



Governing External Cost of Shipping in Emission Control Areas: An Instrumentation Approach

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ABSTRACT

This paper investigates emission control areas (ECAs) as an instrument to address external costs from shipping. Though ECAs have been researched in a versatile manner by scholars of economics, management and policy studies, rather less attention has been paid to the complex multi-level and multi-actor institutional environments into which ECAs are implemented. Yet, the decisions of shipping actors regarding the improvement of their safety and environmental performance can be both enhanced and constrained by the 'rules of the game' embedded within respective institutional frameworks. The paper investigates the case of the Baltic ECA in order to explore the interplay between the existing and emerging arrangements for shipping externalities governance. Methodologically it draws upon the instrumentation approach, which conceptualises governance instruments as policy implementation choices and reveals which relations between the actors involved into the governance process they imply. The study explores the origin, content and power implications of technical instruments associated with the goal of enhanced environmental protection of the Baltic Sea. It aims to assess how the new instrument of ECAs can play itself out in terms of externalities governance. The paper concludes with a discussion of the role of ECAs as a potential enabling environment for quality shipping.

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1. Introduction

Awareness of the negative environmental impacts of global maritime transport has risen over the last two decades (Mitchell, 1994; Tan, 2006; Corbett, 2007; OECD, 2011). In relation to this, questions on the mitigation of adverse environmental effects from shipping have gained more attention from policymakers, shipping industry and other societal actors, including academic researchers. Despite shared understanding in the shipping sector that environmental quality improvements do pay off in the medium and long terms, the challenge of balancing safety, environmental protection and economic sustainability when trying to preserve competitive advantage often reduces shipping companies' motivation to quality improvement in the short-term (Alderton and Winchester, 2002; Pawlik et al., 2012;

Cheng and Choy, 2013). Thus, maritime transport is an example of a private service with public externalities.

Wide recognition of the negative effects of vessel-induced pollution on ecosystems, human health and commercial activities, brought it into the realm of public regulation (Tan, 2006; Roe, 2012). The cornerstones of statutory regulation are laid down in the United Nations Convention on the Law of the Sea (UNCLOS 1982) and the International Convention for the Prevention of Marine Pollution from Ships (MARPOL 1973/1978), as well as in specified legal instruments for different types of pollution on the international, regional and national levels. The legal architecture includes both framework instruments on marine environment protection and regulatory provisions setting emission standards, prohibiting certain operations or providing penalties in case of polluting discharges.

In addition to public governance, a number of private regulatory arrangements and voluntary schemes were developed by the shipping industry actors in cooperation with each other, as well as in collaboration with public sector and non-governmental

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organisations (NGOs) (Wuisan et al., 2012; Yliskylä-Peuralahti and Gritsenko, 2014). Such self-regulatory measures are mainly seen as a complement to conventional command-and-control regulations (Steurer, 2010), increasing the potential of the whole governance system to contribute to avoiding market failure. Yet, the effectiveness of private and public measures taken separately or in combination remains an empirically open question.

Apart from being multi-leveled and multi-actor, arrangements for governing shipping externalities also demonstrate differences from one locality to another. Designation of some parts of the world ocean to particularly sensitive sea areas (PSSA), emission control areas (ECA), more stringent regulation at supranational (e.g., European Union) and local (e.g., the Californian Coast) levels resulted in significant spatial variability of institutional frameworks. Attempts to resolve the environmental problems created by global shipping by differentiating the rules on a spatial basis require special attention. On the one hand, they urge the globalized and inherently trans-boundary multinational shipping industry to diversify their strategies in order to adapt to special operational environments. On the other hand, they pose fundamental questions regarding the role of regulation in addressing trans-boundary environmental concerns.

This paper seeks to clarify how designation of ECAs can affect externalities governance in shipping. Drawing upon the instrumentation approach (Lascoumes and Le Gales, 2007), governance instruments are conceptualised here as policy implementation choices, which allow for analysing the types of governance that are emerging in ECAs. On the basis of empirical investigation of the Baltic ECA, the paper concludes that to date governance structure of the Baltic ECA is heavily focused upon states and public forms of governance, neglecting the ever-growing private governance, which is manifested through the development of green shipping practices and corporate social responsibility initiatives. It claims that in their present form ECAs have only limited potential for uncoupling economic growth and negative environmental impacts in shipping. Eventually, the paper speculates on the conditions under which ECAs can contribute to shipping externalities governance by specifying the shipping governance structure in terms of mechanisms, instruments and implementation entities in a contextually-sensitive manner.

