

All Necessary Measures: Climate Law for International Shipping

BAINE P. KERR*

International shipping is one of the largest sources of climate pollution. The conventional view is that, despite some ambiguities in the climate treaties, international law only requires states to implement global rules adopted by the International Maritime Organization. This overlooks the important and timely question of whether other sources of law oblige states to do more. This Article argues that customary environmental principles, human rights law, and the UN Convention on the Law of the Sea mandate that states take all necessary measures to prevent and reduce shipping's climate risks. The measures that are necessary are dynamic and differential, and they include support for ambitious and effective global rules and unilateral actions. Because shipping is a well-quantified sector, emissions data is readily available and there are various options for legal accountability.

* Ph.D. Candidate, Utrecht University School of Law. For their very helpful comments on earlier drafts, I thank Seline Trevisanut, Natalie Dobson, and Julie Fraser. I also appreciate feedback from members of the Utrecht Center for Water, Oceans, and Sustainability Law and participants at the 2023 University College London/Kings College London Postgraduate Environmental Law Symposium. This Article benefited from insightful conversations with Benjamin Franta, Danae Georgoula, Lucas Roorda, and Rupert Stuart-Smith. I am grateful to Jason Weiner for his constructive suggestions and unwavering support and encouragement. Finally, sincere thanks to the *Virginia Journal of International Law* staff for their excellent editorial work. Any errors are my own.

I. INTRODUCTION	524
II. REGULATING SHIPPING’S CLIMATE POLLUTION	531
III. LEGAL OBLIGATIONS	537
A. <i>The Climate Treaties</i>	537
B. <i>A Due Diligence Obligation to Mitigate</i>	542
1. <i>Customary International Law</i>	542
2. <i>Human Rights</i>	546
3. <i>The UN Convention on the Law of the Sea</i>	550
IV. NECESSARY MEASURES	555
A. <i>Decision-Making Within the IMO</i>	557
B. <i>Unilateral Measures</i>	563
C. <i>Accountability</i>	567
V. CONCLUSION	570

I. INTRODUCTION

What law governs the world’s eighth-largest greenhouse gas (GHG) emitter? International shipping—a vast industry and the backbone of world trade—emits approximately 700 million metric tons of carbon annually; if it were a country, shipping’s emissions would be about the same as Germany’s.¹ The sector is regulated on a global level by the International Maritime Organization (IMO), a specialized agency of the United Nations headquartered in London.² In July 2023, the IMO’s member states agreed “to peak GHG emissions from international shipping as soon as possible and to reach net-zero GHG emissions by or around, i.e. close to,

1. U.N. Conference on Trade & Development, *Review of Maritime Transport 2022*, 107, U.N. Doc. UNCTAD/RMT/2022 (Nov. 29, 2022) [hereinafter UNCTAD]; JRC *Science for Policy Report: CO2 Emissions of All World Countries*, at 33, 110 (Sept. 16, 2022), <https://publications.jrc.ec.europa.eu/repository/handle/JRC130363>.

2. Int’l Maritime Org. [IMO], Assembly Res. A.908(22), *Agreement with the Host State Regarding Extension of Privileges and Immunities to Permanent Representatives and Divisional Directors* (Jan. 25, 2002) (amending and approving the headquarters agreement); Convention of the Intergovernmental Maritime Consultative Organization arts. 1, 2, 38, Mar. 6, 1948, 9 U.S.T. 621, 289 U.N.T.S. 3, as amended. A consolidated version is contained in Int’l Maritime Org., *Basic Documents, Volume I* (2010 ed.), at 8–32, <https://digitallibrary.un.org/record/701517> [hereinafter IMO Convention].

2050”³ But the measures currently in place are inadequate to meet that goal, with emissions projected to either remain relatively constant or even rise between now and the middle of the century.⁴ Emissions at that level are incompatible with limiting global warming to 1.5 degrees above pre-industrial levels,⁵ which the Paris Agreement calls for and scientists view as necessary to avoid catastrophic climate change.⁶ Earlier this year, the European Union enacted climate regulations for international shipping that are more stringent than the IMO’s, stating that progress at the IMO “has so far not been sufficient to achieve the objectives of the Paris Agreement.”⁷

This Article identifies states’ international legal obligations to mitigate shipping’s climate emissions and describes the ways in which compliance with those obligations may be assessed.⁸ It analyzes the IMO’s institutional structure and relationship with its members, as well as the international law that applies to the regulation of climate pollution from ships. Historically, the scholarly attention on this subject has focused on obligations—or the

3. IMO, Assembly Res. MEPC.377(80), *2023 IMO Strategy on Reduction of GHG Emissions from Ships*, annex 15, at 6, IMO Doc. MEPC 80/WP.12 (July 7, 2023) [hereinafter IMO 2023 Strategy].

4. IMO, *Fourth IMO Greenhouse Gas Study 2020*, at 26 (2020), <https://www.imo.org/en/OurWork/Environment/Pages/Fourth-IMO-Greenhouse-Gas-Study-2020.aspx>.

5. Simon Bullock et al., *The Urgent Case for Stronger Climate Targets for International Shipping*, 22 CLIMATE POL’Y 301, 301 (2022) (stating that Paris-compliant targets for international shipping “require a 34% reduction in emissions by 2030, with zero emissions before 2050”); JEAN-MARC BONELLO ET AL., SCI. BASED TARGETS INITIATIVE, SCIENCE BASED TARGET SETTING FOR THE MARITIME SECTOR 9 (2023), <https://sciencebasedtargets.org/resources/files/SBTi-Maritime-Guidance.pdf> (“For maritime transport emissions, a long-term science-based target means reducing emissions to a 96% residual level in line with 1.5°C scenarios by no later than 2040.”); U.N. Environment Programme, *Emissions Gap Report 2020*, at xiii (Dec. 9, 2020), <https://www.unep.org/emissions-gap-report-2020> (explaining that shipping and aviation together will consume between 60–220% of the carbon budget for the goal of 1.5 degrees by 2050). When referring to temperature, this Article uses Celsius rather than Fahrenheit.

6. U.N. Framework Convention on Climate Change [UNFCCC], Adoption of the Paris Agreement, art. 2, U.N. Doc. FCCC/CP/2015/L.9/Rev.1, annex, art. 2 (Dec. 12, 2015) [hereinafter Paris Agreement]; INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SPECIAL REPORT: GLOBAL WARMING OF 1.5°C, at 4–6 (2018), <https://www.ipcc.ch/sr15/> [hereinafter IPCC].

7. Directive 2023/959, of the European Parliament and of the Council of 10 May 2023 Amending Directive 2003/87/EC Establishing a System for Greenhouse Gas Emission Allowance Trading Within the Union and Decision (EU) 2015/1814 Concerning the Establishment and Operation of a Market Stability Reserve for the Union Greenhouse Gas Emission Trading System, 2023 J.O. (L 130) ¶ 19 [hereinafter EU Maritime ETS Measure]. The European Union also recently enacted a maritime fuel measure to reduce GHG emissions. See Regulation 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the Use of Renewable and Low Carbon Fuels in Maritime Transport, and Amending Directive 2009/16/EC, 2023 O.J. (L 234) [hereinafter EU Maritime Fuel Measure].

8. For reasons of space, this Article does not address the important question of whether ship owners, operators, or other components of the shipping industry could be independently liable for climate emissions. Nor does it address the IMO’s climate obligations, which have been explored in other scholarship. See, e.g., Baine P. Kerr, *Bridging the Climate and Maritime Legal Regimes: The IMO’s 2018 Climate Strategy as an Erga Omnes Obligation*, 11 CLIMATE L. 119 (2021); Baine P. Kerr, *Binding the International Maritime Organization to the United Nations Convention on the Law of the Sea*, 19 INT’L ORGS. L. REV. 391 (2022).

lack thereof—that might arise from international climate treaties.⁹ The conventional view is that, despite some ambiguities in the climate treaties, states are solely required to implement the IMO’s rules.¹⁰

That view is incomplete. There is an ongoing debate about whether climate treaties are the exclusive source of international obligations regarding climate change.¹¹ Other sources of law that could apply are customary international law (informed by principles such as harm prevention and the precautionary approach), human rights treaties, and the UN Convention on the Law of the Sea (LOSC, sometimes styled UNCLOS).¹² At least three international courts—the International Court of Justice, the Inter-American Court of Human Rights, and the International Tribunal for the Law of the Sea—are examining this question in advisory proceedings.¹³ I do not definitively determine whether and how customary principles, human rights law, or the LOSC apply to climate change. But to the extent that they do, a state’s obligations to mitigate climate change should encompass all activities within its territories and under its jurisdiction and control—including ships that fly its flag, the voluntary entry of ships into its ports, its regulation of shipping companies, and the positions its representatives take at the IMO.¹⁴ I argue that states have a due diligence obligation to reduce GHG emissions from shipping beyond the obligations imposed by the climate treaties and IMO rules.¹⁵

9. See *infra* Part II.A; Beatriz Martínez Romera, *The Paris Agreement and the Regulation of International Bunker Fuels*, 25 REV. EUR. COMPAR. & INT’L ENV’T L. 215 (2016) (noting that bunker fuels and shipping’s climate impacts were deliberately omitted from the Paris Agreement, although some mitigation obligation might apply based on UNFCCC Art. 4.1).

10. See, e.g., YUBING SHI, CLIMATE CHANGE AND INTERNATIONAL SHIPPING: THE REGULATORY FRAMEWORK FOR THE REDUCTION OF GREENHOUSE GAS EMISSIONS 424 (2017) (describing how under the harm prevention principle, flag states must implement pollution control rules that take into account IMO standards).

11. Compare Alexander Zahar, *The Contested Core of Climate Law*, 8 CLIMATE L. 244 (2018), with Benoit Mayer, *Interpreting States’ General Obligations on Climate Change Mitigation: A Methodological Review*, 28 REV. EUR. COMPAR. & INT’L ENV’T L. 107 (2019).

12. See sources cited *infra* notes 16, 20–23, and 27.

13. G.A. Res. A/77/L.58 (Mar. 29, 2023); Request for Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law, Case No. 31, Order 2023/4 of June 30, 2023, https://itlos.org/fileadmin/itlos/documents/cases/31/C31_Order_2023_4_30_June_2023.pdf; Request for an Advisory Opinion on the Climate Emergency and Human Rights Submitted to the Inter-American Court of Human Rights by the Republic of Colombia and the Republic of Chile (Jan. 9, 2023), https://www.corteidh.or.cr/solicitud_opinion_consultivas.cfm?lang=en.

14. See Federica Violi, *The Function of the Triad “Territory,” “Jurisdiction,” and “Control” in Due Diligence Obligations*, in DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER 75 (Heike Krieger et al. eds., 2021); Ana Sofia Barros & Cedric Ryngaert, *The Position of Member States in (Autonomous) Institutional Decision-Making*, 11 INT’L ORGS. L. REV. 53, 55 (2014); see *infra* Part III.

15. I use the term “due diligence” to describe a type of primary obligation rather than a stand-alone rule of international law. See generally Neil McDonald, *The Role of Due Diligence in International Law*, 68 INT’L & COMPAR. L.Q. 1041 (2019).

Customary international law principles require that states take all necessary measures to prevent transboundary harm and exercise precaution when making decisions that pose a risk of harm to the environment.¹⁶ Shipping's climate impacts cross these thresholds.¹⁷ There is not yet sufficient state practice to demonstrate a binding customary obligation on states to mitigate these effects, but there is an emerging customary norm, and that has several important legal consequences.¹⁸ In addition, customary international law principles inform and define the scope of states' other obligations, in particular by requiring that states mitigate climate change in order to prevent warming above 1.5 degrees.¹⁹

International human rights treaties guarantee rights to life and property—rights that international and domestic courts have found implicate a positive obligation to reduce environmental risks, including risks of harm from climate change.²⁰ Recent opinions from human rights treaty bodies have articulated a test for the application of human rights obligations to climate change: if it is reasonably foreseeable that an activity under a state's jurisdiction or control will cause a risk of climate harm, the state must diligently prevent the harm within the limits of its capacity.²¹ Applying that

16. Jorge E. Viñuales, *Due Diligence in International Environmental Law: A Fine-Grained Cartography*, in DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER, *supra* note 14, at 113; *see also* Mayer (2019), *supra* note 11 (discussing the general obligation to avoid transboundary harm); Benoit Mayer, *Climate Change Mitigation as an Obligation Under Customary International Law*, 48 YALE J. INT'L L. 105, 130–31 (2023) (discussing how the precautionary approach is related to an obligation of prevention).

17. *See infra* Part II.A, Part II.B.

18. *See* Michael P. Scharf, *Accelerated Formation of Customary International Law*, 20 INT'L L. STUDENTS ASS'N J. INT'L & COMP. L. 305, 314 (2014). *See generally* Irit Mevorach, *Modified Universalism as Customary International Law*, 96 TEX. L. REV. 1403 (2018) (describing the formation and function of customary international law).

19. *See infra* Part II.A.

20. *See, e.g.*, Case of Verein Klimaseniorinnen Schweiz and Others v. Switzerland, App. No. 53600/20, ¶¶ 573–74 (Apr. 9, 2024), <https://hudoc.echr.coe.int/eng?i=001-233206> (holding that Switzerland is required to quantify GHG emissions limitations through a carbon budget and implement reduction measures); Budayeva v. Russia, App. No. 15339/02, ¶¶ 116, 133 (Mar. 20, 2008), <https://hudoc.echr.coe.int/eng?i=001-85436> (holding that states have a positive obligation to protect life and property from environmental risks); HR 20 december 2019, RvdW 2020, 19/00135 mn.nt C.A.S. (The State of the Netherlands (Ministry of Economic Affairs and Climate Policy)/Stichting Urgenda) (Neth.). *See also* Jacqueline Peel & Hari M. Osofsky, *A Rights Turn in Climate Change Litigation?*, 7 TRANSNAT'L ENV'T L. 37, 48 (2018) (discussing case law); Siobhán McInerney-Lankford, *Climate Change and Human Rights: An Introduction to Legal Issues*, 33 HARV. ENV'T L. REV. 431, 433 (2009) (examining the nexus of human rights and climate change). Other courts have recognized the right to a healthy environment as an autonomous right. *See, e.g.*, The Environment and Human Rights (Arts. 4(1) and 5(1) American Convention on Human Rights), Advisory Opinion OC-23/17, Inter-Am. Ct. H.R. (ser. A) No. 23, ¶¶ 62–63, 101–03 (Nov. 15, 2017) [hereinafter Colombia Advisory Opinion].

21. U.N. International Covenant on Civil and Political Rights [ICCPR], Views Adopted by the Committee Under Art. 5 (4) of the Optional Protocol, Concerning Communication No. 3624/2019, ¶ 8.13, U.N. Doc. CCPR/C/135/D/3624/2019 (Sept. 22, 2022) [hereinafter Billy et al.]; U.N. Convention on the Rights of the Child, Decision Adopted by the Committee Under the Optional Protocol to the Convention on the Rights of the Child on a Communications Procedure, Concerning

test to shipping suggests that states must use their best efforts to mitigate the risk that their acts and omissions related to international shipping will result in harmful climate change.

The LOSC mandates that states protect the marine environment and instructs them to “take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source.”²² Climate effects “more than satisfy the test for marine pollution” under the LOSC, and therefore states must take all necessary measures to prevent, reduce, and control them.²³ Accordingly, the LOSC and human rights law impose an equivalent obligation—whether termed “best efforts” or “all necessary measures”—on states to diligently mitigate shipping’s climate emissions.²⁴

The obligation I identify shares characteristics with other due diligence obligations.²⁵ It is complex, contingent, and dynamic, with a graduated level of care that correlates to the gravity of risk presented.²⁶ Drawing on reasoning from other scholars, I argue that in this context, the risk calculus includes the inadequacy of states’ commitments under the Paris Agreement,

Communication No. 104/2019, ¶ 10.5–7, U.N. Doc. CRC/C/88/D/104/2019 (Oct. 8, 2021) [hereinafter Saachi]; see Recent Cases, *Saachi v. Argentina*, No. CRC/C/88/D/104/2019, 135 HARVARD L. REV. 1981 (2022); Violi, *supra* note 14, at 81–82 (stating that in Colombia Advisory Opinion, OC-23/17, the “court equated jurisdiction with causality and ultimately with imputability, thus altering the vertical understanding of human rights jurisdiction, and eventually risk proximity”).

22. U.N. Convention on the Law of the Sea, arts. 192, 194(1), *opened for signature* Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter LOSC]. The United States has not ratified the LOSC but regards portions of it as reflecting customary international law. See John A. Duff, *The United States and the Law of the Sea Convention: Sliding Back from Accession and Ratification*, 11 OCEAN & COASTAL L.J., 1, 10, 15 (2005). Articles 192 and 194 impose obligations on “states” rather than “state parties,” indicating they may have been intended to have legal effects even for states that did not ratify the LOSC. See Stephen Vasciannie, *Part XI of the Law of the Sea Convention and Third States: Some General Observations*, 48 CAMBRIDGE L.J. 85, 91 (1989) (explaining that some rules in Part XI of the LOSC are addressed to “all states” and some to “state parties,” and that the former may have been intended to have erga omnes effects).

23. Alan Boyle, *Litigating Climate Change Under Part XII of the LOSC*, 34 INT’L J. MARINE & COASTAL L. 458, 463 (2019). *But see* SHI, *supra* note 10, at 43 (“GHG emissions from international shipping can be regarded as a type of ‘conditional’ pollution.”). The non-governmental organization, Opportunity Green, argued in a submission to the International Tribunal for the Law of the Sea that the LOSC requires GHG reductions for international shipping. See Brief of Opportunity Green as Amicus Curiae, Request for an Advisory Opinion Submitted by the Commission of Small Island States on Climate Change and International Law (June 15, 2023).

24. See generally Tomer Broude & Yuval Shany, *The International Law and Policy of Multi-Sourced Equivalent Norms*, in MULTI-SOURCED EQUIVALENT NORMS IN INTERNATIONAL LAW 2 (Tomer Broude & Yuval Shany eds., 2011) (discussing “normative parallelism and equivalence” in international law).

