indeed, total emissions have been projected to rise by 50 percent to 250 percent of 2012 levels by 2050, due to estimated increases in world trade.[59]

The dominant role of the increase in world trade in the projected increase of emissions raises two issues. First, is it fair to demand that shipping reduce its total emissions when the cause of the increase lies in factors beyond shipping? While ship-based reduction targets may be easier to justify, it is more difficult to establish a 'fair share' of the total emission reduction by the sector as a whole, as the growth in trade is neither known nor controllable by the industry itself. Second, how is the balance to be struck between technical feasibility and promotion of innovation? On the one hand, it appears widely accepted that technological solutions and fuels that are currently in use will not be able to achieve reductions of the magnitude required,[60] which make very ambitious reduction requirements seem unrealistic. On the other hand, it is equally well-understood that stringent forward-looking requirements with a clear goal are needed to foster technological change and promote investments and research and development into new technologies, in this case notably regarding alternative fuels for ships.

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[56] See n 3.

[57] Beatriz Martínez Romera, 'The Paris Agreement and the Regulation of International Bunker Fuels' (2016) 25(2) *Review of European Community & International Environmental Law* 215, 221.

[58] See, Scott and others (n 53) 234.

[59] *Ibid.* See also, MEPC, Third IMO GHG Study 2014: Final Report, MPEC Doc 67/INF.3, 25 July 2014, and the somewhat moderated predictions made in Fourth IMO Study (n 47).

[60] See, eg, various presentations in the Symposium on Alternative Low-Carbon and Zero-Carbon Fuels (9 and 10 February 2021) <www.imo.org/en/About/Events/Pages/Symposium-alternative-low-carbon-and-zero-carbon-fuels.aspx>.

Against the backdrop of such challenges, a closer look is undertaken below, first, on the measures (Section 3.2) and strategy (Section 3.3) so far adopted by the IMO, followed by a quick review of some of the remaining gaps and key institutional pressures that surround the activities of the IMO in this field (Section 3.4).

3.2 Technical and Operational Measures

Emission of GHGs is not a new topic for the IMO. Since the late 1990s, the organisation has sought to address the reduction of GHGs from ships, with a particular focus on CO_2, which is directly related to the amount of fuel consumed by ships.

The first regulatory progress was achieved in 2011, when new design requirements for the energy efficiency of new ships were introduced as Chapter 4 to MARPOL Annex VI, which entered into force on 1 January 2013.[61] These rules make mandatory the Energy Efficiency Design Index (EEDI) for new ships. The index is based on a formula dividing the emissions (from main and auxiliary engines, subject to various correction factors) by the benefits for society (capacity and speed of the ship), and establishes index levels that new-built ships (differentiating between different categories of ships) have to comply with before they are entitled to operate. The index requirements will be gradually strengthened, so as to require higher energy efficiency by ships built in the future than by those built today.[62] The reduction factors and reference line values, which form the basis of the energy efficiency requirements, are to be reviewed subject to technical developments and the first adjustments have already been made.[63] However, since the measure only covers new ships (or major conversions), a significant time lag for its impact on global emissions is inevitable. Ships normally have a commercial life of some 30 years, and it will therefore take several decades until all ships have been built to the EEDI standards.

The addition of the new Chapter 4 to MARPOL Annex VI in 2011 also included a provision aimed at reducing GHG from ships by means of operational measures.[64] However, the normative effect of the requirement is limited, as it only represents a requirement that a Ship Energy

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[61] MEPC, Resolution. MEPC.203(62): Amendments to the Annex of the Protocol of 1997 to Amend the International Convention for the Prevention of Pollution from Ships, 1973, as Modified by the Protocol of 1978 Relating Thereto, MEPC Doc 62/24/Add.1, (MEPC, Resolution 203(62)) Annex 19, 15 July 2011.

[62] MARPOL, Annex VI: Prevention of Air Pollution from Ships (entered into force 19 May 2005) (MARPOL, Annex VI), Reg. 21, as amended in 2011.

