Transnational Environmental Law (2025) 1–27
doi:10.1017/S2047102524000372

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ARTICLE

Identifying Key Polluters: The Feasibility of Applying the Polluter Pays Principle to Marine Greenhouse Gas Emissions

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Abstract
Greenhouse gas (GHG) emissions from shipping contribute meaningfully to climate change. Despite significant efforts of the International Maritime Organization over recent decades, existing measures are still inadequate for achieving net-zero GHG emissions in the shipping sector and multilateral negotiations hold little promise for improvement. This article considers the polluter pays principle (PPP) as an alternative or additional pathway for tackling marine GHG emissions. The article focuses on the challenges in identifying polluters, which is the key issue that must be addressed before the PPP can be applied. Specifically, the article presents an analytical framework and examines various approaches to identifying marine GHG emissions polluters. Firstly, it identifies the polluter from a general perspective, using three approaches: examining the issue broadly, reviewing international conventions and European Union initiatives that incorporate the PPP, and analyzing selected domestic legislation reflecting the PPP. The article then focuses on maritime shipping, considering specifically two types of contract of affreightment – charterparties and bills of lading – while highlighting key factors in identifying the polluter. In conclusion, the assessment of causal links, along with operational and management decisions regarding the vessel, attribute the status of primary polluter to the shipowner, demise charterer, and time charterer.

Keywords: Polluter pays principle; Polluter; Marine greenhouse gas emissions; International Maritime Organization (IMO); European Union; Climate change

1. Introduction

Climate change is one of the most concerning issues related to the global environment. The primary cause of climate change is the increasing concentration of anthropogenic greenhouse gases (GHGs) released into the atmosphere.[1] The global nature of climate change necessitates joint efforts at the international level, which led to the adoption of

[1] V. Nanda & G.R. Pring, *International Environmental Law and Policy for the 21st Century* (Martinus Nijhoff, 2012), pp. 399–400. See also European Commission, 'Causes of Climate Change', available at: https://climate.ec.europa.eu/climate-change/causes-climate-change_en.

a legal framework with a unified goal for reducing anthropogenic GHG emissions.[2] This goal is intended to be achieved in a manner that promotes global socio-economic development.[3] The 1992 United Nations Framework Convention on Climate Change (UNFCCC)[4] sets the goal of stabilizing GHG concentrations in the atmosphere at a level that prevents detrimental anthropogenic interference with the climate system.[5] The UNFCCC has led to the adoption of several legislative milestones, including its 1997 Kyoto Protocol[6] and the 2015 Paris Agreement.[7] Moreover, the latest Glasgow Climate Pact has strengthened the previous agreement in several significant respects.[8] These agreements, along with other amendments and protocols,[9] guide global and domestic efforts to address climate change.

GHG emissions from shipping contribute notably to overall anthropogenic GHG emissions. Ships are propelled primarily by heavy fuel-oil combustion,[10] which results in substantial emissions of carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O).[11] To control GHG emissions from shipping, the International Maritime Organization (IMO) has adopted a series of measures to tackle the matter. In 1973, the IMO adopted the International Convention for the Prevention of Pollution from Ships (MARPOL),[12] a regulatory instrument addressing marine pollution. In 1997, a Protocol was adopted to amend MARPOL[13] and Annex VI, entitled 'Regulations for the Prevention of Air Pollution from Ships', which marked the IMO's first step towards managing shipping-related air pollution. Annex VI provides a legal basis for

2 See UNFCCC, n. 4 below.

3 Y. Chen, 'Reconciling Common but Differentiated Responsibilities Principle and No More Favorable Treatment Principle in Regulating Greenhouse Gas Emissions from International Shipping' (2021) 123 *Marine Policy*, pp. 1–9, at 1.

4 New York, NY (United States (US)), 9 May 1992, in force 21 Mar. 1994, available at: https://unfccc.int.

5 Ibid., Art. 2.

6 Kyoto (Japan), 10 Dec. 1997, in force 16 Feb. 2005, available at: http://unfccc.int/kyoto_protocol/items/2830.php.

7 Paris (France), 12 Dec. 2015, in force 4 Nov. 2016, available at: http://unfccc.int/paris_agreement/items/9485.php.

8 Decision 1/CMA.3, 'Glasgow Climate Pact', 13 Nov. 2021, UN Doc. FCCC/PA/CMA/2021/10/Add.1.

9 See, e.g., Decision 2/CP.15, 'Copenhagen Accord', 18 Dec. 2009, UN Doc. FCCC/CP/2009/11/Add.1, available at: http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf; Decision 1/CP.16, 'The Cancun Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention', 11 Dec. 2010, UN Doc. FCCC/CP/2010/7/Add.1, available at: http://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf.

10 Chen, n. 3 above, p. 1.

11 J. Chen, Y. Fei & Z. Wan, 'The Relationship between the Development of Global Maritime Fleets and GHG Emissions from Shipping' (2019) 242 *Journal of Environmental Management*, pp. 31–9, at 31. After the introduction of Energy Efficiency Design Index (EEDI) and Energy Efficiency Operational Indicator (EEOI) standards, the reduction effects of CH_4 and N_2O emissions were particularly prominent. CO_2 still accounts for the largest portion of GHG emissions from shipping.

12 London (United Kingdom (UK)), 2 Nov. 1973, in force only after the 1978 London Protocol on 2 Oct. 1983, available at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/ConferencesMeetings/Documents/MARPOL%201973%20-%20Final%20Act%20and%20Convention.pdf.

13 Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973, London (UK), 17 Feb. 1978, in force 2 Oct. 1983, available at: https://treaties.un.org/doc/Publication/UNTS/Volume%201340/volume-1340-A-22484-English.pdf.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

adopting measures to prevent air pollution from shipping.[14] The IMO adopted further amendments to Annex VI in MARPOL in 2011 and also introduced the first mandatory measures to reduce marine GHG emissions.[15] The amendments added a new Chapter 4 to Annex VI on Regulations on Energy Efficiency for Ships, which regulates the Energy Efficiency Design Index (EEDI), and sets minimum standards for the energy efficiency of new ships. In addition, the Ship Energy Efficiency Management Plan (SEEMP) requires all ships to develop plans to improve energy efficiency. A further amendment to MARPOL Annex VI entered into force on 1 November 2022. This amendment further introduces two main energy performance indicators: the Energy Efficiency Existing Ship Index (EEXI), which is an evolved version of the EEDI and applies to certain existing ships, and the Carbon Intensity Indicator (CII), which is a new approach to measuring CO_2 emissions from ship operations, and is adopted as an indicator to characterize a ship's operational energy efficiency level. The EEXI and CII certification requirements apply from 1 January 2023. The first annual reporting of the operational CII will be completed in 2023, with the first ratings issued in 2024.[16]

In 2018, the Marine Environment Protection Committee (MEPC) of the IMO adopted the Initial Strategy on Reduction of Greenhouse Emissions from Ships (IMO GHG Strategy),[17] which was then revised by the 2023 IMO GHG Strategy adopted in July 2023. Together, they serve as a framework for member states, establishing the future vision for international shipping, and identifying levels of ambition for the international shipping sector to reduce GHG emissions.[18] The 2023 IMO GHG Strategy has made progress towards a basket of mid-term measures, including the establishment of a global goal-based marine fuel standard and a global pricing mechanism for GHG emissions from ships.[19] These measures are expected to promote the energy transition of shipping and are predicted to be approved at MEPC 83 in 2025. The IMO also carried out four GHG studies between 2000 and 2020.[20]

[14] R. Churchill, V. Lowe & A. Sander, *The Law of the Sea* (Manchester University Press, 2022), p. 635. See also V. Piccolo, 'GHG Emissions from Shipping: How to Overcome Persistent Challenges', NUS Centre for Maritime Law, NUS Law Working Paper 2023/019, 11 July 2023, p. 31, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4506467.

[15] IMO, 'Cutting GHG Emissions from Shipping: 10 Years of Mandatory Rules', 15 July 2021, available at: https://www.imo.org/en/MediaCentre/PressBriefings/pages/DecadeOfGHGAction.aspx.

[16] IMO, 'EEXI and CII: Ship Carbon Intensity and Rating System', available at: https://www.imo.org/en/MediaCentre/HotTopics/Pages/EEXI-CII-FAQ.aspx.

[17] IMO, 'Marine Environment Protection Committee (MEPC), 72nd session, 9–13 April 2018', Apr. 2018, available at: https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/MEPC-72nd-session.aspx.

[18] IMO, '2023 IMO Strategy on Reduction of GHG Emissions from Ships', available at: https://www.imo.org/en/OurWork/Environment/Pages/2023-IMO-Strategy-on-Reduction-of-GHG-Emissions-from-Ships.aspx.

[19] IMO, '2023 IMO Strategy on Reduction of Greenhouse Gas Emissions from Ships', Res. MEPC.377(80), 7 July 2023, IMO Doc. MEPC 80/17/Add.1, Annex 15, para. 4.5, available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/annex/MEPC%2080/Annex%2015.pdf.

[20] K.O. Skjølsvik et al., 'First IMO Greenhouse Gas Study 2000', IMO, available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/First%20IMO%20GHG%20study.pdf; Ø. Buhaug et al., 'Second IMO Greenhouse Gas Study 2009', IMO, available at: https://wwwcdn.imo.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

Undoubtedly, the IMO has made considerable efforts to control and reduce marine GHG emissions; however, this progress does not match the escalating impact of such emissions. As stated in the Fourth IMO GHG Study, in 2018, GHG emissions from shipping accounted for 1,076 million tonnes of CO_2, about 3% of global GHG emissions.[21] Maritime trade grew about 2.4% in 2023,[22] so the challenges associated with the effect of maritime shipping on the environment are increasing. It has become evident that merely using technical and operational measures will not achieve the ideal outcome of reduction measures on GHG emissions from international shipping,[23] and additional measures are clearly required to control these emissions. The IMO shares this concern and has held further discussions on technical approaches, such as the Greenhouse Gas Fuel Standard (GFS) and the Greenhouse Gas Fuel Intensity (GFI) standard, as well as economic measures.[24]

Against this background, the article analyzes issues in relation to the identification of polluters for the potential implementation of the polluter pays principle (PPP) to control maritime GHG emissions. The remainder of the article is arranged as follows. Section 2 presents an analytical framework by introducing the PPP and demonstrating its potential to address marine GHG emissions. Section 3 sets out the various approaches used to identify maritime polluters in international, regional, and domestic laws. Section 4 introduces the measures taken by the European Union (EU) related to the EU Emissions Trading System (EU ETS). The discussions in Section 5 focus on the specific approaches to identifying polluters relevant to maritime GHG emissions. Section 6 concludes.