25. See generally Anne Peters et al., *Due Diligence in the International Legal Order: Dissecting the Leitmotif of Current Accountability Debates*, in DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER, *supra* note 14, at 1.

26. Viñuales, *supra* note 16, at 124 (citing Int’l Law Comm’n, Rep. on the Work of Its Fifty-Third Session, U.N. Doc. A/56/10, at 155, commentary to art. 3, ¶ 18 (2001)).

as well as the IMO's insufficient climate measures.²⁷ In other words, because the risk of harm posed by climate change is not effectively addressed by the climate regime or IMO rules, general obligations imposed by human rights treaties and the LOSC demand that states do more.

When and how this obligation applies depends on the state. The size of a state's maritime sector, measured by the number of vessels that fly its flag or by its port traffic, impacts its lawmaking power within the IMO and the mitigation potential of any unilateral measures.²⁸ As with other international environmental obligations, the required degree of diligence differs based on states' development and individual circumstances, and it can change over time.²⁹ Thus, similarly to the International Law Commission's finding on hazardous transboundary activities,³⁰ a highly developed or technologically advanced state with a large maritime sector has a greater scope of diligent conduct than other states.

There are two specific types of acts—or omissions—that in my view are particularly relevant to assess compliance with the obligation I identify.³¹ Cases from the International Court of Justice, the International Tribunal for the Law of the Sea, and the European Court of Human Rights indicate that when states make decisions within an international organization, they must adhere to their human rights obligations and substantive obligations related to the organization's area of competence.³² Therefore, the IMO's member

27. See NATALIE L. DOBSON, EXTRATERRITORIALITY AND CLIMATE CHANGE JURISDICTION: EXPLORING EU CLIMATE PROTECTION UNDER INTERNATIONAL LAW 30 (2021); Jacqueline Peel, *Climate Change*, in THE PRACTICE OF SHARED RESPONSIBILITY IN INTERNATIONAL LAW 1041–44 (André Nollkaemper ed., 2018) (explaining that failure to stop, reduce or regulate emitting activities could be a basis for finding that a state did not discharge its due diligence obligation of harm prevention); Rozemarijn J. Roland Holst, *Taking the Current When It Serves: Prospects and Challenges for an ITLOS Advisory Opinion on Oceans and Climate Change*, 32 REV. EUR. COMPAR. & INT'L ENV'T L. (SPECIAL ISSUE) 217, 223 (2022) (“As long as current NDCs collectively fall short of reaching this target, it can be argued that due diligence under UNCLOS obligates States to do more.”).

28. Flag states have codified influence in the adoption of IMO rules that correlate to the relative size of their fleets. Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships arts. 16(2)(f)(ii), (iii), Feb. 17, 1978, 1340 U.N.T.S. 61, 191 [hereinafter MARPOL] (stating that amendments to MARPOL are effective when ratified by states representing fifty percent of the world's merchant fleet). As discussed *infra* Part I, flag states and port states have prescriptive jurisdiction to set vessel-source pollution rules under the LOSC.

29. Viñuales, *supra* note 16, at 125–126; Peel, *supra* note 27, at 1033.

30. Int'l Law Comm'n, Rep. on the Work of Its Fifty-Third Session, *supra* note 26, commentary to art. 3, ¶ 18; see Viñuales, *supra* note 16, at 124, 126.

31. Generally speaking, due diligence obligations “do not prescribe a particular measure that has to be taken.” Medes Malaihollo, *Due Diligence in International Environmental Law and International Human Rights Law*, 68 NETH. INT'L L. REV. 121, 123 (2021). But whether a measure is “necessary” is fact dependent, and in certain scenarios, only some might be sufficient to show compliance. *Id.* at 146 (discussing European Court of Human Rights jurisprudence).

32. Application of the Interim Accord of 13 September 1995 (Maced. v. Greece), Judgment, 2011 I.C.J. Rep. 644 (Dec. 5) [hereinafter FYROM]; Southern Bluefin Tuna (N.Z. v. Japan; Austl. v. Japan), Case No. 3 & 4, Order of Aug. 27, 1999, 1999 ITLOS Rep. 280, 294, ¶ 50 [hereinafter Southern Bluefin

states are required to use their best efforts to ensure that shipping's GHG emissions do not harm human rights or the marine environment when they adopt climate measures at the IMO. Assuming that proposed climate measures do not burden the least developed countries or small island developing states and otherwise account for equitable principles,³³ IMO members are obliged to use their influence to push the organization to adopt ambitious and effective measures that are consistent with scientific and technological developments.³⁴

States' jurisdiction over their ports, ships that fly their flags, and private entities within their territories likewise implicate their obligations to prevent and reduce shipping's climate impacts. Ports are part of states' territories, and port states have jurisdiction under international law to condition the voluntary entry of ships on environmental standards.³⁵ Moreover, states can regulate ships that fly their flags and shipping companies that operate from within their territories. The European Union has asserted this jurisdiction to reduce international shipping's climate emissions more steeply and comprehensively than the IMO has. This type of action is particularly relevant in determining whether a state is complying with its due diligence obligation, at least for states similarly situated to the European Union.³⁶

In addition to being interpretively sound, there are legal and practical benefits to the approach taken here. By clarifying the legal source and nature

Tuna]; *Gasparini v. Italy & Belgium*, App. No. 10750/03 (May 19, 2009), <https://hudoc.echr.coe.int/eng?i=001-92899>; *Perez v. Germany*, App. No. 15521/08 (Jan. 6, 2015), <https://hudoc.echr.coe.int/eng?i=001-151049>; *Klausecker v. Germany*, App. No. 415/07 (Jan. 6, 2015), <https://hudoc.echr.coe.int/eng?i=001-151029>. See generally *Barros & Ryngaert*, *supra* note 14, at 55; ANA SOFIA BARROS, GOVERNANCE AS RESPONSIBILITY: MEMBER STATES AS HUMAN RIGHTS PROTECTORS IN INTERNATIONAL FINANCIAL INSTITUTIONS (2019). There are multiple and complex ways in which states and international organizations obligations intersect. See, e.g., Kristina Daugirdas, *Member States' Due Diligence Obligations to Supervise International Organisations*, in DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER, *supra* note 14, at 59. Those are surveyed and distinguished from the case at hand *infra* Part III.A.

33. See Kerr (2022), *supra* note 8, at 395–96 (discussing preferences for developing states in IMO climate measures).

34. See Nikolaos Giannopoulos, *International Law and Offshore Energy Production: Marine Environmental Protection Through Normative Interactions* (2020) (Ph.D. dissertation, Utrecht University) (on file with Utrecht University Library at <https://dspace.library.uu.nl/handle/1874/400007>), at 456–57 (demonstrating that the best available techniques and best environmental practices required by due diligence obligations are subject to change).

35. LOSC, *supra* note 22, art. 211(3). As discussed *infra* Part I, although generally accepted, this understanding of port state jurisdiction is nevertheless contested. Arron N. Honniball, *The "Enrica Lexie" Incident Award and Exclusive Flag State Jurisdiction*, NAT'L UNIV. SING.: CIL DIALOGUES, <https://cil.nus.edu.sg/blogs/the-enrica-lexie-incident-award-and-exclusive-flag-state-jurisdiction-by-arron-n-honniball> (last visited July 18, 2023) (discussing the M/Norstar Judgment and Enrica Lexie Award).

36. As a party to the Paris Agreement and in light of its actions to regulate shipping's emissions, the European Union itself may bear legal obligations related to the sector's climate emissions. Natalie L. Dobson, *Competing Climate Change Responses: Reflections on EU Unilateral Regulation of International Transport Emissions in Light of Multilateral Developments*, 67 NETH. INT'L L. REV. 183, 206 (2020). That question is beyond the scope of this Article.

of states' obligations to address shipping's climate impacts, it unifies rather than fragments international law.³⁷ Yet it is also flexible: the standard of compliance changes over time, is responsive to new scientific and technological developments, and accounts for states' differential capacities and capabilities.³⁸ It is therefore consistent with equity, sustainable development, and the common-but-differentiated responsibilities principle.³⁹ Because shipping is a well-studied and well-quantified sector, states' individual shares of the total risk can be easily determined and assigned, and the multi-source nature of the obligation means that there are various legal options for ensuring compliance.⁴⁰

To prove its claims, the Article first explains the current regulatory framework for GHG emissions from ships in Part I. It discusses the IMO's prescriptive jurisdiction over vessel-source pollution under the LOSC and states' jurisdiction to set rules for ships that enter their ports and fly their flags.⁴¹ In so doing, it provides the legal basis for the maritime climate measures enacted by the IMO and the European Union. Part II develops the Article's central thesis that states have a due diligence obligation to mitigate shipping's climate impacts. It addresses the conventional view, grounded in the climate treaties, that international law does not directly or clearly require that states reduce GHG emissions from shipping. I survey scholarship and case law on customary international principles, human rights law, and the LOSC, showing that these sources of law indicate that states must diligently address the climate risks posed by shipping. Part III develops a framework to assess whether states are meeting this obligation, focusing both on decision-making within the IMO and on unilateral actions. The Article concludes by briefly examining potential legal venues to hold states to account.

II. REGULATING SHIPPING'S CLIMATE POLLUTION

Defining climate obligations for shipping requires understanding state jurisdiction over ships and how that jurisdiction relates to IMO rules. Under the LOSC, vessels engaged in international shipping are regulated by

37. See Int'l Law Comm'n Study Group, Conclusions of the Work of the Study Group, Fragmentation of International Law: Difficulties Arising From the Diversification and Expansion of International Law, U.N. Doc. A/CN.4/L.702 (July 18, 2006).

38. Giannopoulos, *supra* note 34, at 457.

39. See generally SUMUDU ATAPATTU, EMERGING PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW (2007) (discussing international environmental principles' legal sources, significance, and interactions).

40. See *infra* Part IV.

41. For a description of different types of jurisdiction under LOSC, see generally Aaron N. Honniball, *The Exclusive Jurisdiction of Flag States: A Limitation on Pro-active Port States?*, 31 INT'L J. MARINE & COASTAL L. 499 (2016).

multiple states.⁴² These include the states where they are flagged or registered, the states whose coastal zones they sail through, and states whose ports they enter.⁴³ When and how these states can assert jurisdiction varies. In the context of pollution control, jurisdiction is tightly tied to rules adopted by the IMO's Marine Environmental Protection Committee (MEPC), which are made effective as annexes to the International Convention for the Prevention of Pollution by Ships (MARPOL).⁴⁴ In addition to directly regulating ships, states can also regulate shipping companies doing business within their territories. Part I explains these different bases for jurisdiction, and in doing so gives an overview of the IMO's GHG reduction measures and the European Union's parallel measures.

The IMO is charged with developing uniform pollution-control rules for ships engaged in international voyages.⁴⁵ Over eighty percent of world trade in goods is conducted by sea, and the IMO has stated that "the global character of shipping requires global regulation that applies universally to all ships."⁴⁶ The IMO has emphasized the need for uniform climate measures for shipping as well, asserting that "IMO regulations apply worldwide without discrimination, thus providing a global equal level playing field, preventing distortion of specific trade flows and trade agreements, [and] avoiding carbon leakage or sub-optimal shipping in certain parts of the world."⁴⁷

MARPOL Annex VI entered into force in 2005 and regulates air pollution from ships.⁴⁸ Annex VI provisions cover various types of pollution, including nitrous oxides, sulfur oxides, and volatile organic

42. Henrik Ringbom, *Regulating Greenhouse Gas Emissions from Ships*, in *THE LAW OF THE SEA AND CLIMATE CHANGE* 131 (Elise Johansen et al. eds., 2021).

43. DONALD R. ROTHWELL & TIM STEPHENS, *THE INTERNATIONAL LAW OF THE SEA* 382–86 (2d ed. 2016).

44. MARPOL, *supra* note 28; IMO Convention, *supra* note 2, art. 38.

45. See *supra* note 2; Frederic L. Kirgis, Jr., *Shipping*, in 2 *UNITED NATIONS LEGAL ORDER* 718–23 (Oscar Schachter & Christopher C. Joyner eds., 1995).

46. UNCTAD, *supra* note 1, at 153; IMO, Submission to the 34th Session of SBSTA, in UNFCCC, Information Relevant to Emissions from Fuel Used for International Aviation and Maritime Transport, paper no. 2, U.N. Docs. FCCC/SBSTA/2011/MISC.5, at 15, ¶ 2 (Apr. 20, 2011).

47. IMO, *Note by the International Maritime Organization to the Fifty-Seventh Session of the UNFCCC Subsidiary Body for Scientific and Technological Advice*, <https://www4.unfccc.int/sites/SubmissionsStaging/Documents/202210281824---IMO%20submission%20to%20SBSTA%2057.pdf> (last visited July 19, 2023); see Ellen Hey, *Regime Interaction and Common Interests in Regulating Human Activities in Areas Beyond National Jurisdiction*, in *REGIME INTERACTION IN OCEAN GOVERNANCE: PROBLEMS, THEORIES AND METHODS* 93–98 (Seline Trevisanut et al. eds., 2020) (discussing the IMO's design and implementation of non-discriminatory climate measures).

48. *International Convention for the Prevention of Pollution from Ships (MARPOL)*, INT'L MARITIME ORG., [https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx) (last visited July 19, 2023).

compounds.⁴⁹ The MEPC—which is composed of all IMO member states—usually adopts measures by consensus,⁵⁰ but it can amend a MARPOL annex through a two-thirds majority vote representing fifty percent of the world’s merchant fleet.⁵¹ The amendment must then be ratified by individual states to become effective, but as with the MEPC procedure, not all IMO member states are equal in this process: for a MARPOL annex or amendment to enter into force it must be adopted by states representing at least fifty percent of the world’s merchant fleet.⁵² Once effective, IMO rules are regarded as “generally accepted international rules and standards” under the LOSC, and thereby trigger a variety of obligations and powers for flag, coastal, and port states.⁵³

Shipping’s climate impacts have been on the IMO’s agenda since the early 1990s.⁵⁴ It did not act until 2011, when it amended MARPOL Annex VI, instituting fuel efficiency rules for new ships over a certain size and operational rules that adjusted ship routing and speed to lower energy consumption.⁵⁵ In 2016, the IMO adopted rules requiring that ships collect and register data on their fuel consumption.⁵⁶ In 2021, it strengthened the efficiency and operational rules in an effort to reduce carbon intensity across the sector.⁵⁷

These climate measures—like other MARPOL provisions—bind states and are enforceable against ships in various ways that illustrate the breadth and depth of the IMO’s law-making authority. Under the principle of no-more-favorable treatment, states that have ratified an IMO rule must enforce it not only against their own ships but also the ships of non-parties that visit their ports.⁵⁸ The principle thus promotes a level playing field by preventing states from opting out of pollution-control rules.⁵⁹ To illustrate, even though Bahrain, Colombia, Israel, and other states have not ratified

49. *Index of MEPC Resolutions and Guidelines Related to MARPOL Annex VI*, INT’L MARITIME ORG., <https://www.imo.org/en/OurWork/Environment/Pages/Index-of-MEPC-Resolutions-and-Guidelines-related-to-MARPOL-Annex-VI.aspx> (last visited July 19, 2023).

50. Sophia Kopela, *Climate Change, Regime Interaction, and the Principle of Common but Differentiated Responsibility: The Experience of the International Maritime Organization*, 24 Y.B. INT’L ENV’T L. 70, 80 (2014).

51. MARPOL, *supra* note 28, art. 16(2)(d), (f).

52. *Id.* For readability, this Article refers to effective MARPOL annexes as “IMO rules.”

53. LOSC, *supra* note 22, art. 211; see ERIK MOLENAAR, COASTAL STATE JURISDICTION OVER VESSEL SOURCE POLLUTION 136–37 (1998) (explaining that the IMO is “the competent international organization” for vessel source pollution under the LOSC).

54. IMO, Assembly Res. A. 719(17), *Prevention of Air Pollution from Ships*, IMO Doc. A 17/Res. 719 (Dec. 4, 1991).

55. IMO, Marine Env’t Prot. Comm. [MEPC] Res. 203(62), IMO Doc. MEPC 62/24/Add.1, annex 19 (July 15, 2011).

56. IMO, MEPC Res. 278(70), IMO Doc. MEPC 70/18/Add.1, annex 3 (Oct. 28, 2016).

57. IMO, MEPC Res. 328(76), IMO Doc. MEPC 76/15/Add.1, annex 1 (July 12, 2021).

58. MARPOL, *supra* note 28, arts. 5(4), 16(4)(a); IMO, Assembly Res. A. 1119(30), *Procedures for Port State Control, 2017* (Dec. 6, 2017), annex, at 4–5.

59. MOLENAAR, *supra* note 53, at 114.

MARPOL Annex VI, ships flying their flags are subject to IMO climate measures when visiting the ports of Annex VI parties, including the United States, the Netherlands, China, and other major maritime states.⁶⁰ Moreover, under the LOSC, flag states' national rules relating to vessel-source pollution must have "at least the same effect" as IMO rules, regardless of whether they have ratified a particular MARPOL annex or amendment.⁶¹ And flag states must take IMO rules "into account" for atmospheric pollution from vessels.⁶² IMO rules thus operate as binding legal standards for all states.

Under the LOSC, IMO rules are enforceable at port and at sea. States cannot independently set pollution rules for ships sailing through their exclusive economic zones and territorial seas unless ecological conditions for a clearly defined area warrant the rules and procedural steps are followed.⁶³ But they can enforce IMO rules for violations in their territorial seas, including by detaining suspect ships, and suspected violations of IMO rules in exclusive economic zones can trigger a more limited enforcement procedure.⁶⁴

States have discretion to go beyond IMO rules for ships voluntarily entering their ports.⁶⁵ Although some scholars contend that there is a customary international law principle establishing a right to entry,⁶⁶ there is little state practice supporting that position,⁶⁷ and the LOSC specifies that states exercise sovereignty over their ports as part of their territories.⁶⁸ Moreover, many scholars agree that states retain jurisdiction over their ports under customary international law.⁶⁹ The U.S. Supreme Court has held that ports and inland waters are "subject to the complete sovereignty of the

60. See *Ratifications by State*, INT'L MARITIME ORG., <https://www.imo.org/en/About/Conventions/Pages/StatusOfConventions.aspx> (last visited July 21, 2023).