[63] The EEDI originally covered only the largest and most energy intensive segments of the world's merchant fleet, ie tankers, bulk carriers, gas carriers, general cargo ships, container ships, refrigerated cargo carriers and combination carriers. In 2014, MARPOL, Annex VI was amended to extend the scope of EEDI to: LNG carriers, ro-ro cargo ships (vehicle carriers), ro-ro cargo ships; ro-ro passenger ships and cruise passenger ships having non-conventional propulsion. For certain types of ship, the implementation dates were strengthened in May 2019. See, MEPC, Report of the Marine Environment Protection Committee on its Seventy-Fourth Session, MEPC Doc 74/18, 9 June 2019.

[64] All ships above 400gt are, based on MARPOL, Annex VI (n 62) Reg. 22, required to have a Ship Energy Efficiency Management Plan (SEEMP). The plan seeks to help ship operators to improve the energy efficiency of a ship by means of operational measures (eg through improved voyage planning or more frequent hull cleaning, or introduction of technical measures such as waste heat recovery systems or a new propeller).

Efficiency Management Plan (SEEMP) exists. It does not include any standards on the content of the plan, nor any reduction targets that ships must meet.[65]

Some further developments to both requirements were approved in June 2021.[66] The Energy Efficiency Existing Ship Index (EEXI) will extend the principles of the EEDI to existing ships,[67] while the 'Annual operational carbon intensity indicator' (CII) requires ships to determine the annual reduction factor needed to ensure continuous improvement of the ship's operational carbon intensity and to document the achieved annual operational CII in the SEEMP.[68] Failure to attain the CII targets will not, under the current rules, automatically result in operational limitations or other forms of sanctions.[69] However, many details about the practical applications of these measures remain to be settled through further guidelines, on, *inter alia*, exemptions, corrections, methods for setting the targets and on the enforcement of the rules.[70]

A global data collection system for maritime transport was adopted in 2016 to address the absence of reliable ship emission data and to facilitate the development of further regulatory measures.[71] Starting from 2020, IMO's data collection system requires all ships above 5,000 gross tonnage to collect consumption data for each type of fuel oil they use, as well as other, additional, specified data including proxies for transport work. The data is reported by owners to the flag State on a yearly basis.

3.3 The Initial IMO Strategy

The above technical and operational measures will not suffice to bring shipping in line with the targets of the Paris Agreement, or even reduce the overall emissions of the sector in view of the projected growth in international trade. Following the adoption of the Paris Agreement in 2015, the IMO adopted a Roadmap for developing a 'Comprehensive IMO strategy on

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[65] MARPOL, Annex VI (n 62) Reg. 22. See also, MEPC, Guidelines for voluntary use of the EEOI, IMO Doc MEPC.1/Circ.684, 17 August 2009.

[66] MEPC, Report of the Marine Environment Protection Committee on its Seventy-Fifth Session, MEPC Doc 75/18, 15 December 2020; MEPC, Consideration and Adoption of Amendments to Mandatory Instruments, MEPC Doc 76/3, 16 February 2021; MEPC, Draft Report of the Marine Environmental Protection Committee on its Seventy-Sixth Session, MEPC Doc 76/WP.1/Rev.1, 23 June 2021, para. 3.32 (MEPC, Draft Report 2021).

[67] IMO, MEPC Resolution 328(76), MEPC Doc 76/15/Add.1, Annex, 24 August 2021 (Revised MARPOL, Annex VI), Regs 23 and 25.

[68] *Ibid*, Reg. 24.

[69] *Ibid*, Reg. 28.

[70] MEPC, Draft Report 2021 (n 66) paras 7.1–7.60.

[71] MPEC, Resolution MEPC.278(70): Amendments to the Annex of the Protocol of 1997 to Amend the International Convention for the Protection of Pollution from Ships, 1973, As Modified by the Protocol of 1978 Relating Thereto, MEPC Doc 70/18/Add.1, Annex 3, 28 October 2016 (MPEC, 70/18/Add.1), introducing a new Reg. 22A to MARPOL, Annex VI, including two new appendices. See also, MEPC, Resolution MEPC.293(71): 2017 Guidelines for the Development and Management of the IMO Ship Fuel Oil Consumption Database, MEPC Doc 71/17/Add.1, 7 July 2017, Annex 17; MEPC, Resolution MEPC.292(71): 2017 Guidelines for Administration Verification of Ship Fuel Oil Consumption Data, MEPC Doc 71/17/Add.1, 7 July 2017, Annex 16, including guidance for shipowners. See also, IMO, MARPOL amendments enter into force - ship fuel oil reporting requirements, garbage classification and IOPP certificate (5 March 2018) <www.imo.org/en/MediaCentre/PressBriefings/Pages/04MARPOLamendments.aspx>.

