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The Promise and Limits of Private Standards in Reducing Greenhouse Gas Emissions from Shipping

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ABSTRACT

This article examines private standards that aim to mitigate greenhouse gas (GHG) emissions in shipping. These have emerged against a backdrop of regulatory inertia and the exclusion of international shipping from the Paris Climate Change Agreement. They are a product of complex governance arrangements and they have addressed areas of market failure that have held back fuel efficiency advances that are made possible by technological innovations. These private standards hold considerable promise but suffer to different degrees from certain weaknesses, notably a lack of transparency, a low level of ambition and concerns about data reliability. This article examines these deficiencies together with the reasons for them, and assesses the role that law could play in addressing them. It argues that the conditions may be present for the mitigation of shipping's GHG emissions to become a site of 'hybrid' governance, combining private standards and state/supra-state law in a productive way.

KEYWORDS: Climate change, international shipping, private standards, EU-MRV, meta-regulation

1. INTRODUCTION

This article looks at the recent development of a series of private greenhouse gas (GHG) emission standards in the global shipping industry in the context of the profound decarbonisation challenge faced by this sector. These arise out of complex governance arrangements based on fluid partnerships between industry, non-governmental orgnisations (NGOs), climate change philanthropy organisations and academic institutions. They have addressed areas of market failure that have held back fuel efficiency advances that are made possible by technological innovations.

The emergence of private GHG emission reduction standards in shipping holds considerable promise and these standards have been enthusiastically, if unevenly taken up. Nonetheless, and to different degrees these standards are characterised by

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a number of weaknesses: namely a lack of transparency, a low level of ambition and concerns about data reliability.

In this article, we exemplify these weaknesses by looking at a range of different private standards that aim to reduce GHG emissions in shipping. Drawing upon an analytical framework developed by Mattli and Woods,[1] we examine the context in which these standards have emerged with a view to understanding better why they suffer from these weaknesses. We find that the bodies that promulgate these standards are relatively closed and heavily dominated by industry. Moreover, their accountability mechanisms tend to be ad hoc rather than integrated into their routine operation.

We also find that the demand for private standards in this area is relatively narrowly focused. Demand is driven in the main by 'corporate consumers' who have an interest in promoting energy efficiency to lower the cost of shipping services by reducing the amount of fuel that is used in the transportation of goods. This narrow focus stands in contrast to other areas of shipping regulation where demand for regulation has been driven by a broad coalition of actors including NGOs and 'corporations at risk'.[2] One consequence of this narrow focus is that private standards place emphasis upon improving energy efficiency and realising a reduction in the GHG emissions *intensity* of shipping. At the same time, it operates to distract attention from the scale of the shipping sector's absolute or cumulative emissions.

Recently, however, there have been calls within the International Maritime Organization (IMO) to establish a cumulative emissions target for shipping. In 2016, the International Chamber of Shipping (ICS) proposed the establishment of an 'Intended Nationally Determined Contribution' (INDC) for shipping. This intervention reflects the fears of some within the industry that unless the IMO acts (or at least appears to be acting), the exclusion of international shipping from the Paris Agreement on Climate Change will lead to a proliferation of 'regional' GHG standards. The IMO's Marine Environment Protection Committee has agreed to establish a Working Group to develop a work plan and timetable to define the shipping sector's 'fair share' of GHG emissions with a view to censuring that the sector makes its fair contribution to achieving the Paris's Agreements ambitious climate change goals.[3]

We argue that the adoption by the IMO of a cumulative emissions target for shipping would be highly significant. One consequence of this would be that the actions of any one emitter would have implications for all other emitters in the shipping sector as they would all be eating from the same finite emissions pie. This would create interdependence between emitters. There is evidence from other areas of shipping regulation to suggest that such interdependence can generate pressure for more effective private standards and for more robust forms of industry-wide peer-to-peer review of compliance with them.

1 Walter Mattli and Ngaire Woods, 'Whose Benefit: Explaining Regulatory Change in World Politics' in Walter Mattli and Ngaire Woods (eds), *The Politics of Global Regulation* (Princeton UP 2009).

2 The terms 'corporate consumers' and 'corporations at risk' are taken from ibid.

3 IMO, 'Report of the Marine Environment Protection Committee on its Sixth-Ninth Session' (MEPC 69/21, para 7.7(7)). See also (n 137). Note also the results of MEPC70 in October 2016 which agreed on a roadmap towards the development of a strategy on the reduction of GHG emissions from ships.

Industry fears about the emergence of a patchwork of regional regulation have been fuelled by the actions of the European Union (EU). Although the EU has so far stopped short of including international shipping within its emissions trading scheme, it has adopted a Regulation on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport (EU–MRV). [4]

We argue that EU–MRV has the potential to shape private standards in two important ways. First, by making the GHG emissions data of vessels calling at EU ports publicly available, it will go some way in offsetting the lack of transparency that characterises many private standards. The EU data will not only be available to those who purchase shipping services, but also to regulators and campaigning NGOs. Secondly, and more tentatively, we argue that EU–MRV presents the EU with an opportunity to assume the role of a meta-regulator, by using EU–MRV as a resource to create incentives for private standard-setting bodies to comply with EU governance requirements. Here, we draw inspiration from EU regulation of biofuels where recognition of private standard-setting bodies by the EU is conditional upon their demonstrating compliance with EU requirements relating to transparency and data reliability. We argue that a meta-regulatory approach to EU–MRV could empower the EU vis-a-vis private standard-setting bodies and create space for potentially fruitful industry experimentation in the design of cost-effective systems of MRV.

In short, this article identifies the promise and the limits of private standards to reduce GHG emissions from shipping, sheds light on why more robust standards have not emerged and considers different ways in which these standards could be improved as a result of their interaction with law.

This article begins by explaining the scale of the shipping sector's decarbonisation challenge and provides a brief overview of existing regulatory responses to this (section 2). It proceeds to introduce the concept and promise of private standards (section 3) and to identify the most important private standards that aim to mitigate GHG emissions from shipping and to explore their potential (section 3). Before concluding (section 8), the article examines the deficiencies inherent in private standards (section 5), assesses the reasons for these (section 6) and explores the relationship between private standards and law (section 7).

2. TACKLING GHG EMISSIONS FROM SHIPPING: THE SHIPPING SECTOR'S GHG EMISSIONS GAP

There is a substantial distance—the so-called 'emissions gap'— between the international community's commitment to contain the increase in global temperature to well below 2 degrees Celsius (2 °C) and the volume of current and projected GHG emissions.[5] Not surprisingly, the shipping sector's 70,000 vessels contribute to the

4 Parliament and Council Reg 2015/757 of 29 April 2015 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport [2015] OJ L123/55.

5 United Nations Environment Programme (UNEP), *The Emissions Gap Report 2015* (UNEP 2015). Even if the 6 gigatonnes of emission reductions included in countries [I]NDCs are respected, a further 12 gigatonnes of reductions will be required.

existence of this 'emissions gap'.[6] Global GHGs from shipping are calculated as around 2–3% of the total anthropogenic GHG emissions over the last decade, and are projected to rise above current levels by between 50% and 250% by 2050. For the shipping sector to contribute in equal proportion to other sectors to ensure a 50% probability of attaining the 2 °C limit to global temperature rises, shipping emissions must be reduced by 50% by 2050 and reach zero emissions by 2080.[7]

Clearly the production of GHGs by ships is a by-product of their primary function of servicing the global economy by transporting goods. Fuel costs account for 25 to 50% of total costs in shipping and represent the single largest 'cost position' in the industry.[8] There are, therefore, clear economic incentives to reduce fuel use in shipping. This could have the happy co-benefit of reducing GHG emissions as well.

However, the apparently simple win–win benefit of increasing the efficiency of fuel use in shipping is attenuated by the particular commercial arrangements of the shipping industry and, in particular, the market barriers that stand in the way of achieving improvements in energy efficiency.[9] Here, the lack of reliable information of various sorts is key[10]. The shipping sector is also characterised by the high level of asymmetric information that contracting parties hold. In some cases, ship owners may have the incentive to misrepresent the fuel efficiency of their ship to a potential charterer.[11] Therefore in the absence of reliable data, it is difficult for those purchasing shipping services, such as cargo owners or charterers, to integrate energy efficiency considerations into the procurement decisions that they make. They either do not have the information which they would need to distinguish between efficient and inefficient ships or they cannot trust this information.

There is also a lack of capital available to invest in fuel efficiency improvements on existing ships.[12] This is partly because of the existence of a split incentive problem in shipping. While ship owners generally bear the cost of achieving technological improvements, it is those who charter ships who will generally reap the fuel savings that are achieved, unless ship owners can recoup their investments through higher charter rates.[13] The split incentive is also a function of shipping markets exposure to time charters and the length of time charters.

It is also difficult for those selling fuel efficiency retrofits to make a business case in favour of energy efficiency in the absence of reliable data about the fuel savings

6 Tristian Smith and others, *CO_2 Targets, Trajectories and Trends for International Shipping* (Shipping in Changing Climates 2015). <https://www.bartlett.ucl.ac.uk/energy/publications/co2-targets-trajectories-and-trends-for-international-shipping> accessed 15 September 2016.

7 This is relative to a 2012 baseline.

8 DNV-GL, *Maritime Energy Management Study 2015: Energy Efficient Operation – What Really Matters'* (DNV-GL 2015) 8.

9 Victoria Stulgis and others, *Hidden Treasure: Financial Models for Retrofits* (Carbon War Room, & UCL Energy Institute 2014) 6.

10 Nishatabbas Rehmatulla and Tristan Smith, 'Barriers to Energy Efficiency in Shipping: A Triangulated Approach to Investigate the Principal Agent Problem in Shipping' (2015) 84 Energy Policy 44.

11 Albert Veenstra and Jan van Dalen, 'Ship Speed and Fuel Consumption Quotation in Ocean Shipping Time Charter Contracts' (2011) 45 Journal of Transport Economics and Policy 41.

12 Nishatabbas Rehmatulla and Tristan Smith, 'Barriers to Energy Efficient and Low Carbon Shipping' (2011) 110 Ocean Engineering 102.

13 On average only 40% of the financial savings delivered by energy efficiency accrue to the ship owner for the period 2008–12 in the drybulk Panamax sector.

and other economic benefits that technological improvements of different kinds will produce.[14] This is because historically fuel consumption in shipping has been in the form of low frequency data (one observation every day)[15] and the wide variety of operating conditions experienced by a ship makes performance analysis difficult.

