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Article

Maritime Policy Design Framework with ESG Performance Approach: Case of Estonia

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Abstract: In policy-making, the design of a policy is considered to be one of the most significant steps. A well designed policy will be able to solve sectoral problems across stakeholders as well as support the competitive development of the entire economy. Enterprises of the maritime sector have been influenced by environmental, social, and governance (ESG) changes with the push coming from financiers, insurers, regulators, and customers. To meet the ESG challenges and utilize the benefits ahead, they need to be addressed in the new policy design processes. The specificities of a maritime sector as well as science-based policy-making framework are the fundamentals of successful maritime policy development. Estonia is located on the eastern border of the EU, and has always aimed to be a maritime state. National maritime policy has been adopted (2012–2020) and currently, the Estonian Transport and Mobility Master Plan incorporates maritime aspects. Actors of the maritime sector have remained dissatisfied and advocate the reinstatement and redevelopment of Estonian maritime policy. The aim of this study was to present a framework for the design of maritime policy that uses maritime economics, ESG performance goals, and policy design analyses as inputs. As a result, a maritime policy design framework is proposed.

Keywords: policy design; maritime policy; ESG concept; policy framework



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1. Introduction

Sustainable development with environmental, social, and governance (ESG) aspects has become increasingly important (Egorova et al. 2021), and societies need to be able to adapt to these changes. This requires a joint effort by stakeholders including policy makers, actors from public and private sectors, economic experts, scientists, etc., so that the economic environment can remain competitive (Bochenski et al. 2021). A dynamic and forward-looking policy process plays an important role in creating that environment. Over the years, different theoretical and practical approaches in policy formulation have been developed (e.g., rational model, incremental model, policy output analysis, political system theory, group model, and elite model, etc.) (OECD 2013; Nisa et al. 2021). Given the rapid changes and increasing demands in the ESG aspects in the maritime field (Lee et al. 2019; Koilo 2019; Woo et al. 2018; Lee and Lam 2017), there is a need for a new approach for a policy design framework. This study presents a framework to the policy design process in the maritime sector.

The maritime sector includes shipping, shipbuilding, ports, and fisheries as key maritime activities, and additional activities such as offshore energy, coastal and maritime tourism, etc. (EC 2007). In line with the concept of sustainability, the integration of ESG aspects into policy-making should also consider all areas of the blue economy in the maritime sector. The European Union (EU) has defined the blue economy's sectors as (1) marine-based activities (such as marine living resources, marine minerals, marine renewable energy, desalination, maritime transport, and coastal tourism), and (2) marine-related activities (such as seafood processing, biotechnology, shipbuilding and repair, port

activities, technology and equipment, digital services, etc.) (EC 2021). The EU's Integrated Maritime Policy was launched in 2007 with the invitation to the Member States to draw up national integrated maritime policies following a set of guidelines proposed by the European Commission (EC).

In recent years, the ESG aspects have drawn the attention of policy makers, especially in sustainable finance, to align with social and environmental-related objectives (OECD 2021). Although sustainable development has been one of the key priorities for policy-making for decades, its integration into local policy-making has remained somewhat deficient, as there are no specific requirements at the EU level in relation to the indicators that can be included in policy-making (Camilleri 2015; dos Santos and Pereira 2022). The changes in the ESG sphere have forced stakeholders in different fields (i.e., banking, insurance, investors, customers etc.) to take these aspects into account when making strategic choices. The same has happened in maritime sector—the maritime industry has been increasingly forced to understand the environmental and social consequences of their activities (Lee et al. 2019; Koilo 2019; Lee and Lam 2017). As the maritime sector is a high capital investment industry, the companies' ESG profile may be crucial for investors in making investment decisions. The strong implementation of the ESG concept has become one of the key aspects for strengthening competitiveness, both at the company and regional level. In order to strengthen the macroeconomic competitiveness of the region, it is necessary to integrate the ESG concept into local policy-making.

Estonia, a country located on the eastern border of the EU by the Baltic Sea, adopted its national maritime policy based on EU guidelines in 2012 after consultation with stakeholders in the maritime sector (Ministry of Economic Affairs and Communications 2012a). After the end of the policy implementation period in 2020, several representatives of the Estonian maritime sector including seafarers, were still dissatisfied with the sector's situation in Estonia and the results of the policy implementation. Currently, the concept of maritime transport policy is annexed to the Estonian Transport and Mobility Master Plan 2021–2035, but the maritime sector advocates the reinstatement of Estonian maritime policy.

The development of a new autonomous Estonian maritime policy should be based on a systemic policy-making framework. The aim of this study was to present a framework for the design of maritime policy with a focus on ESG compliance and maritime economics. In order to develop this framework, the study analyzed the Estonian maritime policy 2012–2020 as a case study. The study resulted in the maritime policy design framework, which can be used as a basis for policy design in the maritime sector, taking into account the ESG concept. The study is an important step in designing successful policies in the maritime sector and thereby contribute to the sustainable development of the maritime economy. The results of this work can be used for the further development of frameworks for the next steps in the maritime policy-making cycle.