reduction of GHG emissions from ships'.[72] In line with the Roadmap, an 'Initial IMO Strategy' for dealing with the matter was agreed in 2018,[73] to be replaced by a comprehensive strategy in 2023. Even if it is not a binding instrument, the strategy establishes certain important goals for the organisation in dealing with GHGs from ships and at the same time bridges some of the previous issues of contention.[74]

The Initial IMO Strategy envisages a reduction in carbon intensity of international shipping (to reduce CO_2 emissions per transport work, as an average across international shipping, by at least 40 percent by 2030, pursuing efforts towards 70 percent by 2050, compared to 2008), and that total annual GHG emissions from international shipping should be reduced by at least 50 percent by 2050 compared to 2008. The strategy also makes a bridge to the global climate change framework by acknowledging that the Paris Agreement temperature goals form part of the levels of ambition that direct the strategy[75] and that both non-discrimination and the CBDR principles represent guiding principles for the strategy.[76]

The Initial IMO Strategy includes a list of possible short-, mid-, and long-term further measures, with timelines, to be revised as appropriate as additional information becomes available. The short-term measures (to be agreed between 2018 and 2023) include further improvement of the EEDI and SEEMP tools for improving energy efficiency, along with a series of measures to stimulate the adoption of innovative technologies. There are five mid-term measures (2023-2030), one of which is 'new/innovative emission reduction mechanism(s), possibly including Market-based Measures (MBMs), to incentivize GHG emission reduction'.[77] The long-term goals focus on pursuing the development and provision of zero-carbon or fossil-free fuels and facilitating the general adoption of other innovative emission reduction mechanisms.

As noted above, by June 2021, the IMO's focus has been almost exclusively on short-term measures (EEXI, CII and related measures), whereas the discussions on the more divisive issue of MBMs have barely started.

3.4 Remaining Measures and Pressures

Of the measures discussed to date, MBMs have proven by far the most controversial. MBMs refer to a broad range of measures that provide for economic incentives for ship operators to

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[72] MPEC, 70/18/Add.1 (n 71) Annex 11. See also, MEPC, Reduction of GHG Emissions from Ships: Development of a Road Map to Determine a Possible IMO Fair Share Contribution, MEPC Doc. MEPC 70/7/8, 19 August 2016.

[73] MEPC, Resolution MEPC.304(72): Initial IMO Strategy on Reduction of GHG Emissions from Ships, MEPC Doc 72/17/Add.1, Annex 1, 13 April 2018 (MEPC, Resolution 304(72)).

[74] The legal status of the Initial Strategy was boosted through the 2021 revision of MARPOL, Annex VI, which included a new Regulation, outlining the goal of the relevant chapter as being 'to reduce the carbon intensity of international shipping, working towards the levels of ambition set out in the Initial IMO Strategy'. IMO Doc MEPC Resolution 328 (76), Annex (n 67), Reg. 20.

[75] MEPC, Resolution 304(72) (n 73) para. 3.1.3.

[76] *Ibid*, para. 3.2.1.

[77] *Ibid*, para. 4.8.3. The only candidate longer-term measures (beyond 2030) listed in para. 4.9 are to 'pursue the development and provision of zero-carbon or fossil-free fuels to enable the shipping sector to assess and consider decarbonization in the second half of the century' and to 'encourage and facilitate the general adoption of other possible new/innovative emission reduction mechanism(s).'

reduce their bunker fuel consumption.[78] They range from various forms of 'levies' or 'carbon taxes' on bunker fuel to efficiency credit trading programs and fully fledged 'cap and trade' emission trading schemes where emission rights could be sold and purchased on a market. The two main proposals are: an emissions trading system; and an international levy imposed on bunker fuel at purchase, established by a given cost level per tonne of fuel bunkered. Both measures have the potential to generate significant funds, which could be used for emission reduction measures where they can be most cost-effectively implemented (including emission reductions outside the realm of shipping, if so decided).