61. LOSC, *supra* note 22, arts. 92, 211; Kirsten Bartenstein, *Article 211*, in UNITED NATIONS CONVENTION ON THE LAW OF THE SEA: A COMMENTARY 1419, 1436 (Alexander Proelss ed., 2017).

62. LOSC, *supra* note 22, art. 212(1). Whether the IMO's GHG rules relate to pollution of the marine environment or atmospheric pollution—and thus operate as a floor for flag state rules or merely as standards that need to be taken into account—has not been formally determined and is not relevant to the claims made here.

63. LOSC, *supra* note 22, art. 211(6).

64. LOSC, *supra* note 22, arts. 211(5), 220(2), (3).

65. LOSC, *supra* note 22, art. 211(3). They cannot do so for vessels in distress or in *force majeure* situations. Aaron N. Honniball, *Extraterritorial Port State Measures: The Basis and Limits of Unilateral Port State Jurisdiction to Combat Illegal, Unreported and Unregulated Fishing* 144–45 (2019) (Ph.D. dissertation, Utrecht University) (on file with Utrecht University Library).

66. A.V. Lowe, *The Right of Entry into Maritime Ports in International Law*, 14 SAN DIEGO L. REV. 597, 598 (1977) (discussing *Aramco Arbitration*, 27 I.L.R. 117, 212 (Int'l Lab. Org. Ad. Trib. 1958)).

67. John T. Oliver, *Legal and Policy Factors Governing the Imposition of Conditions on Access to and Jurisdiction over Foreign-Flag Vessels in U.S. Ports*, 5 S.C.J. INT'L L. & BUS. 209, 213–14 (2009).

68. LOSC, *supra* note 22, art. 2(1).

69. See, e.g., Erik Molenaar, *Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage*, 38 OCEAN DEV. & INT'L L. 225, 227 (2007). See also Donald Rothwell et al., *Charting the Future for the Law of the Sea*, in THE OXFORD HANDBOOK OF THE LAW OF THE SEA 893 (Donald Rothwell et al. eds., 2015) ("[T]he balance of the power between flag States and coastal/port States has undoubtedly shifted from the former to the latter of the last two decades . . .").

nation, as much as if they were a part of its land territory, and the coastal nation has the privilege even to exclude foreign vessels altogether.”⁷⁰

The European Union has assertively exercised this type of jurisdiction to regulate international shipping’s climate impacts. In 2016, it instituted a GHG emissions data collection scheme more stringent than the IMO’s global measure for ships visiting European ports and flying European flags.⁷¹ In 2023, it expanded the scope of the EU Emissions Trading System (ETS) to include maritime emissions and limited the GHG intensity of energy used by ships; both measures are designed to lower emissions from international shipping far more quickly than the IMO’s current regulations.⁷² The European Union enforces these measures by regulating shipping companies that are registered within its member states’ territories, individual ships that enter EU ports, and ships that fly its members’ flags.⁷³

The EU measures will initially cover fifty percent of emissions from all international voyages to and from its member states’ ports; the scope of maritime emission coverage in the ETS will rise to one hundred percent if the IMO does not adopt a global market-based measure by 2028.⁷⁴ The ETS measure requires that companies legally affiliated to ships entering and departing European ports purchase credits through the trading system based on emissions for each voyage.⁷⁵ The GHG intensity limit requires that companies report and reduce the yearly average GHG intensity of energy used by ships according to a set schedule.⁷⁶ A ship’s operations on the high seas, including its speed and route, as well as its equipment and the fuel it uses, will impact the quantity of credits that companies must obtain and its compliance with the GHG intensity limits.⁷⁷ By indirectly regulating ships’ conduct on the high seas, the measures represent a significant extraterritorial expansion of port state jurisdiction.⁷⁸

Despite this expansion of regulation on the high seas, the European Union’s measures are lawful.⁷⁹ Under the LOSC, port state “operational measures regulating behaviour occurring outside a state’s territory may raise

70. *United States v. Louisiana*, 394 U.S. 11, 22 (1969).

71. DOBSON, *supra* note 27, at 194–95 (comparing EU and IMO monitoring schemes).

72. EU Maritime ETS Measure, *supra* note 7, ¶¶ 8–9; EU Maritime Fuel Measure, *supra* note 7, arts. 1, 4.

73. EU Maritime ETS Measure, *supra* note 7, ¶¶ 31–32, 34–35; EU Maritime Fuel Measure, *supra* note 7, arts. 2(1), 6–7, 25.

74. EU Maritime ETS Measure, *supra* note 7, ¶ 28; EU Maritime Fuel Measure, *supra* note 7, art. 2(1)(d).

75. EU Maritime ETS Measure, *supra* note 7, ¶ 20.

76. EU Maritime Fuel Measure, *supra* note 7, arts. 4(2), 8, Annex III.

77. EU Maritime ETS Measure, *supra* note 7, ¶¶ 32, 63.

78. Manolis Kotzampasakis, *Intercontinental Shipping in the European Union Emissions Trading System: A “Fifty-Fifty” Alignment with the Law of the Sea and International Climate Law?*, 32 REV. EUR. COMPAR. & INT’L ENV’T L. 29, 33 (2023).

79. *Id.*

issues of extraterritoriality.⁸⁰ In addition, measures that relate to the construction, design, equipment, and manning (CDEM) of ships are “often considered to be the most intrusive ones with respect to ships’ navigational rights,”⁸¹ and are specifically assigned to the jurisdiction of flag states by the LOSC.⁸² But CDEM standards enacted by port states can be justified on a territorial basis because vessels violate the standards when they sail into port.⁸³ As Kotzampasakis explains, the text of the LOSC shows that it “does not preclude States from establishing port entry conditions in relation to ships’ conduct beyond their territorial sea, but it prevents them from undertaking in-port investigations and instituting proceedings related to extraterritorial vessel-source pollution, unless a breach of international rules is suspected.”⁸⁴ Thus, because the European Union’s maritime climate measures operate as port entry conditions, they comply with the LOSC.⁸⁵

Under customary international law’s jurisdictional limitations—non-intervention, non-interference, and sovereign equality—states should exercise self-restraint in designing extraterritorial regulations.⁸⁶ But, as Dobson points out, the question is more complex when it comes to climate change and the relative stringency of the European Union’s regulations compared to the IMO’s measures, given that EU member states will internally suffer the adverse effects of climate harm caused by ships that enter their ports.⁸⁷ Thus, although port state jurisdiction remains a contested issue in the law of the sea,⁸⁸ states have jurisdiction to regulate a ship’s climate emissions outside their territory more stringently than the IMO does, so long as they do so in a manner consistent with the LOSC and with general principles of international law, such as good faith and nonabuse of rights.⁸⁹

At the moment, the European Union stands alone in taking this step; the United States and other major maritime states are using incentives and funding to decarbonize their shipping sectors, but do not currently

80. DOBSON, *supra* note 27, at 104.

81. Henrik Ringbom, *Global Problem—Regional Solution? International Law Reflections on an EU CO₂ Emissions Trading Scheme for Ships*, 26 INT’L J. MARINE & COASTAL L. 613, 621 (2011).

82. LOSC, *supra* note 22, art. 94(3).

83. Ringbom, *supra* note 81, at 632; *see also* DOBSON, *supra* note 27, at 104–05 (collecting literature on the territorial basis for port state jurisdiction over CDEM standards).

84. Kotzampasakis, *supra* note 78, at 33.

85. *Id.* at 36. Kotzampasakis finds that a non-compliance fine included in the measures likely is not a permissible enforcement measure, although the denial of right of entry is.

86. DOBSON, *supra* note 27, at 240–41; *see also* CEDRIC RYNGAERT, JURISDICTION IN INTERNATIONAL LAW 35–37 (2008); RESTATEMENT (FOURTH) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES §§ 403, 407–13 (AM. L. INST. 2018) (providing equivalent “reasonableness” jurisdictional test).

87. DOBSON, *supra* note 27, at 179 (defining “climate change jurisdiction” under customary international law).

88. Honniball, *supra* note 35.

89. Kotzampasakis, *supra* note 78.

implement maritime climate regulations other than IMO rules.⁹⁰ Having shown what states may do to regulate shipping's climate emissions, I now turn to what they must do.

III. LEGAL OBLIGATIONS

A. *The Climate Treaties*

The climate treaties are a logical place to look for state obligations to reduce GHG emissions from shipping, and that is where scholarly attention has focused.⁹¹ As I will elaborate, the climate treaties implicitly include shipping when interpreted in a certain way, but they do not clearly or directly mandate that states reduce GHG emissions from the sector. Despite this ambiguity, the 1.5 degree temperature goal does serve as a binding legal norm for shipping, because states have resolved that it will guide the sector's emissions reductions at the IMO, and the goal reflects what international environmental principles demand.

The United Nations Framework Convention on Climate Change (UNFCCC) encompasses international transport in that its goal is the prevention of “dangerous” climate change, and its principles state that climate policies should “comprise all economic sectors.”⁹² Article 4(2) provides that developed countries “are taking the lead” in adopting national policies and measures to limit GHG emissions.⁹³ Scholars describe this provision as a very soft obligation.⁹⁴ And it may not even apply to shipping, because the UNFCCC's conference of parties decided that international transport emissions should not be included in national totals for Article 4(2) purposes.⁹⁵ Under the Kyoto Protocol, developed countries “shall pursue limitation or reduction” of GHG emissions from shipping, “working

90. OCEAN POLICY COMMITTEE, NAT'L OCEANIC & ATMOSPHERIC ADMIN., OCEAN CLIMATE ACTION PLAN 36–38 (2023). See *infra* Part III (discussing states' voluntary measures). There is legislation pending in Congress that would amend the Clean Air Act to direct the EPA to implement sustainable fuel standards for international shipping and impose a \$150 per ton fee on carbon emissions on marine bunker fuel. Clean Shipping Act of 2023, H.R. 4024, 118th Cong. § 2 (2023); International Maritime Pollution Account Act of 2023, S. 1920, 118th Cong. § 5 (2023).

91. See, e.g., Martínez Romera, *supra* note 9.

92. U.N. Framework Convention on Climate Change, art. 3, May 9, 1992, 1771 U.N.T.S. 107, S. Treaty Doc No. 102-38 (1992) [hereinafter UNFCC Convention].

93. *Id.* art. 4(2)(a).

94. Daniel Bodansky, *The United Nations Framework Convention on Climate Change: A Commentary*, 18 YALE J. INT'L L. 451, 515–16 (1993) (citing Philippe Sands, *The United Nations Framework Convention on Climate Change*, 1 REV. EUR. COMPAR. & INT'L ENV'T L. 270 (1992)); see also BEATRIZ MARTINEZ ROMERA, REGIME INTERACTION AND CLIMATE CHANGE: THE CASE OF INTERNATIONAL AVIATION AND TRANSPORT 67 (2018) (referring to UNFCC Convention art. 4(2) as an “ill-defined obligation”).

95. FARHANA YAMIN & JOANNA DEPLEDGE, THE INTERNATIONAL CLIMATE CHANGE REGIME 84 (2004).

through” the IMO.⁹⁶ But even assuming that this language constitutes an obligation, it only applies to developed countries that are parties to the Protocol, and thereby excludes non-party developed states, like the United States and Canada, and states such as China, India, Singapore, South Korea, and the Gulf States, which the UNFCCC classifies as developing states.⁹⁷

The Paris Agreement does not directly refer to shipping or the IMO. For nearly a year, the Agreement’s negotiating text contained provisions requiring parties to work through the IMO to reduce emissions consistent with the Agreement’s temperature goals, and that they establish a levy scheme for shipping to that end.⁹⁸ Those provisions were removed from the Agreement’s text at the last minute, without any public explanation.⁹⁹ Some scholars nevertheless view the Paris Agreement’s temperature goal as a “rule for interpretation” for all obligations within the UNFCCC, including its implicit requirement that states limit all emissions, including those arising from shipping, so as to prevent dangerous climate change.¹⁰⁰ Others argue that the Paris Agreement is a stand-alone treaty, albeit one that is closely linked to the UNFCCC.¹⁰¹

Regardless of the Paris Agreement’s relationship with the UNFCCC, several of its articles indirectly include shipping. These include Article 4(4), which states that developed country parties “should continue taking the lead by undertaking economy-wide absolute emission reduction targets.”¹⁰² Because international shipping is a part of developed countries’ economies, the sector could be construed to fall within that provision. The European Union appears to agree: in its legislation mandating the inclusion of maritime transport in the EU carbon market, the European Union noted that all sectors of the economy need to contribute to achieving emissions reductions, and its 2020 nationally-determined contribution stated that the European Union complies with Article 4(4) by having an economy-wide absolute target.¹⁰³ But, as Lavanya Rajamani points out, Article 4(4) uses the

96. Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 2(2), Dec. 10, 1997, 2303 U.N.T.S. 148.

97. *Id.*; UNFCCC Convention, *supra* note 92, annexes I, II; *A Kyoto Protocol to the United Nations Framework Convention on Climate Change*, U.N. TREATY COLLECTION, https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-7-a&chapter=27&clang=_en.

98. Yubing Shi, *The Implications of the Paris Agreement for the Regulation of Greenhouse Gas Emissions from International Shipping*, 32 OCEAN Y.B. 528, 532 (2018); Ringbom, *supra* note 42, at 136.

99. MARTINEZ ROMERA, *supra* note 94, at 80. *See generally* Radoslav S. Dimitrov, *The Paris Agreement on Climate Change: Behind Closed Doors*, 16 GLOB. ENV’T POL. 1 (2016).

100. MARTINEZ ROMERA, *supra* note 94, at 181.

101. Daniel Bodansky, *The Paris Climate Change Agreement: A New Hope?*, 110 AM. J. INT’L L. 288, 296 (2016).

102. Paris Agreement, *supra* note 6, art. 4(4).

103. EU Maritime ETS Measure, *supra* note 7, ¶¶ 2, 4; European Commission Press Release, Update of the Nationally Determined Contribution of the European Union and its Member States, annex at 19 (Oct. 16, 2023), <https://unfccc.int/sites/default/files/NDC/2023-10/ES-2023-10-17%20EU%20submission%20NDC%20update.pdf>.

term “should” rather than “shall,” indicating a normative expectation that parties will exercise a particular mitigation pathway rather than a legal obligation.¹⁰⁴ That word choice was deliberate, and appears to have been a precondition for the United States to join the Agreement.¹⁰⁵ Thus, Article 4(4) should be read as indicating a normative expectation that states will implement economy-wide reductions in light of their national circumstances, rather than a binding obligation that they must do so.

Other provisions in Article 4 could likewise encompass shipping. Article 4(2) states that parties “shall” submit nationally-determined contributions (NDCs) towards the temperature goals, and that parties “shall pursue domestic mitigation measures” in order to achieve those contributions.¹⁰⁶ But scholars disagree about whether these are substantive obligations at all, given the aspirational nature of the temperature goals and the procedural nature of NDCs.¹⁰⁷ And in 2018, the parties to the Paris Agreement decided that emissions from international shipping and aviation should be reported separately from national totals.¹⁰⁸ The logic of the Paris Agreement is premised on the reporting of national emissions, the communication of national contributions towards the temperature goals based on emissions reporting, and an obligation that states pursue domestic mitigation measures to meet their contributions.¹⁰⁹ Because national emissions reporting is legally tied to substantive mitigation requirements under the Agreement, it is therefore unclear whether Article 4(2) encompasses shipping.¹¹⁰

Can supplementary means of interpretation resolve this ambiguity?¹¹¹ The conscious decision of the Agreement’s drafters to omit any explicit reference to shipping indicates that the sector’s emissions should not be subject to the Agreement’s obligations, whether substantive or

104. Lavanya Rajamani, *Ambition and Differentiation in the 2015 Paris Agreement: Interpretive Possibilities and Underlying Politics*, 65 INT’L & COMPAR. L.Q. 493, 510–11 (2016).

105. *Id.* at 510–11.

106. Paris Agreement, *supra* note 6, at art. 4(1)–(3).

107. Alexander Zahar, *Collective Obligation and Individual Ambition in the Paris Agreement*, 9 TRANSNAT’L ENV’T L. 165, 167–73 (2019) (collecting and discussing literature).

108. UNFCCC, Rep. of the Conf. of the Parties Serving as the Meeting of the Parties to the Paris Agreement, U.N. Doc. FCCC/PA/CMA/2018/3/Add.2, at 23, 27.

109. *See* Rajamani, *supra* note 104, at 497–98.

110. *See* Chris Lyle, *Beyond the ICAO’s CORSIA: Towards a More Climatically Effective Strategy for Mitigation of Civil-Aviation Emissions*, 8 CLIMATE L. 104, 122 (2018) (arguing that “[i]nternational aviation should be brought under the direct responsibility of states through their NDCs”).

111. Vienna Convention on the Law of Treaties art. 32, May 23, 1969, 1155 U.N.T.S. 331 (stating that if the meaning of a treaty is ambiguous, “[r]ecourse may be had to supplementary means of interpretation, including the preparatory work of the treaty and the circumstances of its conclusion”); *see also* Arbitral Award of 31 July 1989 (Guinea-Bissau v. Sen.), Judgment, 1991 I.C.J. Rep. 53, ¶ 48 (Nov. 11) (“Articles 31 and 32 of the Vienna Convention on the Law of Treaties . . . may in many respects be considered as a codification of existing customary international law . . .”).

procedural.¹¹² Nevertheless, Cabo Verde, China, the Marshall Islands, the United Kingdom, and the United States asserted in their NDCs that they are committed to reducing shipping's impacts through the IMO.¹¹³ Yet the Vienna Convention on the Law of Treaties “demands the agreement of *all the parties* in order to make [subsequent] practice relevant for treaty interpretation,”¹¹⁴ and most states do not refer to shipping at all in their NDCs. Instead, the only relevant practice on this point is the decision by the Agreement's parties to exclude shipping from national totals.¹¹⁵ That carries particular weight because decisions by the Paris Agreement's conference of parties have binding legal force under the Agreement.¹¹⁶ State practice is therefore insufficient—at least currently—to support interpreting the Paris Agreement's obligations as including international shipping's GHG emissions.