2. Background

2.1. The Concept of Maritime Policy Design

A maritime state should be able to optimally utilize its potential resources including natural, human, political, and cultural resources as well as potential from a strategic geopolitical environment (Rochwulaningsih et al. 2019). Achieving this will require consistent cooperation between maritime actors (Bochenski et al. 2021) that should be based on a new approach to a policy-making framework.

In different maritime policy analyses, authors have used a variety of approaches in defining the concept of maritime policy. Braid (2005) reviewed Scotland's maritime policy and defined maritime policy as decisions covered by resources that could influence the development of maritime activities. The author stated that maritime policy is usually an outcome of different public policies, and societal, economic, defense, and other interests. Al-Bisher et al. (2012) studied the concept of integrated national maritime policy and its application to Saudi Arabia, and explained the concept as a constellation of interrelated ideas. According to Al-Bisher et al. (2012), the main aim of an integrated maritime policy is

“to integrate strategic, security, economic and environmental factors in order to deal more effectively with maritime problems and opportunities by a systemic change in the thinking behind maritime governance”. [Bochenski et al. \(2021\)](#) studied the development of major seaports in the context of national maritime policy in Poland and viewed maritime policy as a component of economic policy that enables state authorities to identify major development goals and find measures to achieve them. [Kivalov \(2021\)](#) studied Ukrainian maritime policy and defined maritime policy as program documents such as maritime doctrines and strategies that consolidate the main streams of the development of the maritime sector. Despite the different approaches, the word ‘policy’ means i.a. a definite course of action with a clear statement of directions including discussions over the pros and cons of solutions to the problems to allow policy-makers to decide on the best way forward. A policy should lead to an outcome being dynamic at the same time to adapt to changing circumstances ([EU 2017](#); [Northern Ireland Executive 2016](#)).

The maritime sector is a unique sector that differs from other economic sectors in many ways. Different authors have identified the specificities of the maritime sector that affect maritime policy-making and are important in shaping the policy design framework. These specificities include ([Braid 2005](#); [Al-Bisher et al. 2012](#); [Van de Voorde and Verhoeven 2016](#); [Bochenski et al. 2021](#); [Kivalov 2021](#)):

- The maritime sector is interdisciplinary, covering a wide range of sectors including public service, science, economics, technology, sociology, etc., which makes policy-making influenced by the interests of different sectors;
- The maritime sector’s solutions should balance the aspects of environmental, economic, social, and governance dimensions, and conflicting interests of the stakeholders;
- The implementation of the maritime cluster concept has an important role in increasing the competitiveness of the maritime sector, thus, the policy should support it through various initiatives;
- The maritime sector includes not only industry, services, and goods but also the living environment of people in coastal areas, the cultural heritage, and historical traditions;
- The maritime sector is a strictly regulated area, both nationally and internationally;
- Activities in the maritime sector are managed not only by public administrations but also by supranational organizations such as the EC, International Maritime Organization, United Nations, etc.;
- The maritime sector has an international dimension that is sometimes in conflict with national interests;
- The maritime sector has an impact on the surrounding area, especially the geographically concentrated area around ports, which makes regional development goals and also impacts an important part of policy-making;
- Marine resources generally belong to the public so their management is the responsibility of governmental entities rather than private entrepreneurs; and
- In the EU, the EU rules must be taken into account when planning maritime activities to ensure any possible support from the EU.

The maritime sector uses long-term and large-scale investments such as shipbuilding or port construction. In theory, a five-step model is usually used to describe the policy-making process in any sector (Figure 1) ([Howlett and Giest 2015](#)). The first step is agenda setting, where problems are defined and possible solutions are suggested. The second step is policy formulation, where options are analyzed from different perspectives and possible solutions are selected. As a third step of policy-making, a final formal policy of actions are compiled and preferred solutions are selected by the decision makers. The fourth step is the implementation of a policy that means the implementation of the developed operational program by various parties. The last step is policy evaluation or maintaining the policy, which includes monitoring the results and deciding the necessary next steps (e.g., implementing changes, developing a new policy, etc.) ([Howlett and Giest 2015](#)). According to policy analysis, the first steps that include designing the policy are the most important in a successful policy-making process ([Walker 2000](#)). The same policy-making cycle can be

applied to maritime policy-making, but given the specificities of the maritime sector, the content of each step could be adapted.

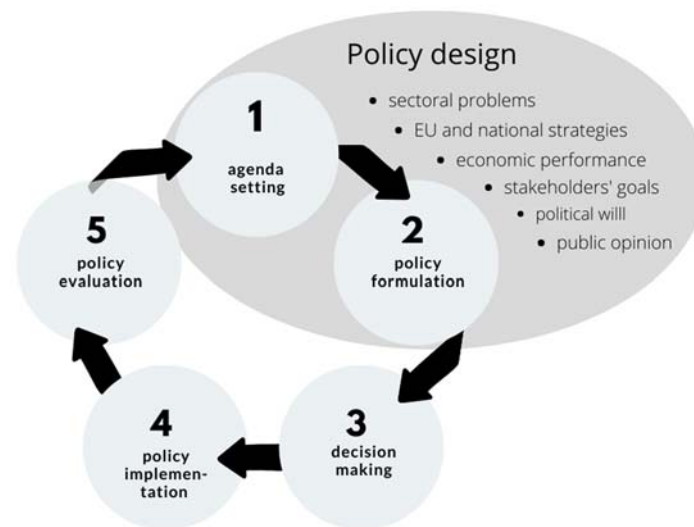


Figure 1. Policy design in the policy-making cycle with main inputs (Adapted from (EU 2017); modified by the authors).