MBMs have been discussed at the IMO since 2003, and in some greater depth from 2006.[79] The organisation's members have been deeply divided on whether and how to include MBMs, and in the event they are included, whether it should be a system for the shipping sector alone or whether reduction measures could be taken in other sectors. Deep divisions have also existed as to whether, and if so in what manner, the system should accommodate the CBDR principle. Indeed, the topic proved so divisive that in 2013 it was decided to suspend the discussions.[80] Discussions on MBMs have yet to resume at the IMO, but pressure to reach a result in this field further increased in 2016 when the International Civil Aviation Organization (ICAO) succeeded in adopting a global emission reduction scheme.[81]

Apart from the tensions in relation to other global institutions, the regulation of GHGs at the IMO is subject to unusually strong pressures from certain other directions as well. Notably, the European Union has voiced its concerns with the slow progress at the IMO for a long time, more recently coupled with the observation that shipping is by now the only sector not expressly addressed by an EU emissions reduction objective or specific mitigation measures.[82] Climate change is currently among the main policy priorities of the EU and the European

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[78] The Organisation for Economic Co-operation and Development (OECD) has defined market-based measures more narrowly by stating that they 'seek to address the market failure of "environmental externalities" either by incorporating the external cost of production or consumption activities through taxes or charges on processes or products, or by creating property rights and facilitating the establishment of a proxy market for the use of environmental services.' See, OECD, 'Glossary of Statistical Terms: Market-Based Instruments' (23 July 2017) <https://stats.oecd.org/glossary/detail.asp?ID=7214>. See also, Harilaos N Psaraftis, 'Market-Based Measures for Greenhouse Gas Emissions from Ships: A Review' (2012) 11(2) *WMU Journal of Maritime Affairs* 211.

[79] IMO, 'Market-Based Measures' <https://www.imo.org/en/OurWork/Environment/Pages/Market-Based-Measures.aspx>.

[80] MEPC, Report of the Marine Environment Protection Committee on its Sixty-Fifth Session, MEPC Doc 65/22, 24 May 2013, 44.

[81] ICAO Assembly, Resolution A39-3: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Global Market-based Measure (MBM) scheme, 2016 <https://www.icao.int/environmental-protection/documents/resolution_a39_3.pdf>, setting up the 'Carbon Offsetting and Reduction Scheme for International Aviation' (CORSIA). The scheme entered its pilot phase in 2021, but individual reduction obligations, which represent the real incentive for air operators to reduce their emissions, will only apply from 2030. Nevertheless, it is clear that its establishment has contributed to a convergence of regimes governing international and national emissions and that many of the arguments relating to the impossibility of finding solutions for international bunker fuels have weakened along the way.

[82] See, eg, Directorate-General for Climate Action, Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2015/757 in order to take appropriate account of the global data collection system for ship fuel oil consumption data, EC Doc COM(2019) 38 final, 4 February 2019, 1 (EU, COM(2019) Proposal).

Parliament adopted a proposal in 2020 to include shipping in the European emission trading scheme.[83] While the final outcome of the EU proposals is uncertain at time of writing, they indicate a preparedness within two key institutions to take a tougher stance on the issue of GHG emissions from shipping. To back potential future regional reduction measures, the EU has already developed its own scheme for monitoring, reporting and verification of CO_2 emissions from ships.[84] Clearly, regional MBMs, such as inclusion of international shipping in the EU emission trading scheme, would give rise to a number of intricate international law questions and policy concerns,[85] as was already seen when a similar proposal to include international aviation was approved in 2008.[86]

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[83] In a partial decision of 16 September 2020, the European Parliament considered that ships with a gross tonnage of 5,000 or more should be included in the EU ETS in order to contribute to the achievement of the climate neutrality objective for the EU economy as a whole, along with a series of other proposals, including rules relating to methane emissions from ships and to shore-side electricity for ships at berth (European Parliament, Global data collection system for ship fuel oil consumption data, EU Doc P9_TA(2020)0219). As of June 2021, the matter had not been discussed by the Council, where the EU Member States are represented. In addition, the European Commission is reported to be preparing proposals on, *inter alia*, carbon intensity standards on fuels used by ships and zero emissions at berth. See, eg, Anastassios Adamopoulos, 'The EU is about to push the first-ever fuel carbon intensity measure on shipping' *Lloyd's List,* 5 February 2021 <https://lloydslist.maritimeintelligence.informa.com/LL1135688/The-EU-is-about-to-push-the-first-ever-fuel-carbon-intensity-measure-on-shipping>.