Yet there are two ways in which the Agreement's temperature goals, as opposed to its procedural and substantive obligations, are legally linked to international shipping. First, in 2018, the IMO's member states, all of whom are parties to the Agreement, resolved that the IMO would reduce shipping's GHG emissions to fifty percent below 2008 levels by 2050 “whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO₂ emissions reduction consistent with the Paris Agreement temperature goals.”¹¹⁷ The IMO has also stated that it

112. See RICHARD GARDINER, *TREATY INTERPRETATION* 386–87 (2d ed. 2015) (discussing cases interpreting “the meaning of a term by showing that the course of the negotiations excluded an interpretation that is being put forward”).

113. CABO VERDE, 2020 UPDATE TO THE FIRST NATIONALLY DETERMINED CONTRIBUTION (NDC) 26 (Apr. 2, 2021), https://unfccc.int/sites/default/files/NDC/2022-06/Cabo%20Verde_NDC%20Update%202021.pdf; CHINA FIRST NDC (UPDATED SUBMISSION) 47 (Oct. 28, 2021), <https://unfccc.int/sites/default/files/NDC/2022-06/中国落实国家自主贡献成效和新目标新举措.pdf>; UPDATE COMMUNICATION ON THE MARSHALL ISLANDS PARIS AGREEMENT NDC 3 (Dec. 30, 2020), https://unfccc.int/sites/default/files/NDC/2022-06/RMI%20NDC-UpdateUPDATED_01.20.2021.pdf; UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND'S NATIONALLY DETERMINED CONTRIBUTION 6 (Sept. 22, 2022), <https://unfccc.int/sites/default/files/NDC/2022-09/UK%20NDC%20ICTU%202022.pdf>; THE UNITED STATES OF AMERICA NATIONALLY DETERMINED CONTRIBUTION 4 (Apr. 4, 2021), <https://unfccc.int/sites/default/files/NDC/2022-06/United%20States%20NDC%20April%202021%20Final.pdf>.

114. Christopher Peters, *Subsequent Practice and Established Practice of International Organizations: Two Sides of the Same Coin?*, 3 GOETTINGEN J. INT'L L. 617, 619 (2011).

115. *Id.* at 627 (stating that the resolutions of a treaty's parties reflect their agreement on its interpretation).

116. Rajamani, *supra* note 104, at 499–500 (citing Paris Agreement, *supra* note 6, arts. 4(8), (9)); see also HARRO VAN ASSELT, *THE FRAGMENTATION OF GLOBAL CLIMATE GOVERNANCE: CONSEQUENCES AND MANAGEMENT OF REGIME INTERACTIONS* (2014) (discussing the importance of climate regime lawmaking by treaty bodies).

117. IMO, MEPC Res. 304(72), IMO Doc. MEPC 72/17/Add.1, annex 11 (Apr. 13, 2018), at 5. Compare *Member States*, INT'L MARITIME ORG., <https://www.imo.org/en/OurWork/ERO/Pages/MemberStates.aspx> (last visited July 20, 2023), with *Status of Paris Agreement*, U.N. TREATY COLLECTION, https://treaties.un.org/Pages/ViewDetails.aspx?src='TREATY&mtdsg_no=XXVII-7-d&chapter=27&clang=_en (last visited July 20, 2023).

supports the Glasgow Climate Pact, which resolved to pursue efforts to limit global temperature increase to 1.5 degrees.¹¹⁸ In its July 2023 climate strategy, the IMO resolved that GHG emissions from shipping would reach net-zero “by or around, i.e. close to 2050 . . . consistent with the long-term temperature goal set out in Article 2 of the Paris Agreement.”¹¹⁹

Moreover, principles of international environmental law indicate that the Paris Agreement’s 1.5 degree temperature goal should guide states in their actions related to shipping’s climate impacts. Under the harm prevention principle, a States is required to “take all appropriate measures to prevent significant transboundary harm or at any event minimize the risk thereof” from activities in its territory or arising under its jurisdiction or control.¹²⁰ Viñuales explains that this principle overlaps with others, including the “responsibility to ensure that activities within [a State’s] jurisdiction and control do not cause damage to the environment of other States or of areas beyond national jurisdiction”—articulated in the Rio Declaration—and the requirement that states take precautionary measures even in the absence of scientific certainty as to significant harm.¹²¹ Climate change poses a risk of significant harm: “[a]ssuming an approximately linear relation between GHG concentrations in the atmosphere and the severity of climate change, even very small cuts in global emissions can achieve significant global harm-prevention (or risk-reduction) benefits.”¹²² Accordingly, these customary principles apply to climate change.¹²³

These principles should be read to encompass shipping’s climate impacts for the same reason that they encompass states’ emissions: the sector’s aggregate annual GHG emissions are more than 700 million metric tons of carbon, which qualifies it as a leading global source of climate pollution.¹²⁴ Accordingly, the risk that shipping contributes to climate change is likely rather than speculative.¹²⁵ Although each state’s share of the harm posed by shipping’s climate impact varies depending on its maritime trade, incremental reductions will lessen the risk of significant harm, as with

118. UNFCCC, Rep. of the Conf. of the Parties Serving as the Meeting of the Parties to the Paris Agreement, U.N. Doc. FCCC/PA/CMA/2021/10/Add.1 (Mar. 8, 2022), Decision 1/CMA.3, ¶ 16; IMO, *Report of the Marine Environment Protection Committee on its Seventy-Eighth Session*, at 33, 40, IMO Doc. MEPC 78/17 (June 24, 2022).

119. IMO 2023 Strategy, *supra* note 3, at 6.

120. Int’l Law Comm’n, Rep. on the Work of Its Fifty-Third Session, *supra* note 26, at 153, art. 3.

121. Viñuales, *supra* note 16, at 116–17 (citing U.N. Conference on Environment and Development, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Aug. 12, 1992); Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area, Case No. 17, Advisory Opinion of Feb. 1, 2011, 2011 ITLOS Rep. 10, ¶¶ 125–35 [hereinafter Seabed Advisory Opinion]).

122. Mayer (2023), *supra* note 16, at 134.

123. See *infra* Part II.B.1 regarding their relevance to a customary international obligation.

124. See *supra* notes 1, 5.

125. Viñuales, *supra* note 16, at 123 (“Risk, in this context, requires a reliable probability (‘high’ or ‘small’, but reliable as opposed to volatile) of a negative outcome.”).

other emissions. Shipping's climate impacts therefore cross the threshold for harm prevention. Because limiting global warming to 1.5 degrees is necessary to avoid a high risk of sea level rise that damages small islands and coastal areas, species loss and extinction, ocean acidification and other harm,¹²⁶ the Paris Agreement's 1.5 degree goal should be interpreted as a legal benchmark for shipping's climate emissions and for the prevention of disastrous levels of climate change more broadly.

Yet multiple studies suggest that the IMO's current measures are not compatible with that goal, assuming that shipping only needs to achieve average global reductions.¹²⁷ Thus, although the Paris Agreement's temperature goals are substantively linked to shipping—through the IMO's citation of them in its resolutions and through the application of principles of international environmental law—there is not yet a legal framework to hold states to account for this sector's emissions. National courts have given the Paris Agreement's temperature goals legal weight as normative standards for actions by governments and corporations, standards that inform the substance of legal obligations.¹²⁸ As discussed next, the 1.5 degree goal can operate in a similar way to inform legal obligations for international shipping.

B. *A Due Diligence Obligation to Mitigate*

In this section, I discuss the debate on whether states have a due diligence obligation to take all necessary measures to mitigate climate change, imposed by three areas of international law: customary international law, human rights treaties, and the LOSC. I do not definitively answer those important questions, but instead examine sources of law and scholarly perspectives to determine that, to the extent that such obligations exist, they must extend to international shipping.

1. *Customary International Law*

The application of international environmental legal principles to specific disputes—and their crystallization into binding customary

126. IPCC, *supra* note 6, at 8–9.

127. *See* sources cited *supra* note 5. There are reasons to believe that the sector should decarbonize more quickly, given that it is relatively easy and inexpensive for it to do so compared with other economic sectors such as aviation and land use. Maria Sharmina et al., *Decarbonising the Critical Sectors of Aviation, Shipping, Road Freight and Industry to Limit Warming to 1.5–2°C*, 21 CLIMATE POL. 455, 462 (2021).

128. *See, e.g.*, HR 20 december 2019, RvdW 2020, 19/00135 mn.nt C.A.S. (The State of the Netherlands (Ministry of Economic Affairs and Climate Policy)/Stichting Urgenda) (Neth.); Bundesverfassungsgericht [BvR] [Federal Constitutional Court] Mar. 24, 2021, 2656 Entscheidungen des Bundesverfassungsgerichts [BVerfGE] 1, ¶¶ 7, 192 (2021) (Ger.) (English translation).

international law—is ad-hoc.¹²⁹ Courts identify customary international law by looking to whether there is a “general practice . . . accepted as law[;]” in other words, whether there is widespread, representative, and consistent practice among states that is viewed by those states as legally required.¹³⁰

Mayer surveys state practice and identifies a customary obligation to mitigate climate change, but finds that because almost all states are mitigating in a way that is inconsistent with the Paris Agreement’s temperature goals (both the 2 and 1.5 degree goals), there is currently insufficient state practice to support a customary obligation tied directly to them.¹³¹ He instead identifies an obligation for states to “follow consistently, over time, a reasonable interpretation of the temperature targets” as applied to their own mitigation goals—in other words, a state could choose the least demanding interpretation of its fair share of the collective effort to meet the targets as long as the choice was justified.¹³² Under Mayer’s analysis, as part of their good faith mitigation efforts, states must take necessary or appropriate measures, which might include assessment, project planning, and internally consistent policies.¹³³ He concedes that his conservative approach is less demanding than that adopted by several courts that have relied on customary legal principles in climate disputes, including the Dutch Supreme Court’s approach in *Urgenda v. Netherlands*.¹³⁴

How does Mayer’s finding intersect with international shipping? I agree that there is insufficient state practice to indicate a customary legal obligation to mitigate climate change consistent with the Paris Agreement’s goals. Mayer also appears correct that states have a customary legal obligation to identify and implement a fair-share contribution towards the prevention of global warming that reaches disastrous levels.¹³⁵ That process necessarily involves consideration of international shipping: the sector consists of a large and growing share of the carbon budget available to prevent global warming above 1.5 degrees, and some studies estimate that it will account for more than one hundred percent by 2050 under a business-as-usual scenario.¹³⁶ Thus, any “reasonable interpretation” of what the temperature goals demand must include the sector and its growth.¹³⁷

129. PIERRE-MARIE DUPUY & JORGE E. VIÑUALES, INTERNATIONAL ENVIRONMENTAL LAW 60–62 (2d ed. 2018) (discussing the differences between principles, concepts, and rules).

130. Int’l Law Comm’n, Rep. on the Work of Its Seventieth Session, U.N. Doc. A/73/10, at 135–38 (2018).

131. Mayer (2023), *supra* note 16, at 142–43.

132. *Id.* at 145.

133. *Id.* at 147–50.

134. *Id.* at 150.

135. *Id.* at 145.

136. *See* sources cited *supra* at note 5.

137. *See* Mayer (2023), *supra* note 16.

Is there also a specific customary legal obligation to consider and mitigate the international shipping sector's emissions, either through the IMO or on a unilateral, bilateral, or regional basis? The IMO's member states have unanimously resolved that the IMO will reduce shipping's emissions consistent with the Paris Agreement's temperature goals.¹³⁸ But those resolutions themselves do not legally bind states,¹³⁹ and the IMO has not implemented measures that would achieve emissions reductions consistent with the Agreement's temperature goals.¹⁴⁰ The resolutions therefore do not constitute state practice consistent with a customary legal obligation.

As noted above, some states have asserted in their NDCs that they are committed to reducing shipping's climate impacts through the IMO.¹⁴¹ NDCs have legal status under the Paris Agreement, are arguably binding undertakings, and have been enforced against states in domestic courts.¹⁴² Committing to an act in an NDC therefore has particular legal salience. In contrast to state practice when used as a supplementary means of treaty interpretation, in which case the state practice must be unanimous, in the case of the identification of customary international legal obligations, "the most important practice is that of 'States whose interests are specially affected.'"¹⁴³ The states that have committed to work through the IMO in their NDCs to reduce shipping's emissions include some, but not all, major flag and port states.¹⁴⁴ But it is very difficult to determine which, if any, states are "specially affected" by international shipping's climate impacts, given its global reach.¹⁴⁵ Therefore, in my view there is insufficient support for a customary international legal obligation requiring that states reduce shipping's climate impacts through the IMO or on a unilateral, bilateral, or regional basis.

Yet states' commitments in their NDCs and increasing unilateral actions indicate that there may be an emerging customary norm that states must

138. MEPC Res. 304(72), *supra* note 117, at 4; IMO 2023 Strategy, *supra* note 3, at 6; IMO, *Report of the Marine Environment Protection Committee on its Seventy-Eighth Session*, *supra* note 118, at 33.

139. Aldo Chircop, *The IMO Initial Strategy for the Reduction of GHGs from International Shipping: A Commentary*, 34 INT'L J. MARINE & COASTAL L. 482, 509 (2019).

140. IMO, *Fourth IMO Greenhouse Gas Study*, *supra* note 4.

141. *See* sources cited *supra* at note 113.

142. Benoit Mayer, *International Law Obligations Arising in Relation to Nationally Determined Contributions*, 7 TRANSNAT'L ENV'T L. 251 (2018); Mayer (2023), *supra* note 16.

143. Scharf, *supra* note 18, at 315 (quoting *North Sea Continental Shelf* (Ger. v. Den., Ger. v. Neth.), Merits, 1969 I.C.J. 3, ¶ 74 (Feb. 20)).

144. *See* sources cited *supra* note 113; UNCTAD, *supra* note 1, at 41 (top flag states), 82 (top port states).

145. *See* UNCTAD, *supra* note 1, at xv (noting that ships carry over eighty percent of the volume of global trade); Kevin Jon Heller, *Specially-Affected States and the Formation of Custom*, 112 AM. J. INT'L L. 191, 193 (2018) ("[A] state should be considered specially affected if it either engages in a practice that some states do not or is distinctively affected by a practice—directly or indirectly—in a manner that distinguishes it from other states.").

address shipping's climate impacts.¹⁴⁶ This has several legal consequences. States are under an obligation to persistently object to an emerging customary norm if they disagree in order to avoid being bound to the resultant customary legal obligation.¹⁴⁷ The current body of state practice will be relevant to judicial determinations of general trends that can “crystalize[] emerging rules and [] influence[] state behavior.”¹⁴⁸ In addition, a future UN General Assembly resolution could be sufficient to “consolidate” the state practice into a customary obligation, depending on the resolution's text and the vote.¹⁴⁹

Even though there is no binding obligation in customary international law to mitigate shipping's climate emissions, principles of international environmental law nevertheless play an important role in the scope and content of any treaty obligation to do so. Principles can give coherence to obligations and help with their interpretation.¹⁵⁰ They “point to particular decisions about legal obligation[s] in particular circumstances,” and give “a reason that argues in one direction, but does not necessitate a particular decision.”¹⁵¹ There are many examples of this function: the harm prevention and precaution principles were used by the International Court of Justice to illuminate Uruguay's treaty obligations in *Pulp Mills*;¹⁵² the Dutch Supreme Court cited the no harm principle to interpret Articles 2 and 8 of the European Convention on Human Rights;¹⁵³ and the Inter-American Court of Human Rights referred to the principles of harm prevention and precaution, among others, in addressing Colombia's obligation to respect the rights to life and personal integrity.¹⁵⁴ Thus the climate risks posed by a state's maritime sector and a state's associated due diligence obligations under treaty regimes should be informed by general principles, such as harm prevention and precaution, even in the absence of a legally-binding customary obligation.

146. See Scharf, *supra* note 18, at 318–20 (discussing the role of emerging norms in the development of customary international law); *id.* at 323 (explaining how acceptance of such norms as law can be shown by couching “their innovation in the language of existing law” or through “consent to an emerging rule” rather than acknowledgement that it already has the force of law).

147. *Id.* at 318.

148. *Id.* at 321 (quoting Anthea E. Roberts, *Traditional and Modern Approaches to Customary International Law: A Reconciliation*, 95 AM. J. INT'L L. 757, 775 (2001)).

149. *Id.* at 326–27.

150. Gilles J. Martin, *Principles and Rules*, in 4 ELGAR ENCYCLOPEDIA OF ENVIRONMENTAL LAW 19–21 (2018).

151. RONALD DWORKIN, *TAKING RIGHTS SERIOUSLY* 24, 26 (1977).

152. *Pulp Mills on the River Uruguay (Arg. v. Uru.)*, Judgment, 2010 I.C.J. 14, ¶¶ 193, 200 (Apr. 20).

153. HR 20 december 2019, RvdW 2020, 19/00135 mn.nt C.A.S. (The State of the Netherlands (Ministry of Economic Affairs and Climate Policy)/Stichting Urgenda), ¶¶ 5.6.1, 5.7.5 (Neth.).

154. Colombia Advisory Opinion, OC-23/17, ¶¶ 104(h), 106, 107; see also Mayer (2023), *supra* note 16, at 139, 143 (citing domestic and regional litigation that appeals to customary law).

2. *Human Rights*

For over a decade, climate law has experienced a “rights based turn,”¹⁵⁵ and in recent years that turn has been wide enough to encompass international shipping. Successful climate lawsuits have been grounded in human rights guaranteed under international treaties, state constitutions, and other legal bases, such as the use of tort law in the *Urgenda* case.¹⁵⁶ The European Court of Human Rights recently ruled that Switzerland’s climate mitigation measures were inconsistent with the rights to life and health guaranteed under the European Convention on Human Rights.¹⁵⁷ The UN General Assembly, in its request for an advisory opinion to the International Court of Justice, asked the court to have regard for the “the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights . . . [and] the rights recognized in the Universal Declaration of Human Rights,”¹⁵⁸ demonstrating that human rights implicate climate obligations.