Policy-making can be problem-oriented as well as goal-oriented. In a problem-oriented approach, the focus of the policy design is on the persistence of the problem (Bali et al. 2019). Policy design seeks to create different alternatives to policy actions in order to solve identified problems (Howlett 2014). In policy design, the need for policy-making arises when defining and negotiating a problem and different alternatives for addressing it (Haelg et al. 2019). The effectiveness of policy implementation often depends on the accuracy of the problem definition (Walker 2000). Therefore, the effectiveness of the policy results should be the basis of any design (Bali et al. 2019).

The purpose of a policy design is to find alternative combinations from various policy elements that would be the most effective in solving problems and achieving policy objectives (Howlett 2014). There are different policy elements to incorporate (e.g., problems, goals and aims, policy means, tools and instruments) (Howlett 2014; Howlett and Cashore 2009). Policy goals and aims mean what the policy seeks to achieve, and policy means, tools, and instruments are ways that help achieve these goals (Haelg et al. 2019). Analyzing potential policy elements and their impacts on the policy implementation phase is a crucial step in policy design (Howlett 2014). From potential solutions developed during policy design, policy makers choose a complex package to be implemented as policies.

2.2. Expectations on Sustainability

Sustainability has become increasingly important both at the global level and a number of sustainability agreements have been approved internationally. The United Nations Sustainability Development Goals (SDGs) were set in the context of the 2030 Agenda for Sustainable Development (UN 2022). In this document, 17 SDGs were defined addressing the global challenges for sustainable development. Reductions in emissions to limit the global temperature rise to 1.5 °C was agreed at the United Nations Climate Change Conference in 2021 (COP26) (UK Government 2021). The European Commission has proposed cutting greenhouse gas emissions by at least 55% by 2030 in order to become climate neutral by 2050 (EC 2022). All this means that additional regulations for economic activities to cut greenhouse gas emissions and create green jobs are required.

The ESG concept is one of the modern methods of evaluating a company's sustainability aspects through ESG performance indicators (dos Santos and Pereira 2022). The concept can also be used as input for policy-making in order to achieve environmental goals, increase social values, and maintain high quality governance. The ESG topic is at an

early development stage (dos Santos and Pereira 2022) and there are no specific requirements for the ESG performance indicators at the EU level (Camilleri 2015; dos Santos and Pereira 2022). The concept is strongly rooted in the financial and banking sector in decision-making and strategic planning. In these sectors, companies are encouraged to only make investment decisions after fully considering all factors related to the ESG (Tan and Zhu 2022; Egorova et al. 2021; dos Santos and Pereira 2022). The ESG aspects of management have a positive impact on a company's value and competitiveness (Egorova et al. 2021).

The ESG aspects also influence the activities of the maritime sector (Lee et al. 2019; Koilo 2019; Woo et al. 2018; Lee and Lam 2017), but the implementation of the concept is rather deficient (dos Santos and Pereira 2022). Out of the three, environmental and social aspects have received the most attention in policy-making as well as in the literature (Lee et al. 2019). Over the past 30 years, international bodies have paid great attention to the impact of the maritime sector on the environment and provided a number of regulations to protect it (Koilo 2019; Woo et al. 2018; Lee et al. 2019). Due to the proximity of ports and other maritime related services to cities and residential areas, the social aspect has also become a major point of policy focus (Lee et al. 2019). In addition, as the governance of maritime industry, especially seaports, have also gone through major transformations over the past decades (Lee and Lam 2017), the governance aspects also need more attention in policy-making. Therefore, there is an opportunity in policy-making to increase the competitiveness of both companies and the economic sector through the implementation of ESG criteria in strategic decision-making, taking into account the existing regulations and requirements.

The ESG concept recommends companies develop and implement management methods and tools that allow them to measure ESG performance goals (Egorova et al. 2021). For example, the Norwegian Shipowners' Association has published guidelines for ESG reporting in the shipping and offshore industries (Norwegian Shipowners' Association 2021) with proposed indicators to measure the performance of operating in the field. The guidelines suggest that the ESG report should be included in the annual report and additional information can be provided on the company's website. dos Santos and Pereira (2022) proposed a method to quantify the ESG performances of international ports including over 20 metrics to evaluate the ESG score for ports. A similar ESG performance indicator system should be included in the development of any maritime policy, as it concentrates on environmental, social, and governance issues as wide-ranging goals, and at the same time, focuses on local regional issues.