[84] Commission Implementing Regulation (EU) 2017/757 of 28 April 2017 on the issue of licenses for importing rice under the tariff quotas opened for the April 2017 subperiod by Implementing Regulation (EU) No 1273/2011 [2017] OJ L 113/42 (EU Regulation 2017/757) was adopted ahead of the approval of the IMO's data collection system. The two systems are not identical and are unlikely to be so, even if a current EU proposal seeks to align the two systems, at least as far as reporting is concerned. See, EU, COM(2019) Proposal (n 82), which is still being discussed among the EU institutions. European Parliament, 'Carbon dioxide emissions from maritime transport: global data collection system for ship fuel oil consumption data', Procedure 2019/0017 (COD).

[85] The international law concerns centre around the extent to which a State (or region) may require foreign ships to comply with unilateral requirements that extend beyond its territorial jurisdiction, on the basis of its temporary presence in the port. It is, in other words closely related to the discussion on port State jurisdiction in Section 2.2 above. See also, Henrik Ringbom, 'Global Problem – Regional Solution? – International Law Reflections on an EU CO_2 Emissions Trading Scheme for Ships' (2011) 26(4) *International Journal of Marine and Coastal Law* 613.

[86] The EU's legislation on the regional emission trading system was amended by Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community [2009] OJ L 8/3 to include aviation within the scope of the EU ETS as from 2012. However, due to strong protests from third countries, it was decided to postpone application of this amendment for flights between the EU and third countries. Intra-EU flights remain included in the ETS, while the future inclusion of flights to and from third countries will depend on regulatory progress made at ICAO. See, European Commission Climate Action, 'Reducing emissions from aviation' <https://ec.europa.eu/clima/policies/transport/aviation_en>. The application of EU rules to non-EU flights raised legal concerns, too, but in Case C-366/10 *Air Transport Association of America and Others v Secretary of State for Energy and Climate Change* [2011] ECR I-13755, the Court of Justice of the EU considered that the extension did not amount to a breach of international law. The judgment has been criticized in legal literature for being too superficial on the question of extraterritorial jurisdiction. See, eg, Geert De Baere and Cedric Ryngaert, 'The ECJ's Judgment in Air Transport Association of America and the International Legal Context of the EU's Climate Change Policy' (2013) 18(3) *European Foreign Affairs Review* 389, 402.

Finally, reducing the climate impact of shipping involves an uncharacteristically broad range of non-State actors. Bottom-up approaches adopted by individual corporations have not been common in shipping governance, though they have played a key role in the development of the global climate regime more generally.[87] In the context of GHG regulation, however, certain industry players have developed their own requirements at industry-level in response to slow progress at the IMO.[88] Examples include systems that monitor the carbon footprint of transport,[89] set up a certification and benefit scheme in ports[90] or an environmental index for ships,[91] or address more general sustainability questions in maritime transport.[92] To date, such initiatives have complemented existing regulation and have not, therefore, challenged the authority of the IMO. Nevertheless, these developments are still indicative of a governance trend in shipping towards broader participation by non-State actors in the regulatory process and bottom-up initiatives by individual industry sectors, which in the future could represent additional pressures on the IMO to increase its level of ambition in this area.

3.5 Assessment

Despite decades of work aimed at reducing GHG emissions from ships, the IMO's progress is not impressive in terms of emission reduction. The work has been hampered by uncharacteristically difficult political divides among its membership, but also unprecedented pressures from other regulatory authorities at global and regional levels, as well as other non-governmental stakeholders. While it is still far too early to claim success, several recent developments in this field indicate a shift towards a better regulatory environment, allowing the IMO to focus on meeting the aims of its initial strategy.