Even if these barriers can be overcome, there is still no guarantee that this will suffice to close the shipping sector's projected emissions gap. This is because even substantial improvements in energy efficiency may not bring about a (sufficient) reduction in the *cumulative* emissions generated by the shipping sector.[16] This is due to expectations of rising transport demand. The transport demand scenarios included in the Third IMO GHG Study posit the possibility of a 4-fold increase in transport demand during in the years 2012–50.[17]

The regulatory response to the challenge of reducing the shipping sector's GHG emissions has been disappointing. While the Kyoto Protocol delegated responsibility for regulating shipping emissions to the IMO,[18] shipping is nowhere mentioned in the Paris Agreement on Climate Change.[19] Although the EU pushed hard for its inclusion, there was strong opposition from within the Group of G77 countries. This opposition was driven in significant part by disagreements between developed and developing countries about the status and implications of the principle of common but differentiated responsibilities and respective capabilities (CBDR) in international shipping.[20]

The 2015 Paris climate negotiations prompted the expression of different positions from within the shipping industry. While some argued that the exclusion of international shipping from the text of the climate change agreement would send a clear signal that the IMO is the appropriate forum for the pursuit of emission reductions in shipping, others were critical of the decision to exclude shipping, fearing that this might lead to a rise in regional (EU) regulation.[21] Given the strength of the

14 Nishatabbas Rehmatulla and others, 'Wind Technologies: Opportunities and Barriers to a Low Carbon Shipping Industry' (2016) 70 Marine Policy 1.

15 L Aldous and others, 'Uncertainty Analysis in Ship Performance Monitoring' (2015) 110 Ocean Engineering 29.

16 See Kevin Anderson and Alice Bows, 'Executing a Scharnow turn: Reconciling Shipping Emissions with International Commitments on Climate change' (2012) 3 Carbon Management 615.

17 These demand scenario (relating to containers, dry bulkers and tankers) are represented in Figure 3 of Smith and others (n 6).

18 art 2.2 of the Kyoto Protocol to the United Nations Convention on Climate Change 2303 UNTS 148 (1997). The IMO is the UN specialised agency with responsibility for the safety and security of shipping and the prevention of maritime pollution by ships.

19 The implication of this is that parties are not required to include GHG emissions from international shipping in their national GHG emission inventories.

20 For a detailed discussion see Sophia Kopela, 'Climate Change, Regime Interaction and the Principle of Common but Differentiated Responsibility: The Experience of the International Maritime Organization' (2013) 24 Yearbook of International Environmental Law 70.

21 The International Chamber of Shipping adopted the former position, while the latter viewpoint was espoused by a group of large ship-owners including Maersk and the Danish Shipowners' Association. Jane Lister, Rene Taudal Poulsen and Stefano Ponte, 'Orchestrating Transnational Environmental Governance in Maritime Shipping' (2015) 34 Global Environmental Change 185 observe the tendency of 'major shipping companies [to form] alliances to encourage regulation', particularly with a view to ensuring uniform, global rules (190). They also stress, however, the more general tendency of the shipping industry to adopt rhetorically progressive positions whilst lobbying against regulation.

disagreements between countries and within the shipping sector, it is not surprising that the negotiators ultimately took the decision to exclude international shipping from the text of the final agreement.

The IMO's main response to the shipping emissions gap occurred in 2011,[22] when it introduced a Mandatory Energy Efficiency Design Index (EEDI) for new ships and required all ships to have a Ship Energy Efficiency Management Plan (SEEMP).[23] These regulations were adopted by adding a new chapter to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL). While the IMO is to be commended for securing their introduction, they are expected to fall considerably short in their ability to close the shipping sector's GHG emissions gap.[24] Indeed, the projected rise in shipping's GHG emissions (50–250% by 2050) already takes the implementation of these regulations into account.

The inability of these regulations to deliver emission reductions on a scale that is commensurate with the shipping sector's decarbonisation challenge is in significant part because the IMO's EEDI regulations only apply to new ships built after 2013 and are concerned exclusively with a ship's design efficiency and not with its operational efficiency. It is estimated that only 15% of the fleet will be subject to EEDI by 2020. In contrast, although the SEEMP is concerned with a ship's operational efficiency, it does not require any specific outcomes in terms of energy efficiency improvements and realisation of energy efficiency improvements will be impeded by the market barriers identified above.

Hence, as things stand, neither the functioning of the market nor the instruments adopted by the IMO will serve to ensure that the shipping sector makes a proportionate contribution to achieving the international community's 'well below 2 °C' climate change mitigation goal. It is in view of this shortfall that we turn to consider the potential for private standards to contribute to the attainment of this goal.

3. THE CONCEPT OF PRIVATE STANDARDS

Abbott and Snidal coined the expression 'regulatory standard-setting' to describe a new mode of transnational regulation which has proliferated rapidly during the last two decades.[25] According to their use of this term, regulatory standard-setting occurs when voluntary standards are adopted (principally) by non-state actors such as firms and/or NGOs. These voluntary norms are intended to facilitate technical coordination through standardisation and address social and environmental externalities such as climate change. We characterise voluntary standards adopted by non-state actors as 'private standards'.

22 IMO Resolution MEPC.203(62), 'Amendments of the Annex to the Protocol of 1997 to Amend the International Convention for the Prevention of Pollution of Ships 1973 (Inclusion of regulations on energy efficiency for ships in MARPOL Annex VI)' <http://www.imo.org/en/MediaCentre/HotTopics/GHG/Documents/eedi%20amendments%20RESOLUTION%20MEPC203%2062.pdf> accessed 15 September 2016.

23 ibid, Reg 19-21 on EEDI and Reg 22 on SEEMP. These measures apply to ships of 400GT and over.

24 Anderson and Bows (n 16) and Smith and others (n 6).

25 Kenneth Abbott and Duncan Snidal, 'The Governance Triangle: Regulatory Standards Institutions and the Shadow of the State' in Mattli and Woods (n 1).

Private standards are now so widespread that their existence has been recognized by the World Trade Organization (WTO). The WTO's Technical Barriers to Trade Agreement (TBT Agreement) distinguishes between regulations and standards.[26] While compliance with 'regulations' is mandatory, compliance with 'standards' is voluntary. Drawing on this definition, as well as upon discussions on private standards in the WTO's Sanitary and Phytosanitary Measures Committee,[27] we conceive private standards as written documents adopted by a non-governmental entity which lay down rules, guidelines and/or characteristics, for common or repeated use, for products or related processes and production methods, including transport. Compliance with private standards is not mandated by law and such standards may deal exclusively with labelling or designation.

Maritime transport has been a rich source of evidence and examples for scholars exploring the role of private standards in transnational governance.[28] Furger offers an overview of private standards in maritime transport, focusing on the activities of ship classification societies, marine underwriters and P&I clubs.[29] He argues that the maritime industry has 'displayed a surprising ability to address its own institutional failures' in regulating issues of ship safety and the protection of the environment, particularly from oil spills.[30] He highlights the peer review function that is played by different standard-setting bodies, with the marine insurers' Salvage Association and P&I clubs informally reviewing the adequacy of the surveys conducted by ship classification societies.[31] He also places emphasis upon the positive role played by industry-wide associations that serve to temper competition with cooperation by adopting private standards that serve as membership access rules.[32]

More detailed studies provide evidence of the positive impact of private standards on ship survival.[33] These suggest that ship inspections undertaken by industry have been as effective in increasing the probability of ship survival as inspections that are undertaken by state authorities pursuant to port state control.[34] While the layering of additional types of inspections generates a diminishing return in prolonging ship

26 World Trade Organisation Technical Barriers to Trade Agreement, 1868 UNTS (1994), Annex 1.1 (regulations) and 1.2 (standards).

27 SPS Committee, 'Report of the Co-Stewards of the Private Standards E-Working Group on Action I' G/SPS/W/276 (18 March 2014) paras 8 and 9.

28 For just one of many examples see, A Claire Cutler, 'Private Authority in International Trade Relations: The Case of Maritime Transport' in A Claire Cutler, Virginia Haufler and Tony Porter (eds), *Private Authority and International Affairs* (State University of New York Press 1999).

29 Franco Furger, 'Accountability and Systems of Self-Governance: The Case of the Marine Industry' (2002) 19 Law & Policy 445. Classification societies 'class' or certify ships as being in conformity with the standards that they draw up. Acting as recognised organisations, they also certify compliance with national and international regulations on behalf of flag states. P&I clubs (Protection and Indemnity Clubs) are non-profit, mutual insurance associations that provide cover for third-party liabilities.

30 ibid 465.

31 ibid 458, 462.

32 ibid, 465–67. He argues that the International Union of Marine Insurers has only been 'marginally successful in addressing issues of common concern' (467).

33 See Govert Bijwaard and Sabine Knapp, 'Analysis of Ship Life Cycles – The Impact of Economic Cycles and Ship Inspections' (2009) 33 Marine Policy 350.

34 ibid 361–63. By contrast ISM audits are not found to decrease the incident rate for most ship types.

Table 1 Private standards governing GHG emissions from shipping

Type of private standard	Prominent examples
MRV (other than when incorporated in ship rating scheme)	DAMCO CarbonCheck OCIMF CO_2 Trajectory Prediction Model
Environmental management system (EMS) (other than when incorporated in ship rating scheme)	DAMCO CarbonDashboard
Ship rating schemes	CCWG CSI RightShip/Carbon War Room GHG emissions rating ESI DNV-Triple E Green Award
Ship Finance Standards	Efficient Ship Finance (with Liberian Ship Registry)

survival, even industry inspections that are *additional* to port state control inspections decrease the risk of accidents for ships.[35]

4. THE EXISTENCE AND POTENTIAL CONTRIBUTION OF PRIVATE STANDRDES IN REDUCING GHG EMISSIONS FROM SHIPPING

While private standards lack the 'command and control' quality of much state-based environmental law, there is evidence that they are being developed to reduce social and environmental externalities.[36] There has been a proliferation of private standards in the area of climate change.[37] Abbott has identified more than fifty climate change initiatives that are led by civil society organisations and/or firms.[38] As Abbott himself acknowledges, his list is not intended to be exhaustive and indeed it does not include any one of the shipping specific examples that are set out in Table 1 further.