3. Materials and Methods

This study was based on the research of policy design and document review of Estonian maritime policy. The work was divided into three stages: (1) data and information collection; (2) literature review; and (3) development of the policy design framework. In the first stage, the most relevant contributions from the literature about policy design and the ESG concept were gathered. Both theoretical works from the scientific literature related to policy-making and policy design and ESG concept, and practical recommendations from the EU and other institutions were used as background information. The stakeholders' views were mapped using publicly available sources. Information was collected from the databases of scientific journals and from the official websites of the EU institutions, and it was summarized and analyzed systematically according to the policy design features. As a result, the possible steps and elements of the policy design framework and their content were shaped. In addition, input was collected related to the case study. Publicly available information was collected from the Estonian e-consultation system and from the websites of the institutions.

The analysis of the gathered documents and the case study was carried out. The prepared initial stages and elements of policy design were compared with those contained in the Estonian maritime policy 2012–2020. The structure and content of the Estonian maritime policy were analyzed based on the main document as well as additional materials (explanatory statement, material for approval, operational program, etc.). The results of the analysis were compared with the theoretical information of policy design, the ESG concept, and the recommendations of the EU institutions.

As a final step, a concept for maritime policy design framework was developed based on the background, the practical recommendations, and the example of the Estonian maritime policy. This policy design framework includes the main elements from the generally used policy-making cycle, adding different components from policy design and ESG theory and maritime sector specificities. The ESG indicators proposed in this study were based on the UN SDGs and background research. Connecting the design concept to the ESG concept ensures that policy design framework is linked to changes in the global economy and frames the overall policy design.

This paper contributes to the body of literature of maritime policy design and implementation of the ESG concept in the maritime sector. The results contribute to the body of literature of maritime policy design in two ways. First, the study contributes on relations between steps of the generally used policy-making cycle and detailed overview of the policy formulation process, and second, by proposing a more precise framework with steps and indicators for maritime policy design. The results also contribute to the implementation of the ESG concept in the maritime sector with the suggestion of ESG performance indicators to evaluate the contribution of the policy to the ESG goals.

4. Results

4.1. Case Study: The Estonian Maritime Policy

The EU's Integrated Maritime Policy launched by the European Commission (EC) in 2007 invited Member States to draw up national integrated maritime policies following a set of guidelines. The EC encouraged Member States to establish their own integrated national maritime policies, create internal coordinating structures for a governance framework, allow all maritime stakeholders to participate in the policy-making process, develop cross-border coordination, and share information between Member States (EC 2007). Estonia, a country located on the eastern border of the EU by the Baltic Sea, was one of the Member States who followed the recommendation.

The role of maritime transport in Estonia's economic growth and competitiveness is significant. In 2019, Estonian companies, whose main activity was directly related to maritime sector, had more than 6700 employees and a total turnover of more than €1.2 billion (Estonian e-Business Register 2021). Estonian ports play an important role in the north–south and east–west transit corridors of the EU. In terms of total seaborne goods, Estonia ranked 19th in Europe in 2020 (Eurostat 2021a). Estonia's largest seaport, the Port of Tallinn was, in 2020, the 28th largest port in Europe in terms of gross weight of goods, which accounted for ca. 21.2 million tons (19.6 million in 2019) (Eurostat 2021b), and the 8th largest port in Europe in terms of passengers embarked and disembarked in the port accounted for ca. 4.3 million passengers in 2020 (10 million in 2019) (Eurostat 2021c). The number of active companies and added value per employee of the Estonian maritime sector in 2012–2019 are presented in the following figure (Figure 2).

The official process of the development of the Estonian maritime policy that took into account the EU guidelines lasted from 2009 to 2012. The main goal of the policy was to use and maintain Estonia's marine resources as much as possible and contribute to the development of the maritime sector. The specific activities of the policy aimed to support the development of maritime businesses, improve the safety of shipping and other maritime activities, and protect the marine and coastal environment and cultural heritage (Ministry of Economic Affairs and Communications 2012a). The policy claims to have the maritime issues and their solutions closely interlinked and addressed in a coordinated

manner. In addition, the document included the indication that the EC's Communication on the Integrated Maritime Policy for the EU was also taken into account in the policy-making process (Ministry of Economic Affairs and Communications 2012b). Elements of the Estonian maritime policy document is shown in the following figure (Figure 3).