2. Analytical Framework

The PPP was introduced initially as an economic principle to internalize the external costs of pollution and has gradually evolved into a legal principle. An in-depth analysis of the PPP is a prerequisite to examining its potential in addressing GHG emissions from shipping from a legal perspective. Equally significant is the exploration of the advantages and operationalization framework of applying the PPP to mitigate GHG emissions from shipping.

org/localresources/en/OurWork/Environment/Documents/SecondIMOGHGStudy2009.pdf; T.W.P. Smith et al., 'Third IMO Greenhouse Gas Study 2014', IMO, available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Third%20Greenhouse%20Gas%20Study/GHG3%20Executive%20Summary%20and%20Report.pdf; J. Faber et al., 'Fourth IMO Greenhouse Gas Study 2020', IMO, available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Fourth%20IMO%20GHG%20Study%202020%20-%20Full%20report%20and%20annexes.pdf.

[21] Faber et al., ibid., p. 112.

[22] United Nations Conference on Trade and Development (UNCTAD), 'Review of Maritime Transport 2023', available at: https://unctad.org/publication/review-maritime-transport-2023.

[23] Y. Shi, 'Reducing Greenhouse Gas Emissions from International Shipping: Is It Time to Consider Market-Based Measures?' (2016) 64 *Marine Policy*, pp. 123–34, at 123.

[24] Discussions were held at the Intersessional Working Group on Reduction of Greenhouse Gas (GHG) Emissions from Ships (ISWG-GHG 16), 11–15 Mar. 2024. Information is available from: https://www.ics-shipping.org/wp-content/uploads/2023/11/ISWG-GHG-16-2-XX-Revised-GFS-draft-amendments-ICS-and-IBIA-final.docx.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

2.1. The PPP

The PPP is a principle, acknowledged by many international and national laws, that requires that those responsible for polluting the environment should be held accountable for the associated costs.[25] It emerged initially as an economic principle for cost allocation, which allows for the internalization of external costs.[26]

At the international level, the Organisation for Economic Cooperation and Development (OECD) first officially introduced the PPP as an economic principle in 1972.[27] In 1975, the EU Recommendation 75/436 of March 1975 provided that 'natural or legal persons governed by public or private law who are responsible for pollution must pay the costs of such measures as are necessary to eliminate that pollution or to reduce it so as to comply with the standards or equivalent measures'.[28] In 1992, the OECD further confirmed that the PPP 'started out as an economic principle but has recently become a legal one'.[29] Principle 16 of the Rio Declaration[30] then emphasizes the significance of 'the internalization of environmental costs' and 'the use of economic instruments'. The PPP has gradually become a part of international law,[31] and is now the cornerstone of many pollution-related regulations.[32]

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[25] N. de Sadeleer, *Environmental Principles: From Political Slogans to Legal Rules* (Oxford University Press, 2020), p. 33.

[26] Ibid.

[27] OECD, 'Recommendation of the Council on Guiding Principles concerning International Economic Aspects of Environmental Policies', 26 May 1972, C(72)128, Annex, para. 4, available at: https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0102 (OECD 1972 Recommendation).

[28] EU, 'Council Recommendation of 3 March 1975 regarding Cost Allocation and Action by Public Authorities on Environmental Matters' [1975] OJ L 194/1, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31975H0436 (Recommendation 75/436/Euratom, ECSC, EEC).

[29] OECD, 'The Polluter-Pays Principle: OECD Analyses and Recommendations', Paris (France), 1992, OECD/GD (92) 81, Conclusion, available at: https://one.oecd.org/document/OCDE/GD(92)81/En/pdf.

[30] Report of the United Nations Conference on Environment and Development, Rio de Janeiro (Brazil), 3–14 June 1992, UN Doc. A/CONF.151/26, 12 Aug. 1992, Principle 16, available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf.

[31] Several international conventions or agreements acknowledge the PPP. See, e.g., UN, Convention on the Transboundary Effects of Industrial Accidents, Helsinki (Finland), 17 Mar. 1992, in force 19 Apr. 2000, available at: https://treaties.un.org/pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVII-6&chapter=27&clang=_en; Council of Europe, Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, Lugano (Switzerland), 21 June 1993, available at: https://rm.coe.int/168007c079#:~:text=This%20Convention%20aims%20at%20ensuring,means%20of%20prevention%20and%20reinstatement; IMO, Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances 2000, London (UK), 15 Mar. 2000, in force 14 June 2007, available at: https://www.imo.org/en/About/Conventions/Pages/Protocol-on-Preparedness,-Response-and-Co-operation-to-pollution-Incidents-by-Hazardous-and-Noxious-Substances-(OPRC-HNS-Pr.aspx; Protocol concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea [2004] OJ L 261/41.

[32] D. Schmidtchen, J. Helstroffer & C. Koboldt, 'Regulatory Failure and the Polluter Pays Principle: Why Regulatory Impact Assessment Dominates the Polluter Pays Principle' (2021) 23 *Environmental Economics and Policy Studies*, pp. 109–44, at 110.

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Numerous studies and scholarly works underscore the significant functions of the PPP.[33] The OECD has prohibited state aid from paying the costs of pollution control. This prohibition recognizes the primary function of the PPP – namely, *economic integration*, which avoids distortion of competition.[34] The *distribution function*, as its second function, allows for the internalization of the social costs of pollution prevention and control borne by public authorities.[35] Thus, polluters are allowed to pollute so long as they pay the appropriate price for doing so.[36] The third function is the *preventative function*, which may encourage polluters to reduce their emissions.[37] As the PPP demands the internalization of negative externalities into the price of products when the pollution costs are borne by polluters, the prices of goods and services will be increased to cover these costs. To be more specific, there is a positive correlation between the price of the product and the cost of pollution. Therefore, consumer preferences for low prices will incentivize producers to generate more eco-friendly products, thereby reducing pollution.[38] However, despite its preventative measures, the risk of environmental damage remains; the PPP thus serves a further function – namely, a *curative function*, which ensures comprehensive damage repair, including residual damage.[39]

There is an argument that the PPP manifests the equity principle recognized in common law systems.[40] It aims to distribute responsibility to parties who cause the pollution rather than passing the burden on to a third party who may be innocent as to the cause of such pollution.[41] Implementation of the principle thus arguably falls within the notion of 'environmental justice':[42] by applying the PPP, those responsible for polluting the environment should bear the financial costs associated with the resulting damage. Polluters may pay in the form of taxes, emissions allowances ('cap and trade'), and command-and-control measures, among others.[43] The underlying goal is to internalize the cost of pollution by requiring the polluter to bear the cost.[44]

[33] De Sadeleer, n. 25 above; A. Bleeker, 'Does the Polluter Pay? The Polluter Pays Principle in the Case Law of the European Court of Justice' (2009) *European Energy and Environmental Law Review*, pp. 289–306; L. Zhu, 'Is the Polluter Paying for Vessel-Source Pollution?' (2015) 4 *Journal of Business Law*, pp. 348–60.

[34] De Sadeleer, n. 25 above, p. 42; M.R. Grossman, 'Agriculture and the Polluter Pays Principle: An Introduction' (2006) 59(1) *Oklahoma Law Review*, pp. 1–52, at 32, available at: https://digitalcommons.law.ou.edu/olr/vol59/iss1/1.

[35] De Sadeleer, n. 25 above, p. 43.

[36] Ibid.

[37] Ibid., p. 44.

[38] J.H. Jans & H.H.B. Vedder, *European Environmental Law* (Europa Law, 2008), p. 267.

[39] De Sadeleer, n. 25 above, p. 45.

[40] Bleeker, n. 33 above, p. 290.

[41] Ibid.

[42] P.G.G. Davies, *European Environmental Law: An Introduction to Key Selected Issues* (Routledge, 2004), p. 121.

[43] Schmidtchen, Helstroffer & Koboldt, n. 32 above, p. 110.

[44] C.B. Anderson, 'Marine Pollution and the "Polluter Pays" Principle: Should the Polluter also Pay Punitive Damages?' (2012) 43(1) *Journal of Maritime Law & Commerce*, pp. 43–58, at 43. See also Rio Declaration, n. 30 above, Annex 1, Principle 16.

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2.2. The PPP and GHG Emissions from Shipping

The potential of the PPP in mitigating GHG emissions is gradually being recognized in many sectors. For instance, scholars have examined the application of the PPP in agriculture and the energy sector to tackle GHG emissions.[45] In addition, the principle has also been introduced into an initiative to address climate change issues with regard to aviation through the International Aviation Carbon Offsetting and Reduction Scheme (CORSIA) of the International Civil Aviation Organization.[46] The necessity to consider the PPP in the context of reducing marine GHG emissions lies with the inadequacy of the existing measures to achieve the target of net-zero GHG emissions in a certain area, as well as the growing desirability of internalizing the 'externalities' (i.e., damage from GHG emissions).[47]

Maritime transportation plays a significant role in international logistics. Of particular importance is the transportation of passengers or cargo across the ocean, but its negative impacts on the environment cannot be underestimated. Applying the PPP to mitigate marine GHG emissions would have two obvious benefits. Firstly, it is legally sound to identify parties as liable to bear the negative impact they have caused on the environment and victims of pollution, as well as the costs of prevention and control of emissions.[48] However, in the current context of marine GHG emissions, there is no specific pollution liability mechanism in place to punish the emitter or to compensate victims who have been affected by such polluting activities. Secondly, if a person is aware that he will ultimately be held accountable for such emissions, this principle would be effective in incentivizing and compelling those able to address and rectify a situation that may lead to pollution.[49] Therefore, applying the PPP may create a sense of fear or apprehension, which would encourage potential emitters to reduce their pollution and minimize their emissions. Similar viewpoints have been expressed elsewhere regarding the application of the PPP. For example, the OECD indicates that

[45] See, e.g., J.A. Tobey & H. Smets, 'The Polluter-Pays Principle in the Context of Agriculture and the Environment' (1996) 19(1) *The World Economy*, pp. 63–87; J. Pretty et al., 'Policy Challenges and Priorities for Internalizing the Externalities of Modern Agriculture' (2001) 44(2) *Journal of Environmental Planning and Management*, pp. 263–83; L.H. Goulder & I.W.H. Parry, 'Instrument Choice in Environmental Policy' (2008) 2(2) *Review of Environmental Economics and Policy*, pp. 152–74; R.N. Stavins, 'A Meaningful U.S. Cap-and-Trade System to Address Climate Change' (2008) 32 *Harvard Environmental Law Review*, pp. 293–371.