It is our contention that private standards in shipping have the potential to help overcome the market barriers that impede energy efficiency improvements in shipping. This potential exists due to the ability of these standards to increase the availability of relevant information, to inculcate procedures within companies for identifying and exploiting opportunities for reducing GHG emissions from shipping, and by increasing the availability of capital for fuel efficiency retrofits by providing

35 ibid 363. However, the authors do conclude that too many inspections are performed on ships, particularly tankers, and call for better coordination of inspection efforts.

36 See David Vogel, 'The Private Regulation of Global Corporate Conduct' in Mattli and Woods (n 1).

37 Kenneth Abbott, 'The Transnational Regime Complex for Climate Change' (2012) 30 Enviornment and Planning C Government Policy 571.

38 ibid 575–77.

information and alleviating the split incentive problem in shipping. The impact of these and other private standards will depend also upon the ability of supply-side 'norm entrepreneurs' to persuade stakeholders in the shipping sector to implement these standards and to use the information that they generate in their decision-making.[39] These different pathways to influence for private standards are explored further below. Table 1 identifies what we consider to be the most important private standards that aim to GHG emissions from shipping.[40]

The standards listed in Table 1 meet the definition of private standards provided above. While there is rich variation among these, they all comprise written documents containing rules, guidelines or characteristics for repeated use in respect of GHG emissions generated in the transportation of products by sea. The requirements set out by the private standards are frequently process oriented, in that they prescribe appropriate conduct rather than require a specific outcome; for example, they may prescribe a methodology for measuring GHG emissions or the steps that should be taken within companies to identify opportunities to reduce GHG emissions. While some of the ship rating schemes are purely procedural in orientation (Green Award and DNV-Triple E), others rate or rank vessels according to their level of GHG emissions. These latter schemes embody a substantive standard in that a specified level of performance must be attained to achieve a particular rating (eg an 'A' rating), which may be viewed as a label or designation within our definition of private standards above. Thus, where ratings or performance indicators are developed to provide a short-hand method of communicating compliance (or a degree of compliance) with private standards, we view these ratings or performance indicators as forming a component of the broader concept of private standards.[41] We now turn to consider the different pathways to influence for private standards that aim to reduce GHG emissions from shipping.

4.1 Increasing the Availability of Information

All of the private standards included in Table 1 serve to generate information about the fuel efficiency/GHG emissions of vessels. Where this information is made available, it permits comparisons to be drawn between more or less polluting vessels. We see a clear example of information about a vessel's GHG emissions being used by those chartering shipping services in the context of RightShip/Carbon War Room's (RightShip) GHG Emissions Rating.[42] RightShip was set up in 2001 by the

39 While we highlight the role of supply-side 'norm entrepreneurs' in this section of the article, we return in section 5 to consider demand-side entrepreneurs.

40 Only measures that go further than existing governmental or international regulations are included as private standards here. We reached the conclusion that these are the most important standards following discussion with shipping industry stakeholders present at the Stakeholder Workshop on 'Reducing Greenhouse Gas Emissions from Shipping' that was convened by the UCL-based members of the Shipping in Changing Climates project at the Royal Society in London on 28th August 2015.

41 For a discussion of the relationship between standards and indicators see Kevin Davies, Benedict Kingsbury and Sally Engle Merry, 'Indicators as a Technology of Global Governance' (2012) 46 Law and Society Review 71. While these authors accept that indicators 'embody' broad standards (eg good governance) we suggest here that standards may also embody indicators.

42 For an overview of the RightShip GHG Emissions Rating see: <http://site.rightship.com/services/ghg-emissions-rating/> accessed 17 September 2016.

commodity companies (and ship charterers) BHP Billiton and Rio Tinto, with Cargill joining as an equity partner in 2006. RightShip has developed an Existing Vessel Design Index (EVDI) which uses a ship's design to estimate its CO_2 emissions per nautical mile. Depending upon a ship's performance based on the EVDI relative to the average of ships of a similar size and type, RightShip assigns an A-G energy efficiency rating to that ship. More than two dozen large corporations currently use this ship rating scheme to avoid chartering the least efficient vessels (F and G rated). It has been reported that RightShip's GHG Emissions Rating is shifting 20% of global shipped tonnage away from the least efficient vessels, resulting in average emissions savings of between 5% and 9%.[43]

The information generated by private standards is also available for use by other shipping stakeholders. For example, the Environmental Ship Index (ESI) forms part of the World Ports Climate Initiative.[44] It aims to provide information about vessels' airborne emissions and includes a reporting scheme on GHG emissions (as will be seen, GHG emissions currently form only a very small part of this). This information is intended for use by ports to reward participating ships as well as by shipping companies themselves. Forty port authorities, situated in seventeen different countries, currently offer economic incentives to vessels that participate in this scheme.[45] For example, the Port of Oslo offers a 40% rebate on port dues for ships that achieve an ESI score of at least 50 (the maximum possible score is 100). Further, it has been claimed that leading banks in the shipping industry, including HSH Nordbank and KfW IPE-Bank, are using the data generated by private standards to assess investment risk and return, with inefficient vessels being regarded as a higher-risk investment.[46]

4.2 Improving Companies' Internal Procedures for Measuring and Mitigating GHG Emissions

Some of the private standards identified in Table 1 aim to secure positive change by bringing about an improvement in companies' internal procedures to increase awareness about the importance of reducing GHG emissions and the means by which this can be achieved. 'Management-based' standards of this kind use procedural interventions in a bid to promote attainment of a substantive goal.[47]

The 'Triple-E' vessel rating scheme developed by the Norwegian ship classification society DNV GL offers a good example in this respect. This aims to improve a company's organisational performance, to identify ways of minimising environmental

43 As reported by participant at Stakeholder Workshop (n 40).

44 For details of ESI see <http://www.environmentalshipindex.org/Public/Home> accessed 17 September 2016.

45 For a list see <http://esi.wpci.nl/Public/PortIPs> accessed 17 September 2016. A number of ports also use RightShip's GHG emissions rating to offer incentives to the most efficient vessels.

46 CWR, 'Higher Revenue Potential Drives Use of Energy Efficiency Data by Leading Shipping Banks' (CWR 26 May 2015) <http://www.shippingefficiency.org/sites/shippingefficiency.org/files/press/files/CWR_eshot_shipping_KFWNordbank_FINALd4.pdf> accessed 17 September 2016.

47 Cary Coglianese and David Lazer, 'Management-Based Regulation: Prescribing Private Management to Achieve Public Goals' (2003) 37 Law and Society Review 691.

impact, and to optimise fuel consumption thereby reducing cost. Under this scheme, the rating achieved by a particular vessel will depend in significant part upon a company's internal management procedures.[48] Subject to complying with mandatory regulations (such as the IMO's EEDI for new ships), the attainment of a particular rating does not depend upon substantive targets being met. To achieve a top rating (Level 1 of 4 possible levels), a company must implement a certified environmental management system, make use of an Energy Efficiency Operational Indicator (EEOI) to document performance and carry out an environmental risk assessment as well as environmental training of management and crew.

DAMCO's CarbonDashboard offers another example of a management-based approach to securing GHG emission reductions.[49] This is intended to assist companies to calculate their supply-chain emissions and to increase their capacity to identify and address carbon 'hot spots' within it. One DAMCO customer is said to have achieved a 40% reduction in its supply-chain CO_2 emissions by using the CarbonDashboard tools.[50]

4.3 Increasing the Availability of Capital by Mitigating the Split Incentive Problem

As was noted above, split incentives constitute a significant market barrier to achieving energy efficiency in shipping. These arise where the party which is responsible for investing in energy efficiency (the ship owner) is not the party which will reap the financial return (the charterer).

We are, however, starting to see the emergence of private standards that are intended to remove this split incentive barrier, thereby unlocking additional capital for investment in energy efficiency improvements on ships. A US company called Efficient Ship Finance (ESF) has an innovative system for financing large-scale fuel efficiency retrofits on existing ships. Crucially, this system does not require up-front or on-balance sheet investment by ship owners.[51] ESF makes the up-front investment and recoups the cost of this by claiming a share of the additional revenues that are generated as a result of it. The expectation is that additional revenues will be generated as a result of lower fuel costs, increased charter rates, greater fleet utilization and higher resale value of vessels among other things. As things stand, take-up of ESF finance appears to be curtailed by the high cost of the finance provided and the rapid decline in the cost of fuel.

ESF's innovative financing model has required the development of private standards for measuring energy efficiency improvements and for quantifying the economic return that flows from these. It has also required the development of methodologies

48 To the extent that Triple-E scheme does lay down substantive requirements, these do not go further than existing, binding regulations.

49 For an overview, see DAMCO, 'Ecologics CarbonDashboard: End-to-End Carbon Visibility and Management' <http://www.damco.com/en/our-services/supply-chain-design-and-optimisation/~/media/430b5be85d25404892bd36d50d0e4dad> accessed 1 October 2016.

50 As reported by participant at Stakeholder Workshop (n 40).

51 This builds on a model first developed at UCL Energy Institute in collaboration with the Carbon War Room (n 9).

for dividing up the financial returns flowing from investments between ESF and the owner and operator of an ESF-retrofitted ship.

Additionally, the very fact that a vessel has undergone ESF-financed fuel efficiency retrofits is now being used as a standard by the Liberian shipping registry as a benchmark for awarding significant tonnage tax discounts to ship owners.[52] This, and future rises in fuel costs, may create an incentive for future take-up of ESF finance.

4.4 The Activities of 'Norm Entrepreneurs'

The influence of private standards will depend upon the institutional framework within which they are embedded and upon the capacity of private standard-setting bodies and others to serve as successful 'norm entrepreneurs'.[53] Here, we treat private standards as norms as they meet the generally accepted definition of norms as 'a standard of appropriate behavio[u]r for actors with a given identity'.[54] Private standards governing GHG emissions from shipping are often embedded within a 'thick' institutional environment which is characterised by the existence of organisations and networks that are committed to encouraging the take-up of the standards. Their ability to persuade an adequate number of target actors to make use of the standards is a critical determinant of the effectiveness of private standards.[55] These supply-side norm entrepreneurs rely principally upon material incentives—such as reductions in fuel costs or enhancements to reputation—to persuade ship owners and consumers of shipping services to use these standards.

