

ENVIRONMENTAL CRITERIA FOR SUSTAINABLE DEVELOPMENT IN STRATEGIC MANAGEMENT OF SEA TRANSPORT COMPANIES

V.V. Zhykharieva¹, V.M. Yastrebnii²

¹Doctor of Economics, Professor, Head of Economics and Finance Department,
Odesa National Maritime University, Odesa, Ukraine,
ORCID ID: 0000-0002-2179-8483

²Postgraduate of the Economics and Finance Department,
Odesa National Maritime University, Odesa, Ukraine,
ORCID ID: 0009-0004-2916-7776

Summary

Introduction. The relevance of the research topic is due to the significant impact of environmental factors on the world economy, in particular, the shipping industry, and increased attention from investors, regulators, employees and other stakeholders to the environmental aspects of the activities of transport and logistics companies. **Purpose.** The article is devoted to the improvement of the methodological and methodical foundations of the development of the corporate strategy of transport companies, taking into account the environmental criteria of sustainable development, based on the analysis of the practical experience of shipping and logistics companies, and the study of new approaches to financing investing in projects directed to the solution of environmental problems in the shipping industry. **Results.** The practical experience of development the corporate strategy by shipping and logistics companies taking into consideration environmental factors is systematized. The role of The Poseidon's Principles in financing investments related to solving environmental problems in the shipping industry and new instruments for financing investments in projects related to solving environmental problems in shipping based on long-term debt financing are determined. A universal structure of environmental criteria for sustainable development of shipping and logistics companies is proposed. **Conclusions.** The most important environmental factors for shipping and logistics companies include: emission reduction, wastewater treatment system, decarbonization of supply chains, green fuel and promotion of ship recycling. The practical benefit of The Poseidon Principles, which are widely recognized by the largest financial institutions in the shipping industry, is that companies must measure their emissions annually and publish the results, indicating the extent to which specific measures meet strategic commitments to gradually reduce emissions. To finance projects related to solving environmental problems, it is advisable to attract long-term investments through the targeted issuance of corporate green bonds. The universal structure of environmental criteria for sustainable development for transport and logistics companies should include the formation of environmental policies, plans and periodic review of intermediate goals; creation of an environmental management system; setting deadlines for achieving goals in accordance with the requirements of international organizations and state legislation; an obligation to use only fuel that meets standards and an active focus on reducing fuel consumption; development of ship modification and conversion

programs; improvement of operational efficiency; introduction of energy-efficient and decarbonization technologies and equipment; promotion of green recycling of ships; improvement of the ballast water treatment system; support for research, financing, development and implementation of ship facilities to improve the energy efficiency of ships. The integration of environmental criteria into the strategic management of the enterprise helps to ensure a balance between achieving profit and preserving nature, improving the lives of employees and maintaining high standards of corporate responsibility.

Key words: environmental criteria, sustainable development, greenhouse gases, emissions, transport and logistics infrastructure, maritime transport, shipping, strategic management, green investments.

ЕКОЛОГІЧНІ КРИТЕРІЇ СТАЛОГО РОЗВИТКУ В СТРАТЕГІЧНОМУ УПРАВЛІННІ ПІДПРИЄМСТВАМИ МОРСЬКОГО ТРАНСПОРТУ

В.В. Жихарєва¹, В.М. Ястребний²

¹д.е.н., професор, завідувач кафедри «Економіка і фінанси»,
Одеський національний морський університет, Одеса, Україна,
ORCID ID: 0000-0002-2179-8483

²аспірант кафедри «Економіка і фінанси»,
Одеський національний морський університет, Одеса, Україна,
ORCID ID: 0009-0004-2916-7776