[46] K.A. Nwosi & B.S. Kokpan, 'The Polluter Pays Principle and Nigerian Legal Framework for Aviation Pollution Mitigation' (2023) 17(2) *Journal of Jurisprudence, International Law & Contemporary Legal Issue*s, pp. 145–55, at 154.

[47] L. Zhu, 'Some Thoughts on Application of the Polluter Pays Principle for Controlling Marine Greenhouse Gas Emissions' (2023) 158 *Marine Policy*, pp. 1–4, at 3. See also B. Garcia, A. Foerster & J. Lin, 'Net Zero for the International Shipping Sector? An Analysis of the Implementation and Regulatory Challenges of the IMO Strategy on Reduction of GHG Emissions' (2021) 33(1) *Journal of Environmental Law*, pp. 85–112; H. Bach & T. Hansen, 'IMO Off Course for Decarbonisation of Shipping? Three Challenges for Stricter Policy' (2023) 147 *Marine Policy*, pp. 1–7.

[48] A.M. Kenneth, 'The Polluter Pays Principle: Preventing Ship-Source Pollution in the Arctic', in A. Chircop et al. (eds), *The Regulation of International Shipping: International and Comparative Perspectives – Essays in Honor of Edgar Gold* (Brill/Nijhoff, 2012), pp. 143–70, at 144, 148.

[49] A. Aragão, 'Polluter-Pays Principle', in J. Cremades & C. Hermida (eds), *Encyclopedia of Contemporary Constitutionalism* (Springer, 2022), pp. 1–24, at 3.

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'[w]hat matters, therefore, is that the polluter should be the first party to pay, so that he can give full weight in his decision-making process to the economic factor of overall environmental costs'.[50] Also, the Preamble to the EU 2004 Environmental Liability Directive (ELD)[51] states that adoption of the PPP is 'to induce operators to adopt measures and develop practices to minimize the risks of environmental damage so that their exposure to financial liabilities is reduced'.[52]

Despite the many benefits of the PPP and its seemingly straightforward concept in theory, its practical implementation can be challenging, as the principle is often too vague to be directly applied or enforced.[53] There are three basic elements in the operationalization framework of the PPP.[54] Firstly, clear policy objectives are essential as they guide the purpose and expected results of the approach that can enforce the principle.[55] Secondly, the establishment of appropriate liability rules in accordance with the PPP is crucial. Certain interactions exist between the principle and strict liability, which eliminates the need for the victim to prove the polluter's fault in causing damage. Under strict liability, polluters are liable for the pollution simply because they operate and derive financial benefit from their activities.[56] This liability rule is favoured because it does not require the victim to prove fault on the part of the polluter, which can be difficult to establish in environmental liability cases.[57] Thirdly, effective enforcement of the PPP is necessary.[58] To ensure successful enforcement, practical challenges must be addressed. Specifically, a normative interpretation in the context of specific legislative instruments is required in order to resolve issues such as identifying the polluter, defining pollution, determining the appropriate recipient of payment, and establishing the extent to which the polluter should bear the financial burden.

Among these unresolved and challenging issues, identifying the polluter is the primary topic for discussion. Pollution may involve a complicated web of entities that can be held accountable for the resulting damage,[59] and implementing the PPP necessitates the identification of polluters and the fair allocation of liability between

[50] OECD, 'The Polluter Pays Principle: Definition, Analysis, Implementation', 20 Feb. 2008, p. 6, available at: https://read.oecd-ilibrary.org/environment/the-polluter-pays-principle_9789264044845-en#page1.

[51] Directive 2004/35/EC on Environmental Liability regarding the Prevention and Remedying of Environmental Damage [2004] OJ L 143/56 (Environmental Liability Directive).

[52] Ibid., Recital 2.

[53] Bleeker, n. 33 above, p. 290.

[54] Environmental Law Centre (Alberta), 'The Polluter Pays Principle in Alberta Law: An Introduction & Survey', Dec. 2019, p. 9, available at: https://elc.ab.ca/wp-content/uploads/2019/12/The-Polluter-Pays-Principle-in-Alberta-Law-December-2019.pdf.

[55] Ibid.

[56] De Sadeleer, n. 25 above, pp. 63–5.

[57] Ibid.

[58] Environmental Law Centre (Alberta), n. 54 above, p. 9.

[59] J. Adshead, 'The Application and Development of the Polluter-Pays Principle across Jurisdictions in Liability for Marine Oil Pollution: The Tales of the "Erika" and the "Prestige"' (2018) 30(3) *Journal of Environmental Law*, pp. 425–51, at 429.

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them. It is not uncommon for individuals, organizations or countries to be hesitant in admitting their responsibilities as a polluter. In addition, it is unclear how the various links in the chain of polluters can be established or attributed.[60]

Moreover, it should be pointed out here that GHG emissions remain in the atmosphere for decades or even longer, potentially surpassing the lifespan of those who originally emitted them.[61] The emitters may even have no awareness, at the time, that their behaviour was considered wrongful or harmful.[62] The question is whether current generations should be responsible for pollution generated by previous generations. The historical view of the PPP aims to ensure that all polluters pay for all pollution they produce;[63] however, there are several practical obstacles regarding the implementation of such a historical view. For example, it is difficult to guarantee the veracity of historical data because, as we investigate further into the past, the available data on pollution becomes increasingly ambiguous and less precise.[64] It is also questionable how far back we should go to collect past emissions data.[65] It has been suggested that compensation for emissions should be made from the point when the harm was recognized.[66] This means that compensation should be paid retroactively for emissions dating back to the 1980s or, at the latest, the 1990s.[67] It is also extremely hard to discern the real polluter of historical pollution in that the previous generations can be dead or unidentified.[68] It is argued that the PPP as a basic legal rule must focus on a known polluter responsible for the pollution rather than calling to account a polluter who is unknown.[69] Nevertheless, no academic consensus has been reached regarding how to address historical emissions.

As an alternative to the shortcomings of the PPP in addressing climate change, the beneficiary pays principle (BPP) is worth considering.[70] The BPP suggests that those who benefit from activities that contribute to GHG emissions should be liable for the detrimental consequences of climate change.[71] The responsibility of beneficiaries is not based on fault, and emitters are not solely liable for their harmful actions. It is also possible to fall back on this principle when taking into account historical emissions.[72]

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60 J.F. Pinto-Bazurco, 'How to Enforce the Polluter-Pays Principle', International Institute for Sustainable Development, Policy Brief No. 31, Feb. 2022, pp. 1–7, at 2, available at: https://www.iisd.org/system/files/2022-02/still-one-earth-polluter-pays-principle.pdf.

61 T. Brooks, *Climate Change Ethics for an Endangered World* (Routledge, 2021), p. 34.

62 M.R. Khan, 'Polluter-Pays-Principle: The Cardinal Instrument for Addressing Climate Change' (2015) 4(3) *Laws*, pp. 638–53, at 648.

63 Brooks, n. 61 above, p. 34.

64 Ibid.

65 Ibid.

66 S. Caney, 'Climate Change and the Duties of the Advantaged' (2010) 13(1) *Critical Review of International Social and Political Philosophy*, pp. 203–28, at 208. See also Khan, n. 62 above, p. 648.

67 Ibid.

68 M. Munir, 'History and Evolution of the Polluter Pays Principle: How an Economic Idea Became a Legal Principle?', 8 Sept. 2013, p. 19, available at: https://ssrn.com/abstract=2322485.

69 L. Krämer, *Focus on European Environmental Law* (Sweet & Maxwell, 1992), p. 258.

70 L. García-Portela, 'Backward-Looking Principles of Climate Justice: The Unjustified Move from the Polluter Pays Principle to the Beneficiary Pays Principle' (2023) 29 *Res Publica*, pp. 367–84, at 368.

71 Ibid.

72 Ibid., p. 371.

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We refer to the BPP in a later section when identifying polluters in the context of the bill of lading.

3. Approaches to Identifying the Polluter

Identifying the polluter is one of the most fundamental issues in applying the PPP to GHG emissions from shipping. Approaches to this identification can be categorized into three main parts. Firstly, a general understanding of the polluter, which is based on their involvement in causing pollution, is briefly discussed from a broad perspective. Secondly, international conventions or agreements and regional legislation, particularly under EU law, along with EU case law, provide frameworks for determining the polluter. Thirdly, domestic laws in various countries that have incorporated the PPP offer valuable references for identification.

3.1. General Approaches

From a broad perspective, the identification of polluters can vary depending on the specific type of pollution involved. General ideas of 'pollution' under international law can be summarized as the introduction by humans, directly or indirectly, of substances or energy into a specific environment, resulting in deleterious effects that could endanger human health, damage biological resources, disturb the functioning of ecosystems, cause deterioration of material goods, and injure or damage amenities and other legitimate uses of the environment.[73] This definition demonstrates that the polluter is the one who directly or indirectly causes environmental degradation or establishes conditions that lead to such deterioration. Therefore, many entities may be categorized as 'polluters' based on their involvement in causing pollution. An individual who directly causes pollution through physical involvement is considered a polluter. For example, the operators of production activities like tanneries, smelters or mining operations that generate toxic or hazardous waste would be classified as polluters.[74] Similarly, consumers who contribute to pollution through the use or handling of products – such as vehicle emissions, battery disposal or the use of harmful cleaning detergents – may

[73] Similar formulations of the term 'pollution' can be found in many international environmental agreements. These include, but not exclusively, IMO, International Convention on Civil Liability for Oil Pollution Damage 1969, Brussels (Belgium), 29 Nov. 1969, in force 19 June 1975, Art. I(6), available at: https://treaties.un.org/pages/showDetails.aspx?objid=08000002801083db; Convention for the Protection of the Mediterranean Sea Against Pollution, Barcelona (Spain), 16 Feb. 1976, in force 12 Feb. 1978 (revised as Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, Barcelona (Spain), 10 June 1995, in force 9 July 2004), Art. 2, available at: https://planbleu.org/sites/default/files/upload/files/Barcelona_convention_and_protocols_2005_eng.pdf; United Nations Convention on the Law of the Sea (UNCLOS), Montego Bay (Jamaica), 10 Dec. 1982, in force 16 Nov. 1994, Art. 1(1)(4), available at: http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm; Convention for the Protection of the Marine Environment of the North-East Atlantic, Paris (France), 22 Sep. 1992, in force 25 Mar. 1998, Art. 1(d), available at: http://www.ospar.org.