The paper proceeds as follows. Section 2 introduces the problem of external cost governance in maritime transport. Section 3 presents the method of the study. Section 4 reports on research results for the case of Baltic ECA. Section 5 discusses the findings in the broader research context and concludes.

2. Maritime Transport and the Problem of External Cost Governance

Maritime transport is a constant source of environmental risks (Asariotis and Benamara, 2012; Corbett et al., 2007; Kuronen and Tapaninen, 2009). In tandem with the growing intensity of shipping, its contribution to global climate change and a wide range of polluting emissions and discharges into water, the atmosphere and shorelines is growing accordingly. The negative spillovers of shipping as an economic activity upon third

parties in the form of negative environmental impacts have been accurately conceptualised as externalities (DeSombre, 2006; Kalli et al., 2012; Lun, Lai, and Cheng, 2013; Ng and Song, 2010).

The term externality comes from economic literature, where it is used to describe effects of human actions external to the actor, and is usually classified as a special case of market failure. In the process of social interaction, externalities occur whenever some actors do not take account of the consequences of their actions on others (Buchanan and Stubblebine, 1962). Environmental externality is a special case of externalities, which arises when production and/or consumption have environmental effects that negatively affect consumers, but are not compensated through the market mechanisms. In the case of shipping, harmful effects range from negative health effects for people confronted with emissions (e.g., disease, low quality of life) to negative business effects for activities bound up with the good ecological state of the environment (e.g., tourism and fisheries) and they are not fully borne by the polluter, nor passed to the end consumer, so the total cost is larger than the private cost. From a social science point of view, externalities are an indicator of collective action problems.

The negative environmental externalities, especially those from multi-actor and trans-boundary activities such as shipping, constitute a challenge in terms of governance. Thus in public policy research the central question associated with the study of negative externalities is: "what are the policy options available to resolve the problems that externalities create?" This question has two interconnected facets: (a) externalities cost and its calculation; and (b) actions by government and market forces aimed at their internationalisation. In public governance there are at least three classical solutions to externalities problem: (1) introduction of taxation equal to the size of externality cost, (2) establishment of property rights and (3) direct government command-and-control regulation (standards and charges or standards and permits) (Cornes, 1996).

The first solution - government regulation and taxation - is highly debated in the light of market self-regulatory capacity. The main challenge of the second solution is the need for a transparent and clear property rights system, low transaction costs and complete information about the transaction for both sides, which prove to be difficult to ensure. Finally, the third solution - a regulatory solution based on setting standards and either a charge for incompliant behaviour or set a permit scheme - is criticized on the grounds that it does not address the problem, but rather provides an end-of-the-pipe solution to the consequences, neither does it allow dealing with inefficiencies, since the cost of externality is not addressed per se. A lack of enforcement capacities within the states (not fully democratic and accountable political system, corruption), or lack of authority in trans-boundary (situations in which 'neither market nor states' (Ostrom, 1994) have the capacity to enforce regulation due to trans-boundary gaps, such as in maritime transport) undermine the three classical solutions (Börzel and Risse, 2010). In addition to public intervention, externalities can be addressed through private voluntary action, e.g., in shipping through the development of green practices within the shipping companies

(Lai et al., 2011). Yet, this solution based on self-regulation requires credible future commitments and trust among the actors that their actions will strengthen rather than undermine their market position.

Shipping represents an interesting case for speculations about collective action and externalities governance. Though shipping externalities have been addressed through a variety of technical and regulatory instruments embedded within international, regional and national laws and conventions (Hyvätinen and Hildén 2004; Psaraftis and Kontovas 2010; Tan 2006), the enforcement rates of global shipping regulation are poor (Rodrigue et al., 2009). Governments are not only unwilling to enforce regulation on safe, secure and environmental shipping, but also lack the capacity to provide adequate measures. Limitations on maritime transport governability constitute a significant obstacle to compliance provision.