Many scholars and UN bodies take this view, finding that the protection of human rights necessarily requires preventing and addressing climate harm.¹⁵⁹ Others argue that human rights offer only a “narrow window” to compel mitigation for various reasons, including the diffuse and technical causes of climate change and the “absence of identifiable victims.”¹⁶⁰ For example, Mayer writes that “a state’s action on climate change mitigation, in itself, cannot be considered as a necessary or appropriate measure because it would result in virtually no benefit to the rights of individuals within that state’s territory or under its jurisdiction.”¹⁶¹ He concludes that, because a state’s individual emission reductions alone are insufficient to remedy human rights violations resulting from climate harm within its territory,

155. Peel & Osofsky, *supra* note 20, at 46.

156. *See, e.g.*, HR 20 december 2019, RvdW 2020, 19/00135 mn.nt C.A.S. (The State of the Netherlands (Ministry of Economic Affairs and Climate Policy)/Stichting Urgenda), at 46, n.35 (Neth.); 2656 BVerfGE 1, ¶ 203. *See also* Anxhela Mile, *Emerging Legal Doctrines in Climate Change Law—Seeking an Advisory Opinion from the International Court of Justice*, 56 TEX. INT’L L.J. 59, 83–85 (2021) (discussing human rights cases and climate mitigation duties).

157. *Case of Verein Klimaseniorinnen Schweiz and Others v. Switzerland*, App. No. 53600/20, ¶¶ 573–74.

158. G.A. Res. A/77/L.58, *supra* note 13, at 3.

159. *See, e.g.*, Off. of the U.N. High Comm’r for Hum. Rts., Rep. on the Relationship Between Climate Change and Hum. Rts., U.N. Doc. A/HRC/10/61, ¶ 16 (Jan. 15, 2009); Human Rights Council Res. 29, U.N. Doc. A/HRC/29/L.21, ¶ 4 (June 30, 2015); Alan Boyle, *Climate Change, the Paris Agreement and Human Rights*, 67 INT’L & COMP. L.Q. 759, 773–76 (2018); John H. Knox, *Climate Change and Human Rights*, 50 VA. J. INT’L L. 163, 190–210 (2009).

160. Benoit Mayer, *Climate Change Mitigation as an Obligation Under Human Rights Treaties?*, 115 AM. J. INT’L L. 409, 413, 422 (2021); *see also* Alexander Zahar, *Human Rights Law and the Obligation to Reduce Greenhouse Gas Emissions*, 23 HUM. RTS. REV. 385, 407 (2022) (arguing that causation and non-trivial harm amounting to a human rights violation cannot be shown from GHG emissions).

161. Mayer (2021), *supra* note 160, at 433; *see also* Peel & Osofsky, *supra* note 20, at 40, 63 (noting that many states resist extra-territorial human rights obligations).

human rights law—with its traditional territorial grounding—is not legally suited to address climate change.¹⁶²

Recently, the Committee on the Rights of the Child in *Saachi v. Argentina* took a different approach, adopting a test that looked to whether petitioners’ asserted climate harms were caused by the respondent states’ acts or omissions because they were “reasonably foreseeable” consequences of the states’ GHG emissions.¹⁶³ The Committee drew on the Inter-American Court of Human Rights’ 2017 *Advisory Opinion on the Environment and Human Rights*, which held that a state’s human rights jurisdiction for transboundary harms arises “if there is a causal link between the action that occurred within its territory and the negative impact on the human rights of persons outside its territory.”¹⁶⁴ Although the Committee ultimately found it did not have jurisdiction because the petitioners failed to exhaust domestic remedies, the decision nevertheless represents a meaningful evolution in human rights jurisprudence.¹⁶⁵

In addition to causation objections, scholars and states have argued against using the climate regime’s temperature goals in human rights disputes.¹⁶⁶ For example, in the *Billy et al.* case at the UN Human Rights Committee, Australia argued that systemic integration under the Vienna Convention on the Law of Treaties did not justify the incorporation of the Paris Agreement’s temperature goals into its obligations under the International Covenant on Civil and Political Rights (ICCPR) because the “two instruments have different aims and scopes.”¹⁶⁷ The Committee found that it could consider arguments about whether Australia was complying with its obligations under other treaties and agreements,¹⁶⁸ but did not directly incorporate the climate regime’s principles or standards into ICCPR obligations.¹⁶⁹ On the merits, the Committee determined that because the threat to Torres Strait islanders from climate change was reasonably foreseeable to Australia, Australia had a duty to take “necessary” measures, including adaptation measures that would protect the islanders’ human rights.¹⁷⁰ Several Committee members wrote separately to say that Australia

162. Mayer (2021), *supra* note 160, at 424–25.

163. Saachi, *supra* note 21, ¶ 10.5–7.

164. *Id.*; Colombia Advisory Opinion, OC-23/17, ¶ 104(h).

165. Colombia Advisory Opinion, OC-23/17, ¶ 10.21.

166. Mayer, *supra* note 160 (2021), at 442–43.

167. Billy et al., *supra* note 21, ¶¶ 4.1–4.3.

168. *Id.* ¶ 7.5.

169. *Id.* ¶¶ 8.1–12 (noting that climate regime’s principles and standards are not referenced in merits portion of decision); *see also* ICCPR, Views Adopted by the Committee Under Article 5(4) of the Optional Protocol, Concerning Communication No. 2728/2016, ¶ 9.11, U.N. Doc. CCPR/C/127/D/2728/2016 (Oct. 24, 2019) (“[W]ithout robust national and international efforts, the effects of climate change in receiving states may expose individuals to a violation of their rights under articles 6 or 7 of the Covenant.”).

170. Billy et al., *supra* note 21, ¶ 11.

also had human rights obligations to reduce its GHG emissions in a way that was consistent with the Paris Agreement's temperature goals.¹⁷¹

Other scholars claim that human rights law requires states to go beyond the commitments in their Paris Agreement NDCs because the commitments, even if carried out, fall far short of preventing “disastrous” human rights outcomes.¹⁷² Margaretha Wewerinke-Singh and Ashleigh McCoach argue that the 1.5 degree target should be incorporated into human rights obligations, and, in a similar approach to the one taken in *Urgenda*, suggest that courts could determine acceptable emissions trajectories for particular states using principles such as equity and common-but-differentiated responsibilities and respective capacities (CBDR-RC).¹⁷³ They reason that the 1.5 degree target can be seen as “common ground” between states, which must then individually translate scientific evidence into fair shares in light of those principles.¹⁷⁴

That approach is being implemented in practice. A member of the UN Human Rights Committee in *Billy et al.* found that states have a due diligence obligation to set their national mitigation targets at the highest possible level, and a higher standard of due diligence applies with respect to states with significant total emissions, very high per capita emissions, and greater capacities to mitigate.¹⁷⁵ The Dutch Supreme Court followed a similar line of reasoning when holding that the Netherlands had to do more because of its high level of development and high per capita emissions.¹⁷⁶ And in *Declic Association v. The Government of Romania et al.*, the petitioners argue that the test of whether “all possible measures [have] been taken to reduce emissions” consistent with human rights obligations requires examining whether a state has taken steps to eliminate “luxury emissions” or “convenience emissions” and only allowed emissions “strictly necessary for the realization of human rights.”¹⁷⁷ Thus, a sliding scale of risk and care can

171. *Id.* at annex I, ¶¶ 4–6; *id.* at annex II, ¶¶ 10–13.

172. Boyle, *supra* note 159, at 774 (quoting Rep. of the Special Rapporteur on the Issue of Hum. Rts. Obligations Relating to the Enjoyment of a Safe, Clean, Healthy, & Sustainable Env't, ¶¶ 72–84, U.N. Doc. A/HRC/31/52 (Feb. 1, 2016)).

173. Margaretha Wewerinke-Singh & Ashleigh McCoach, *The State of the Netherlands v. Urgenda Foundation: Distilling Best Practice and Lessons Learnt for Future Rights-Based Climate Litigation*, 30 REV. EUR. COMPAR. & INT'L ENV'T L. 275, 278–80 (2021).

174. *Id.* at 280.

175. Billy et al., *supra* note 21, ¶¶ 3–5 (Zyberi, comm. member, concurring).

176. HR 20 december 2019, RvdW 2020, 19/00135 mn.nt C.A.S. (The State of the Netherlands (Ministry of Economic Affairs and Climate Policy)/Stichting Urgenda), ¶¶ 6.2, 7.3.4 (Neth.).

177. Cluj Ct. of Appeal Jan. 31, 2023, File No. 114/33/2023 (Rom.), Complaint at 44, translated in Declic et al. v. the Romanian Government, CLIMATE CASE CHART, <https://climatecasechart.com/non-us-case/declic-et-al-v-the-romanian-government/> (last visited Apr. 7, 2023).

be applied depending on a respondent's level of development and the diligence of its actions.¹⁷⁸

A human rights obligation to prevent climate harm would likewise apply to international shipping. The sector has many legal interactions with states: through the control of shipping companies by flag states and other states, the regulation of port access, and decision-making within the IMO.¹⁷⁹ The European Court of Human Rights has held that states are required to use all possible efforts to secure rights even if a state does not have full control over a territory or activity and more recently found that Switzerland must account for and prevent the human rights harms caused by GHG emissions “embedded” in imported products, even though those emissions occur outside that country's territory.¹⁸⁰

In calling for a new binding instrument to regulate transnational corporations with respect to human rights, the UN Human Rights Council stressed that while international obligations to protect human rights lie with states, they “must protect against human rights abuse within their territory and/or jurisdiction by third parties, including transnational corporations.”¹⁸¹ Similarly, the Committee on the Rights of the Child found that states' obligations under the Convention on the Rights of the Child “must” be fulfilled with respect to business activities under their jurisdiction.¹⁸² Thus, states' jurisdiction over the entities and vessels engaged in international shipping implicates their due diligence obligations to prevent climate harm, even though vessels emit GHGs both outside and within national maritime zones.¹⁸³

Shipping's climate impacts meet the causal test articulated in *Saachi v. Argentina* and *Billy et al.*¹⁸⁴ Large port states have shipping sectors that generate millions of tons of carbon dioxide emissions annually, and some

178. Rep. of the Special Rapporteur on the Issue of Hum. Rts. Obligations, *supra* note 172, ¶ 46 (“All States have a duty to work together to address climate change, but the particular responsibilities necessary and appropriate for each State will depend in part on its situation.”).

179. See *supra* Part I.

180. *Ilașcu v. Moldova & Russia*, App. No. 48787/99, ¶¶ 331, 333 (July 8, 2004), <https://hudoc.echr.coe.int/eng?i=001-61886>; *Case of Verein Klimaseniorinnen Schweiz v. Switzerland*, App. No. 53600/20, ¶¶ 279–83, 287.

181. Human Rights Council Res. 26/9, U.N. Doc. A/HRC/RES/26/9, at 2 (July 14, 2014).

182. Convention on the Rts. of the Child, General Comment No. 16 (2013) on State Obligations Regarding the Impact of the Business Sector on Children's Rights, ¶ 8, U.N. Doc. CRC/C/GC/16 (Apr. 17, 2013).

183. See Alex Oude Elferink, *The Arctic Sunrise Incident: A Multi-Faceted Law of the Sea Case with a Human Rights Dimension*, 29 INT'L J. MARINE & COASTAL L. 244, 270–73 (2014) (discussing the interaction between a state's human rights jurisdiction and enforcement jurisdiction under the law of the sea).

184. *Billy et al.*, *supra* note 21, ¶ 8.3; *Saachi*, *supra* note 21, ¶¶ 10.4–5.

flag states have primary jurisdiction over thousands of ships.¹⁸⁵ It is therefore reasonably foreseeable that those states' shipping policies could pose a significant risk of climate change that will harm human rights.¹⁸⁶ And the sector as a whole, governed by states through the IMO, emits a significant and increasing share of global emissions.¹⁸⁷ Therefore, states must diligently address ship emissions at the IMO and unilaterally in order to prevent temperature increases above 1.5 degrees and avoid the human rights harms that will foreseeably follow.

Moreover, human rights law continues to evolve towards environmental protection. In 2022, the UN General Assembly recognized the right to a clean, healthy, and sustainable environment as a human right,¹⁸⁸ and cases before regional human rights courts and the International Court of Justice may further clarify how human rights intersect with and impact states' obligations to prevent climate harm.¹⁸⁹ In light of the international shipping sector's climate impacts, human rights law requires that states diligently mitigate the risk of climate harm that the sector poses to the greatest extent possible.

3. *The UN Convention on the Law of the Sea*

Similar to human rights treaties, the LOSC does not mention climate change or ocean warming and acidification. But Part XII of the treaty imposes environmental obligations that apply to states' climate emissions, including those arising from shipping.¹⁹⁰ Article 192 provides that “[s]tates have the obligation to protect and preserve the marine environment.”¹⁹¹ Article 194 requires that they take “all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source,” and that they “take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment.”¹⁹²

185. UK DEP'T FOR BUS., ENERGY, & INDUS. STRATEGY, 2020 UK GREENHOUSE GAS EMISSIONS, FINAL FIGURES (Feb. 1, 2022) (stating that international shipping emissions were estimated at 6.1 million tons in 2020); UNCTAD, *supra* note 1, at 42.

186. *See* sources cited *supra* note 21.

187. *See* sources cited *supra* notes 1, 5.

188. G.A. Res. 76/300, ¶ 3 (July 28, 2022).

189. *See* sources cited *supra* notes 13, 157.

190. Catherine Redgwell, *Treaty Evolution, Adaptation and Change: Is the LOSC “Enough” to Address Climate Change Impacts on the Marine Environment?*, 34 INT'L J. MARINE & COASTAL L. 440, 445 (2019); *see also* Jesse Cameron Glickenhau, *Potential ICJ Advisory Opinion: Duties to Prevent Transboundary Harm from GHG Emissions*, 22 N.Y.U. ENV'T L.J. 117, 141–45 (2015) (discussing states' affirmative duties under the LOSC and that they encompass the prevention of GHG emissions).

191. LOSC, *supra* note 22, art. 192.

192. *Id.* art. 194.

These provisions codified the harm prevention principle in the context of protecting the marine environment.¹⁹³ Perhaps recognizing the existence of a customary obligation, the UN General Assembly asked the International Court of Justice to have regard to “the duty to protect and preserve the marine environment,” in addition to having regard to the LOSC, in an advisory opinion on climate obligations.¹⁹⁴ But in contrast to a legal principle that binds through custom, the LOSC is a treaty that has been ratified by nearly every state.¹⁹⁵ The most significant non-party—for the purposes of this Article—is the United States, whose courts have found that certain of its provisions, including those in Part XII, reflect customary international law.¹⁹⁶ Accordingly, the treaty’s text, signatories’ subsequent practice, and judicial decisions applying the treaty can help determine the scope and content of what it requires.¹⁹⁷

The LOSC’s reference to “pollution of the marine environment” encompasses GHG emissions.¹⁹⁸ The Convention defines pollution broadly as “the introduction by man . . . substances or energy into the marine environment,” and various types of pollutants have been classified as such in IMO legal instruments, including noise, trash, and GHG emissions from ships.¹⁹⁹ Moreover, ocean acidification directly results from CO₂ emissions, establishing a clear nexus between impacts on marine biodiversity and the predominant climate pollutant.²⁰⁰ Thus, “[t]here is widespread consensus that climate change and ocean acidification fall within the scope of Part XII.”²⁰¹ Accordingly, the LOSC is facially broad enough to include GHG

193. DUPUY & VIÑUALES, *supra* note 129, at 67.

194. G.A. Res. A/77/L.58, *supra* note 13, at 3.

195. *United Nations Convention on the Law of the Sea*, UN TREATY COLLECTION https://treaties.un.org/Pages/ViewDetailsIII.aspx?src=IND&mtmsg_no=XXI-6&chapter=21&Temp=mtmsg3&clang=_en (last visited July 20, 2023).

196. *Sarei v. Rio Tinto, PLC*, 221 F. Supp. 2d 1116, 1160–63 (C.D. Cal. 2002) (explaining that plaintiffs could state a claim that for environmental harm based on violation of LOSC provisions because the treaty “reflects customary international law”); *Sarei v. Rio Tinto, PLC*, 650 F. Supp. 2d 1004, 1026 (C.D. Cal. 2009) (explaining that while the LOSC’s environmental provisions “may reflect customary international law that is specific and obligatory,” they are not *jus cogens* norms); see Duff, *supra* note 22.

197. Redgwell, *supra* note 190, at 446 (“LOSC was always intended to be capable of further evolution.”); IRINA BUGA, MODIFICATION OF TREATIES BY SUBSEQUENT PRACTICE 337, n.835 (2018) (“[T]he general environmental approach of the LOSC is gradually changing through regime interaction fuelled by subsequent practice.”).

198. Boyle, *supra* note 23, at 463.

199. LOSC, *supra* note 22, art. 1(1)(4); *International Convention for the Prevention of Pollution from Ships (MARPOL)*, *supra* note 48.

200. Karen N. Scott, *Ocean Acidification: A Due Diligence Obligation Under the LOSC*, 35 INT’L J. MARINE & COASTAL L. 382, 384–89 (2020).