[74] M. Pintado & A. Aragão, 'Pollution and Law', in M.G. Garcia & A. Cortês (eds), *Blue Planet Law: The Ecology of Our Economic and Technological World* (Springer, 2023), pp. 85–98, at 92.

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also be regarded as polluters.[75] Furthermore, entities that contribute indirectly to environmental degradation may also come within the category of polluter. These include manufacturers of toxic products the production activities of which indirectly lead to pollution, as well as producers and vendors of pollution sources.[76]

Similarly, the identification of polluters in the context of climate change often focuses on individuals, companies, and states responsible for emitting GHGs into the atmosphere. Moreover, polluters are typically classified as those who emit GHGs in quantities that exceed their fair share or a predetermined threshold.[77] This may imply that emitters will not be considered polluters merely by emitting GHGs, but when their emissions exceed a certain threshold,[78] such as when their emissions are considered excessive or disproportionate to their responsibilities in mitigating climate change. The term 'fair share' is frequently cited, but its understanding may vary depending on different perspectives, such as historical emissions or the principle of common but differentiated responsibilities (CBDR).[79] At the same time, it is reasonable to assign responsibilities to GHG emitters in proportion to their emissions.[80]

Many international agreements, regional arrangements, and national laws have directly or indirectly incorporated the PPP, and valuable insights into identifying 'the polluter' may thus be derived from them. By examining a selection of these legal instruments below, we can better understand how polluters may be defined and identified.

3.2. International or Regional Approaches

A series of international conventions or agreements explicitly or implicitly acknowledge the PPP. Some have incorporated the principle in their preambles, where the PPP plays a role in interpreting or supporting the norms in the agreements.[81] Others have affirmed the PPP in a more binding expression in their operative provisions.[82] Moreover, the PPP is

[75] Ibid.

[76] Ibid.

[77] M. Blomfield, 'Who is Responsible for the Climate Change Problem?' (2023) 123(2) *Proceedings of the Aristotelian Society*, pp. 126–49, at 130.

[78] Ibid.

[79] J. Hickel, 'Quantifying National Responsibility for Climate Breakdown: An Equality-Based Attribution Approach for Carbon Dioxide Emissions in Excess of the Planetary Boundary' (2020) 4(9) *Lancet Planet Health*, pp. 399–404, at 399; L. Rajamani et al., 'National "Fair Shares" in Reducing Greenhouse Gas Emissions within the Principled Framework of International Environmental Law' (2021) 21(8) *Climate Policy*, pp. 983–1004, at 983, 988.

[80] S. Caney, 'Climate Justice', *Stanford Encyclopedia of Philosophy* (Winter 2021), available at: https://plato.stanford.edu/archives/win2021/entries/justice-climate.

[81] See, e.g., IMO, International Convention on Oil Pollution Preparedness, Response and Cooperation, London (UK), 30 Nov. 1990, in force 13 May 1995, available at: https://treaties.un.org/pages/showDetails.aspx?objid=08000002800aada6; Convention on the Transboundary Effects of Industrial Accidents, n. 31 above; Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment, n. 31 above; IMO, Protocol on Preparedness, Response and Co-operation, n. 31 above; and many others.

[82] See, e.g., ASEAN Agreement on the Conservation of Nature and Natural Resources, Kuala Lumpur (Malaysia), 9 July 1985, not in force, Art. 10(d), available at: https://agreement.asean.org/media/download/20161129035620.pdf; IMO, 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, London (UK), 4 Feb. 1998, in force 24 Mar. 2006,

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also incorporated into many maritime conventions. For example, Article 2(2)(b) of the 1992 Convention for Protection of the Marine Environment of the North-East Atlantic[83] provides that the polluter should bear the costs of pollution prevention, control and reduction measures. The Protocol concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea[84] explicitly integrates the PPP with other principles, such as the precautionary principle and environmental impact assessment, in the Preamble, which ensures that those responsible for the pollution are financially accountable for its prevention, mitigation, and control.

One notable example, among the maritime conventions, is the civil liability and compensation system for oil pollution damage, which deserves a more detailed discussion. There is a well-known two-tier liability system for compensating for such damage. The shipowner[85] has primary liability, but if the compensation exceeds the limit of the shipowner's liability, the oil industry assumes the second-tier liability and covers the additional compensation. The core idea of this liability system arguably is a form of implementing the PPP, as it strives to enforce accountability by the parties responsible for detrimental activities and provide timely and appropriate compensation for pollution victims.[86] As said, this system holds the shipowner strictly liable for paying for pollution damage, irrespective of the fact that other parties may be at fault for the pollution incident, which seems to deviate from the core idea of PPP. However, this strict liability rule is complemented by the right of recourse. In other words, after paying compensation, the shipowner may claim against others who may be liable for the pollution caused. Therefore, this system is deemed capable of allocating oil pollution liability and ensuring that all potential polluters can be held accountable for their polluting activities.

At the regional level, the PPP is acknowledged as a pillar of the European environmental policy established by the EU.[87] It is referenced explicitly in Article 191(2) of the Treaty on the Functioning of the EU (TFEU),[88] which signifies that the PPP has an impact on all areas of EU environmental legislation.[89] Although this provision is legally binding for all EU Member States, its effective enforcement is hindered by the ambiguities surrounding the principle, particularly in terms of determining who the polluter is.[90] To provide clarification, EU legislators made an

Art. 3(2), available at: https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/PROTOCOLAmended2006.pdf.

83 N. 73 above, Art. 2(2)(b).

84 N. 31 above.

85 IMO, International Convention on Civil Liability for Oil Pollution Damage 1992, London (UK), 27 Nov. 1992, in force 30 May 1996, Art. I (3), available at: https://iopcfunds.org/uploads/tx_iopcpublications/Text_of_Conventions_e_01.pdf (Civil Liability Convention 1992).

86 Zhu, n. 33 above, p. 359.

87 M. Grosz, *Sustainable Waste Trade under WTO Law: Chances and Risks of the Legal Frameworks' Regulation of Transboundary Movements of Wastes* (Brill/Nijhoff, 2011), pp. 128–32.

88 [2016] OJ C 202/47, Art. 191(2), available at: https://eur-lex.europa.eu/resource.html?uri=cellar:9e8d52e1-2c70-11e6-b497-01aa75ed71a1.0006.01/DOC_3&format=PDF (previously in Art. 174(2) of the Treaty establishing the European Community).

89 C.Y. Uğur, 'The Polluter Pays Principle within the Framework of the European Union Emissions Trading System' (2022) 22(2) *Abant Sosyal Bilimler Dergisi (Journal of Abant Social Sciences)*, pp. 862–72, at 866.

90 Ibid., p. 867.

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attempt in as early as 1975 to define the term 'polluter' through EU Recommendation 75/436 of March 1975.[91] This recommendation established three classes of polluter, namely, a person who (i) directly damages the environment, (ii) indirectly damages the environment, and (iii) creates a condition leading to such damage.[92] While this clarification may support courts in the application of the PPP to some extent, it still does not provide a definitive answer regarding any specific polluter in a given case.[93] Consequently, secondary legislation was introduced to address some ambiguous aspects of the PPP. Examples include the 2004 ELD[94] and the 2008 Waste Framework Directive (WFD).[95]

The ELD adopts the PPP and aims to regulate that polluters must restore environmental damage to land, water, and natural species.[96] Article 1 ELD provides that the purpose of the ELD is to establish a framework of environmental liability based on the PPP.[97] Moreover, to ensure the effectiveness of the liability mechanism, it expressly states that 'there needs to be one or more identifiable polluters, the damage should be concrete and quantifiable, and a causal link should be established between the damage and the identified polluter(s)'.[98]

Article 15 of the 1975 version of the WFD already called on the polluter to pay. It provides that 'the cost of disposing of waste' should be borne by three categories of party: (i) the holder who has waste handled, (ii) the previous holders, and/or (iii) the producer of the product from which the waste came.[99] Article 14(1) of the 2008 version remains largely unchanged, stating that '[i]n accordance with the polluter-pays principle, the costs of waste management shall be borne by the original waste producer or by the current or previous waste holders'.[100] As the financial obligation for the waste is imposed on the holder, the previous holder, or even the producer, this provision encompasses a broad interpretation of the parties who may be considered responsible for waste pollution.

It is suggested that the PPP has been transformed into a legal rule through EU recommendations regarding the various treaties and EU secondary law.[101] Nevertheless, it could also be noted that uncertainties surrounding the understanding of the PPP – including questions about who should be deemed the polluter and the

[91] Recommendation 75/436, n. 28 above.
[92] Ibid., Art. 3.
[93] Bleeker, n. 33 above, p. 293.
[94] Environmental Liability Directive, n. 51 above.
[95] Directive 2008/98/EC on Waste and Repealing Certain Directives [2008] OJ L 312/3 (Waste Framework Directive).
[96] E.D. Soomer, 'Liability for Environmental Damage from Shipping Incidents in the European Union: A Shipowner's Perspective', Royal Belgian Shipowners' Association, 28 Mar. 2022, p. 2, available at: https://safety4sea.com/wp-content/uploads/2022/03/Royal-Belgian-Shipowners-Association-Liability-for-Environmental-Damage-from-shipping-incidents-in-EU-2022_03.pdf.
[97] Environmental Liability Directive, n. 51 above, Art. 1.
[98] Ibid., Recital 13.
[99] Directive 75/442/EEC on Waste [1975] OJ L 194/39, as amended by Directive 91/156/EEC [1991] OJ L 78/32, Art. 15.
[100] Waste Framework Directive 2008, n. 95 above, as amended by Directive (EU) 2018/851 [2018] OJ L 150/109, Art. 14(1).
[101] De Sadeleer, n. 25 above, p. 36.