Maritime transport can be conceptualized as a classical case for "involuntary non-compliance" (Börzel and Risse, 2010). As a result, neither innovation nor regulation alone has been able to ensure the quality of shipping (Haralambides, 1998; Shinohara, 2005). Quality shipping is defined in this research as maritime transportation activities with a special focus on safety and environmental protection, aiming at a high standard of operational performance and economic sustainability throughout the vessel's lifecycle (Gritsenko, 2014). This definition implies that externalities governance is a part of a comprehensive programme for delivering quality in shipping.

Where the classical theory predicted the "tragedy of the commons" (Hardin, 1968), Ostrom (2012) proposed an alternative view on externalities governance in trans-boundary, multi-leveled and multi-actor settings. Her research questioned the conventional theory due to (1) lack of empirical support in small-to medium-size environmental social dilemmas; and (2) existence of multiple benefits from emission reduction that actors may want to take into account. Ostrom's findings suggest that the capacity of states to implement sustainability policies should not be considered as the only factor shaping the policy output. Whereas globalisation poses considerable challenges to provide the credible threat of costly legislation, monitoring, and enforcement with severe punishment, actions of private actors at small- and medium-scale may contribute to the governance of negative environmental externalities, including the case of shipping. ECAs can be seen as such medium-scale frameworks, thus, they have the potential to resolve collective action problems. Yet, little academic insight was provided as regards mechanisms of maritime transport externalities governance in the ECAs.

Since traditional maritime governance has been acknowledged as ineffective and Roe (2012) speaks of 'maritime governance failure', the governance of environmental externalities in maritime transport constitutes a research subject of particular interest. This paper aims at filling in this gap and providing an investigation of the governance of shipping externalities in the Baltic Sea region (BSR), which is one of the ECAs designated by the International Maritime Organization (IMO). The improvement of shipping quality is among the biggest challenges posed by the current economic and environmental sit-

uation, therefore research on the mechanisms that allow the internalising of the negative environmental externalities from shipping has relevance not only on the regional, but also on the global scale.

3. Instrumentation Approach to Governance

Governance is, without exaggeration, a 'buzzword' (Jessop, 1998), a contested and 'fashionable' concept which 'stretched beyond any useful meaning' (Benz and Dose, 2010; Porta and Keating, 2013, 37; Roe, 2012). "In generic terms, governance can be defined as the process of steering society and the economy through collective action" (Torfinn et al., 2013, p.11). Thereby governance research highlights that there is no single actor, institution or source of authority that defines and steers quality in shipping, but there is instead a plurality of policy arrangements, understood here as "the substance and the organisation of policy domains in terms of policy discourses, coalitions, rules of the game and resources" (Arts et al., 2006, p.94). Thus, in its essence the concept of governance comes back to the fundamental problem of the role of the state and the "division of labor" between public and private sectors in policymaking.

The study of governance is tightly connected to how governance is conceptualised. If governance is a network, it can be studied by means of network analysis, if a discourse, by discourse analysis, if a process, process-tracing can be employed, etc. Among other approaches, governance can be analysed using the instrumentation approach developed by Lascoumes and Le Gales (2007). Interest in public policy instrumentation within governance research has grown over the last years (Hood 2007; Bache 2010; Halpern 2010; Kassim and Le Galès 2010; Heidebreder 2011; Knol 2011). One of the reasons for this exponential growth is that this approach allows researchers to account for both governance structure and process by focusing on policy instruments as indicators of both "who governs" and "how governs" dimensions (Lascoumes and Le Gales 2007, p.15). Differing from a functionalist view on the governance instruments, the instrumentation approach seeks to understand the relationship between the (public) regulator and the regulated entity by exploring the origin, content and power implications of technical instruments.

Instrumentation analysis begins with identification of governance instruments. Once instruments are listed, for each instrument one can establish a number of properties: (1) target; (2) implementing body; (3) governance mode; (4) governance mechanism (Table 1).

Conceptualising instruments as policy implementation choices, the instrumentation approach allows one to study the emergence of new instruments as an indicator for proliferation of new relations between the actors involved in the governance process. Thus, instruments open a unique perspective for understanding governance arrangements. The principal advantage of the instrumentation approach in governance research is that it allows the de-coupling collective action from any particular institutional form of governance, be it state, civil society or networks. The instrumentation research of governance eventually

Table 1: Conceptual framework for instrumentation analysis

Target	Implementing body
Who is the target of this instrument? Who is supposed to be governed? Who's action does this instruments seeks to change?	Who is supposed to implement this instrument? Who governs?
Governance mode	Governance mechanism
What is the locus of the governance process? Is it hierarchical governance (typically between state and citizens), self-governance (outside the purview of government) or co-governance (joint effort)?	How does this instrument govern? By virtue of which mechanisms is the action supposed to be changed? Does the instrument foresee introduction of standards, procedures, monitoring of activities etc.?