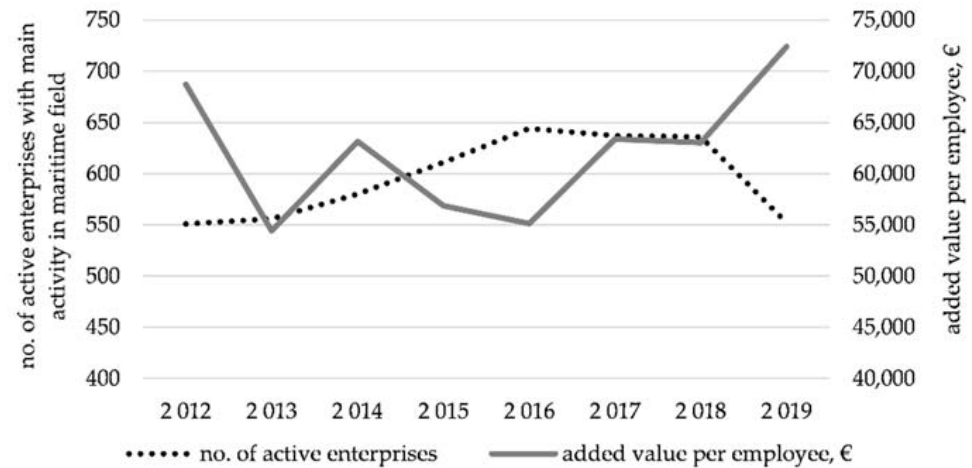


Figure 2. The number of active companies and added value per employee of the Estonian maritime sector in 2012–2019 (Estonian e-Business Register 2021, created by the authors).

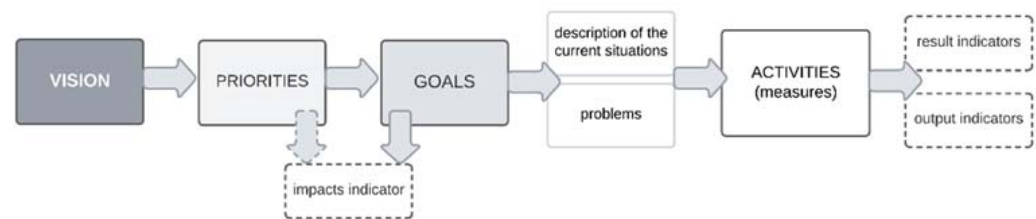


Figure 3. Elements of the Estonian maritime policy 2012–2020 (based on Ministry of Economic Affairs and Communications (2012a), created by the authors).

The policy included ambitious priorities, which covered aspects related to the whole sector. For example, the first priority was that the entrepreneurship environment in the marine sector should be entrepreneur-friendly and competitive at the international level. The objectives were also comprehensive and provided a relatively misleading impression that achieving the objectives would guarantee achieving the priorities. The detailed activities under the objectives included specific problems that the policy actually addressed. The document missed an analysis on how the implementation of the quite narrow activities would achieve both the objectives and the priorities.

The policy included different sets of indicators: impact indicators; result indicators; and output indicators. Impact indicators evaluated the effect of priority or objectives. This indicator was the broadest. The policy used result indicators as a description of quantitatively measurable results for policy activities (e.g., turnover growth, value added, number of cargo ships, etc.). Output indicators were also set to assess the implementation of activities (e.g., analysis has been carried out, a situation has been reviewed, contracts have been concluded, a concept has been developed, etc.). The indicator system was unevenly defined, and not all priorities and objectives were covered with indicators, which made the evaluation of the effectiveness of policy more complicated, and could give the stakeholders misleading hope for the overall improvement.

The EU has placed a maritime cluster concept at the center of the EU's integrated maritime policy (EC 2007). According to the EU, the integration of the maritime cluster concept into the national maritime policies is one of the most important instruments (EC 2007). Although there is currently no coherent approach in applying the maritime

cluster concept into the policy-making process, linking the concept to policy-making helps to achieve strategic development goals (Nõmmela and Kaare 2021). The Estonian maritime policy also contained a chapter on a cluster-based approach to maritime affairs, but there was no understanding on how the cluster concept was taken into account in setting priorities, goals, or activities. There was also no overview of the interrelationships among problems, which would provide an idea of how the situation of the sector will improve if the goals are met.

One of the major shortcomings of the policy document is the lack of impact analysis of objectives and activities in relation to other areas and alternative sectors and transport modes. Although the document contained a chapter on links with other national development plans, it mainly included a list of other sectoral development strategies. As a result, a number of activities were not fully implemented due to a lack of agreement between government agencies from different sectors. In addition, although the policy operational program had some changes during the implementation period including cancelling some activities as well as adding new activities, the general directions were not changed during the period. However, given the changing international situation during the implementation period (e.g., the change in Russian transit services after 2014), the policy should have been more dynamic, taking into account of changing circumstances and adapting to these changes (EU 2017).

4.2. The Maritime Policy Design Framework

The maritime policy design framework proposed in this work is based on a problem-oriented approach to policy-making, which means that the definition of a precise problem is at the center of successful policy design (Bali et al. 2019). The more precisely the problems are defined, the more accurately it is possible to design goals and solutions. The key elements of the proposed framework are commonly used policy-making steps, but with an emphasis on sequence and content related to the specificities of the maritime sector. These elements are problems, goals, solutions, performance indicators, and assessment (Figure 4). The framework proposes to evaluate all elements with assessment indicators to measure the overall effectiveness of policy design. The ESG indicators are used as an input to show the performance of the maritime sector in the ESG areas. The same indicators are also used as an output to clarify the compliance of the designed policy to the ESG criteria.