The ship rating scheme that has had the greatest success in securing take-up is the Clean Cargo Working Group (CCWG) which covers 80% of global ocean container capacity by weight. '[CCWG] is a global, business-to-business initiative dedicated to improving the environmental performance of marine container transport.'[56] Many large corporations with immediate name recognition (eg Electrolux, Heineken, M&S, Nike and IKEA) have already used their metrics and tools to improve environmental performance in the supply-chain.[57]

The Carbon War Room (CWR) offers another example of a prominent norm entrepreneur. [58] The CWR is a non-profit organisation founded by Richard Branson in 2009. It aims to help break down market barriers to capital investment in

52 A 50% discount in the first year and 25% in the next two. See <http://www.hellenicshippingnews.com/liberian-registry-launches-green-ship-initiative/> accessed 17 September 2016.

53 Martha Finnemore and Katherine Sikkink, 'International Norm Dynamics and Political Change' (1992) 52 International Organization 887.

54 ibid 891.

55 Vogel (n 36) identifies this as one of the key factors influencing the success of what he calls 'civil regulation'.

56 BSR (CCWG), 'Complete Overview' <https://www.bsr.org/collaboration/groups/clean-cargo-working-group. accessed 8 August 2016. For evidence of RightShip acting as a norm entrepreneur see its promotional films and other features <http://site.rightship.com/services/ghg-emissions-rating/> accessed on 17 September 2016.

57 Angie Farrage-Thibault and Nate Springer, 'Clean Cargo Working Group: Transparency and Transformation in Ocean Transport' (*BSR Blog*, 6 May 2014) ,https://www.bsr.org/en/our-insights/blog-view/clean-cargo-working-group-transparency-and-transformation-in-ocean-transpor> accessed 17 September 2016.

58 The Sustainable Shipping Initiative offers another important example. This brings together 17 leading shipping companies with WWF and Forum for the Future. It provides a compilation of environmentally

potentially profitable and scalable clean technologies. The CWR launched shipping-efficiency.org in 2010 to partner with RightShip in the development and promotion of its GHG Emissions Rating.[59]

5. EVALUATING PRIVATE STANDARDS FOR REDUCING GHG EMISSIONS FROM SHIPPING

The previous section argued that private standards have the potential to contribute to reducing GHG emissions from shipping by helping to overcome the market barriers that stand in the way of achieving energy efficiency improvements in shipping. This section, by contrast, identifies the principal deficiencies inherent in existing private standards. It argues that the effectiveness of these standards will be reduced when they lack transparency, are imbued with a low level of ambition, and give rise to concerns about data reliability.

5.1 Limited Transparency

One of the main aims of the private standards listed in Table 1 is to generate reliable information about vessels' GHG emissions and to facilitate comparisons between different vessels. The information that is generated has the potential to become embedded in the decision-making processes of a wide variety of actors. It is, however, important to be aware that there are specific limits to the transparency of these standards. These limits can be readily illustrated by reference to one of the most important and successful of the ship rating schemes, namely the CCWG which was introduced above.

The CCWG aims to 'provide reliable year-on-year emissions performance data from 23 of the world's leading ocean carriers that represent approximately 80% of global ocean container capacity'.[60] However, this emissions performance data is only made available to CCWG members and their access is conditional upon their signing a confidentiality agreement. Membership of the CCWG is restricted to cargo carriers, cargo owners (shippers) and freight forwarders. Consequently, whilst this information is available to members who are chartering shipping services, it is not available to other kinds of actors such as governments, NGOs, consumers, financiers, shareholders or ports.

This limited transparency is evident also in the operation of the Clean Shipping Index (CSI) which is another of the ship rating schemes listed in Table 1.[61] Again, access to information about the environmental footprint of participating ships is only available to cargo owners and freight forwarders and is similarly conditional upon their signing a confidentiality agreement.[62] However, the CSI has stated that it aims

oriented private standards in shipping and provides online guidance for potential users <http://ssi.brenock.com> accessed 1 October 2016.

59 See <http://www.shippingefficiency.org/carbon-war-room-rightship> accessed 17 September 2016.

60 See BSR, 'Our Accomplishments' <http://www.bsr.org/files/work/bsr-ci-ccwg.pdf> accessed 17 September 2016.

61 For an overview see Clean Shipping Index, 'Environmental Opportunities for shipping' (2015) at: <http://www.cleanshippingindex.com/wp-content/uploads/2015/03/CleanShippingIndex-brochure-2015.pdf> accessed 30 September 2016.

62 Classification societies and ports are not full members but they may gain limited access to information subject to the approval of shipping companies.

in the future 'to increase the transparency in the index and end the need for confidentiality'.[63] By contrast, the ship rating schemes developed by RightShip and the ESI are commendable in that they do grant public access to vessel-level GHG emissions performance data.[64]

Aside from restrictions on access to aggregate and disaggregated GHG emissions performance data, there is little information about the contribution that private standards make to reducing GHG emissions from shipping.[65] Unsurprisingly, this is particularly the case in respect of process-based management standards which do not set substantive standards or goals. Many generic claims are made about the excellence of these standards and about their success in encouraging users to achieve reductions in their GHG emissions. However, concrete examples of progress are rare and quantitative evidence of the GHG emissions reductions achieved by private standards is virtually impossible to find.[66] This is true even in relation to ship rating schemes.

The CCWG makes greater efforts than most to put information of this kind into the public domain. It reports average CO_2 emissions per container per kilometer for 25 trade lanes on an annual basis, breaking the data down into dry and 'reefer' (refrigerated) containers.[67] CCWG's latest annual report 'indicates that average CO_2 emissions per container per kilometer for global ocean-based transport routes have declined by 8.4 percent from 2013 to 2014 and by more than 29 percent since 2009'.[68] While the CCWG recognises that 'changes in carrier representation or global trade conditions [for example, the use of "slow steaming" during the global recession] likely explain a portion of these results', it considers that 'the continued performance improvement is also attributable to carrier fleet efficiency and data quality'.[69]

Whilst recognising that it is difficult to provide conclusive evidence that improvements in energy efficiency and reductions in GHG emissions are directly and uncontrovertibly attributable to the implementation of private standards, CCWG at least tries to present systematic evidence of the energy efficiency improvements that participating vessels and carriers have achieved. While ad hoc examples of improvements in energy efficiency and/or reductions in GHG emissions attributable to private standards often emerge in conversation with those working in the organisations concerned, neither these claims nor the supporting data are available in the public domain.

63 Email to Joanne Scott from Rickard Lindström, Maritime Sustainability and Account Management, CSI (8 October 2015).

64 RightShip has entered into a partnership with the Carbon War Room to make this information <http://www.shippingefficiency.org/> accessed 17 September 2016.

65 For a general discussion about the difficulties of proving causation in relation to corporate social responsibility see Carrie Bradshaw, 'The Environmental Business Case and Unenlightened Shareholder Value' (2013) 33 Legal Studies 33.

66 BSR, *Collaborative Progress: Clean Cargo Working Group (CCWG): 2015 Progress Report* (BSR August 2015).

67 ibid.

68 BSR (n 66) 5.

69 ibid.

5.2 Low Levels of Ambition

Private standards are facilitative in that they rely on information, processes and persuasion to encourage and to overcome obstacles to behavioural change. In many cases, it is far from straightforward to assess the level of ambition inherent in these standards, not least because the organisations responsible for administering the standards tend in the main not to publish data on how significant a contribution to achieving GHG emission reductions the standards are thought to have made.

Assessing the underlying level of ambition is a little easier when it comes specifically to ship rating schemes. These are distinct from other categories of private standards in that their implementation necessitates a judgment about how well a particular vessel or a carrier has performed by reference to substantive benchmarks. This judgment is captured in shorthand form by locating a vessel or carrier at a certain point on a GHG emissions rating scale (a performance indicator): for example, A-G under RightShip's GHG emissions rating scheme, or Levels 1-4 for DNV Triple-E. Where a vessel or a carrier is awarded an excellent rating as a result of being placed at the top of the relevant scale, this is intended to communicate the fact that this vessel or carrier is performing extremely well.

There are a number of factors that would appear to reduce the level of ambition inherent in private standards for reducing GHG emissions from shipping including the various ship rating schemes. First, there is considerable variation in the importance of private standards attribute to GHG emissions relative to other factors, including especially other environmental risks posed by ships. This varies from 100% in the case of RightShip's GHG Emissions Rating to 2.9% currently in the ESI (which also includes sulphur oxides and nitrogen oxides). These and other elements pertaining to level of ambition are set out in Table 2 below.

Further, certain schemes award a top rating to a carrier merely on the basis that it has complied with a series of relatively non-demanding procedural requirements. We see this especially in relation to DNV-Triple E and the Green Award.[70] The ESI awards a maximum GHG emissions score to companies that merely report basic data on fuel consumption and distance travelled.[71] However, because the GHG emissions component of the scheme makes up only 2.9% of the final possible score, even companies that do not report this basic data can achieve a maximum possible score of 97.1%.[72]

It is also notable that none of the schemes require any absolute level of attainment in relation to GHG emissions, choosing instead to evaluate performance exclusively by reference to the average vessel's level of GHG emissions. For example, the CCWG will award the highest rating to a vessel whose performance is at least 25% better than the average for the trade lane concerned.[73] Likewise, RightShip and the CSI use data relating to performance relative to the industry average to determine the rating to be awarded to a particular vessel.[74] It is, therefore, the case that if

70 For details see DNV Triple-E <https://www.dnvgl.com/maritime/advisory/triple-e.html> accessed 17 September 2016 and Green Award http://www.greenaward.org/greenaward/> accessed 17 September 2016.