Source: Authors

aims at showing how the societal approach to managing issues of common interest can be balanced given the institutional complexity manifested through diverse instrument choices.

4. Governing External Cost of Shipping in the Baltic ECA

4.1. Introducing an ECA in the Baltic Sea Region

The instrument of emission control areas (ECAs) was introduced by the IMO as a part of progressive emission reduction policy within the framework of the MARPOL Convention. For the time being, four areas designated as ECAs, among them the Baltic Sea, the North Sea, the North American EEZ and the Californian Coast, have become SO_x control areas, which effectively means that the maximum sulphur content of the fuel oils loaded, bunkered and used onboard vessels in these areas should currently not exceed 1.00% m/m and should be further reduced 0.10% m/m after 1 January 2015, a very ambitious target in comparison to 3.50% global cap applicable worldwide (at least until 2020). Consequently, ECAs will also feature more stringent standards for NO_x and PM emissions. MARPOL Annex VI NO_x reduction scheme foresees three different levels of control (so-called tiers) applied, based on the ship's construction date. Whereas Tier II is applied to all vessels constructed after 1.1.2011, the Tier III limits adopted in 2008 are to be applicable to ships built from 2016 when sailing in ECAs. In 2013 IMO decided to postpone the entry into force of the Tier III NO_x emissions limits for ship engines from 2016 to 2021.

The idea of defining certain sea areas as special areas - and then provide them with a higher level of protection than other areas of the sea - was inherent to MARPOL Convention straight from its adoption in 1973. The designation of special areas in made for reasons related to the oceanographical and ecological conditions of the area, as well as to its shipping traffic patterns, and presupposes the adoption of additional mandatory rules of pollution prevention. Special areas can be adopted in relation

to MARPOL Annex I (oil pollution prevention), Annex II (prevention of pollution by noxious liquid substances), Annex IV (sewage pollution prevention), Annex V (garbage pollution prevention). In addition to the recent Baltic ECA, the Baltic Sea was previously designated by the MARPOL Convention as a special area in terms of oil, sewage, garbage; this covers the Baltic Sea proper with the Gulf of Bothnia, the Gulf of Finland and the entrance to the Baltic Sea.

Apart from MARPOL special areas, in 2005 parts of the Baltic Sea (excluding Russian territorial waters) were designated as a particularly sensitive sea area (PSSA). In practical terms, a PSSA gives a possibility to introduce associated protective measures (APMs), including specific ways of controlling the maritime activities in the PSSA, such as routing measures, discharge and equipment requirements for ships. In addition to local instruments developed under the auspices of global organisations, genuinely regional instruments play no less an important role in elaborating the shipping governance structure and equipping it with specific instruments. The 1992 Helsinki Convention is a legal instrument developed to improve the status of the Baltic Sea, i.a., addressing emissions and discharges from maritime transport. Some of the provisions of the Helsinki Convention go beyond global regulation, e.g., it has taken a progressive stance in matters of ballast water treatment, introduced no-special-fee system for port reception facilities, and covered the whole Baltic Sea area by land-based AIS monitoring systems. Moreover, traffic separation schemes, mandatory ship reporting systems (GOFREP, BELTREP, SOUNDREP, GDAN-REP), which require ships to submit a report to the designated shore-based Vessel Traffic System Centre, deep water routing and other instruments for enhancing the safety of maritime navigation and improving vessels' environmental performance are a part of Baltic shipping governance system (a comprehensive list of these instruments can be derived from Table 2).