The adoption of the Paris Agreement and the subsequent developments at the IMO have removed some of the longstanding difficulties that have beset the regulation of GHGs from international shipping. This advance may give reason for some optimism with respect to regulatory progress in the future. The institutional battle has entered a period of consolidation and relative 'truce' since the adoption of the Paris Agreement in 2015 and with the unanimous approval of the Initial IMO Strategy. The regime currently provides for 'dynamic stability', with the IMO clearly positioned in the driving seat. The truce is not without its conditions,

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87 The Paris Agreement specifically recognises 'the importance of the engagements of all levels of government and various actors ... in addressing climate change' (Paris Agreement, Preamble, para. 15) and refers to public and private sector participation in the implementation of nationally determined contributions (Art. 6(8)(b)). See also, UNFCCC COP, Report of the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 13 December 2015, UN Doc FCCC/CP/2015/10/Add.1, 29 January 2016, Decision 1/CP.21, paras 134-137.

88 See, eg, Jane Lister, René Taudal Poulse and Stefano Ponte, 'Orchestrating Transnational Environmental Governance in Maritime Shipping' (2015) 34 *Global Environmental Change* 185; Lindsay Wuisan, Judith van Leeuwen and CSA (Kris) van Koppen, 'Greening International Shipping Through Private Governance: A Case Study of the Clean Shipping Project' (2012) 36(1) *Marine Policy* 165; Scott and others (n 53).

89 *The Environmental Ship Index (ESI)* <www.environmentalshipindex.org/>.

90 *Green Award* <www.greenaward.org/>.

91 *Clean Shipping Index* <https://cleanshippingindex.com>.

92 *Sustainable Shipping Initiative* <www.ssi2040.org>.

however, and a key milestone for measuring the IMO's success in the field will be in 2023.[93] Much of the result will depend on how the organisation manages to face the challenge of MBMs and, in the longer term, on the pace of the industry's shift towards alternative zero-carbon fuels.

With respect to guiding principles, the shift made in the Paris Agreement towards a more nuanced form of differentiation between States has paved the way for convergence between the two competing principles on whether and how to differentiate between States' obligations (the non-differentiation principle and the CBDR principle), which had been so problematic for the work at the IMO. There now seems to be a good basis for continuing the IMO tradition of regulating ships without differentiation as to their flag in this field. As acknowledged by the Initial IMO Strategy, the objectives of the CBDR principle remain relevant – but that principle may be expected to feature mainly in the form of allocation of revenues to developing countries for financing mitigation and adaptation measures, or through technical assistance, while playing a limited role (if any) in the design of technical, operational or MBMs as such. This development is indeed welcome, and a condition for an effective regulatory regime in shipping.

While reaching consensus on these goals and principles is significant in light of the earlier divisions in the IMO, the Initial Strategy is still very far from producing any reductions in emissions from shipping. The document is an expression of objectives rather than of actions, in a legally non-binding format, and includes no concrete commitment in the form of reduction measures to be undertaken. In reality, existing technologies may not be sufficient to achieve the longer-term reduction goals. Moreover, even if the reduction goals expressed in the Initial Strategy are achieved, these will not be sufficient to meet the climate goals of the Paris Agreement.[94]

4. CONCLUDING OBSERVATIONS

As noted at the outset, the legal framework for vessel-source pollution is more settled than it has ever been before. The LOSC comprehensively deals with the jurisdictional aspects of the matter, it is broadly accepted in formal terms and its detailed provisions on vessel-source pollution are widely recognised as representing customary international law. At the technical level, the IMO has been productive in responding to new environmental challenges by adopting and continuously updating a broad range of conventions on the topic, which have contributed to a very comprehensive set of standards aimed at minimising ships' environmental impact.

Upon closer analysis, however, the regime is neither as stable nor as comprehensive as it may first appear. As the BBNJ negotiations illustrate, our increased knowledge and altered

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[93] 2023 is not only the time for the review of IMO's GHG Strategy, but also the year for the first global stocktake of the Paris Agreement and the deadline set by the EU for IMO measures that 'duly contribute' to achieving the climate goals of the Paris Agreement under Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reductions and low-carbon investments, and Decision (EU) 2015/181 [2018] OJ L 76/3, Recital No 4.