71 For details see ESI (n 44).

72 This becomes apparent from the 'Formulas' section of ESI's website (n44).

73 CCWG, 'How to Calculate and Manage CO_2 Emissions from Ocean Transport' (February 2015) 3.

74 CSI Guidance Document Version 5.0 (April 2015) 10.

Table 2 Level of ambition inherent in ship rating schemes

Rating scheme	Weight attached to GHG emissions	Performance required to achieve top score
Rightship 's GHG emissions	100%	A rating requires a vessel to achieve an EVDI size score indicating at least two standard deviations from average for similar sized vessel of same ship type.
rating		'A' rating awarded to top 2.5% ships (but NB operational factors excluded)
A-G		On sample journey of 11,023 nautical miles from Vitoria, Brazil to Qingdao, China, B rated vessel emits 13% less CO_2 than average. The equivalent figure for A-rated vessels is not provided.
		Also, availability of '+' sign to recognise approved retrofits or upgrades.
CSI	20%	Provision of information + EEOI less than 10% *above* the reference value ($EEOI_{ref}$).
High (green), medium (yellow) or low (red)		Green rating awarded to ~ top 60% ships
		Need to score at least 35% in relation to CO_2 to be eligible for top rating of 'Green' (35% of maximum 30 points = 10.5 points. Three points available for provision of information, therefore need 9 points in addition to have potential to achieve 'Green'. Nine points if EEOI is less than 10% *above* the reference value.
CCWG	40%	Attain maximum score for verified data + at least 25% better than CCWG average for trade lane.
Max score of 100 points		Maximum score awarded to ~ top 30% ships
ESI	2.9%. Anticipate increasing weight in future.	Maximum score can be achieved by reporting two elements of

(*Continued*)

Table 2 (continued)

Rating scheme	Weight attached to GHG emissions	Performance required to achieve top score
		EEOI (fuel consumed and distance travelled).
DNV-Triple E 4-1 (1 highest)	Covers wide range of factors. No weighting given.	SEEMP with targets implemented, monitored and followed-up + EEOI used to document energy efficiency performance + EEDI for new ships.
Green Award Award of certificate	Covers wide range of factors. No weighting given.	Participation in ESI is mandatory. Promotes use of SEEMP + IMO/industry guidelines to implement energy efficiency measures.

benchmark emissions within the relevant segment of the shipping industry increase on average, an increase in a particular vessel's emissions can still result in a vessel achieving a top rating within a ship rating scheme.

Striking also is the fact that in a number of the schemes examined in Table 2, a lower than average level of performance can still result in the attainment of a top rating. This is notably the case within the CSI where an energy efficiency score (EEOI) that is less than 10% *above* the industry benchmark, can still result in the award of a sufficient number of points to allow the vessel to be rated as 'Green'.[75]

Turning specifically to ship rating schemes, there is significant variation in the share of participating vessels that are awarded a top ranking within these. While around 60% of participating vessels are eligible for top ranking (green) within the Clean Shipping Index, around 40% of participating vessels are eligible for a top-score (100 points) within the CCWG.[76] By contrast, across ships of all types, only 2.5% of vessels are expected to achieve an A-rating under RightShip's GHG emissions rating.[77]

One additional factor may be usefully highlighted that bears upon the level of ambition inherent in RightShip's GHG emissions rating scheme. As RightShip acknowledges, a ship's actual emissions will depend not only upon its design characteristics, but also upon operational factors such as speed, cargo load and weather conditions.

75 ibid. This can achieve 12 points out of 30 available points when 3 points are also awarded for the provision of information. To be awarded a 'Green' rating the vessel has to score 50% overall and at least 35% in each of the five available fields.

76 Authors' own estimate.

77 RightShip, *Calculating and Comparing CO_2 Emissions from the Global Maritime Fleet* (RightShip 2013) 8. That said, a number of large charterers have used the RightShip GHG emissions rating scheme to eliminate only the least efficient vessels from their supply-chain. Cargill, in particular, no longer charters F and G rated ships.

These additional factors are not currently taken into account by RightShip in applying its GHG emissions rating to ships.[78]

Finally, in terms of level of ambition, it is important to observe that while the private standards under discussion aim to improve the energy efficiency of shipping, they do not seek to guard against rising GHG emissions that are generated as a result of increasing transport demand. We will highlight below the importance of the shipping sector's cumulative emissions.

5.3 Data Reliability

Where private standards involve the collection, use or publication of data, then the reliability of the data must be considered. This is perhaps of greatest sensitivity where the purpose of the private standard is to increase the availability of information to encourage differentiation between more or less efficient ships. Data can be unreliable due to the poor quality of the data measurement or due to the intentional submission of misleading data. Table 3 outlines for three of the initiatives that are particularly data-centric, some of the details that can influence data reliability. This issue can be addressed through the inclusion of a verification step, and Table 3 also details the required verification step for each of these three initiatives.

The table shows that in several instances the information submitter has a vested interest in the values of the data (eg the shipowner has a vested interest in reporting a good performance), and this increases the importance of the verification step. Furthermore, there appears to be limited specification of data measurement standards—perhaps a symptom of the shortage of available standards in this area of in-service fuel consumption and efficiency measurement. Without further analysis, this

Table 3 Key data reliability parameters for three of the data-centric private standard initiatives

	Source or submitter of data	Measurement standard (eg specification of sensor accuracies)	Verification
Rightship GHG rating	Either IHS Maritime database, ship owner or classification societies	Industry standard procedures	Some verification for ship owner submitted data
CSI	Ship owner	None	Sampled verification
CCWG	Ship owner	None listed in public domain	Some verification applied, but no detail given in the public domain

78 RightShip suggests that '[b]y focusing on design and then supplementing results with operational metrics, a more meaningful outcome is achievable - enabling a like-for-like comparison.' ibid 17. RightShip does recognise retrofits and upgrades through the award of a '+' rating.

implies that there is scope for improvement both with regards to verification and the specification of data measurement.

Further insights on data reliability can be obtained through investigation of RightShip's GHG emissions rating. This uses an Existing Vessel Design Index (EVDI) to estimate a ship's CO_2 emissions per tonne nautical mile travelled and to compare emissions from existing vessels of a similar size and type. This measurement draws upon a number of different data sources, including RightShip's own vetting database, the IHS Maritime and Trade database, classification societies, engine manufacturers and shipyards. In many instances (especially in relation to ships built before the entry of the IMO's EEDI regulations in 2013), the dominant source of information in the calculation of a ship's EVDI is the IHS Maritime and Trade database. This IHS database collects data from a variety of sources, but IHS Maritime and Trade does not offer any guarantee or explanation of the quality procedures followed in collecting this data. RightShip acknowledges the differential reliability of different sources of information, and has therefore established a hierarchy of data sources as follows:

1. EEDI from Class—(most preferred)
2. Ship sourced data—eg sea trial and shop tests
3. Industry/third-party data sources—eg engine manufacturers' specifications or ship yard data
4. Assumed data/databases—(eg IHS Maritime and Trade data) (least preferred)

A systematic analysis of the population of some of the key fields within the database undertaken as part of the IMO's Third Greenhouse Gas Study[79] found that some fields of the database (main engine consumption) are only 20–30% populated, and the 'speed' field used in the EVDI is populated 87–93%. Analysis of the accuracy of the RightShip EVDI calculations has been performed in a study that was commissioned by RightShip and carried out in 2015 by DNV GL[80]. For a number of ships that had EEDI ratings (which are rigorously calculated and verified according to procedures defined by the IMO), the EVDI was also calculated. The median difference between EVDI and EEDI was found to be 5% which is equivalent to approximately one rate difference in the A-G system (meaning, eg that a ship would receive a RightShip rating of E rather than F).[81]

Given that there is this choice to volunteer to submit verified EVDI or EEDI data if they have an EEDI certificate, this immediately identifies a bias (the value of EVDI is known to be a function of the different calculation methods used, and the data is biased preferentially to those ships with data sourced from class, ship owners or

79 Smith and others (n 6). Tristan Smith was lead author on this IMO report.

80 RightShip, 'GHG Emissions Ratings, DNV GL Review: Executive Summary' (RightShip 2015) <http://site.rightship.com/resources/downloads/dnv-gl-methodology-review-executive-summary/> accessed 17 September 2016.

81 ibid. In discussion with Tristan Smith, a representative of RightShip suggested that the fact that the EVDI is conservative relative to EEDI acts as an incentive for shipowners to submit verified data as it is likely that this will improve their rating

yards). However, the more pertinent question in a relative rating scheme is not what the median difference is, but the extent of the standard deviation or variability of the difference. This would indicate how consistently the EVDI derived ratings was in its ranking.

An independent study using a similar method to DNV GL, comparing ships which had published EEDI with their Estimated Index Value (EIV) was undertaken by CE Delft.[82] Whilst EIV's are not identical to unverified EVDI scores, the data source and method used are very close and so inference can be drawn from this study on the accuracy of RightShip's unverified EVDI. The study calculated the coefficient of determination (R^2) in the relationship between the EEDI and EIV scores, and found overall a value of 0.92, but that for some ship types (bulk carriers), the coefficient was as low as 0.66.[83] This finding indicates that many values of unverified EVDI are misrepresentative of a ship's actual design efficiency, and are creating errors in the rank-ordering that informs the A–G scale.

Recognition should be given to RightShip acknowledgment of the need for data validation, and their appeal to interested parties—ship owners/managers—to update their RightShip-calculated EVDI values. However, since there is no stated validation procedure,[84] or stipulation that the validation be carried out or audited by an independent third party, this updating risks adding further erroneous data to the database. In combination with a database that already mixes two sources of data which have an acknowledged difference (EEDI and EVDI), this updated data has the potential to further reduce the reliability of the RightShip's GHG Emissions Rating.

Other private standards, such as the CSI, use ship-owner reported data. The CO_2 component of the CSI requests an owner or operator's Energy Efficiency Operational Indicators (EEOI) which is calculated using annual fuel consumption and transport work. Independent studies[85] have attempted to perform this calculation for a number of ship owners and found variability from company to company in the method and quality of the data. For all shipping companies inspected in the study, there were some ships and voyages for which the data was too poor to enable the calculation. To the credit of the CSI, there is a defined verification procedure that is performed by an independent third party (classification societies).[86] At present carriers are *required* to verify at least two vessels which may constitute a very small percentage of their fleet. Nonetheless, CSI's ultimate goal is to ensure that all vessels included in its index are subject to verification. Maersk, which is considered to be an industry leader in this field, already permits random verification of its entire fleet. The CCWG also has a verification procedure (protocol).[87] However, no detail is given in the public domain of this protocol and the requirements of carriers to apply the protocol to their fleets.

82 Jasper Faber and others, *Estimated Index Values of New Ships: Analysis of EIVs of Ships that Have Entered The Fleet Since 2009* (CE Delft 2015) 14

83 ibid.

84 See, eg the International Organization for Standardization's defined sea trial standards (ISO 15016:2015).

85 Sophia Parker and others, *Understanding the Energy Efficiency Operational Indicator: An Empirical Analysis of Ships from the Royal Belgian Shipowners* (UCL Energy Institute 2015).

86 CSI, *Verification Guidelines' for Vessels and Shipping Companies Version 4* (April 2015).

87 ibid.