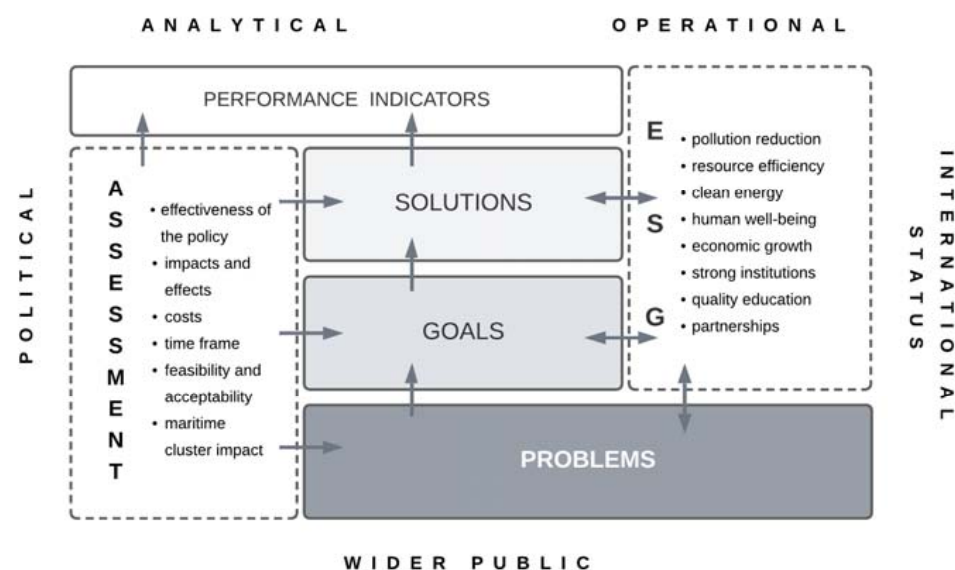


Figure 4. The maritime policy design framework (created by the authors).

The maritime policy design framework includes the following steps:

1. Define problems: All stakeholders of the maritime sector must be involved in defining the problems including those operating in other fields but whose activities are maritime related (e.g., financial institutions, insurance companies, etc.). The problems should be divided into what can and cannot be solved by the policy taking into account a particular maritime legal system and requirements of supranational organizations. Problems that can be solved by the policy should then be distributed into what is known how to solve, and what is not known how to solve, involving research and development institutions to interlink cross-sectoral problems. The ESG indicators could be used to evaluate the maritime sector performance to the ESG criteria, which helps to balance environmental, economic, social, and governance dimensions of the problems. The ESG indicators proposed in this study are described below and are shown in Figure 4 and Table 1;
2. Design goals: The second step is to design goals (i.e., what could be the situation in the sector after the policy implementation period has ended). Goals should take into account the interdisciplinarity of the sector and its impact on non-economic aspects of the sector such as the coastal living environment, cultural heritage, maritime historical traditions, etc., and also the international dimension. The goals should also follow the objectives of the ESG concept and the UN SDGs;
3. Design solutions: Solutions should be based on the potential direct and indirect effects of the maritime sector's developments in different areas, particularly environmental, social, and economic. The possible impact of the solutions in geographically concentrated areas should also be taken into account considering the regional development goals. The capacity and content of the investment program is also important in selecting solutions resulting from the characteristic of maritime investments. The solutions should also follow the ESG criteria, as this helps to monitor the potential impact of solutions on the ESG areas. All alternatives that have the potential to solve problems should be considered when defining solutions;
4. Set performance indicators: Performance indicators should be selected according to the level of designed goals; they should not go beyond or diminish the objectives, otherwise the measurement of the policy effectiveness will be distorted. Indicators should be able to accurately measure the achievement of the goals over the policy implementation period. This means setting measurable quantitative or qualitative performance indicators. The system of indicators should be redesigned as part of the design of each policy as indicators need to be directly linked to the goals designed in the current policy; and
5. Assessment of policy design: The last step of policy design is the assessment of the designed policy. The assessment should evaluate whether the policy addresses the problems sufficiently and is able to achieve goals. The assessment indicators proposed in this study are described below and are shown in Figure 2.

The ESG concept is influencing maritime enterprises worldwide and these issues will not fade in the near future. Therefore, it has the strong potential to be a consistent framework for policy design. As the performance of the ESG is assessed by different actors with different metrics (Camilleri 2015; Huber and Comstock 2017; dos Santos and Pereira 2022), a common measurement system should be developed as a basis for maritime policy. This system should be linked to the UN SDGs. This study proposes a list of topics and metrics as measurement indicators for policy design in the maritime sector (as shown in Table 1 with the assessment of the Estonian maritime policy priorities' contribution to the indicators, adapted from the research).

Table 1. Estonian maritime policy 2012–2020 priorities contribute (grid), contribute partially (horizontal), no contribution (dark grey), does not contribute, and not applicable (white) to the ESG indicators proposed in this work.