[94] For criticism of the IMO in this respect, see, eg, Faig Abbasov, 'Shipping body's climate plan "ignores Paris Agreement"' (*Transport & Environment*, 30 October 2020) <www.transportenvironment.org/news/shipping-body's-climate-plan-'ignores-paris-agreement'>.

perception of the environmental challenges facing the oceans calls, at times, for additional treaty-making efforts to fill the most pressing jurisdictional gaps.

The jurisdictional regime is also subject to change through State practice. In reality, jurisdictional boundaries have been, and continue to be, shifted through a complex and not so obvious web of developments in law and practice, at global, regional and national levels. One example of key relevance for the overall jurisdictional scheme of shipping is the development of port State jurisdiction, where small advances have gradually come to adjust the boundaries of what is legally permissible, in particular in relation to the imposition of prescriptive requirements on foreign ships. The general direction of these developments, in subsequent treaty law as well as through State practice, has clearly been towards increased possibilities for non-flag States to exercise authority over ships. Nevertheless, the development has taken place without calling into question the position of the LOSC as the 'Constitution for the Oceans' and the main authority for jurisdictional matters relating to maritime activities.

As with jurisdictional developments, continuous development of technical standards has also occurred, with the main developments having taken place at the IMO. Indeed, the IMO has both been granted and has used its privileged position in the international law of the sea to actively manifest itself as the chief regulator of global shipping, including in respect of vessel-source pollution. In general, the competence of the IMO with respect to vessel-source pollution has remained unchallenged and it has delivered a significant body of authoritative regulatory instruments in the field.

The main exception to its regulatory efficacy is to be found in the field of climate change. Despite decades of work aimed at reducing GHG emissions from ships, the IMO's progress has been slow, due to, *inter alia*, uncharacteristically difficult political divides among its membership and pressures from other regulatory authorities at global and regional levels, as well as other non-governmental stakeholders.

All in all, GHGs represent a formidable challenge for the IMO. From a *technical* point of view the problem is not only difficult to understand, quantify and concretise, there is also a shortage of technical solutions available to address the matter at reasonable cost. In terms of *regulatory design*, the challenge lies in the many potential ways to address it, all of which involve hugely complex issues in terms of robustness, coverage, avoiding loopholes and other forms of 'leakages', along with various international legal uncertainties linked to establishing economic requirements at the global level. *Politically*, the matter is unusual for the IMO as the underlying problem to be solved extends well beyond shipping, which implies not only the involvement of a series of national policies from other sectors but also scrutiny by a wide spectrum of actors that are understandably engaged in the matter. Finally, in terms of *regulatory authority*, as has been noted above, the matter also potentially involves an unusual plurality of institutions. At the global level, the UNFCCC regime remains an option while, as highlighted by the determination by the current EU leadership to include shipping among the industries covered by EU reduction measures, the prospect of regional rules also looms in the background as a legal alternative.

As the GHG discussions illustrate, the IMO does not have a regulatory monopoly or a particular 'constitutional' claim to fend off competing regulatory initiatives on shipping emissions by others. Thus, the possibility of competing regulatory action by individual States, regions or other international organisations constantly hangs over the regulatory work of the IMO. The IMO's handling of GHG emissions from shipping will therefore be a critical test for assessing its capacity to deal with pressing environmental concerns. It is by far the most

significant challenge the IMO has faced in its history and many different types of measures will be needed to meet the objectives the IMO has set for itself. While the ultimate solution for shipping may lie in technical inventions to permit a shift to new types of fuel, the main role of regulation in the meantime is to reduce emissions in the interim and to develop technical, operational and MBMs to steer development towards the necessary technological and operational change, not least, by reducing the economic risks linked to innovations.

Currently, at long last, there are signs indicating progress in this field, but the main work is yet to be done if the goals of the Initial IMO Strategy and the Paris Agreement are to be met. The regulation of GHG emissions from ships has been on the IMO's regulatory agenda for many years. While several recent developments in this area suggest that regulatory progress may be in the making, all indications are that it will remain so for decades to come.