In summary, there are a number of identifiable shortcomings on data quality across existing private standards. These could be addressed by developing or incorporating internationally recognised protocols for data measurement and analysis into the standard and/or by placing greater emphasis upon verification, eg through random, independent auditing and cross-referencing.

6. EXPLAINING THE LIMITS OF PRIVATE STANDARDS GOVERNING GHG EMISSIONS FROM SHIPPING

We have identified a number of deficiencies inherent in private standards governing GHG emissions from shipping. We turn now to examine the context in which these standards have emerged with a view to understanding better why they are characterised by these deficiencies albeit to different degrees. To do so, we make use of an analytical framework developed by Mattli and Woods to assist in evaluating when regulation (public or private) may be expected to serve the public interest as opposed to the concentrated interests of narrow elites.[88] This analytical framework emphasises the importance of 'institutional supply' and 'societal demand' in shaping regulatory outcomes.[89] The more extensive the institutional supply and the more robust the societal demand, the more likely it is that public interest-oriented regulation will emerge.

The concept of institutional supply concerns the institutional context in which regulatory processes occur. This is deemed to be 'extensive' and to promote the public interest when it provides for 'open forums, proper due process, multiple access points, and oversight mechanisms'.[90] By contrast, it is deemed to be 'limited' and to favour elite interests when regulatory processes are 'club-like, that is, exclusive, closed and secretive'.[91]

The concept of societal demand, by contrast, concerns the breadth and intensity of the demand within society for regulatory change. This is said to depend upon the availability of information about the social costs of inadequate regulation ('demonstration effects'), the mobilisation of broad coalitions of actors with an interest in achieving regulatory change, and the emergence of ideas that can serve to motivate and sustain these broad coalitions.[92]

Institutional supply appears to be quite limited in relation to private standards governing GHG emissions from shipping. Industry actors play a dominant role in the promulgation and implementation of these standards, including cargo owners, ship owners and freight forwarders. Most of the bodies in question were established by, and are governed by, actors from within the shipping industry and provide no formal opportunities for non-industry actors, including NGOs, to participate in their decision-making processes. While there tends to be a relatively high level of transparency as regards the methodologies underpinning private standards, there is limited

88 Mattli and Woods (n 1).
89 ibid 17–21.
90 ibid 17.
91 ibid.
92 ibid 21–39.

ongoing transparency. For example, the agendas and minutes of meetings are not published.

Even where these private standard setting bodies are formally independent of industry, as is the case for example with the CCWG, industry actors continue to play a dominant role.[93] The CCWG was set up by the Business Sustainability Roundtable which is a business-oriented NGO. Membership is made up of cargo owners, shipping companies and freight-forwarders and it is strongly, and explicitly, member driven in its operation.

Equally, the oversight mechanisms put in place to enhance the accountability of the relevant private standard setting bodies tend to be ad hoc. Whilst a number of these methodologies have been improved as a result of independent, third-party reviews,[94] there is an absence of established procedures for routinised, ongoing, scrutiny of the standards and their implementation.[95]

When we turn to consider the *demand* for private standards governing GHG emissions from shipping, we can gain further insight into the reasons for their shortcomings, including by comparison with the more encouraging example of private standards governing ship safety/survival and oil pollution highlighted above. Of particular salience is the fact that demand for GHG standards appears to be narrow rather than broad. Drawing upon Mattli and Woods' typology of different 'entrepreneurs of regulatory change',[96] it is 'corporate consumers', namely those who are paying for shipping services and who have an economic interest in reducing fuel use, who constitute the principal drivers of demand. There is evidence that this demand does not resonate strongly with shipping companies (including ship managers, owners and operators). Although energy efficiency is *said* by most shipping companies to *the* topic of key importance,[97] the average quantitative energy saving target of shipping companies lack ambition and the 'organizational anchoring' of energy management in shipping remains weak.[98] Survey evidence demonstrates a relatively low

93 The ESI (n 44) was established by the World Ports Climate Initiative (WPCI) which brings together 55 key ports in a bid to reduce maritime GHG emissions. See WPCI, 'About us' <http://wpci.iaphworldports.org/about-us/index.html> accessed 1 October 2016. However, as noted, GHG emissions play a very small role within the rating scheme established by the ESI.

94 For example, DAMCO's CarbonDashboard was verified by academics at the Massachusetts Institute of Technology (Edgar E Blanco and Anthony J Craig, 'Detailed Logistics Information in Carbon Footprints' (MIT Center for Transportation and Logistics 2009) and RightShip's GHG emissions rating was reviewed by DNV-GL(DNV GL, 'GHG Emissions Rating' (November 2015).

95 Green Award is an outlier in this respect in that it has a formal, elaborate, governance structure in place, including by-laws to govern its operation. See the materials included under the heading 'organisation' <http://www.greenaward.org/greenaward/> accessed on 17 September 2016. Nonetheless, industry actors remain dominant within this and third parties are precluded from lodging a complaint before its Board of Appeal.

96 Mattli and Woods (n 1) 28–36. These include NGOs, public officials and private sector entrepreneurs (corporations). In relation to the last category, they distinguish between corporate newcomers, corporations at risk, corporate consumers and corporate levellers of the playing field.

97 DNV-GL (n 8) 13. 76% of the shipping companies surveyed considered the realisation of energy/bunker savings to be the topic of key importance.

98 ibid. The average annual fuel reduction targets of the shipping companies surveyed in 2015 was 2.8%, the same as in 2014. 28% of the companies surveyed have no fuel reduction target. Less than one-third of the companies surveyed had a dedicated energy manager or team.

uptake of energy efficiency measures especially for the measures that can help to reduce emissions significantly.[99]

Demand for private standards seems to be more intense within the container sector where the take-up of private standards is much greater even though the standards themselves are still flawed. There are many reasons for this augmented take-up including higher fuel costs due to higher average speeds (even in an era of slow steaming), and the fact that these companies are more public-facing in that they transport goods for consumers in rich countries. Also, the container sector is much more consolidated, with around twelve companies dominating global supply.[100] Partly because of this, containerships tend to be on longer contracts and are often owned and operated by the same company.[101] Consequently, there are fewer market barriers and an easier alignment of incentives on the benefits of data sharing. More anecdotally, there also seems to be a 'Maersk effect', whereby the environmental leadership shown by this company has encouraged their competitors to keep up by signing up to the ship rating schemes.

Overall, the demand for private standards governing GHG emissions from shipping is much narrower and less intense than that leading to the emergence of private standards governing ship safety/survival and oil pollution. The latter were driven by dramatic evidence of the consequences of weak regulation including accidents and serious maritime pollution incidents and by the coming together of a broad coalition of environmental NGOs and 'corporations at risk, including marine insurers, class societies, ship owners; and their various collective associations'.[102]

While, in general it is difficult to ascribe particular shortcomings to particular aspects of underlying demand, there is one feature of the private standards governing GHG emissions from shipping that may suggest a direct correlation of this kind. The primary objective of the corporate consumers who drive demand for these private standards is to save money as a result of energy efficiency improvements in shipping. While they are, therefore, keen to promote standards that reduce the GHG emissions intensity of shipping, they are not, absent external intervention, keen to promote the adoption of standards that limit the sector's total, cumulative emissions because this could serve to constrain the sector's overall growth. It is, therefore, unsurprising that none of the private standards highlighted above seek to constrain the sector's cumulative emissions.

Yet, as was noted previously, the introduction of a quantitative cap on the entire shipping sector's cumulative emissions could be of key importance due its capacity to alter the relationship between different companies within this sector. An overall

99 Nishatabbas Rehmatulla, *Barriers to the Update of Energy Efficient Operational Measures: Survey Report* (Energy Institute UCL 2012).

100 See 'Alphaliner - Top 100 Operated Fleets as per 3 October 2016' <http://www.alphaliner.com/top100/> accessed 3 October 2016. The top 12 operators represent over 70% of the global container line capacity.

101 UNCTAD, Table 1.7. 'Developments in International Seaborne Trade. UNCTAD Review of Maritime Transport' (2015), Table 1.7 showing that the global container trade is still dominated (in 2014), by Asia–Europe and Asia–US trade.

102 Samuel Barrows, 'Racing to the Top. . .at Last' in Mattli and Woods (n 1). Also Elisabeth de Sombre, *Flagging Standards: Globailization and Environmental, Safety, and Labor Regulations at Sea* (MIT Press 2006) ch 8.

emissions cap of this kind could serve to create interdependence between different companies by making it clear that they are engaged in a zero-sum game. Every tonne of CO_2 emitted by one vessel/company would imply that one tonne less is available to other vessels/companies that make up the sector as a whole.

A cumulative emissions frame recognises the need for the shipping sector as a whole to operate within the confines of an overall carbon budget if it is to play its part in limiting dangerous climate change.[103] Where the whole sector's absolute level of carbon emissions is constrained by external action, each shipping company responsible for generating GHG emissions will have a direct interest in encouraging the emergence of a regulatory framework that prevents or discourages other companies from using more than their fair share of what is now conceived of as a finite sector-wide carbon budget.

The existence of economic interdependence between companies has been one of the key factors influencing the adoption of private standards in shipping. For example, outside of the area of climate change, ship owners have taken steps to pool third-party liabilities through the establishment of individual P&I Clubs as well as an overarching International Group of P&I Clubs.[104] These bodies adopted private standards to govern the behaviour of (prospective) members to guard against the 'moral hazard' that is associated with the pooling of risk.[105]

The legal scholar Neil Gunningham has recognised the important role that interdependence between companies—particularly reputational interdependence—can play in driving the adoption of sector-wide private standards, arguing that companies sometimes require a 'collective licence to operate'.[106] In this and other respects, Gunningham pays particular attention to the intersection between law and private standards, emphasising that law can play an important role in generating and sustaining interdependencies between companies. To take the example of oil pollution from ships, the adoption of mandatory third-party liability insurance for oil tankers served as an important catalyst for the establishment of P&I Clubs as referred to above.[107] It is to this intersection between law and private standards, including law's role in the emergence of a collective licence to operate, that this article will now turn.

7. THE INTERACTION BETWEEEN LAW AND PRIVATE STANDARDS

This article took the inadequacy of legal responses to the regulation of GHG emissions from shipping as its starting point. It was in light of this that it set out to explore the possible contribution of private standards. It may, therefore, seem counter-intuitive to now address the question of what role law and law-making

103 For an effort to derive CO_2 budgets for the shipping sector that are consistent with limiting global warming to 2 °C and 1.5 °C, respectively see Smith and others (n 6).