Group	Goals	Metrics	Priorities of Estonian Maritime Policy ¹				
			1	2	3	4	5
Environmental	Pollution reduction	Air pollutants management					
		Waste management					
	Resource efficiency	Energy consumption					
		Upgrading infrastructure					
	Clean energy	Renewable energy solutions					
		Clean energy research and technology					
Social	Human well-being	Jobs creation					
		Work conditions					
		Labor rights					
		Safety and security					
	Economic growth	Technological upgrading and innovation					
		Supported entrepreneurship					
		Supported access to financial services					
Governance	Strong institutions	Financial performance					
		Operational performance					
		Supported local and foreign investments					
		Ethics and corruption					
	Quality education	R&D					
	Partnerships	Career development					
		Local and international connectivity					

¹ Priority 1—Entrepreneurship environment in the marine sector is entrepreneur-friendly and competitive at the international level; priority 2—Maritime sector is safe, secure, and contributes to diminished environmental pollution load; priority 3—Public sector activities support the development of the marine sector; priority 4—Maritime education, R&D activities meet the contemporary level requirements; priority 5—Coastal life and visiting environment are attractive and facilitate maritime tourism and the development of local entrepreneurship and passing the maritime sector's cultural heritage to coming generations.

The policy design effectiveness assessment should indicate the quality criteria for final policy decisions by the policy-makers. The assessment should evaluate the main elements of the designed policy and include at least the following dimensions (Klaus et al. 2019, modified by the authors):

- Effectiveness of the policy;
- Impacts and effects;
- Costs;
- Time frame;
- Feasibility and acceptability; and
- Maritime cluster impact.

The effectiveness shows how well the policy addresses the problems and which changes occur compared to the initial situation and the achievable situation. The impact analysis clarifies what the effects of the policy are for different aspects of the stakeholders including different interests. Under effects, both the intentional effects and unintended effects should be explained. The financial costs and cost-effectiveness of the policy including hidden costs also need to be identified. It is also necessary to assess whether the policy can be implemented within the set timeframe, and whether it is technically and operationally feasible and acceptable for the stakeholders. Finally, the designed policy

should be assessed based on the potential impact of maritime cluster to policy areas and the economic development of a region. In order to evaluate this impact, the maritime cluster impact index (Nömmela and Kõrbe Kaare 2022) can be used. The index is a tool for policy-makers with validated and comparable data on how a maritime cluster affects the strategic performance of a region in selected policy areas, and how policies can guide the development of a maritime cluster (Nömmela and Kõrbe Kaare 2022). The input–output model of the framework is shown in Figure 5.

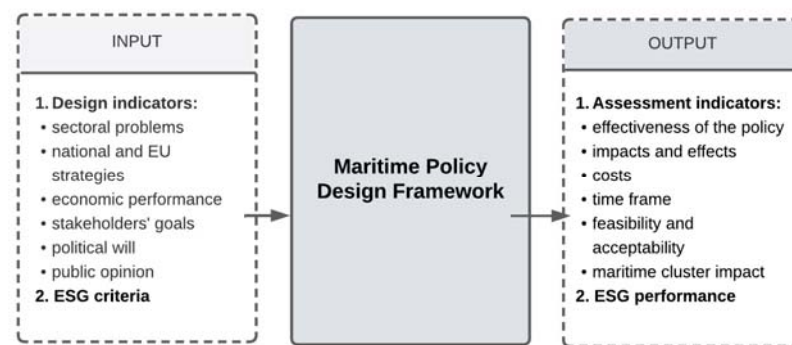


Figure 5. Input–output model of the maritime policy design framework (created by the authors).

The policy design framework was based on five pillars: analytical, operational, political, wider local public, and international status. This means that all steps of policy design should be analyzed in each of the five pillars. This part does not differ from any other sector's policy design concept, but validates the need to implement this step, as the context of the pillars are fundamental in the maritime sector. The analytical pillar means that each step should be based on qualitative and sound evidence. There is a consensus among various authors that successful policy-making should be evidence-based (Kano and Hayashi 2021; Bochenki et al. 2021; Northern Ireland Executive 2016), therefore, it is important that each policy design step is analyzed based on high-quality information. In the maritime sector, the availability of detailed reliable information could be a major concern for policy-makers as well as for researchers. Official statistical sources only usually provide aggregated information about regional developments in the maritime sector, and little is known about the situation of shipping companies, port operators, and other maritime actors. Company-based information is only available on the basis of nationally mandatory annual reports, but other information is generally sensitive (Marzano et al. 2020; Ben-Akiva et al. 2016). Although the collection of reliable data is time consuming (e.g., through interviews and surveys) and thus prevents effective policy-making (Marzano et al. 2020), this pillar is fundamental for successful maritime policy design.

The operational pillar ensures that the policy takes into account the capacity and resources of public authorities and private sector to implement the policy. As focused and independent public administration is crucial for successful maritime policy design (Braid 2005; Kivalov 2021), the analysis of the design operational pillar helps to ensure this. The operational pillar includes administrative, financial, technological, and legal capacity, and the level of knowledge and skills of the public and private sectors. In addition, the operational pillar can be analyzed at three levels: individual (institution or company), organizational (public or economic sector), and systemic (the entire region or country) (Wu et al. 2017). In the maritime sector, there are often core companies around which other smaller companies are concentrated. In this case, the operational capability must be assessed both within the group and individually.