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payment obligations that should be imposed – may provide the courts with a degree of discretion when it comes to its interpretation, such as in the *Standley* case,[102] which concerned the EU's 1991 Nitrates Directive[103] implemented by the UK government. According to the ruling of the Court of Justice of the European Union (CJEU), when multiple sources of pollution are involved, polluters are liable only for the pollution they have caused; they should not be liable for the costs of elimination and prevention of pollution which they have not generated.[104] There is thus an implied causal link between the polluter and the pollution. The *Van de Walle*[105] case gave further interpretation of the identification of a polluter under Article 15 of the 1975 WFD. In *Van de Walle*, the Court imposed a test of 'causation and negligence' to determine whether to channel liability to the producer of the oil products (i.e., Texaco) in this case. The outcome was for the national court to assess whether Texaco caused the waste production by disregarding any of its contractual obligations, such as by supplying the wrong type of oil or by any negligent conduct.[106] The Court's interpretation of the PPP acknowledges the potential for accountability throughout the production chain.[107] Furthermore, one of the most concerning issues in the *Erika* case[108] was whether Total France SA and Total International Ltd (Total), as seller of the oil and charterer of the vessel, should be deemed to be a polluter under Article 15 of the 1975 WFD. The Court concluded that Total, as seller of the heavy fuel oil and charterer of the *Erika*, could be held liable to pay the costs in accordance with the PPP as expressed in Article 15. It stated that the chain of responsibility could extend to the seller and charterer if it were proved that Total failed to take necessary actions to prevent the risk, thus increasing the risk of pollution.[109] Total was proved to be at fault for chartering a vessel beyond her life expectancy to transport heavy fuel oil. Also, it did not take appropriate action to prevent the accident, which consequently increased the risk of the pollution resulting from the shipwreck. The Court therefore concluded

[102] Case C-239/97, *The Queen* v. *Secretary of State for the Environment and Minister of Agriculture Fisheries and Food*, ex parte *H.A. Standley and Others and D.G.D. Metson and Others* [1999] ECR I-02603 (note that Brexit officially took place on 31 Jan. 2020.)

[103] Directive 91/676/EEC concerning the Protection of Waters against Pollution caused by Nitrates from Agricultural Sources [1991] OJ L 375/1. The aim of this Directive is to reduce pollution of water caused by nitrate discharges from agriculture; it requires the government to designate the 'vulnerable zone' and to establish appropriate action programmes to regulate agricultural activities in order to limit the concentration of nitrates in the designated water.

[104] P.E. Lindhout & G.M. van den Broek, 'The Polluter Pays Principle: Guidelines for Cost Recovery and Burden Sharing in the Case Law of the European Court of Justice' (2014) 10(2) *Utrecht Law Review*, 46–59, at 49.

[105] Case C-1/03, *Criminal Proceedings against Paul van de Walle, Daniel Laurent, Thierry Mersch and Texaco Belgium SA* [2004] ECR I-07613.

[106] Ibid., para. 60.

[107] Bleeker, n. 33 above, p. 296.

[108] Case 188/07, *Commune de Mesquer* v. *Total France SA and Total International Ltd* [2008] ECR I-04501 (*Erika*). The oil firm Total International Ltd (Total) chartered the 25-year-old oil tanker *Erika* to transport heavy fuel oil from Dunkerque in France to Milazzo in Italy. The oil was supplied to an Italian energy firm named ENEL which bought the oil from Total. To fulfill the contract, Total bought the oil from Total France SA. During the transportation, the tanker broke into two in the Bay of Biscay.

[109] Ibid., para. 78.

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that Total could be liable for waste disposal costs since it had contributed to the causal chain that resulted in the shipwreck at the source of the accidental spillage.[110] In both the *Van de Walle* and the *Erika* cases the producers were liable for pollution because their conduct caused waste generation.

Establishing a causal link is well acknowledged in many later cases. Examples can be seen in the judgment of *ERG and Others*,[111] as well as in the judgment of the *Fipa Group*.[112] To impose remedial measures on these two operators, the cases strengthened the requirement for the competent authority to establish a causal link between the activity of one or more identifiable operators and concrete, quantifiable damage. In the *Futura Immobiliare* case,[113] Advocate General Kokott even drew an analogy between the PPP and the criterion of causality in non-contractual liability law, construing the PPP as a precise cost allocation system.[114]

3.3. National Law Approaches

Many countries have explicitly or implicitly incorporated the PPP into their domestic legislation, as well as underlined the causal link between the polluters' activities and the harmful consequences. For example, French law provides for the PPP in its Environmental Code, stating that 'the costs resulting from measures to prevent, reduce and control pollution should be borne by the polluter'.[115] The French Constitutional Charter for the Environment implicitly embodies the PPP by requiring that 'everyone shall be required … to contribute to the making good of any damage he or she may have caused to the environment'.[116] German law refers to the PPP by transforming it into the causality principle (*Verursacherprinzip*), where the liable party is a *Verursacher*.[117] The German doctrine proposes that the PPP (*Verursacherprinzip*) should be the central principle in environmental policy, whereby those accountable for pollution should bear the costs of such pollution.[118] Under Italian law, the PPP is implemented in Part IV (remediation procedure) and Part VI (environmental damage compensation) of its Environmental Code,[119] and the public authorities have the legal obligation to identify the polluter in order to

[110] Ibid., para. 78; Opinion of Advocate General (AG) Kokott in *Erika*, n. 108 above, para.147.

[111] Case C-378/08, *Raffinerie Mediterranee (ERG) SpA, Polimeri Europa SpA and Syndial SpA* v. *Ministero dello Sviluppo Economico and Others* [2010] ECR I-01919, paras 52, 53.

[112] Case C-534/13, *Ministero dell'Ambiente e della Tutela del Territorio e del Mare and Others* v. *Fipa Group SRL and Others* [2015] Court reports – general, paras 54, 57.

[113] Case C-254/08, *Futura Immobiliare SRL Hotel Futura and Others* v. *Comune di Casoria* [2009] ECR I-06995.

[114] *Futura Immobiliare*, ibid., Opinion of AG Kokott, para. 36.

[115] Code de l'Environnement (Environmental Code), Art. L 110-1, available at: https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006074220, unofficial English version available at: https://www.wipo.int/wipolex/zh/text/493035.

[116] Charter for the Environment, Constitutional Council, Art. 4, available at: https://www.conseil-constitutionnel.fr/sites/default/files/2019-03/20190304_charter_environnement_0.pdf.

[117] De Sadeleer, n. 25 above, p. 41.

[118] Ibid.

[119] Legislative Decree No. 152 of 3 Apr. 2006, available at: https://leap.unep.org/en/countries/it/national-legislation/legislative-decree-3-april-2006-n-152-environmental-regulations.

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make the PPP effective.[120] The Italian Highest Administrative Court has endorsed the approaches held by the CJEU in identifying the polluter, emphasizing the necessity of establishing a causal link between the contamination and the operator's activities (or omissions).[121]

In contrast, several other countries not only incorporate the PPP within their domestic laws but also specifically identify potential polluters. For example, under the Environmental Protection Law of the People's Republic of China (PRC) 2014, the responsible parties for causing pollution (i.e., the polluters), include 'enterprises, public institutions and other producers and business operators that discharge pollutants', and are charged for their pollutant discharge.[122] The idea of 'polluter' is also identified in Article 21 of the Marine Environment Protection Law of the PRC, which provides that '[a]n enterprise, a public organization, or any other producer or distributor that directly discharges a taxable pollutant into the ocean shall pay environmental protection tax in accordance with the law'.[123] In Article 5 of the Law of the PRC on the Prevention and Control of Environmental Pollution by Solid Wastes, 'polluters' are illustrated as entities and individuals involved in generating, collecting, storing, transporting, utilizing, and treating solid waste.[124]

Under United States (US) law, some scholars argue that the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[125] is an excellent illustration of the PPP in practice.[126] The Act comprehensively delineates a liability system that involves a wide range of responsible parties. The 'potentially responsible parties' include the owner, the operator, the arranger who sent hazardous substances to the site, and the transporter who brought hazardous substances to the site.[127] That the owner and operator are liable for contamination is built on a

[120] D. Covucci, 'Il principio "Chi inquina, paga": responsabilità ambientali e prova scientifica nell'ordinamento giuridico italiano' ('The "Polluter Pays Principle": Environmental Liabilities and Scientific Evidence under the Italian Law System') (2019) 8(4) *Italian Journal of Groundwater*, pp. 69–72, at 71, available at: https://www.acquesotterranee.net/acque/article/view/427.

[121] Ibid.

[122] Environmental Protection Law of the People's Republic of China (2014 Revision), Standing Committee of the National People's Congress, Order No. 9 of the President of the People's Republic of China, in force 1 Jan. 2015, Art. 43, available at: http://greenaccess.law.osaka-u.ac.jp/wp-content/uploads/2019/03/Environmental-Protection-Law-of-the-Peoples-Republic-of-China-2014-Revision.pdf (this is not an official version).

[123] Marine Environment Protection Law of the People's Republic of China (2023 Revision), Standing Committee of the National People's Congress, Order No. 12 of the President of the People's Republic of China, in force 1 Jan. 2024, Art. 21, available at: https://www.lawinfochina.com/display.aspx?id=42096&lib=law&SearchKeyword=&SearchCKeyword=.

[124] Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Wastes (2020 Revision), Standing Committee of the National People's Congress, Order No. 43 of the President of the People's Republic of China, Art. 5, available at: http://en.npc.gov.cn.cdurl.cn/2020-04/29/c_845992.htm.

[125] 42 U.S.C. 9601 et seq.

[126] P.A. Barresi, 'The Polluter Pays Principle as an Instrument of Municipal and Global Environmental Governance in Climate Change Mitigation Law: Lessons from China, India, and the United States' (2020) 10(1) *Climate Law*, pp. 50–93; De Sadeleer, n. 25 above, p. 77.

[127] 42 USC §9607(a), available at: https://www.law.cornell.edu/uscode/text/42/9607.