201. Redgwell, *supra* note 190, at 445 n.27 (citing Alan Boyle, *Law of the Sea Perspectives on Climate Change*, 27 INT’L J. MARINE & COASTAL L. 831, 832 (2012)); see also Roland Holst, *supra* note 27.

emissions from any source within its definition of pollution of the marine environment.²⁰²

Moreover, LOSC jurisprudence supports the argument that the treaty imposes a due diligence obligation to mitigate climate change.²⁰³ The *South China Sea* arbitral tribunal found that Articles 192 and 194 impose due diligence obligations to protect the marine environment from future damage and preserve the marine environment in its present condition.²⁰⁴ And in an advisory opinion examining the general obligations in Articles 192 and 194, the International Tribunal for the Law of the Sea found that due diligence requires a state to “deploy adequate means, to exercise best possible efforts, to do the utmost.”²⁰⁵ As Roland Holst points out, “the open-ended character of due diligence obligations . . . requires a case-by-case assessment” and “also provides an opening for systemic integration by interpreting UNCLOS” in line with other sources of international law, such as the UNFCCC, Paris Agreement, or customary international law.²⁰⁶ She further notes that because states’ NDCs under the Paris Agreement fall short of preventing warming above its temperature goals, “it can be argued that due diligence under UNCLOS obliges States to do more.”²⁰⁷

The LOSC has a global reach.²⁰⁸ In *South China Sea*, the tribunal held that “the obligations in Part XII apply to all States with respect to the marine environment in all maritime areas, both inside the national jurisdiction of States and beyond it.”²⁰⁹ In that case and *Southern Bluefin Tuna*, the tribunals found that the general obligation in Article 192 and 194 to protect the marine environment includes the protection of ecosystems and biodiversity, in line with developments in international environmental law.²¹⁰ Thus, the LOSC’s scope includes the entirety of the world’s ocean and the life within it.

There would likely be *lex specialis* objections to interpreting the LOSC as imposing climate obligations that are more stringent than what the Paris Agreement demands.²¹¹ But what the Paris Agreement demands is open-

202. Redgwell, *supra* note 190, at 448–50.

203. Roland Holst, *supra* note 27, at 219 (citing *S. China Sea (Phil. v. China)*, 33 R.I.A.A. 153, 521–22, ¶¶ 743–44 (Perm. Ct. Arb. 2016) [hereinafter *South China Sea*]); *Southern Bluefin Tuna*, 1999 ITLOS Rep.

204. *South China Sea*, 33 R.I.A.A. at 373, ¶ 940.

205. Request for Advisory Opinion Submitted by the Sub-Regional Fisheries Commission, Case No. 21, Advisory Opinion of Apr. 2, 2015, 2015 ITLOS Rep. 4, ¶ 129 [hereinafter *SRFC Advisory Opinion*] (quoting *Seabed Advisory Opinion*, 2011 ITLOS Rep. ¶¶ 110–17).

206. Roland Holst, *supra* note 27, at 223.

207. *Id.*

208. *But see* Mayer (2023), *supra* note 16, at 109 (explaining that the LOSC “may imply an obligation for states to mitigate climate change only in relation to the particular environmental resources [it] oblige[s] states to conserve”).

209. *South China Sea*, 33 R.I.A.A. at 373, ¶ 940.

210. *Id.* ¶¶ 941–45; *Southern Bluefin Tuna*, 1999 ITLOS Rep. ¶ 70.

211. Boyle, *supra* note 23, at 471–72.

textured.²¹² Thus, as Boyle explains, “if the question arises what measures are ‘ambitious’ enough to constitute the ‘necessary measures’ required by the LOSC, a comparison could be made with the best performers in a similar situation.”²¹³ Accordingly, the LOSC’s broad environmental obligations and progressive caselaw indicate it could support a due diligence climate change obligation that, depending on the state and the factual situation, would allow incorporation of the Paris Agreement’s requirement that states adopt the highest possible ambition for GHG reductions.²¹⁴

Yet, as detailed above, the Paris Agreement does not directly or clearly apply to shipping, while the LOSC does. Irini Papanicolopulu notes that the content of the LOSC’s general due diligence obligation can be “proceduralized” with specific rules that must be adopted. She gives as an example the pollution of the marine environment by ships and “generally accepted international rules and standards” (GAIRS)—i.e., the MARPOL regulatory regime.²¹⁵ In a similar vein, Redgwell writes that “[t]he only elaboration of GAIRS in the climate context has been the amendment of MARPOL Annex VI to include the regulation of GHG emissions from international shipping.”²¹⁶ Other scholars have argued that Article 211, which requires that states establish GAIRS for shipping through the IMO, “completes the obligation of States under article 194, paragraph 3(b), to take measures designed to minimize to the fullest possible extent pollution of the marine environment from vessels.”²¹⁷

In my view, the reference to the “fullest possible extent” in Article 194 is analogous to the Paris Agreement’s requirement that its parties make contributions representing their “highest possible ambition” to the temperature goals.²¹⁸ Thus, when adopting GAIRS at the IMO, states are obliged to take all necessary measures to protect the marine environment. That obligation has a particular meaning in the context of designing and implementing IMO climate regulations, discussed *infra* Part III.A.²¹⁹

The LOSC can also be interpreted to oblige states to act unilaterally to prevent, reduce, and control vessel source pollution in a way that is more aggressive than what GAIRS require. In other words, IMO rules should be seen as either a floor or a reference point for what states must do to fulfill their general obligations to protect the marine environment, not a standard

212. *See supra* Part II.A.

213. Boyle, *supra* note 23, at 474.

214. *Id.*

215. Irini Papanicolopulu, *Due Diligence in the Law of the Sea*, in *DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER*, *supra* note 14, at 158.

216. Redgwell, *supra* note 190, at 450–51.

217. 4 UNITED NATIONS CONVENTION ON THE LAW OF THE SEA 1982: A COMMENTARY 180, 211.1 (Myron H. Nordquist et al. eds., 1985).

218. Paris Agreement, *supra* note 6, art. 4(3).

219. *See infra* Part III.

that per se satisfies Articles 192 and 194.²²⁰ Under the LOSC's Article 211, flag states must adopt rules "at least as effective" as IMO rules, and Article 212 requires flag states to adopt and implement rules for atmospheric pollution from ships that take IMO rules "into account."²²¹ Other articles in the LOSC differ because they require that states enact or enforce laws that "conform to" GAIRS or "ensure compliance with them."²²² In contrast, the the LOSC's drafters expressly anticipated in this case that states could and would implement measures that are more demanding than IMO rules.

Moreover, Articles 192 and 194 mandate that states protect the marine environment using the "best practicable means at their disposal and in accordance with their capabilities."²²³ This differentiated approach contrasts starkly with the no-more-favorable treatment principle enshrined in Articles 211, 212, and MARPOL,²²⁴ and it applies to all states and all maritime zones, not only flag states.²²⁵ The LOSC contemplates that states will impose "particular requirements"²²⁶ for vessels that voluntarily enter their ports, and port state control is "developing from a right into an obligation."²²⁷ In light of the current inadequacy of the IMO's climate rules,²²⁸ the best practical means to protect the marine environment are unilateral measures, at least for states similarly situated to those in the European Union.²²⁹

This progressive interpretation of states' obligations under the LOSC is consistent with the way in which due diligence climate obligations are viewed generally. As Jacqueline Peel explains, compliance with climate treaty obligations should not be viewed as legally equivalent to satisfying a due diligence obligation to prevent environmental damage.²³⁰ She reasons that the climate regime has a relatively narrow focus on requiring cooperation between states, and emission reduction commitments made within it are widely viewed as inadequate.²³¹ Similarly, in the context of maritime climate measures, because the emission reduction pathways established by IMO rules are incompatible with limiting global warming to 1.5 degrees, compliance with them should not be viewed as satisfying the requirement

220. LOSC, *supra* note 22, art. 211.

221. *Id.* arts. 211, 212.

222. *Id.* arts. 41(3), 53(8), 94(5).

223. *Id.* art. 194(1).

224. *See supra* text accompanying notes 58–62.

225. LOSC, *supra* note 22, arts. 211, 212.

226. *Id.* arts. 211(3), 218(2).

227. Rothwell et al., *supra* note 69, at 893.

228. *See* sources cited *supra* notes 5, 6.

229. *See* EU Maritime ETS Measure, *supra* note 7, ¶ 28 (expanding shipping measures in 2028 if IMO has not enacted a market-based measure by then); *see infra* Part III.B (discussing unilateral measures).

230. Peel, *supra* note 27, at 1034–35.

231. *Id.*

that states take “all measures . . . that are necessary to prevent, reduce and control pollution of the marine environment from any source.”²³² State practice more stringent than IMO pollution rules is “scarce.”²³³ But the European Union’s climate measures, and an earlier ship recycling regulation, are notable examples.²³⁴ Accordingly, rather than merely requiring that states implement IMO rules, the LOSC—read together with human rights obligations and customary principles—obliges states to use all necessary measures to mitigate shipping’s climate risks.

IV. NECESSARY MEASURES

What exactly must states do to fulfill their due diligence obligation to mitigate shipping’s climate impacts? The sector’s effects on the climate system are cumulative to those from national emissions and international aviation. Thus, if states collectively reduced emissions from all sources besides shipping and implemented carbon removal and sequestration to address shipping’s emissions, no further action would be needed to prevent 1.5 degree warming.²³⁵

That scenario is unrealistic. Therefore, states must address the sector’s emissions in order to prevent climate change that harms human rights and the marine environment. But not every action relating to shipping’s impact on the climate would be enough. Establishing compliance with due diligence obligations in the climate context “requires assessing whether a balance has been equitably struck ‘between what is possible and what is economically acceptable.’”²³⁶ Reasonableness, flexibility, and objectivity are common elements of due diligence obligations, and measures must be proportional, meaning that technological and economic abilities should be balanced against state interests.²³⁷ Accordingly, the content of obligations can change over time.²³⁸ Due diligence can be measured “in terms of technical and

232. LOSC, *supra* note 22, art. 194.

233. Bartenstein, *supra* note 61, at 1429 n.55.

234. *Id.*

235. See Bullock, *supra* note 5, at 304–05 (explaining that a global carbon budget of 373 gigatons of CO₂ from 2021 to 2050 remains available for a fifty percent chance of limiting warming to 1.5 degrees); IMO, *Fourth IMO Greenhouse Gas Study*, *supra* note 4, at 2–3, tbl.1, fig.1 (estimating international shipping’s annual emissions from 2021 onwards at between eight hundred million tons and one gigaton of CO₂).

236. Annalisa Savaresi, *Inter-State Climate Change Litigation: “Neither a Chimera nor a Panacea,”* in CLIMATE CHANGE LITIGATION: GLOBAL PERSPECTIVES 366, 377 (Ivano Alogna et al. eds., 2021).

237. Papanicolopulu, *supra* note 215, at 152–53 (citing Seabed Advisory Opinion, 2011 ITLOS Rep. ¶ 110); see also Christina Voigt, *State Responsibility for Climate Change Damages*, 77 NORDIC J. INT’L L. 1, 10 (2008) (explaining that with due diligence obligations, “[w]hat constitutes the appropriate standard of care is, thus, determined by looking at a State’s means and capacities at its disposal in an international context”).

238. Papanicolopulu, *supra* note 215, at 149–50.

scientific standards of behavior that are commonly accepted by States.”²³⁹ As Nikolaos Giannopoulos writes, states “must consider the contemporary level of technological and scientific progress, because developments in scientific awareness regarding the risks posed by specific activities may enhance the level of due diligence required.”²⁴⁰

Shipping industry practice also illuminates the due diligence that should be expected from states. The World Shipping Council, which represents the liner shipping industry, has endorsed climate policies that are more ambitious than the IMO’s, calling for application of a carbon price using a market-based mechanism such as a trading system or tax on maritime fuel.²⁴¹ Specific companies have gone further: Maersk, one of the world’s largest container shipping companies, has committed to net zero emissions by 2040, and other companies have committed to interim goals and policies that are more ambitious than those adopted by the IMO.²⁴² These industry practices form part of the facts and circumstances in which states’ diligence can be assessed.²⁴³

Due diligence requires states to “employ all means reasonably available to them” to prevent a violation “so far as possible.”²⁴⁴ The types of conduct that could breach a due diligence obligation include action, inaction, and deficient action.²⁴⁵ With that in mind, this Part discusses the two primary areas of state conduct—decision-making within the IMO and states’ unilateral actions. It also shows how relatively few states control whether

239. Giannopoulos, *supra* note 34, at 156 (quoting DUNCAN FRENCH & TIMOTHY STEPHENS, INTERNATIONAL LAW ASSOCIATION STUDY GROUP ON DUE DILIGENCE IN INTERNATIONAL LAW, FIRST REPORT 29–30 (2014)).

240. *Id.*

241. IMO, Submission by the World Shipping Council, *Reduction of GHG Emissions from Ships*, at 2–3, IMO Doc. MEPC 78/7 (Feb. 9, 2022).

242. *Decarbonising Ocean Transport*, MAERSK, <https://www.maersk.com/sustainability/our-esg-priorities/climate-change/decarbonising-ocean-shiping> (last visited July 20, 2023); *Energy and Greenhouse Gas Management*, EVERGREEN MARINE, https://csr.evergreen-marine.com/csr/jsp/CSR_EnergyEmissionManagement.jsp (last visited July 20, 2023) (committing to a fifty percent reduction below 2008 levels by 2030); *Sustainability Strategy*, HAPAG-LLOYD, <https://www.hapag-lloyd.com/en/company/responsibility/sustainability/strategy.html> (last visited July 20, 2023) (giving an objective of net-zero GHG emissions by 2045); see *20 Largest Container Shipping Companies in the World in 2024*, MARINE INSIGHT (Apr. 30, 2023), <https://www.marineinsight.com/know-more/10-largest-container-shiping-companies-in-the-world/>.

243. Peel, *supra* note 27, at 1035.

244. Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosn. & Herz. v. Serb. & Montenegro), Judgment, 2007 I.C.J. Rep. 43, ¶ 430 (Feb. 26, 2007) [hereinafter Genocide]; *accord* SRFC Advisory Opinion, 2015 ITLOS Rep. 205, ¶ 129. Although the court in *Genocide* interpreted a treaty obligation, “its comments on the obligation of prevention are of a general nature.” John Dugard & Annemarieke Vermeer-Künzli, *The Elusive Allocation of Responsibility to Informal Organizations: The Case of the Quartet on the Middle East*, in RESPONSIBILITY OF INTERNATIONAL ORGANIZATIONS: ESSAYS IN MEMORY OF SIR IAN BROWNIE 261, 265 (Maurizio Ragazzi ed., 2013); see also BARROS, *supra* note 32, at 158 n.916 (making the same argument).

245. See BARROS, *supra* note 32, at 195 (explaining that conduct breaching the due diligence obligation can be action, inaction, or the “maintenance of a situation of risk of damage to human rights”).

and how quickly shipping decarbonizes, and it establishes a framework to differentiate and assess states' compliance with the obligation identified above. This Part concludes by surveying legal venues that could hold states to account.

A. Decision-Making Within the IMO

As an international organization, the IMO has legal personality and can bear obligations under international law.²⁴⁶ Thus, there are complex and overlapping ways to conceptualize legal responsibility between the IMO and its member states, given that states and organizations have different international legal obligations and organizations exercise varying degrees of autonomy.²⁴⁷ Possible configurations of this legal relationship include that states might have duties to “supervise” organizations to prevent them from violating their organizational obligations;²⁴⁸ they might be required to implement organizational acts which violate their own obligations;²⁴⁹ and states might be jointly responsible with organizations for internationally wrongful acts.²⁵⁰

This Article is concerned with a particular way in which the IMO and its member states interact: the conduct of the IMO's members in the organization's institutional decision-making.²⁵¹ International organizations are “Janus-faced.”²⁵² They are autonomous entities with their own will, yet they are also fora for their member states to collectively make decisions.²⁵³ The individual diplomats representing states in organizations are state actors under the rules of international responsibility.²⁵⁴ In treaties, soft law, and

246. See Interpretation of the Agreement of 25 March 1951 Between the WHO and Egypt, Advisory Opinion, 1980 I.C.J. Rep. 73, ¶ 37 (Dec. 20, 1980).

247. Tarcisio Gazzini, *The Relationship Between International Legal Personality and the Autonomy of International Organizations*, in INTERNATIONAL ORGANIZATIONS AND THE IDEA OF AUTONOMY 196, 196 (Richard Collins & Nigel D. White eds., 2011).

248. Kristina Daugirdas, *Member States' Due Diligence Obligations to Supervise International Organisations*, in DUE DILIGENCE IN THE INTERNATIONAL LEGAL ORDER, *supra* note 14, at 59, 64.

249. Iain Cameron, *UN Targeted Sanctions, Legal Safeguards and the European Convention on Human Rights*, 72 NORDIC J. INT'L L. 159, 168 (2003).

250. Antonios Tzanakopoulos, *Sharing Responsibility for UN Targeted Sanctions*, in INTERNATIONAL ORGANIZATIONS AND MEMBER STATE RESPONSIBILITY: CRITICAL PERSPECTIVES 139, 151–58 (Ana Sofia Barros et al. eds., 2016). See generally Andre Nollkaemper & Dov Jacobs, *Shared Responsibility in International Law: A Conceptual Framework*, 34 MICH. J. INT'L L. 359, 365–69 (2013); MOSHE HIRSCH, THE RESPONSIBILITY OF INTERNATIONAL ORGANIZATIONS TOWARD THIRD PARTIES: SOME BASIC PRINCIPLES (1995).

251. See Barros & Ryngaert, *supra* note 14; BARROS, *supra* note 32.

252. Ramses A. Wessel & Ige F. Dekker, *Identities of States in International Organizations*, 12 INT'L ORGS. L. REV. 293, 306 (2015). See generally CATHERINE BRÖLMANN, THE INSTITUTIONAL VEIL IN PUBLIC INTERNATIONAL LAW (2007) (describing the legal nature of international organizations).