In the maritime sector, the marine resources are generally in the public domain and the management is the responsibility of governmental entities rather than private entrepreneurs (Al-Bisher et al. 2012). The maritime sector is a traditional industry that operates in a coastal country without major interventions, but each economic field often needs a policy intervention to overcome challenges, especially in light of strict environmental

requirements. Additionally, as the maritime sector is governed not only by national but also by supranational organizations (Braid 2005), the political aspect is vital for successful policy design. In the political pillar, the policy-makers should analyze and evaluate the design from the perspective of the political situation in a country. In the maritime sector, the lack of political interest can be a major obstacle in policy implementation.

People living in coastal areas are commonly included in maritime sector economic development. In addition to the employment in the sector, traditions and practices in coastal areas make up an important part of the maritime sector's welfare. Therefore, maritime policy has the ability to connect the coastal and maritime area to national needs (Al-Bisher et al. 2012). A successful policy design should always include a wider public pillar with an analysis of perspectives of coastal habitants and their living conditions in a country or a region. Coastal residents should be involved in policy-making given that they are directly or indirectly involved in potential outcomes.

Taking into account that the maritime sector is an international economic field, as the last pillar, a policy design should analyze the steps from the perspective of an international status. As the world's seas are open to all, the maritime sector is governed by international laws and conventions (Bochenski et al. 2021), which must also be taken into account in local policy-making. In the EU, the EU Structural Funds can also have an important influence on policy design (Van de Voorde and Verhoeven 2016; Northern Ireland Executive 2016). In addition, the geopolitical environment should also be analyzed when designing a policy. Unlocking geopolitical potential is essential for a strong maritime state (Rochwulaningsih et al. 2019). The following table (Table 2) indicates the proposed maritime policy design framework and shows some examples of the possible content.

Table 2. The maritime policy design framework with examples of content.

Environmental, Social, and Governance (ESG)						
Environmental, Social, and Governance (ESG)		Analytical	Operational	Political	Wider Public	International Status
	Element	Examples of content				
	Problems	Extent of the problem	What are the origin and causes? What are the links of the problem? How is the compliance to ESG criteria?			
	Goals	accessibility; forecast	How are the goals achievable? What needs to be done to achieve the goals? What are the implications of achieving the goals?			
	Solutions	input to solution development	What are the requirements for implementing? What are the obstacles to implementing?			
	Performance indicators	accessibility; forecast	How can the achievement of indicators be supported?			
	Assessment	effectiveness of the policy; impacts and effects; costs; time frame; feasibility and acceptability; maritime cluster impact				

The policy design framework suggests following the concept of a maritime cluster when defining problems and designing policy goals. All members of a maritime cluster, not just those in maritime sector, should be involved in the policy design process. While the sectoral approach takes into account only the actors in the sector, the cluster approach includes all stakeholders whose activities are related to the sector. These stakeholders mainly include government agencies; shipping companies with partners; ports, cargo handling and shipbuilding companies; academic institutions; local governments; local communities and environmental groups; trade unions; citizens; and media (Branten and Purju 2014). The cluster approach makes it possible to identify sectoral problems and find solutions more effectively as it covers all possible influencing factors (Nömmela and Kaare 2021).

5. Conclusions

The present study examined the concept of policy design in the policy-making cycle and the expectations on sustainability areas in the maritime sector. The increased global focus on environmental, social, and governmental aspect in a well-designed maritime policy process is an effective tool to implement internationally adopted sustainability goals and enhance business development. This study proposed a framework for maritime policy design and explored the integration of ESG criteria in the policy design process by analyzing the Estonian maritime policy 2012–2020 as an example.

This research studied steps of a commonly used policy design process based on a literature review with a focus on sequence and content related to the specificities of the maritime sector. The latter were explained by emphasizing the sector's interdisciplinary and international dimension, the importance of the maritime cluster concept, the strict regulation of the sector, and governmental responsibility, etc. The proposed framework offers policy-makers guidance through the maritime specificities in each step when designing a policy.

The proposed framework is linked to the ESG concept in the maritime sector and the UN SDGs in order to guide the compliance of the designed policy to the ESG criteria. The study presents an example on the evaluation of the policy compliance to the ESG criteria based on the Estonian maritime policy using the ESG indicators proposed in this research. The example shows the contribution of the policy priorities and highlights the points where contribution was weak or missing. The ESG indicators can be used as input to show the performance of the maritime sector in the ESG areas. As a result, the second important policy implication is the replication of the policy compliance example in other countries' national maritime policy design.

In summary, the study adds to the existing literature a new approach to a maritime policy design framework with focus on the ESG performance and maritime economics. The study demonstrated a way to use ESG indicators for the evaluation of the policy's ESG compliance. These indicators can also be used for strategic planning in the maritime sector. The findings of this study highlight the need for a systemic policy-making framework in the maritime sector with emphases on maritime specificities, sustainability aspects, and adopted international goals. For further research, a follow-up analysis for the next steps in the maritime policy-making process could be carried out with a focus on changing demands in sustainability aspects and future challenges in the maritime sector.

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