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common-sense notion,[128] because the owner has the most immediate control over the use of the land, and the operator manages the actual activity that leads to the release of hazardous substances.[129] The 'operator' has the legal authority to control the activities at the site and exercises that control.[130] It is thus an individual who must assume a full range of operational responsibilities.[131] 'Arrangers' are persons who 'contract, agree, or otherwise arrange for disposal or treatment, or arrange with a transporter for transport for disposal or treatment of hazardous substances owned or possessed'.[132] 'Transporters', as defined in CERCLA, are those who accept and dispose of or treat a hazardous substance.[133] Moreover, the courts have expanded the scope of transporters beyond those who initially introduce a hazardous substance onto land or water. It includes individuals or entities who move a hazardous substance on site; for example, those who fill and grade the site may also be transporters under the broader interpretation.[134]

Based on the above discussions, establishing a causal link between the activities of the polluter and the pollution itself is an essential factor in enabling the court to identify the polluter. Moreover, under the PPP, it is acceptable to establish a presumption when determining the causal link between an activity and pollution, provided that the underlying rationale of the presumption is reasonably supported.[135]

4. The EU Emissions Trading System

The EU Emissions Trading System (EU ETS) was established through Directive 2003/87/EC,[136] as the EU's cornerstone mechanism for cost-effective GHG emissions reductions.[137] It is regarded as a key tool for reducing GHG emissions in the EU and

[128] M.I. Jeffery QC & X. Zhao, 'Developing a National Contaminated Land Liability Scheme in China: The Comprehensive Environmental Response, Compensation, and Liability Act Revisited' (2012) 30(4) *Journal of Energy & Natural Resources Law*, pp. 423–65, at 432.

[129] J.S. Applegate & J. Laitos, *Environmental Law: RCRA, CERCLA, and the Management of Hazardous Waste* (Foundation Press, 2006), p. 185.

[130] *United States* v. *Bestfoods et al*., 524 U.S. 51 (1998), paras 64–7.

[131] H.R. Rep. No. 96-172, reprinted in 1980 USCCAN 6160, 6181–82; discussed in R.A. Goble, 'EPA's CERCLA Lender Liability Proposal: Secured Creditors Hit the Jackpot' (1992) 32(3) *Natural Resources Journal*, pp. 653–79, at 658; P.R. Hinckley, 'State and Municipal Sewer System Authority Liability under CERCLA: Who Should Pay for the Cleanup of Hazardous Industrial and Commercial Sewer Discharges?' (1994) 22(1) *Boston College Environmental Affairs Law Review*, pp. 89–128, at 99.

[132] 42 USC § 9607(a)(3), available at: https://www.law.cornell.edu/uscode/text/42/9607.

[133] 42 USC § 9607(a)(4), available at: https://www.law.cornell.edu/uscode/text/42/9607.

[134] Jeffery & Zhao, n. 128 above, p. 438. See, e.g., *Kaiser Aluminum & Chemical Corp* v. *Catellus Development Corp*., 976 F 2d 1338 (9th Cir 1992).

[135] *ERG and Others*, n. 111 above, para. 57 ('in order for such a causal link to thus be presumed, the competent authority must have plausible evidence capable of justifying its presumption, such as the fact that the operator's installation is located close to the pollution found and that there is a correlation between the pollutants identified and the substances used by the operator in connection with his activities').

[136] Directive 2003/87/EC Establishing a Scheme for Greenhouse Gas Emissions Allowance Trading within the Community and amending Directive 96/61/EC [2003] OJ L 275/32. This Directive was revised in 2009 and amended by Directive 2009/29/EC [2009] OJ L 140/63.

[137] E.J. Eftestøl, 'The Proposed Extension of the EU-ETS to Shipping – BIMCO's ETS – Allowances (ETSA) Clause for Time Charter Parties 2022 Filling a Legal Gap', in L. Athanasiou (ed.), *Protecting Maritime*

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has garnered widespread attention.[138] By introducing this system, the EU sets a significant example for implementing the PPP in terms of environmental protection and climate change.[139]

In July 2021, the EU initiated a legislative process that proposed involving maritime transport activities in the EU ETS for vessels calling at EU ports.[140] Under the proposal, the EU ETS would set an emissions cap of (i) 50% of the GHG emissions from any intercontinental voyage that begins or ends in an EU/EEA port, and (ii) 100% of emissions that take place between two EU/EEA ports and when ships are within EU/EEA ports, and charge them a carbon price based on the market.[141]

Later, on 16 May 2023, the EU officially published Directive (EU) 2023/959[142] to include the maritime sector within the EU ETS. Meanwhile, Regulation (EU) 2023/957,[143] which amended Regulation (EU) 2015/757[144] on 5 May 2023, includes maritime transport activities in the ETS and aims to monitor, report, and verify emissions of additional GHGs and emissions from additional ship types.[145] Shipping companies are thus held liable for GHG emissions after 2024.

Moreover, in all official EU legislative documents, such as Directive (EU) 2023/959 and Regulation (EU) 2023/957,[146] the primarily responsible party for shipping GHG emissions is the shipping company, which is deemed to be the entity responsible for

Operators in a Changing Regulatory and Technological Environment (Nomiki Bibliothiki, 2023), pp. 321–37, at 323.

138 Despite the contribution of the EU ETS in cutting GHG emissions, there are also arguments about certain shortcomings of the scheme, such as causing negative competitiveness effects, unfair distributional effects, and carbon leakage. See more discussions about the evaluation of the EU ETS in F. Venmans, 'A Literature-Based Multi-Criteria Evaluation of the EU ETS' (2012) 16(8) *Renewable and Sustainable Energy Reviews*, pp. 5493–510; S.F. Verde, 'The Impact of the EU Emissions Trading System on Competitiveness and Carbon Leakage: The Econometric Evidence' (2020) 34(2) *Journal of Economic Surveys*, pp. 320–43; F. Branger, O. Lecuyer & P. Quirion, 'The European Union Emissions Trading Scheme: Should We Throw the Flagship out with the Bathwater?' (2015) 6(1) *Wiley Interdisciplinary Reviews: Climate Change*, pp. 9–16.

139 Uğur, n. 89 above, p. 863.

140 European Commission, 'Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC Establishing a System for Greenhouse Gas Emission Allowance Trading within the Union, Decision (EU) 2015/1814 and Regulation (EU) 2015/757', 14 July 2021, COM(2021) 551 final.

141 Ibid., Art. 1(5), where Art. 3g of Directive 2003/87/EC is replaced; see also M. Kotzampasakis, 'Intercontinental Shipping in the European Union Emissions Trading System: A "Fifty–Fifty" Alignment with the Law of the Sea and International Climate Law' (2023) 32(2) *Review of European, Comparative & International Environmental Law*, pp. 29–43, at 29.

142 Directive (EU) 2023/959 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] OJ L 130/134.

143 Regulation (EU) 2023/957 amending Regulation (EU) 2015/757 in order to Provide for the Inclusion of Maritime Transport Activities in the EU Emissions Trading System and for the Monitoring, Reporting and Verification of Emissions of Additional Greenhouse Gases and Emissions from Additional Ship Types [2023] OJ L 130/105.

144 Regulation (EU) 2015/757 on the Monitoring, Reporting and Verification of Greenhouse Gas Emissions from Maritime Transport, and amending Directive 2009/16/EC [2015] OJ L 123/55.

145 Regulation (EU) 2023/957, n. 143 above.

146 Ibid., Art. 3(d); Directive (EU) 2023/959, n. 142 above, Art. 3(w).

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

monitoring and reporting the relevant parameters during the one-year reporting period.[147] It is the shipping company that is obliged to surrender the allowances.[148] Directive (EU) 2023/959 also defines a 'shipping company' as the shipowner or any other entity/person, such as a manager or bareboat charterer, that assumes operational responsibility from the shipowner and agrees to fulfil the duties imposed by the International Management Code for the Safe Operation of Ships and Pollution Prevention.[149] Furthermore, according to Article 3gc of Directive (EU) 2023/959, when the ultimate responsibility for fuel purchase or ship operation is assumed by another entity through a contractual arrangement, the shipping company is entitled to reimbursement for the costs incurred from the surrender of emissions allowances.[150]

5. Identifying Maritime Polluters

To apply the PPP, one would ideally identify a mechanism for distributing, quantifying, and monetizing the pollution responsibilities. For example, one could aim to attribute responsibilities for GHG emissions to different state entities by measuring historical emissions data, quantifying those emissions, and assigning financial obligations in proportion to such emission shares.[151] This approach largely aligns with a classic interpretation of the PPP, which holds that polluters should be accountable for pollution damage.[152] Nevertheless, states are not the only relevant actors because entities such as companies and individuals are becoming increasingly relevant to environmental issues.[153] Particularly in the context of marine GHG emissions, private parties, such as shipowners and charterers, may play a role in causing pollution and taking responsibility for reducing emissions.