Apart from the fact that the present system of shipping externalities governance in the BSR is complex and multi-leveled, it is also polycentric, meaning that it features multiple overlapping and competing centers of decision-making and policy implementation within a common overarching framework. The design of legal provisions and other instruments allows one to identify multiple actors involved into the Baltic shipping governance, embracing both public and private entities: (1) states (in terms of regulatory and implementation capacity divided into "flag", "port" and "coastal"); (2) inter-governmental organisations (IMO, HELCOM, Paris MOU); (3) oversight agents (marine insurers, P&I clubs, classification societies, vetting inspections); (4) maritime industry (vessel-owners/operators, management, agents, chartering, professional - e.g., bunkering - and shipping association); (5) shippers (cargo-owners) and consumer markets; (6) civil society, NGOs, coastal community. From the brief discussion above, it follows that the Baltic ECA will be implemented in a region where complex a multi-leveled and polycentric shipping governance structure already exists. How will the introduction of the Baltic ECA affect the interactions between these multiple actors (and vice versa)? And what would be the added value of this new instrument in terms of the overall challenges to governance of shipping externalities?

4.2. Instrumentation of the Baltic Shipping Governance

As the new ECA is being put 'on top' of the existing governance system, in order to be able to assess its implications, the structure and process of shipping externalities governance before ECA's introduction needs to be understood. The involvement of different actors can be traced when analysing the shipping governance mix in terms of its instruments (Annex I). Basing itself on the evidence from the BSR, this research analyzed almost 30 of the most used instruments of shipping externalities governance in terms of actors (targeted and implementing bodies), governance mode, and mechanism (Table 1).

The findings of instrumentation analysis suggest that different forms of governance - ranging from governance - by - government to governance-without-government as two extreme cases - can be identified in the area. The embeddedness of these forms varies, though it exhibits a systematic pattern: hierarchy is more likely to be used for regulatory compliance, whereas market coordination contributes more to the development of enabling environments for safe and environmental shipping. Further analysis reveals that not all of the above-identified actors are equally integrated into the implementation process. In legal terms, negative environmental impacts of shipping are subject to public international law (with exception of civil liability conventions), thus, implementation is concentrated within the nation states and is dependent on the translation of international conventions into respective national legislation. The analysis of these regulation shows that ship- owner/ operator is mostly specified as a target of legislation (i.e., subject to standards, liable party), whereas other actors (ports, shippers) are seldom involved.

A further insight from the instrumentation analysis relates to the governance system in terms of modes and mechanisms. The analysis shows that different instruments not only rely on different actors, but also exploit different modes of coordination (and consequentially require different mechanisms). Reflecting the governance structures, hierarchical and market coordination / self-governance modes are most typically used. The lack of negotiation and co-governance may be interpreted as a sign of the weakness of networks in the maritime business. The governance mechanisms explicate that in the 'shadow of hierarchy' (Scharpf 1997) most of immediate implementation is outsourced to regulatory agencies and private actors.

The main conclusion that can be drawn from the instrumentation analysis is that though maritime transport is inherently an area that requires collective action, most of the governance instruments fail in integrating all the relevant actors into the governance process. As a result, the governance mix is largely based in old-fashioned hierarchical modes of governance featured by command-and-control instruments animated by mechanisms of control and punishment. In those cases where a regulatory task is divided between public and private authority, the role of private actors is reduced to public goods suppliers, meaning that policy targets and contributions are decided by public authority and implementation is outsourced to private actors. Moreover, most instruments emphasize the enforcement side of governance, leaving out the compliance side. Thereby

existing policy arrangements do not emphasize the participatory dimension of governance, which limits the range and scope of actors' involvement and, as a result, actors may experience a lack of commitment and little motivation to comply.

5. Discussion: The Potential of ECAs

The results of instrumentation analysis provide insights into how the present system of externalities governance in shipping is functioning, what the generic and specific mechanisms that enable more environmental quality in shipping are, as well as allowing for speculating on how change can be brought about in the governance of shipping externalities. Whereas instruments vary in scope and form, they do not account for the inherent polycentricity of shipping, as little or no links exist between different instruments to coordinate their effects and create synergies between different types of arrangements. For example, the demand of the IMO to adhere to such a technical parameter as a double-hull requires classification societies to inspect a vessel and notify the fact of a double-hull, which can thereafter be monitored by port authorities during a PSC inspection. A different example - the demand of cargo-owners to transport their goods with a vessel that adheres to environmental quality standards - requires vessel-owners to be able to present the corresponding documentation from classification society, which, however, informs only on upholding the minimum standards, but also from ISO certification or even private certification schemes, such as Clean Shipping Index, which can notify environmental performance beyond regulatory requirements. Finally, a demand of coastal communities to diminish air pollution from vessels in harbours requires ports to provide vessels with shore-side electricity, which will allow the abolishing of energy-generation onboard, thus reducing air emissions. This means that improvement of inter- and intra-level coordination (e.g., through proliferation of maritime networks) is a precondition for comprehensive development of shipping externalities governance.