253. Wessel & Dekker, *supra* note 252, at 306.

254. G.A. Res. 56/83, Responsibility of States for Internationally Wrongful Acts, at 2–3 (Dec. 12, 2001).

scholarship, states are often referred to as “acting within” international organizations when they participate in those organs.²⁵⁵ Thus, if the American Permanent Representative to the IMO votes against a climate resolution in the MEPC, her vote is presumably cast under instructions from her government, and it is legally an act of the United States.²⁵⁶

Ana Sofia Barros and Cedric Ryngaert submit that “when member States participate in [an] international organization’s decision-making processes, they are arguably carrying out State acts, which have to comport with their international obligations.”²⁵⁷ The International Court of Justice made just such a finding in *FYROM v. Greece*.²⁵⁸ That case concerned Greece’s opposition to the Former Yugoslav Republic of Macedonia (FYROM)’s accession to the North Atlantic Treaty Organization (NATO). In a 1995 treaty, Greece agreed “not to object” to FYROM’s membership in international organizations.²⁵⁹ Greece made clear before, during, and after a NATO summit in 2008 that it opposed FYROM’s membership in the alliance, and NATO collectively decided not to invite FYROM to apply.²⁶⁰ The Court held that Greece’s opposition to FYROM’s membership could be considered separately from the conduct of NATO’s other members and evaluated in light of Greece’s obligations under the treaty.²⁶¹ Moreover, NATO’s collective decision was irrelevant because Greece had an obligation of conduct not to oppose FYROM’s membership.²⁶² The Court concluded that Greece breached its obligation.²⁶³

In a dictum in *Southern Bluefin Tuna*, the International Tribunal for the Law of the Sea likewise found that it could examine state conduct within an international organization to determine compliance with legal obligations.²⁶⁴ In that case, Australia and New Zealand argued that Japan violated the LOSC by unilaterally fishing for southern bluefin tuna in excess of its national allocation agreed to by the Commission for the Conservation of Southern Bluefin Tuna (the Commission). The tribunal observed that “the conduct of the parties within the Commission . . . is relevant to an evaluation of the extent to which the parties are in compliance with their obligations”

255. Barros & Ryngaert, *supra* note 14, at 58.

256. *See* Wessel & Dekker, *supra* note 252, at 306.

257. Barros & Ryngaert, *supra* note 14, at 55.

258. *FYROM*, 2011 I.C.J. Rep.

259. *Id.* ¶ 21 (citing Interim Accord, Greece-Maced., art. 11, ¶ 1, Sept. 13, 1995, 1891 U.N.T.S. 4).

260. *Id.* ¶¶ 42–43.

261. *Id.*

262. *Id.* ¶ 70; Barros & Ryngaert, *supra* note 14, at 77–78.

263. *FYROM*, 2011 I.C.J. Rep. ¶ 170.

264. *Southern Bluefin Tuna*, 1999 ITLOS Rep. ¶ 50. *See generally* Moritaka Hayashi, *The Southern Bluefin Tuna Cases: Prescription of Provisional Measures by the International Tribunal for the Law of the Sea*, 13 TUL. ENV’T L.J. 361 (2000) (discussing case background and outcome).

under the LOSC.²⁶⁵ It ordered that the parties refrain from unilateral fishing exceeding their national allocations pending further proceedings.²⁶⁶ An arbitral tribunal later found that it lacked jurisdiction to consider the merits of the claims.²⁶⁷ Yet, like *FYROM*, *Southern Bluefin Tuna* shows that courts might be willing to determine the lawfulness of states' conduct within international organizations.

Jurists and scholars nevertheless disagree about whether states should be held individually responsible for the positions they take in international organizations. In *FYROM*, the Greek *ad hoc* judge, Roucounas, argued in dissent that holding a member state legally responsible for its position undercuts the international organization's autonomy because doing so in effect renders judgment on the organization itself.²⁶⁸ Wessel and Dekker note that when states participate in organizations' decision-making processes they are not acting as states *per se*, but as *member* states who are fulfilling a particular role guaranteed to them under an organization's constituent instrument.²⁶⁹ Therefore, in a sense they are a legal arm of the organization.²⁷⁰

Yet a distinction can be drawn between decision-making and decision-implementing.²⁷¹ The former conduct is by a member state—only states (and other international organizations that are also members) hold decision-making authority in international organizations, and they do so as an attribute of their sovereignty. States therefore have discretion to participate or not and to take whatever position they like—subject to their other legal obligations.²⁷² In contrast, when carrying out an international organization's decision, a member state acts more like an arm of the institution, particularly when a state is under a legal obligation to do so, as with implementing UN Security Council sanctions.²⁷³ Thus, the degree to which a member state can be seen through an organization's institutional form depends on the legal context.²⁷⁴

FYROM involved a discrete and specific obligation—Greece had explicitly committed not to do exactly what it did.²⁷⁵ The International Court of Justice has not yet ruled on whether states' positive obligations also apply

265. *Southern Bluefin Tuna*, 1999 ITLOS Rep. ¶ 50.

266. *Id.* ¶ 90.

267. *S. Bluefin Tuna (Austl. & N.Z. v. Japan)*, 23 R.I.A.A. 1, 43–45 (Aug. 4, 2000).

268. *FYROM*, 2011 I.C.J. Rep. 720, ¶ 47 (Roucounas, J., dissenting).

269. Wessel & Dekker, *supra* note 252, at 304–05.

270. *Id.*; see also Niels Blokker, *International Organizations and Their Members*, 1 INT'L ORG. L. REV. 144, 147–48 (2004).

271. BARROS, *supra* note 32, at 77–81.

272. BARROS, *supra* note 32, at 100.

273. See U.N. Charter art. 25; Tzanakopoulos, *supra* note 250.

274. Catherine Brölmann, *Transparency as a Contested Fundamental in the Law of International Organizations*, 20 INT'L ORGS. L. REV. 10, 18–19 (2023).

275. *FYROM*, 2011 I.C.J. Rep. ¶ 70.

to their decision-making within international organizations. But UN human rights bodies have commented that states retain their obligations to comply with human rights when acting within international organizations.²⁷⁶ And in a string of cases, the European Court of Human Rights has gone further. In *Gasparini v. Italy and Belgium*, the court held that states' human rights obligations bind them when they participate in international organizations' decision-making.²⁷⁷ In *Perez v. Germany* and *Klausecker v. Germany*, it likewise contemplated that Germany could be held responsible for the lack of due process at UN bodies and the European Patent Office when it had participated in decision-making within those organizations.²⁷⁸

Barros persuasively applies those cases to the governing boards of international financial institutions, arguing that member states have due diligence obligations to take all measures to ensure that they know about risks to human rights before approving loans, mitigate those risks when making decisions, and ensure that loans already issued conform to their human rights conditions.²⁷⁹ Her approach is broader and more comprehensive than the International Law Commission's in its Draft Articles on the Responsibility of International Organizations, which is limited to states' intentional efforts to "support, push or force international organisations to commit an act that is internationally wrongful."²⁸⁰ But the Commission itself acknowledged that "[n]ot all the questions that may affect the responsibility of a State in connection with the act of an international organization are examined in the present draft articles."²⁸¹ Instead, as Barros argues, the Articles on State Responsibility—which were applied by the International Court of Justice in *FYROM*—indicate that the conduct of state representatives when making decisions at international organizations can be attributed to their state and independently assessed.²⁸²

The same reasoning applies to states' climate decision-making within the IMO. Even more so than directors at international financial institutions,

276. Comm. on Econ., Soc., & Cultural Rts., General Comment No. 19: The Right to Social Security, ¶ 58, U.N. Doc. E/C.12/GC/19 (Feb. 4, 2008) ("States parties should ensure that their actions as members of international organizations take due account of the right to social security."); Convention on the Rts. of the Child, *supra* note 182, ¶¶ 47–48 (stating that states should uphold their obligations under Convention on the Rights of the Child "when acting as members" of international organizations); see Martina Buscemi, *The Duty of States to Ensure Respect for the Duty of Care Through Their Membership in International Organizations*, in *THE DUTY OF CARE OF INTERNATIONAL ORGANIZATIONS TOWARDS THEIR CIVILIAN PERSONNEL* 131 (Andrea De Guttry et al. eds., 2018).

277. *Gasparini v. Italy & Belgium*, App. No. 10750/03.

278. *Perez v. Germany*, App. No. 15521/08; *Klausecker v. Germany*, App. No. 415/07; Buscemi, *supra* note 276, at 137.

279. BARROS, *supra* note 32, ch. III. *Accord Pasquale De Sena, International Monetary Fund, World Bank and Respect for Human Rights: A Critical Point of View*, 20 *ITALIAN Y.B. INT'L L.* 247, 257 (2010).

280. BARROS, *supra* note 32, at 215.

281. Int'l Law Comm'n, Rep. on the Work of Its Sixty-Third Session, U.N. Doc. A/66/10, at 157 (2011).

282. BARROS, *supra* note 32, at 94.

whose legal status “has long been a matter fraught with controversy,” member state representatives at the IMO speak directly on behalf of their governments.²⁸³ Because climate change harms human rights,²⁸⁴ and IMO member states are bound by their human rights obligations when acting as decision-makers within the IMO, they are therefore under an obligation to do all they can in that role to make sure the IMO’s climate decisions uphold human rights.

States’ due diligence obligation to protect the marine environment under the LOSC yields the same result. Article 194 provides that states are to take all necessary measures to “prevent, reduce and control pollution of the marine environment,” and the measures must include those “designed to minimize to the fullest possible extent” pollution from vessels.²⁸⁵ Thus states are obliged to cooperate when establishing rules within the IMO,²⁸⁶ but they must also design them to mitigate climate harm “so far as possible.”²⁸⁷

This means that IMO member states must consider and apply the most comprehensive and current levels of scientific and technological expertise in designing and adopting climate standards for shipping.²⁸⁸ States are therefore required to consider how policies can avoid path dependence and force technological innovation.²⁸⁹ And if a proposed level of ambition or reduction measure is clearly inadequate—and therefore it is reasonably foreseeable that it would exacerbate the risk of catastrophic climate harm—due diligence demands that states vote against it and instead support more ambitious and effective climate measures.

The Paris Agreement’s temperature goals—in particular its 1.5 degree goal—operate as legal benchmarks for avoiding harmful climate change and informing the level of diligence that should be expected of states. As noted above, major maritime states committed in their NDCs to working through the IMO to reduce shipping’s GHG emissions, and within the IMO, its member states have agreed that the temperature goals should guide the IMO’s climate policies in several resolutions adopted over a period of

283. Compare *id.* at 103, with IMO, *Report of the Marine Environment Protection Committee on its Seventy-Eighth Session*, *supra* note 118.

284. See *supra* Part II.C.

285. LOSC, *supra* note 22, art. 194.

286. LOSC, *supra* note 22, arts. 210–11.

287. *Genocide*, 2007 I.C.J. Rep. ¶ 430; *Seabed Advisory Opinion*, 2011 ITLOS Rep. ¶ 117 (stating that the standard of due diligence is “more severe for the riskier activities”).

288. Giannopoulos, *supra* note 34, at 156–57.

289. See Jonathan Köhler et al., *Transitions for Ship Propulsion to 2050: The AHOY Combined Qualitative and Quantitative Scenarios*, 140 MARINE POL’Y 105049 (2022) (analyzing policy as driving shipping’s rapid decarbonization); Eeva-Lotta Apajalahti & Gregor Kungl, *Path Dependence and Path Break-Out in the Electricity Sector*, 43 ENV’T INNOV. & SOC. TRANS. 220, 221–23 (2022) (defining and discussing path dependence).

years.²⁹⁰ Application of the harm prevention principle and precautionary principle yields the same result.²⁹¹ Thus, states are obliged to support a reduction pathway in the IMO that will credibly achieve zero emissions by 2050 and steep emission cuts by 2030,²⁹² which is more ambitious than what the IMO agreed to in July 2023.²⁹³

Should states be held to different standards for their compliance with this duty based on their economic development or other factors? There is a long-standing disagreement about the degree to which the common-but-differentiated-responsibilities (CBDR) principle should be incorporated into climate measures for shipping.²⁹⁴ In my view, the costs and benefits associated with the sector's decarbonization should be allocated in a way that is consistent with the CBDR principle.²⁹⁵ But the principle applies in a specific way here. Unlike climate policies affecting national emissions, states have equal capacity to make informed decisions at the IMO, and the IMO has nearly universal membership.²⁹⁶ Even small landlocked states therefore have some capacity to address shipping's risk of climate harm by virtue of their influence within the IMO's rule-making processes. Thus, if the IMO's climate policies prevent small island developing states and least-developed countries from bearing the burden of decarbonizing shipping and give them preferences in any technology transfer and financial assistance,²⁹⁷ these states are also obliged to use their influence to push the organization to adopt a high level of ambition and effective climate measures.

To the extent that there is differentiation, large flag states should be held to a higher standard, because they enjoy special lawmaking authority within MEPC and therefore have more "control" over the IMO than other states.²⁹⁸ The Marshall Islands seemed to acknowledge this in its most recent NDC, where it noted that it is the second-largest flag registry in the world and stated that it "is proud to support efforts for ambitious decarbonization action in the International Maritime Organization (IMO), including through

290. *See supra* notes 3, 113, 117.

291. *See supra* Part II.A.

292. *See* Bullock et al., *supra* note 5. *See generally* Sam Fankhauser et al., *The Meaning of Net Zero and How to Get It Right*, 12 NATURE CLIMATE CHANGE 15, 17 (2022); Shelley Welton, *Neutralizing the Atmosphere*, 132 YALE L.J. 171 (2022).

293. *See supra* note 3.

294. Kopela, *supra* note 50, at 81–85.

295. Kerr (2022), *supra* note 8, at 419–20.

296. The MEPC is a plenary organ of the IMO. IMO Convention, *supra* note 2, art. 37.

297. Shawkat Alam, *Technology Assistance and Transfers*, in THE OXFORD HANDBOOK OF INTERNATIONAL ENVIRONMENTAL LAW 957 (Lavanya Rajamani et al. eds., 2d ed. 2021) ("At its heart, technology transfers aim to address the inequitable distribution of costs and benefits that have occurred between developed and developing countries under conventional patterns of economic growth.").

298. *See supra* note 28; BARROS, *supra* note 32, at 86 (discussing differentiated diligence burdens on international legal subjects based on the degree of "control" exercised within international organizations).

the introduction of a market-based measure to put a price on carbon.”²⁹⁹ The Marshall Islands’ long-standing commitment to a high level of ambition and effective measures at the IMO has not yet been mirrored by a majority of states at the MEPC.³⁰⁰ And, as discussed below, the IMO’s inadequate response obliges states to enact measures that are more ambitious than the global minimum.

B. *Unilateral Measures*

States are taking a variety of independent actions to decarbonize the international shipping sector. Norway and Singapore are working with the IMO to assist small island developing states and least-developed countries with maritime climate policies.³⁰¹ Cabo Verde and the United States are using voluntary domestic measures to stimulate the sector’s decarbonization.³⁰² Other policies include India’s development of renewable energy at ports and green shipbuilding; Norway’s public procurement of low and zero carbon ships; the United Kingdom’s support for innovators in clean maritime fuel; and Japan’s technology research and development to help meet the IMO’s climate ambitions.³⁰³

At the Glasgow UNFCCC Conference of the Parties, twenty-four states agreed on the “Clydebank Declaration” to establish green corridors for shipping.³⁰⁴ The declaration’s signatories, which include Japan, Singapore, the United Kingdom, and the United States, noted the 1.5 degree global warming goal and the IMO’s endorsement of the goal in its 2018 Strategy.³⁰⁵ They stated that they are alarmed that shipping’s emissions are projected to be 90 to 130 percent of 2008 levels by 2050, and they therefore aimed to establish up to six green shipping corridors by 2030 where zero carbon

299. UPDATE COMMUNICATION ON THE MARSHALL ISLANDS PARIS AGREEMENT NDC, *supra* note 113, at 3.

300. IMO, *Report of the Marine Environment Protection Committee on its Seventy-Ninth Session*, annex 16 at 26–27, IMO Doc. MEPC 79/15/Add.1 (Feb. 9, 2023) (statement by the Marshall Islands to the IMO).

301. Press Release, IMO, Norway and Singapore Sign MOU on Maritime Decarbonization (Mar. 21, 2023), <https://greenvoyage2050.imo.org/1768-2/>.

302. *See supra* note 90 and accompanying text; CABO VERDE, *supra* note 113.

303. MINISTRY OF PORTS, SHIPPING & WATERWAYS, MARITIME INDIA VISION 2030, at 223–25 (Feb. 22, 2021); IMO, *Update on the Norwegian National Action to Address GHG Emissions from Ships and Green Status for Green Shipping in Norway*, IMO Doc. MEPC 76/7/1 (Mar. 9, 2021); UK DEP’T OF TRANSPORT, CLEAN MARITIME PLAN 5 (July 2019); JAPANESE MINISTRY OF LAND, INFRASTRUCTURE, TRANSP. & TOURISM & JAPAN SHIP TECH. RSCH. ASS’N, SHIPPING ZERO EMISSION PROJECT, ROADMAP TO ZERO EMISSION FROM INTERNATIONAL SHIPPING (May 27, 2020); *see National Action Plans*, INT’L MARITIME ORG., <https://www.imo.org/en/ourwork/environment/pages/relevant-national-action-plans-and-strategies.aspx> (last visited July 20, 2023).

304. UK DEP’T OF TRANSP., COP 26: CLYDEBANK DECLARATION FOR GREEN SHIPPING CORRIDORS (Dec. 6, 2023), <https://www.gov.uk/government/publications/cop-26-clydebank-declaration-for-green-shipping-corridors/cop-26-clydebank-declaration-for-green-shipping-corridors>.

305. *Id.*

technology will be used. The declaration specified that ship operators' participation will be voluntary.³⁰⁶

Is the voluntary encouragement of green shipping enough to satisfy the due diligence obligation described above? Scientists believe the sector must reduce emissions by thirty-four to thirty-six percent by 2030 for it to be compatible with limiting global warming to 1.5 degrees.³⁰⁷ Measures that do not represent best efforts toward that goal do not comply with the due diligence obligation identified here. Best efforts can be defined based on risk: states are held to a higher standard of care if activities under their control present a greater risk of harm, and they must do more if they have a greater capacity to address that risk.³⁰⁸ Thus, the legal sufficiency of a measure is dynamic, depending on the facts and on the state in question.