5.1. States

Principle 7 of the Rio Declaration defines the idea of CBDR.[154] Furthermore, Article 3.1 of the UNFCCC includes the principle of CBDR;[155] the 1997 Kyoto Protocol,[156] as well as the Paris Agreement,[157] reaffirm and inherit this principle. The CBDR principle aims to incentivize international cooperation by states in handling environmental issues. The term 'common' means that all states share a common

[147] Directive (EU) 2023/959, n. 142 above, Art. 3gd.
[148] European Commission, 'FAQ – Maritime Transport in EU Emissions Trading System (ETS)', available at: https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector/faq-maritime-transport-eu-emissions-trading-system-ets_en.
[149] Directive (EU) 2023/959, n. 142 above, Art. 3(w).
[150] Ibid., Art. 3gc.
[151] H.D. Matthews, 'Quantifying Historical Carbon and Climate Debts Among Nations' (2016) 6 *Nature Climate Change*, pp. 60–4, at 60.
[152] Brooks, n. 61 above, p. 33.
[153] Ibid., p. 36.
[154] Rio Declaration, n. 30 above, Annex I, Principle 7.
[155] UNFCCC, n. 4 above, Art. 3.1.
[156] Kyoto Protocol, n. 6 above, Art. 10.
[157] Paris Agreement, n. 7 above, see Preamble and Arts 2.2, 4.3 and 4.19.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

heritage, which bestows upon them a shared responsibility to protect the global environment.[158] Meanwhile, 'differentiated responsibilities' are imposed on the industrialized countries because of their disproportionate contributions to both historical and current GHG emissions.[159] In this context, industrialized countries are expected to play a leading role in addressing the global climate change issue,[160] especially as they possess the greatest capacity to take action in addressing GHG emissions.[161] In this sense, it appears that the CBDR principle addresses the question of identifying the polluters. There have been many discussions about the principles of CBDR and the PPP, and it has been argued that the principle of CBDR is rooted in the PPP.[162] However, an inference can be drawn from the idea of the PPP and the mechanisms introduced through the Paris Agreement that all parties to the Agreement have the status of polluter.[163] Thus, there have also been arguments that CBDR 'may underline a larger responsibility for industrialized countries than the PPP'.[164]

When considering the potential role of the PPP in controlling marine GHG emissions, there are, however, two practical difficulties. On the one hand, shipping is largely an activity between ports of different states;[165] therefore, when a ship navigates through multiple countries, GHG emissions are made throughout the journey. States involved in maritime transportation include flag states, coastal states, and port states. It thus becomes difficult, if not impossible, to attribute emissions to a certain state or even several different states.[166] Interestingly, since the nature of GHG emissions is similar to other types of air pollution, one may note that in the arbitration award of the *Trail Smelter* case between Canada and the US in 1941,[167] the tribunal resolved the sovereignty conflict by providing clarity for the PPP. Accordingly, the polluting state should bear the cost of compensation for any cross-border damage it has caused. In this case, Canada was thus obligated to reduce and prevent damage from air pollution in the US state of Washington.[168]

On the other hand, a state is more likely to play the role of supervisor or regulator rather than being viewed as a direct polluter. This is because states are responsible for

[158] D. Butt, '"The Polluter Pays": Backward-Looking Principles of Intergenerational Justice and the Environment', in J.C. Merle (ed.), *Spheres of Global Justice* (Springer, 2013), pp. 757–74, at 758.
[159] Chen, n. 3 above, p. 3.
[160] P.G. Harris, 'Common but Differentiated Responsibility: The Kyoto Protocol and United States Policy' (1999) 7(1) *NYU Environmental Law Journal*, pp. 27–48, at 28.
[161] Brooks, n. 61 above, p. 35.
[162] L. Rajamani, 'The Principle of Common but Differentiated Responsibility and the Balance of Commitments under the Climate Regime' (2000) 9(2) *Review of European, Comparative & International Environmental Law*, pp. 120–31, at 122; R. Watanabe, 'Who Should Pay for Climate Protection? Another Side of the Same Coin of Burden Sharing', Wuppertal Institute for Climate, Environment and Energy, 12 Dec. 2008, pp. 1–22, p. 14, available at: https://wupperinst.org/uploads/tx_wupperinst/pay_for_climate_protection.pdf; Khan, n. 62 above, p. 639.
[163] Pinto-Bazurco, n. 60 above, p. 6.
[164] Watanabe, n. 162 above, p. 14.
[165] Buhaug et al., n. 20 above.
[166] Shi, n. 23 above, p. 123.
[167] *Trail Smelter Arbitration, US* v. *Canada* (1941), 3 *Reports of International Arbitral Awards* (1941) pp. 1905–82, at 1911.
[168] Ibid.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

implementing and enforcing regulations, setting emissions standards, and monitoring the compliance of ships operating within their jurisdictions. In other words, they play a crucial role in overseeing and ensuring that ships adhere to certain standards, and take the necessary and appropriate measures to reduce their emissions. This situation will be evidenced in practice when implementing the EU ETS after shipping is included, as discussed above. The EU Member State is positioned as the administering authority for shipping companies.[169] EU Member States are responsible for setting out rules on penalties applicable to the conduct of shipping companies,[170] and they can impose various environmental taxes.[171] If shipping companies fail to surrender allowances, they are liable to pay an excess emissions penalty,[172] and will be denied access to ports of the EU Member States.[173]

In addition, if we designate the flag state of a ship as the responsible entity for GHG emissions, concerns may arise regarding the common practice of flag of convenience. To circumvent the stringent regulations imposed by the shipowners' own countries, shipowners often choose to register their ships in a country of 'flag of convenience'. In such cases, flag states normally lack sufficient regulatory mechanisms and inspection procedures, let alone the ability to supervise the emissions activities of ships. Additionally, it has also been observed that most of these ships rarely visit the waters of their flag states after registration.[174] Therefore, it becomes questionable whether it would be fair and effective to consider flag of convenience states as polluters in that these states have minimal genuine connection with a registered ship that emits harmful gases; at the same time, it is difficult to establish a causal link because of the potential inability of such flag states to participate in the emissions activities.

It is worth noting that the International Tribunal for the Law of the Sea (ITLOS) unanimously delivered the first international judicial opinion on state obligations addressing climate change in its advisory opinion of 21 May 2024.[175] The tribunal stated that GHG emissions constitute a form of marine pollution under the United Nations Convention on the Law of the Sea (UNCLOS).[176] Consequently, states are granted more stringent due diligence obligations to take all measures necessary to prevent, reduce, and control pollution of the marine environment from any GHG emissions, as well as to protect and preserve the marine environment in relation to climate change impacts.[177] Although the judicial opinion is not binding on states, it will provide significant guidance for states in addressing marine GHG emissions.

[169] Directive (EU) 2023/959, n. 142 above, Art. 3gf.
[170] Ibid., Art. 16(1).
[171] Khan, n. 62 above, p. 644.
[172] European Commission, n. 148 above.
[173] Ibid.; Directive (EU) 2023/959, n. 142 above, Art. 16(11)(a).
[174] Y. Qu & J. Li, 'Dilemma and Solutions of Greenhouse Gas Emission Reduction of International Shipping' (2023) 13(1) *Journal of Shipping and Ocean Engineering*, pp. 10–7, at 11.
[175] *Request for an Advisory Opinion submitted by the Commission of Small Island States on Climate Change and International Law*, ITLOS, Case No. 31, Advisory Opinion, 21 May 2024, available at: https://www.itlos.org/fileadmin/itlos/documents/cases/31/Advisory_Opinion/C31_Adv_Op_21.05.2024_orig.pdf.
[176] UNCLOS, n. 73 above.
[177] *Request for an Advisory Opinion*, n. 175 above, paras 241, 243, 384–440.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

5.2. Private Parties

In shipping practice, as discussed earlier, fuel combustion is recognized as one of the main causes of maritime GHG emissions.[178] Studies have also shown that carbon emissions are positively related to the speed of a vessel in a simple setting,[179] in that a greater vessel speed demands increased fuel consumption, thus causing a greater amount of GHG emissions. The IMO also indicates the need to 'consider and analyze the use of speed optimization and speed reduction as a measure',[180] and thus a regulatory option in GHG degradation. In this sense, the polluter in the shipping industry may be the party that has direct and primary decision-making power over the vessel's operation, in particular, its speed and fuel consumption. Meanwhile, the speed and fuel consumption of a vessel may also be affected by technical and operational measures, such as the availability of alternative fuel engines, hull improvements, and route optimization.

It is clear that the polluter is the person who has caused the pollution. In addition, a causal link between pollution and the polluter's activities is a crucial element to be considered when identifying the polluter. Accordingly, we may suggest that the causal link, as well as who bears responsibility for the operational and/or management decisions of the vessel, are the two key elements that should be taken into account in identifying polluters of marine GHG emissions.

Two basic types of affreightment contract exist: the charterparty and the bill of lading contract. A charterparty is a contract between a shipowner and a charterer, under which the shipowner allows the charterer to use the vessel according to specific terms. A bill of lading is typically issued by a carrier to a shipper with whom the carrier has entered into a contract for carriage of goods. Both contracts involve different parties: a shipowner and a charterer (both of whom may act as carrier) may technically or commercially operate the ship and make operational decisions, such as the choice of fuel oil to be used, whereas a shipper has minimal involvement in vessel operations. The following section elaborates on the characteristics of each party to assess whether they can be identified as a polluter.

It is questionable whether a ship's fuel oil supplier could also be considered under the term 'polluter'. However, oil companies may argue that they are not worsening GHG emissions, as they do not decide on the type of fuel oil that a shipping company may use. Furthermore, as it is usually the case that more than one party is involved in the sea carriage contract, it can happen that a third party may be held accountable for marine GHG emissions. Therefore, it is necessary to consider the channelling of liabilities and proportionality of contributions, the former meaning that liability will

[178] E. Lindstad et al., 'Reduction of Maritime GHG Emissions and the Potential Role of E-fuels' (2021) 101 *Transportation Research Part D: Transport and Environment*, article 103075, p. 1.

[179] R. Leaper, 'The Role of Slower Vessel Speeds in Reducing Greenhouse Gas Emissions, Underwater Noise and Collision Risk to Whales' (2019) 6(505) *Frontiers in Marine Science*, pp. 1–8, at 1.

[180] IMO, 'Initial IMO Strategy on Reduction of Greenhouse Gas Emissions from Ships', Res. MEPC.304(72), 13 Apr. 2018, IMO Doc. MEPC 72/17/Add.1, Annex 11, para. 4.7(4), available at: https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/MEPCDocuments/MEPC.304(72).pdf.

be imposed initially on a specific party or parties. However, this does not prevent them from claiming against other parties liable for the marine GHG emissions. The latter refers to the idea that if more than one party is involved, they will proportionately contribute towards bearing the financial responsibilities for their part in emitting such emissions.

Under the charterparty

The person registered as the ship's owner is the party who decides primarily on matters related to the purchase and combustion of the bunker and the speed of the vessel.[181] It may then be concluded that the shipowner would primarily be regarded as the polluter,[182] even after taking into consideration the causal link, as discussed above.

There are three types of charterparty: (i) a demise charterparty (also called a 'bareboat' charterparty), (ii) a time charterparty, and (iii) a voyage charterparty. Under a *demise charterparty*, the shipowner hands over the control, management, and navigation of the ship to the charterer with full authority during a given period of time. In other words, the shipowner fades into the background, and the charterer is considered a 'quasi-owner'. More specifically, the demise charterer exercises control over the entire operation of the ship, employment of the master and crew, and carrying the cost of the bunkers, stores, and lubricants:[183] their control and decision-making authority over the ship's operation demonstrates the likelihood that they will directly influence fuel consumption. Therefore, based on the described criteria, including causal link and responsibility for the operational decisions of the vessel, the demise charterer can be considered a 'polluter' in certain cases.