104 Paul Bennett, 'Mutual Risk: P&I Insurance Clubs and Maritime Safety and Environmental Performance' (2001) 25 Marine Policy 13.

105 Furger (n 29) 460–62, 465–66. Moral hazard arises because companies might be lax in the safety standards that they follow, secure in the knowledge that the economic costs of ship losses or pollution incidents for which they are responsible will be widely shared across all of the members of a P&I Club.

106 Neil Gunningham, 'Corporate Environmental Responsibility: Law and the Limits of Voluntarism' in Doreen McBarnet, Aurora Voiculescu and Tom Campbell (eds), *The New Corporate Accountability: Corporate Social Responsibility and the Law* (CUP 2009).

107 Benjamin Richardson, *Environmental Regulation through Financial Organisations* (Kluwer 2002) 374.

processes can play in mitigating the deficiencies inherent in private standards. Nonetheless, there are already reasons to think that law can shape private standards in a positive way.[108] For the purpose of this discussion, we use the term law to refer to measures adopted by states as well as regional and international organisations that embody procedural and/or substantive standards of conduct for specified actors. These measures may impose standards of conduct that are binding on the actors concerned or they may create incentives to encourage compliance.

First at a general level, even law-making processes that 'fail' in the sense that they do not result in the adoption of new laws have the potential to play a role in increasing demand for private standards. These processes may signal the likely adoption of future regulation within the same forum or within a different forum. The processes leading to the conclusion of the Paris Agreement on Climate Change are exemplary in this respect. While the decision of the Conference of the Parties to exclude international shipping from the text of this agreement was viewed positively by some within the shipping industry, it was condemned by a number of major ship owners.[109] It is reported to have led the Danish and Swedish Shipowners' Associations to announce plans to implement their own GHG emission reduction goals, and to encourage others within the sector to do the same.[110] These reactions were motivated by a desire to counter the threat of regional—especially EU—regulation.[111]

Even where it is not possible to find clear evidence of cause and effect between law-making processes that are less than entirely successful in their own terms and the emergence or strengthening of private standards, it is likely that these processes can serve to increase awareness of the inadequacy of the existing regulatory framework and facilitate the building of alliances between those who favour stronger regulation. Within the IMO at present, it is the Republic of the Marshall Islands (RMI) which is taking the lead in calling for a GHG emission reduction target for international shipping and in building an alliance of states to press for the adoption of a work-plan to define the what the shipping sector's 'fair share' of the global climate change mitigation burden should be.[112] RMI's proposal received the 'in principle' support of the International Chamber of Shipping which has called upon the IMO to develop an 'Intended Nationally Determined Contribution (INDC)' on CO_2 reduction for the international shipping sector.[113]

108 This is consistent with Abbott and Snidal's discussion of the background role of law in their overview of the regulatory standard-setting and of the different competencies that contribute to the emergence of public-interest oriented regulatory standards (n 25) 83–87.

109 The Naval Architect, 'Air Power: More than Just a Wind Up' (RINA, May 2016) <http://www.rina.org.uk/NA_May_two.html> accessed 3 October 2016.

110 ibid.

111 M Schuler, 'Maersk's disappointed at shipping's exclusion from Paris climate deal' <http://gcaptain.com/maersk-disappointed-by-shippings-omission-from-paris-climate-deal (gCaptain 16 December 2016)> accessed 3 October 2016.

112 IMO, 'Reduction of GHG Emissions from Ships: Setting a reduction target and agreeing associated measures for international shipping' submitted by the Marshall Islands (MEPC 68/5/1) and IMO, 'International shipping's share in international efforts to limit the rise of global average temperature' submitted by Belgium, France, Germany, the Marshall Islands, Morocco and Solomon Islands (MEPC79/7/2).

113 IMO, 'Reduction of GHG Emissions from Ships: Proposal to develop an Intended IMO Determined Contribution on CO_2 reduction for international shipping' Submitted by the ICS (MEPC 69/7/1). The

Current discussions within the IMO about how to define the international shipping sector's 'fair share' of global GHG emissions have the potential to help change the nature of the debate by shifting the focus of discussion from energy efficiency to cumulative GHG emissions. The goal of those who favour this 'fair share' approach is to determine what the shipping sector's fair share of a global carbon budget should be. As noted previously, this kind of cumulative emissions frame has the potential to enhance demand for sector-wide standards because it generates the kind of interdependencies necessary to create a 'collective licence to operate'.[114]

Law-making processes that *do* lead to the adoption of new laws may also play a role in galvanising and shaping private standards. We can see this in relation to the IMO's EEDI regulations which, as noted previously, only apply to new ships. When Denmark submitted its proposal for the EEDI in 2007, it stated that 'it is not inconceivable that design indices or equivalent may be applied retroactively to existing ships'.[115] Subsequently, RightShip, acting 'in response to customer demand' developed a similar tool (the Existing Vessel Design Index) to measure the CO_2 emissions of existing ships.[116]

It is also relevant to consider whether the EU's recently adopted Regulation on the Monitoring Reporting and Verification of shipping emissions (EU-MRV) has the potential to influence private standards.[117] This regulation requires companies operating large ships to report annually to the EU on the volume of CO_2 that is emitted on voyages to and from ports within the jurisdiction of EU Member States and whilst within those ports.[118] They are also required to report on a range of additional factors (parameters) including distance travelled, time at sea and cargo carried to facilitate determination of a ship's average energy efficiency.[119] The data submitted by shipping companies will be subject to independent verification and information pertaining to a particular ship will be published on an annual basis.[120]

This Regulation represents a significant step forward in increasing the transparency of GHG emissions data in respect of voyages to or from EU ports. It therefore goes some way towards removing the incentive of ship owners to maintain the confidentiality of data, whether for reasons of commercial confidentiality or for fears that the ready availability of data may facilitate the adoption of future regulation. Importantly, the EU generated data will be available not only to ship owners but to regulators and campaigning NGOs.

Although the first annual monitoring period under EU-MRV is not until 2018,[121] its future is already uncertain in view of recent and ongoing developments in the

ICS represents 80% of the world's merchant fleet. INDCs were renamed NDCs by the Paris Climate Change Agreement.

114 Gunningham (n 106).

115 As reported in RightShip (n 78) 3.

116 ibid.

117 EU-MRV (n 4).

118 Large means above 5,000 gross tonnes. Emissions from last/first port of call before or after calling at an EU port will be included, with 'port of call' being defined as a port where a ship stops to load or unload cargo or to embark or disembark passengers (ibid, art 3(c)).

119 ibid, art 9(1).

120 ibid, arts 13–17, 21.

121 ibid, art 8.

IMO. The EU has made it clear that it views EU-MRV as providing a catalyst towards the establishment of a global data collection system for GHG emissions in shipping.[122] While the EU has used the adoption of EU-MRV to impose pressure on the IMO, it has not so far sought to use it to induce an improvement in the design and operation of private standards. By contrast with other areas of EU law, the EU has not sought to use the adoption of EU legislation to carve out a role for itself as a 'meta-regulator' vis-à-vis private standard-setting bodies. We will conclude this section by considering whether there may be potential for the EU to assume a role of this kind.

The concept of meta-regulation is used to refer 'to ways that outside regulators deliberately—rather than unintentionally—seek to induce targets to develop their own internal, self-regulatory responses to public problems'.[123] In the context of this article, we view the EU as the outside regulator and private standard-setting bodies as their target. The EU performs a meta-regulatory function in a range of other areas. Perhaps the clearest example arises in EU regulation of biofuels.[124] Here, EU legislation permits suppliers of biofuels to demonstrate compliance with the EU's sustainability criteria by obtaining certification from a voluntary or international scheme which sets standards for the production of biomass and which has been recognised by the EU.[125]

For a voluntary scheme to obtain EU recognition, it must comply with the requirements laid down in EU legislation. The scheme must meet 'adequate standards of reliability, transparency and independent auditing',[126] and schemes that measure GHG emissions savings are also required to comply with a range of additional methodological requirements.[127] Voluntary schemes that have obtained EU recognition are required to submit a detailed annual report to the European Commission to

122 Commission, 'Integrating Maritime Transport Emissions in the EU's Greenhouse Gas Reduction Policies' COM (2013) 479, 5.

123 Cary Coglianese and Evan Mendelson, 'Meta-Regulation and Self-Regulation' in Robert Baldwin, Martin Cave and Martin Lodge (eds), *The Oxford Handbook of Regulation* (OUP 2010). Lister and others (n 21) 20 use the concept of 'orchestration' to address some of the same issues. Our EU-MRV example would take the form of 'directive orchestration' in these terms. Among their varied suggestions, they argue that the IMO could consider aligning its fuel data collection system with the methodologies underpinning private standards and provide incentives to encourage independent auditing of data (193).

124 Yoshiko Naiki, 'Bioenergy and Trade: Explaining and Assessing the Regime Complex for Sustainable Biofuels' (2016) 27 European Journal of International Law 129 and Jolene Lin, 'The Environmental Regulation of Biofuels: Limits of the Meta-Standard Approach' (2011) 5 Carbon and Climate Law Review 34. European Parliament and Council Dir 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources, OJ [2009] L140/16, arts 17–23. This was recently amended by European Parliament and Council Dir 2015/1513/EU of 9 September 2015 amending Dir 98/70/EC relating to the quality of petrol and diesel fuels and amending Dir 2009/28/EC on the promotion of the use of energy from renewable sources OJ [2015] L239/1 in order to strengthen the meta-regulatory aspects of this instrument. For an additional example, see Reg 995/2010 Reg 995/2010/EU of 20 October 2010 laying down the obligations of operators who place timber on the market OJ [2010] L295/23, especially art 8(6). For a discussion of the relationship between certification schemes and the EU's due diligence system see Christine Overdevest and Jonathan Zeitlin, 'Assembling an Experimentalist Regime: Transnational Governance Interactions in the Forest Sector' (2014) 8 Regulation & Governance 22.

125 Dir 2009/28/EC, ibid art 18(4).

126 ibid art 18(5).

127 ibid.

assist the Commission to identify best practices and to report on this to the European Parliament.[128]

What is striking about this example is how well adapted the EU's meta-regulatory requirements for biofuels could be in addressing the transparency and data reliability deficits that are often present in private standards. In light of this, the Commission may wish to consider whether there is scope for the EU to perform a meta-regulatory function under EU-MRV. We make a brief argument in favour of this proposition, whilst acknowledging the existence of a number of obstacles that might be thought to stand in its way.