In this context, major port states and flag states are held to a higher standard of care because more of the international shipping sector falls under their control. Although shipping is a global industry that is important for nearly every national economy, control over it is concentrated: the twenty-five states with the busiest container ports account for seventy-seven percent of global container traffic.³⁰⁹ Slightly more than half of global maritime traffic is containerized, with most of the rest split between tanker and cargo.³¹⁰ The states with the largest tanker terminals—the United States, Saudi Arabia, the United Arab Emirates, Singapore, the Netherlands, and China—overlap with the states with the most container traffic.³¹¹ The states with the most bulk carrier traffic are also generally the same as those with the most container traffic.³¹² The top ten flag states overlap with the top port states, with the exception of Liberia, the Marshall Islands, and the Bahamas.³¹³ And the top ten ship-owning countries overlap with the biggest port states, with the addition of Norway and Switzerland.³¹⁴ Thus, thirty-

306. *Id.*

307. Bullock et al., *supra* note 5, at 305–07; BONELLO ET AL., *supra* note 5, at 14.

308. Viñuales, *supra* note 16, at 124–26 (citing Int'l Law Comm'n, Rep. on the Work of Its Fifty-Third Session, *supra* note 26); Peel, *supra* note 27, at 1035 (noting that states with high per capita GHG emissions or high total emissions are subject to more stringent standards to mitigate climate change).

309. UNCTAD, *supra* note 1, at 82. Although Hong Kong is often designated separately from China in shipping data, this Article does not distinguish between them.

310. *Facts & Figures*, WORLD SHIPPING COUNCIL, <https://www.worldshipping.org/facts-figures> (last visited July 21, 2023). Although container vessels emit the most carbon per ton-mile, container, tanker and cargo traffic each account for about the same amount of GHG emissions. UNCTAD, *supra* note 1, at 107.

311. Craig Jallal, *Top 10 Tanker Terminals Revealed*, RIVIERA (Dec. 5, 2019), <https://www.rivieramm.com/news-content-hub/news-content-hub/top-ten-tanker-terminals-57057>.

312. UNCTAD, *supra* note 1, at 87.

313. *Id.* at 42–43.

314. *Id.* at 39.

three states control the vast majority of international shipping, and six of those are members of the European Union.³¹⁵

Among these states, capacity to address shipping's climate risk can be differentiated based on wealth and technological capacity.³¹⁶ These are relevant factors because the installation of port infrastructure to accommodate low and zero carbon shipping requires significant capital investment and technology, and decarbonization measures will likely lead to incremental shipping costs and potential loss of market share.³¹⁷ Figure 1 depicts some major maritime states according to their wealth, measured in terms of gross domestic product per capita based on purchasing power parity (GDP PPP), and in terms of technological sophistication, measured in terms of the score assigned by the Global Innovation Index (GII), which is published by the World Intellectual Property Organization.³¹⁸ GDP PPP equitably depicts the ability of a country to finance decarbonization: it reflects total economic activity adjusted for population and price differentials across countries, and it also reflects the world income distribution.³¹⁹ GII ranks innovation among 132 countries and has been recognized as an important metric for sustainable development by the UN General Assembly.³²⁰ Bubble sizes correspond to container ship port arrivals, which is a metric used to measure maritime traffic.³²¹

315. These states are Australia, the Bahamas, Belgium, Brazil, Canada, China, Egypt, Germany, Greece, India, Indonesia, Japan, Liberia, Malaysia, Malta, the Marshall Islands, Morocco, the Netherlands, Norway, Oman, Panama, the Philippines, Saudi Arabia, Singapore, South Korea, Spain, Sri Lanka, Switzerland, Thailand, the United Arab Emirates, the United Kingdom, the United States, and Vietnam. *See* sources cited *supra* notes 309–314.

316. *See* Int'l Law Comm'n, Rep. on the Work of Its Fifty-Third Session, *supra* note 26; Viñuales, *supra* note 16, at 124; Peel, *supra* note 27, at 1033 (asserting that assessment of a breach should be differentiated based on a state's individual circumstances).

317. IMO, Submission by India, *Reduction of GHG Emissions from Ships*, at 4–5, IMO Doc. MEPC 78/7/4 (Mar. 30, 2022); EU Maritime ETS Measure, *supra* note 7, ¶¶ 17, 28.

318. *World Economic Outlook Database*, INT'L MONETARY FUND (Apr. 2023), <https://www.imf.org/en/Publications/WEO/weo-database/2023/April>; WORLD INTELLECTUAL PROPERTY ORGANIZATION, GLOBAL INNOVATION INDEX 2022 (Soumitra Dutta et al. eds., 2022) [hereinafter 2022 GII REPORT].

319. PRINCETON ENCYCLOPEDIA OF THE GLOBAL ECONOMY 700 (Kenneth A. Reinert et al. eds., 2009) (describing the use of per-capita GDP as the main way of defining world income distribution); *id.* at 1224 (defining purchasing power parity).

320. 2022 GII REPORT, *supra* note 318; G.A. Res. A/RES/76/213, ¶ 18 (Jan. 7, 2022).

321. UNCTAD, *supra* note 1, at 82.

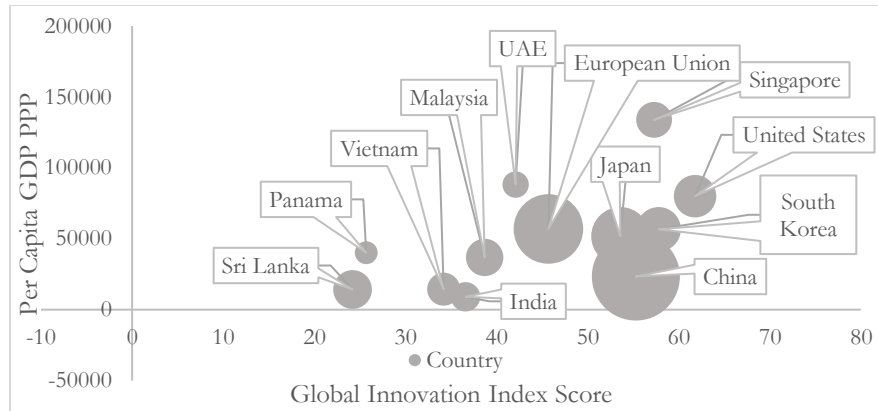


Figure 1: *Shipping's Risk of Climate Harm and State Capacity to Address It*

As Figure 1 shows, a handful of states' shipping sectors pose a significant risk of climate harm, and some of those states are also wealthy and have a high degree of technological sophistication. Accordingly, Japan, Singapore, South Korea, and the United States bear a higher standard of due diligence.³²² These states have policies that are undoubtedly important and necessary for the sector to decarbonize, such as technology development and transfer.³²³ But the European Union's measures demonstrate what technical and scientific GHG reductions are currently possible, and what constitutes "means reasonably available" to similarly situated states.³²⁴ Thus, for highly developed and technologically advanced major maritime states, unilateral actions that do not meet that standard are deficient and inconsistent with the obligation identified here.³²⁵ A lesser degree of diligence would be expected from states such as Panama, Sri Lanka, or Vietnam, which could satisfy their due diligence obligations based on support for ambitious and effective measures at the IMO or participation in voluntary programs such as those discussed above.

Whether a state meets the required level of diligence is fact-driven and shaped by the opportunity to act.³²⁶ Maritime states without a cap-and-trade system similar to the European Union's—such as the United States—would need to use other market-based instruments or technology mandates to

322. Peel, *supra* note 27, at 1033–35.

323. See *National Action Plans*, *supra* note 303.

324. Genocide, 2007 I.C.J. Rep. ¶ 430; Giannopoulos, *supra* note 34, at 447. The European Union will need to monitor the effectiveness of its measures in real time and adjust them in light of "developments in scientific awareness." *Id.* at 479.

325. Viñuales, *supra* note 16, at 125–26; Boyle, *supra* note 23, at 474 (explaining that comparison can be made to a best performer to find out whether "necessary measures" have been implemented).

326. Voigt, *supra* note 237, at 11–15.

accomplish reductions.³²⁷ And landlocked states with close economic connections to the shipping sector, such as Switzerland, would be expected to regulate business entities in a way that reduces climate emissions.³²⁸ Global economic patterns are also relevant: because the European Union's largest maritime trading partner is the United States, if the United States acted similarly to the European Union, a highly significant share of global emissions from shipping would be mitigated in a way that is more ambitious and effective than IMO measures.³²⁹ Similarly, Japan, China, the European Union, and the United States account for half of all shipping imports and exports worldwide.³³⁰ By offering the potential for enhanced shipping emissions mitigation corridors, the European Union's action increases the diligence expected of those other states.

C. *Accountability*

There are various interrelated mechanisms that could hold states to account for their obligation to prevent and reduce shipping's climate risks. Some scholars have proposed utilizing the law of state responsibility for climate harm and damages.³³¹ Others have cautioned that showing causation between a claimed injury and an internationally wrongful act would be difficult because of the diffuse nature of climate emissions and harms.³³² But a case based on shipping could avoid some of those difficulties: as shown above, relatively few states exercise disproportionate jurisdiction and control over the shipping sector, and there is already ample data available about vessel movements and emissions. Accordingly, a market-share division of liability for shipping could be more feasible and justiciable.³³³ Moreover, as Millicent McCreath points out with respect to a claim brought under the LOSC, proving causation is only necessary if damages are claimed: a state could seek declaratory relief and remedies such as cessation, assurances, or guarantees of non-repetition based on an alleged breach of

327. See OCEAN POLICY COMMITTEE, *supra* note 90; International Maritime Pollution Accountability Act of 2023, S. 1920, 118th Cong. § 5 (2023).

328. See UNCTAD, *supra* note 1, at 39 (identifying Switzerland as the eleventh largest ship-owning country).

329. See EUROSTAT, USA-EU—INTERNATIONAL TRADE IN GOODS STATISTICS (Feb. 2024); EU Maritime ETS Measure, *supra* note 7.

330. See EUROSTAT, *supra* note 329, at 4, fig.3.

331. Voigt, *supra* note 237; Wewerinke-Singh & McCoach, *supra* note 173; Seokwoo Lee & Lowell Bautista, *Part XII of the United Nations Convention on the Law of the Sea and the Duty to Mitigate Against Climate Change: Making Out a Claim, Causation, and Related Issues*, 45 *ECOLOGY L.Q.* 129 (2018).

332. Peel, *supra* note 27, at 1042–44.

333. See *id.* at 1046–47 (discussing the market share concept).

the LOSC's environmental obligations, which are owed to the world at large.³³⁴

A climate claim based on shipping could be also grounded in human rights and brought before a regional court or a human rights treaty body. The European Court of Human Rights recently issued a landmark ruling against Switzerland's inadequate climate mitigation measures violated its citizens' human rights.³³⁵ The Inter-American Court of Human Rights could hear a claim by citizens alleging that their country was violating human rights by not diligently addressing shipping's climate impacts if the case were first referred to the court by the Inter-American Commission on Human Rights or by a state party to the American Convention on Human Rights.³³⁶ The third regional human rights court—the African Court on Human and Peoples' Rights—is charged with upholding the African Charter on Human and Peoples' Rights, which guarantees the right to a satisfactory environment as well as other rights that implicate climate change.³³⁷

As discussed above, the UN Committee on Human Rights found that Australia violated human rights based on climate inaction, and the UN Committee on the Rights of the Child articulated a causal test for climate harm and human rights.³³⁸ States that have submitted to monitoring of their compliance with the ICCPR by the UN Committee on Human Rights include Australia, Brazil, Canada, South Korea, Turkey, and all members of the European Union.³³⁹ Most South American states, European states, and Turkey have agreed to compliance procedures before the UN Committee on the Rights of the Child.³⁴⁰ It is therefore plausible that an individual or group of individuals could allege that those states are not complying with their due diligence obligations to address shipping's climate impacts.³⁴¹ Findings by human rights treaty bodies do not bind respondent states, but they are nevertheless important in international diplomatic fora and

334. Millicent McCreath, *The Potential for UNCLOS Climate Change Litigation to Achieve Effective Mitigation Outcomes*, in CLIMATE CHANGE LITIGATION IN THE ASIA PACIFIC 131–32 (Jolene Lin & Douglas Kysar eds., 2020); *contra* Lee & Bautista, *supra* note 331, at 147.

335. *See Case of Verein Klimaseniorinnen Schweiz and Others v. Switzerland*, App. No. 53600/20.

336. American Convention on Human Rights art. 61, Nov. 22, 1969, 1144 U.N.T.S.123.

337. African Charter on Human and Peoples' Rights arts. 2–17, 20, 21, 24, June 27, 1981, 1520 U.N.T.S. 217; *see* Ademola Oluborode Jegede, *Climate Change and the Future Generation Under the African Human Rights System: Fostering Pathways and Partnerships*, GLOB. CAMPUS HUM. RTS. (2021), <https://repository.gchumanrights.org/items/9f84d339-5495-401a-817d-46b56513a97d> (discussing potential climate litigation under the African human rights system).

338. *See* Saachi, *supra* note 21, ¶¶ 8.12, 8.14; Recent Cases, *Sacchi v. Argentina*, *supra* note 21, at 1986–88.

339. U.N. High Commissioner for Human Rights, *Ratification of 18 International Human Rights Treaties*, <https://indicators.ohchr.org/> (last visited July 20, 2023).

340. *Id.*

341. *See* Saachi, *supra* note 21.

domestic legal and political processes, and they would inform the content of the due diligence obligation described here.³⁴²

International law can influence how national constitutions and statutes are interpreted in climate cases. Some countries' court systems allow direct allegations of violations of international law.³⁴³ In many others, international decisions are relevant to the interpretation of national laws. The American Convention on Human Rights requires that its parties' judiciaries consider any decision by the Inter-American Court of Human Rights, including its advisory opinions, when deciding domestic cases.³⁴⁴ The International Tribunal for the Law of the Sea has noted that a domestic court's interpretation of enforcement measures against ships would be guided by the LOSC's provisions.³⁴⁵ Presumably a court's interpretation of the legality of national climate measures for shipping—or the lack thereof—would as well. Germany's constitutional court interpreted the Paris Agreement's temperature goals as legal benchmarks for the constitutionality of the federal government's carbon budget.³⁴⁶ American federal courts give “respectful consideration” to the interpretation of international agreements by international courts and tribunals, and international law can be used to interpret statutes and constitutional provisions.³⁴⁷ Thus, an assertion that the United States or other countries are not diligently mitigating shipping's climate emissions as required by international law could be relevant to cases grounded in national constitutions or statutes.

342. Rosanne van Albeek & André Nollkaemper, *The Legal Status of Decisions by Human Rights Treaty Bodies in National Law*, in U.N. HUMAN RIGHTS TREATY BODIES: LAW AND LEGITIMACY 412 (Helen Keller & Geir Ulfstein eds., 2012); Michael O'Flaherty, *The United Nations Human Rights Treaty Bodies as Diplomatic Actors*, in HUMAN RIGHTS DIPLOMACY: CONTEMPORARY PERSPECTIVES 161 (Michael O'Flaherty et al. eds., 2011); see also Ingrid Wuerth, *International Law in the Post-Human Rights Era*, 96 TEX. L. REV. 279, 284 (2017) (discussing problems with human rights conditions and enforcement).

343. See, e.g., HR 20 december 2019, RvdW 2020, 19/00135 mn.nt C.A.S. (The State of the Netherlands (Ministry of Economic Affairs and Climate Policy)/Stichting Urgenda)(Neth.).

344. Maria Antonia Tigre et al., *A Request for an Advisory Opinion at the Inter-American Court of Human Rights: Initial Reactions*, COLUM. L.: CLIMATE L. (Feb. 17, 2023), <https://blogs.law.columbia.edu/climatechange/2023/02/17/a-request-for-an-advisory-opinion-at-the-inter-american-court-of-human-rights-initial-reactions/> (citing Almonacid-Arellano et al. v. Chile, Preliminary Objections, Merits, Reparations and Costs, Judgment, Inter-Am. Ct. H.R. (ser. C) No. 154, ¶ 124 (Sept. 26, 2006)). The United States is not a party to the Convention. B-32: *American Convention on Human Rights*, ORG. AM. STATES: INTER-AM. COMM'N HUM. RTS., <https://www.cidh.oas.org/basicos/english/Basic4.Amer.Conv.Ratif.htm> (last visited July 17, 2023).

345. M/V Virginia G (Pan. v. Guinea-Bissau), Case No. 19, Judgment of Apr. 14, 2014, 2014 ITLOS Rep. 4, ¶ 294.

346. 2656 BVerfGE 1, ¶¶ 235–36.

347. Sanchez-Llamas v. Oregon, 548 U.S. 331, 355 (2006); see Murray v. The Schooner Charming Betsy, 6 U.S. 64 (1804) (interpreting a statute to avoid conflict with international law); Procopio v. Wilkie, 913 F.3d 1371 (Fed. Cir. 2019) (interpreting a statute in light of international law); Latta v. Otter, 779 F.3d 902, 906 n.7 (9th Cir. 2015) (considering European Court of Human Rights jurisprudence when ruling on a constitutional right to same-sex marriage).

V. CONCLUSION

Climate obligations are in flux, with judgments from international, regional, and national courts establishing increasingly demanding standards for states' behavior. As I discuss in this Article, those obligations should encompass a significant and growing source of climate pollution—the international shipping sector. Human rights law and the LOSC show that states have a due diligence obligation to mitigate shipping's climate impacts, and this obligation is informed and shaped by customary international legal principles of harm prevention and precaution. Consequently, states must take all necessary measures to address the climate risks posed by shipping in order to limit global warming to 1.5 degrees. Whether measures are necessary is fact-dependent, dynamic, and differential. They include decision-making within the IMO as well as the exercise of jurisdiction over ships and shipping companies.

The European Union's maritime climate measures and commitments by the shipping industry show that states can and must do more. Wealthy and technologically advanced states with large maritime sectors are not yet diligently preventing and reducing the sector's climate risks—apart from those in the European Union. Although the IMO's member states recently set new goals for shipping's GHG emission reductions, these goals are incompatible with limiting global warming to 1.5 degrees, and even they will not be met under current regulations. There are potential avenues to hold states to account for their conduct within the IMO and outside of it. Evaluating and applying climate obligations in terms of all activities under states' jurisdiction and control—as done here—can fill gaps in international governance and ensure that every sector is fully addressing the climate crisis.