However, the position is different under time and voyage charterparties. Under the *voyage charterparty*, the ship remains under the control and management of the shipowner, and the shipowner still employs the master and crew.[184] In all cases, the shipowner pays all the operating costs of the ship,[185] including the cost of bunkering.[186] This means that voyage charterers have no power to determine the supply of the bunkers or the speed of the vessel; nor do they directly undertake responsibility to pay for the bunkers, although they will ultimately cover this cost through hire payment. Given the factors mentioned, it would be unfair to designate a voyage charterer as polluter.

The shipowner and time charterer have different duties under a *time charterparty*. The shipowner technically operates the vessel. He supplies the vessel and crew and pays the vessel's running expenses, such as manning, maintenance, upkeep, stores, and

[181] Civil Liability Convention 1992, n. 85 above, Art. I(3).
[182] L. Zhu & Y.C. Zhao, 'A Feasibility Assessment of the Application of the Polluter-Pays Principle to Ship-source Pollution in Hong Kong' (2015) 57 *Marine Policy*, pp. 36–44, at 43.
[183] E. Plomaritou, 'A Review of Shipowner's & Charterer's Obligations in Various Types of Charter' (2014) 4 *Journal of Shipping and Ocean Engineering*, pp. 307–21, at 318.
[184] A. Kasi, *The Law of Carriage of Goods by Sea* (Springer, 2021), p. 376.
[185] P. Brodie, *Commercial Shipping Handbook* (Informa Law from Routledge, 2014), p. 288.
[186] Ibid., pp. 69–70.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

salaries for the master and crew.[187] Conversely, the time charterer operates the vessel commercially, and has the right to make the operational decisions.[188] Most importantly, he is responsible for purchasing bunker fuel and paying for insurance, port charges, and all the costs involved in loading, stowing, trimming, and discharging.[189] Since the time charterer undertakes the commercial employment of the vessel, it is especially important that the time charterer has sufficient and thorough information about the ship, such as a detailed description of the vessel and the necessary information about its construction.[190] This implies that the time charterer plays an important role in operating and managing the vessel. As the time charterer has the right to make operational decisions on purchasing bunkers, such decisions will affect the type and quantity of fuel. Additionally, aspects related to the speed of the vessel and the quality and quantity of bunkers are usually fixed in the time charterparty.[191] Some authors even argue that the time charterer is legally regarded as the owner of the bunkers.[192] Therefore, the control and decision making of a time charterer over the ship's fuel consumption also satisfy the causal link requirement for them to be considered the 'polluter', making them potentially accountable for their role in contributing to pollution.

In this respect, the Baltic and International Maritime Council (BIMCO), the world's largest international shipping association, has already introduced a new clause into the BIMCO standard time charterparty agreement to impose liability on charterers for paying emissions allowances.[193] BIMCO points out that the purpose of the clause is to allocate costs and responsibilities for obtaining, transferring, and surrendering GHG emissions allowances for ships operating under an emissions scheme such as the EU ETS.[194] As stated in the preamble to the clause, 'the ETSA Clause follows the "polluter-pays" principle by ensuring the pass-through of ETS costs to the commercial operators of vessels – in this case, the time charterers'.[195] Subclause (b) sets out the obligation of shipowners to 'follow mandatory reporting obligations such as the EU MRV to establish the ship's emissions',[196] and inform the charterers on a monthly basis about the data and calculations showing the number of allowances.[197] Subclause (c) establishes the responsibility of time charterers to 'provide and pay for' allowances corresponding to the ship's emissions during the time charter period and 'to transfer allowances to the owners' emission scheme account monthly following

[187] Piccolo, n. 14 above, p. 29.
[188] Ibid.
[189] Plomaritou, n. 183 above, p. 313.
[190] Ibid.
[191] See, e.g., Clauses 7 and 9(b) of the New York Produce Exchange Form 93, available at: https://www.bimco.org/contracts-and-clauses/bimco-contracts/nype-93.
[192] C. Hill & Y. Kulkarni, *Maritime Law* (Informa Law from Routledge, 2003), p. 178.
[193] BIMCO, 'ETS – Emission Trading Scheme Allowance Clause for Time Charter Parties 2022' (ETSA Clause), available at: https://www.bimco.org/contracts-and-clauses/bimco-clauses/current/etsa_clause.
[194] Ibid.
[195] Ibid., Background.
[196] Ibid., subclause (b).
[197] Ibid., subclause (c). The monitoring, reporting and verifying (MRV) system for shipping in this context is included in EU regulations (EU Regulation 2015/757, n. 144 above), and requires shipowners and operators to annually monitor, report, and verify CO_2 emissions from their ships.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

receipt of the owners' data and calculations showing the quantity of allowances due for that period'.[198] This implies that owners and charterers should cooperate and promptly share all relevant data and information.[199] As discussed earlier, the shipping company is normally considered liable for surrendering allowances under the EU ETS, and this ETSA Clause under the BIMCO time charterparty shifts the financial burden relating to the cost of emissions to the time charterer.[200] By following the PPP, the ETS costs will thus be passed to the commercial operators of vessels – in this case, the time charterers.[201]

Under the bill of lading contract

Bills of lading are issued to the shipper of goods by the carrier or its agent. This generally involves three parties: the carrier, the shipper, and the consignee. The carrier is the party that transports the goods by sea and issues the bill of lading. A straightforward case is that a shipper contracts directly with the shipowner; alternatively, the shipper may deal initially with a charterer. The charterer may then declare itself as agent of the shipowner by issuing the bill of lading with a demise clause or identity-of-carrier clause.[202] This will render it a shipowner's bill of lading so that the bill of lading contract will be between shipowner and shipper.[203] Therefore, the shipowner, such as a liner shipping company, will be liable as polluter under a simple bill of lading contract. However, if the ship is under charter, whether the carrier is to be regarded as a polluter can vary in different situations, as already discussed above.

Meanwhile, the 'shipper' refers to the person who dispatches the goods and enters into the contract for carriage with the carrier,[204] which could be either the seller or the buyer. The consignor is the seller who delivers the cargo to the vessel;[205] the consignee is the person who takes delivery of the goods, which can be the goods receiver or an agent.[206] It is rare for shippers and consignees to be involved in operational decisions of the vessel such as selecting the type and quantity of bunkers or determining the vessel's speed. Therefore, it may be inappropriate to designate shippers and consignees as polluters, given their limited influence and control over such operational decisions.

Nevertheless, it is well known that shipping serves the international sale of goods. As the parties who benefit from shipping, it may perhaps be necessary to consider their responsibilities for marine GHG emissions based on the BPP, as mentioned earlier. Under the principle of BPP, if shippers and consignees benefit from the transportation of cargo, even though they are not participating in the actual operation of the voyage, they may potentially be held liable for marine GHG emissions. However, further

198 Ibid., subclause (c).
199 Ibid., subclause (a).
200 Eftestøl, n. 137 above, p. 335.
201 BIMCO ETSA Clause, n. 193 above, Background.
202 Kasi, n. 184 above, p. 103.
203 Ibid.
204 Ibid., p. 23.
205 Ibid.
206 Brodie, n. 185 above, p. 18.

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justifications and considerations are required to determine the applicability of the BPP as its application in this situation may involve other parties, thus making the issue more complicated. Nevertheless, it is worth noting that identifying shippers and consignees is normally feasible and relatively straightforward, thus making it straightforward to allocate liability for maritime GHG emissions.

6. Conclusions

Currently, there is no effective liability regime that can help to reduce marine GHG emissions.[207] This article considers the possibility of applying the PPP to fill the resulting liability gap. As a principle with a long history, its application, however, is not straightforward. Among various issues, such application is crucially conditional on identifying the polluter.

Consistent with the current application of the PPP, we consider that the polluters of maritime GHG emissions are those who have either directly or indirectly been involved in causing pollution or maritime environmental degradation. We also consider it fair to require that a causal link is found between pollution activities and environmental degradation.

This article considers the responsibility of states for damage caused by emissions. In addition, evaluating responsibility for the operational decisions of a vessel is crucial in identifying the polluter. Accordingly, the article also suggests that the shipowner, the demise charterer, and the time charterer may most likely be designated as primary polluters in relation to maritime GHG emissions.

This article also considers issues such as the channelling of liabilities, proportionality of contributions, and application of the BPP. The international shipping sector encompasses cross-regional trade and cost shifting, posing challenges in attributing emissions reduction responsibilities to various stakeholders.[208] It is believed that, because of the need for economic efficiency and ease of administration, it is not always essential for the law to mirror reality precisely.[209] In certain cases, it may be more advantageous to apply a similar mechanism, such as channelling of liability, by imposing a polluter pays obligation on a certain category of polluter, although the right of recourse can be called on by the primary polluter as a final resort.

Identifying environmental polluters is inherently complex, and this is particularly true in relation to marine GHG emissions. While this article offers suggestions for identifying the parties responsible for pollution, the associated liability issues warrant further in-depth investigation.

[207] Kotzampasakis, n. 141 above, p. 29.

[208] V. Daioglou et al., 'Implications of Climate Change Mitigation Strategies on International Bioenergy Trade' (2020) 163(3) *Climatic Change*, pp. 1639–58; X.T. Wang et al., 'Trade-linked Shipping CO_2 Emissions' (2021) 11(11) *Nature Climate Change*, pp. 945–51.

[209] De Sadeleer, n. 25 above, pp. 50, 75.

https://doi.org/10.1017/S2047102524000372 Published online by Cambridge University Press

Acknowledgements: We are grateful to the anonymous *TEL* reviewers for their constructive and valuable comments and suggestions, which have helped to improve the quality of our paper. Any mistakes are our own.

Funding statement: The writing of this article was financially supported by the General Research Fund of the Hong Kong Research Grants Council (Funding Body Ref. No: 15601322), Hong Kong SAR (China).

Competing interests: The authors declare none.

Cite this article: L. Zhu & X. Li, 'Identifying Key Polluters: The Feasibility of Applying the Polluter Pays Principle to Marine Greenhouse Gas Emissions' (2025) *Transnational Environmental Law*, pp. 1–27. doi:10.1017/S2047102524000372