As things stands, EU-MRV is dominated by a compliance-oriented approach. It lays down detailed, prescriptive methods and rules for monitoring CO_2 emissions and other parameters.[129] It establishes a standardised MRV framework which is expected to be further refined though the adoption of delegated acts by the European Commission. In keeping with this, EU-MRV accords a largely passive role to the legal entities that bear responsibility for verifying compliance with the EU's detailed methods and rules.[130] Verifiers are not expected to contribute to the future development of the EU's MRV framework and the EU places relatively few demands upon them. Verifiers are required to be independent and to act in the public interest in carrying out their activities under the Regulation.[131]

Under a meta-regulatory approach, it would be open to private standard-setting bodies to apply for EU recognition of their privately developed MRV systems in exchange for their demonstrating compliance with a range of EU requirements. Members of ship rating schemes that have been recognised by the EU would be able to demonstrate compliance with EU-MRV by relying upon data that has been generated as a result of their participation in this recognised scheme. For existing members, this would represent a cost saving in that they would not be required to comply with two different sets of data gathering requirements. A meta-regulatory approach of this kind would aim to foster an active rather than a passive role for private bodies and to encourage innovation and competition in designing cost-effective systems of MRV. Private bodies would, on the one hand, be accorded greater autonomy in developing their own MRV systems but, on the other, they would be required to gain EU recognition of this system before their clients could rely upon it to demonstrate compliance with EU-MRV. The key elements of both a compliance-oriented and meta-regulatory approach are identified in the Table 4.

A meta-regulatory approach would offer the key advantage that the EU would be empowered to shape the design and operation of private standards. It would also leave space for experimentation in the design of cost-effective MRV systems, thereby creating opportunities for the EU to gain insight into best practice and to consider

128 ibid art 18(6).

129 ibid, in particular annexes I and II. At a general level, however, the Regulation does allow ship owners to choose from four possible monitoring methods (the use of Bunker Fuel Delivery Notes, bunker fuel tank monitoring on-board, flow meters for applicable combustion processes or direct emission measurements). However, it provides detailed specifications in relation to each of these.

130 ibid, arts 13-15 concerning the role of verifiers. Verifiers are required to be accredited by national authorities.

131 ibid, art 14(1).

Table 4 Compliance-oriented approach versus meta-regulatory approach

	Compliance-oriented	Meta-regulatory
Nature of norms	Detailed, prescriptive, methods and rules	Broad objectives and principles
Role of private bodies	Perform passive function, verifying compliance with existing methods and rules	Perform active function, designing bespoke MRV schemes
Meta-regulatory role of EU	Impose limited demands on private bodies (verifiers) seeking EU recognition relating to independence and public interest orientation	Impose far-reaching demands on private standard-setting bodies seeking EU recognition of their bespoke MRV schemes

revising its own MRV framework in the light of this.[132] Such insights could be especially valuable at the current time because there would be an opportunity to take them into account in the design of laws adopted in the future by either the EU or the IMO.

What then are the main obstacles that might stand in the way of this proposal? First, the EU may be conceived as a 'contingent unilateralist', deploying unilateral action to overcome negotiation blockages in international organisations.[133] It is consistent with this identity that the EU has stated that if agreement on a global data collection system is reached within the IMO, the EU shall review EU-MRV and, where appropriate, propose amendments to it to ensure that it is aligned with the global system.[134] If this alignment (global harmonisation) were to occur, the EU would no longer enjoy the regulatory flexibility necessary to pursue a meta-regulatory approach. Moreover, while the EU has the institutional resources to implement a meta-regulatory approach, including established procedures for the adoption of delegated legislation,[135] the IMO is not similarly endowed with nimble legislative procedures of this kind.[136] It is, therefore, much more difficult to contemplate the emergence of a meta-regulatory approach—which requires the regular adoption and updating of recognition decisions—within the IMO.

132 In this, it resembles the model of experimentalist governance proposed by Charles Sabel and Jonathan Zeitlin, 'Learning from Difference: The New Architecture of Experimentalist Governance' (2008) 14 ELJ 271. This new architecture promotes experimentation in the pursuit of broadly framed objectives and puts in place procedures to identify best practice and to revise the regulatory framework in light of these.

133 See Joanne Scott and Lavanya. Rajamani, 'EU Climate Change Unilateralism' (2011) 23 European Journal of International Law 469.

134 EU-MRV (n 4) art 22(3).

135 The EU has established procedures for the adoption of delegated legislation including elaborate 'comitology' procedures. European Parliament and Council Reg 182/2011/EU of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers OJ [2011] L55/291.

136 The IMO generally acts on the basis of consensus although amendments can be adopted by a 'tacit acceptance' procedure that creates a presumption in favour of adoption barring objections from a specified number of states.

Nonetheless, while discussions are continuing within the IMO on the establishment of a global data collection system to record the fuel used by ships,[137] the final contours of this system remain uncertain. And so too does the eventual willingness of the EU to align its robust regional system with what may turn out to be a considerably weaker global alternative.[138] It is anticipated that the IMO will provide for the adoption of a mandatory but confidential data protection system which will only record fuel consumption in combination with proxies for transport work (the IMO is expected to collect only maximum capacity, not actual cargo mass data).[139] A confidential system of this kind which does not include actual cargo mass data may well be considered by the European Commission to fall short of what is required to justify the introduction of legislative proposals to amend the EU's existing MRV framework. The European Commission enjoys broad discretion in deciding when it is 'appropriate' to put forward legislative proposals and the adoption of legislation would require the approval of the European Parliament and the Council.[140] Given that the review process within the EU may take many years to complete, the strong likelihood is that EU-MRV and the IMO's data collection system will run in parallel, at least for a reasonably lengthy period of time.

Secondly, while the EU considers that the introduction of EU-MRV is worthwhile in its own right, it also conceives it as a first step in a staged approach to regulation, and ultimately as paving the way for the adoption by the EU or the IMO of a market-based measure (MBM)—such as an emissions trading scheme—for shipping.[141] It is likely that any future MBM would require a robust and harmonised MRV framework to ensure the integrity of the emissions market and the equal treatment of those buying and selling emission allowances within it. As with global alignment, harmonisation would curtail the EU's regulatory flexibility and threaten to impede realisation of a more experimentalist, meta-regulatory, approach.

However, it may be also possible to use the EU's preference for a staged approach to support the argument in favour of EU meta-regulation. The viability of this approach would depend upon private standard-setting bodies having an incentive to apply for EU recognition of their privately developed MRV systems, bearing in mind that recognition would be conditional upon their demonstrating compliance with a range of potentially demanding EU requirements. It may be that this incentive would reside in the opportunity that these bodies would enjoy to develop and, where appropriate, commercialise MRV systems that are more cost-effective than the system that is currently embodied within EU-MRV. This could serve as a strong incentive

137 IMO (n 3) section 6 (MEPC 69/21). The IMO's Marine Environment Protection Committee formally adopted its data collection system at its 70th Session which met on 24-26th October 2016 whilst this article was in production.

138 Unni Einemo, 'EU Evasive on Aligning EU MRV with Future IMO System' *Sustainable Shipping* (21 October 2015).

139 Draft Amendments to MARPOL Annex VI (Data collection system for fuel consumption from ships) (MEPC 69/21/Add.1, Appendix 7).

140 The legislation would have to be adopted under the EU's ordinary legislative procedure, the details of which are laid down in art 294 TFEU.

141 Commission, 'Proposal for a Regulation of the European Parliament and the Council on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport and amending Regulation (EU) No 525/2013' COM(2013) 480 final, 2–3.

given that there some within industry consider that the obligations imposed by EU-MRV are unnecessarily onerous.[142] However, an additional incentive may also arise from the fact that private standard-setting bodies may wish to shape the EU-MRV framework because this may in time come to underpin, or at least influence, the mode of operation of future regulation including a possible future MBM.

8. CONCLUSION

Progress in regulating GHG emissions from shipping has been slow and has been thwarted in significant part because of disagreements between countries about the status and implications of the CBDR principle. It is against this backdrop that private standards governing GHG emissions from international shipping have emerged. Whilst private standards have attracted considerable attention across law, sociology and political science, and whilst environmental standards feature high on the list of those most studied, those that seek to mitigate GHG emissions from shipping have been largely neglected to date.[143] This is a pity because these standards are important both in view of their potential to mitigate the climate change impact of shipping and because they can help us to understand why some private standards may be more effective than others.[144]

In this article, we have explored the promise and the limits of private standards that are intended to mitigate GHG emissions from shipping. We have identified a number of key deficiencies and tried to understand the reasons for these.

In light of this, we turned to consider interactions between law and private standards. Here, we observed that even when law-making processes fail in the sense that they do not lead to the adoption of new laws, they can play a role in increasing demand for private standards. The exclusion of international shipping from the Paris Agreement on Climate Change was seen by some within the shipping industry as exacerbating the risk of regional regulation and as a reason for taking stronger industry-led action and as pushing for more ambitious measures within the IMO.

We also considered the potential for the EU to perform a meta-regulatory function in relation to private standards as a result of the adoption of EU-MRV. In keeping with this, we consider that the mitigation of GHG emissions from shipping has the potential to become a site of 'hybrid' governance in which private standards and law interact in a productive way.[145]

142 Complaints of this kind have been reported within the specialist shipping press and in conversation with shipping stakeholders.

143 See Lister and others (n 21) and citations therein for literature including shipping examples.

144 There is wide variation in the effectiveness of private standards. Vogel examines case studies of relatively effective, moderately effective and relatively ineffective 'civil regulation'; highlighting some of the reasons for these differences (n 36). See also Axel Marx, Miet Maertens, Johan Swinnen and Jan Wouters (eds), *Private Standards and Global Governance: Economic, Legal and Political Perspectives* (Edward Elgar 2012).

145 The term hybrid governance can be used to describe different phenomena. Levi-Faur includes different concepts within this broad category including co-regulation, enforced self-regulation, meta-regulation and multi-level regulation. We are using the term to refer mainly to meta-regulation but it also captures the multi-level elements as between the EU and the IMO. See David Levi-Faur, 'Regulation and Regulatory Governance' in David Levi-Faur (ed), *Handbook on the Politics of Regulation* (Edward Elgar 2011).

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