The integration of relevant stakeholders, based on strengthening the existing formal and informal maritime networks and their inclusion into the governance process, thus seems to be one of the key solutions to effective governance of shipping externalities. The Baltic ECA can be expected to shift the monocentric features of the existing governance structure towards recognition of other decision-making centres, thereby creating new processes, new linkages and new responsibilities. The emission reduction policies have been anticipated by the maritime industry by active partaking in the discussion on how the new ECA standards can be met. Below are two examples of how activation of public discussion around the Baltic ECA infused change in the balance of power among the industry's stakeholders.

Firstly, the Baltic ports recently seem to have realised their potential in the emission mitigation process, which will subsequently shift their role in the governance process (Gritsenko and Yliskylä-Peuralahti, 2013). On the one hand, ports are involved in the creation of a compliance-friendly infrastructure to help shipping meet the new operational requirements (e.g.,

shore-side electricity, availability of compliant fuels, reception of SCR waste). On the other hand, ports seek to raise their own environmental profiles and the attractiveness of shipping as an environmentally-friendly mode of transport by acting as environmental pioneers and leaders of change, welcoming new technology and giving incentives for compliance (e.g., reduction on port duties). Thus, the establishment of a new ECA can be seen as a motivator to re-consider and re-negotiate the roles of certain actors in the governance process.

Secondly, the shipping companies operating in the BSR have been anchoring the new ECA requirements in their corporate social responsibility (CSR) policies. Cutting air emissions before the new regulation came into force has become a part of the corporate responsibility profile of e.g., Maersk and Wallenius Wilhelmsen, which emphasized their willingness to contribute to the development of sustainable supply chains (Yliskylä - Peuralahti and Gritsenko, 2014). However, CSR is not limited to emission mitigation, and has the potential to improve the connections between the actors within the maritime industry as well as within the supply chains by bringing more transparency and accountability into shipping operations. CSR can be seen as a substantially new way of approaching the externalities problem and the establishment of ECAs can prompt consolidation of CSR implementation in these areas.

Eventually, ECAs can strengthen the spatial element in shipping externalities governance. Whereas shipping is usually regarded as a globalized industry that requires overarching global solutions, most types of pollution from maritime shipping are embedded in a certain time and space and their negative shipping externalities are subject to spatial and temporal variability. Thus, the instrument of ECAs recognises local potential to deal with adverse impacts from shipping, despite the trans-boundary nature of air emissions, which do not respect administrative borders.

6. Conclusion

Contemporary shipping lacks a governance system that would recognise that shipping quality governance is an inherently polycentric endeavor and no actor on its own can ensure that external cost is not passed onto the third parties. The central problem of the current global architecture for shipping governance is its focus on public hierarchical forms of governance, neglecting the ever-growing multi-actor engagement. The *de facto* existing links connecting the private and public forms of governance are not institutionalised and do not provide credible future commitments for any of the governing actors. The attempts to enhance compliance of vessels by introducing complex monitoring and inspection procedures led by the state authorities, regional attempts to create a "trend" for clean/green shipping within the maritime industry, as well as self-regulatory schemes developed within the maritime industry remained largely disintegrated. The important producers of public goods associated with quality in shipping, for example, the coastal states, ports and shippers, are not adequately integrated into the governance system.

Since the existing governance does not adequately mirror the interactive and polycentric processes underlying real-life maritime activities, the inadequate outcomes in the struggle for quality shipping are not surprising. Yet, the broad variety of instruments aimed at governing the external cost from shipping indicates a salience among the actors that the issue requires systematic attention. In this situation the instrument of ECAs has a potential to aid coordination problems as it puts emphasis upon the existence of local solutions and reveals problem-solving potential concentrated within the maritime networks in the ECA regions.

The proliferation of ECAs can create a precedent for revisions in the current governance system, as their demanding requirements underline the fact that the problems of shipping externalities require collective action and without cooperation between ship owners, ports, shippers, authorities, technology suppliers and other maritime actors conditions necessary for meeting the ECA standards cannot be established

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