Анотація

Вступ. Актуальність теми дослідження зумовлена суттєвим впливом екологічних факторів на світову економіку, зокрема судноплавну галузь, і підвищеною увагою з боку інвесторів, регуляторів, працівників та інших стейкхолдерів до екологічних аспектів діяльності транспортних та логістичних компаній. **Мета.** Стаття присвячена удосконаленню методологічних та методичних засад розробки корпоративної стратегії транспортних підприємств з урахуванням екологічних критеріїв сталого розвитку та на основі аналізу практичного досвіду судноплавних та логістичних компаній, а також дослідженню нових підходів до фінансування інвестицій у проекти, пов'язані з вирішенням екологічних проблем у судноплавній галузі. **Результати.** Систематизований практичний досвід урахування екологічних аспектів під час розробки корпоративної стратегії судноплавними та логістичними компаніями. Визначено роль Принципів Посейдона у фінансуванні інвестицій, пов'язаних з вирішенням екологічних проблем у судноплавстві, і нові інструменти фінансування інвестицій у проекти, спрямовані на вирішення екологічних проблем у галузі, на основі довгострокового боргового фінансування. Запропоновано універсальну структуру екологічних критеріїв сталого розвитку судноплавних і логістичних компаній. **Висновки.** Найважливіші екологічні фактори для судноплавних і логістичних компаній включають скорочення викидів, систему очищення стічних вод, декарбонізацію ланцюгів постачання, екологічне паливо і просування ресайклінгу суден. Практична користь Принципів Посейдона, які широко визнані найбільшими фінансовими установами в судноплавній галузі, полягає в тому, що підприємства повинні щорічно вимірювати свої викиди та публікувати результати із зазначенням ступеня відповідності конкретних заходів стратегічним зобов'язанням щодо поступового скорочення викидів газів. До фінансування проектів, пов'язаних із

вирішенням екологічних проблем, доцільно залучати довгострокові інвестиції шляхом цільового випуску корпоративних зелених облігацій. Універсальна структура екологічних критеріїв сталого розвитку для транспортно-логістичних компаній повинна включати розробку екологічної політики, планів і періодичний перегляд проміжних цілей; створення системи екологічного управління; встановлення строків досягнення цілей відповідно до вимог міжнародних організацій та законодавства держави; зобов'язання використовувати паливе, яке відповідає стандартам, і активну спрямованість на зниження споживання пального; розробку програм модифікації та переобладнання суден; підвищення ефективності експлуатації; впровадження енергоефективних і декарбонізаційних технологій і обладнання; просування зеленого ресайклінгу суден; удосконалення системи очищення баластних вод; підтримку досліджень, фінансування, розробку та впровадження судових засобів для підвищення енергоефективності суден. Інтеграція екологічних критеріїв у стратегічне управління підприємством допомагає забезпечити баланс між досягненням прибутку та збереженням природи, покращенням життя співробітників та дотриманням високих стандартів корпоративної відповідальності.

Ключові слова: екологічні критерії, сталий розвиток, парникові гази, викиди, транспортна та логістична інфраструктура, морський транспорт, судноплавство, стратегічний менеджмент, зелені інвестиції.

Introduction. Climatic and environmental challenges are causing structural changes in the world economy. Increased focus and pressure from investors, regulators, employees and other stakeholders make ecological aspects of environmental, social and governance (ESG) criteria for assessing business an important issue for strategic management of shipping and logistics companies, as well as transport logistic infrastructure in general.

Formulation of the problem. Sea transport companies use different environmental criteria for strategy development, which makes it important to develop a universal structure of environmental criteria of sustainable development of shipping and logistics companies for use in strategic management. An important role in solving environmental problems in the shipping industry is the ability to attract investments for these purposes, so it is necessary to explore new approaches to investing in environmental projects in the shipping industry.

Analysis of recent research and publications. Climate and environmental challenges are recognized by the European Central Bank as the two main risk factors [1]. According to the Bank for International Settlements, they are one of the sources of systemic financial risks and may become the cause of the next global financial crisis [2]. In the scientific monograph by P. Matos [3] the main forces driving ESG investing and the role of institutional investors were investigated.

In the article by A. Jägerbrand et. al [4] the environmental impact of the shipping industry was investigated, the effects of water transport on water and coastal ecosystems were summarized, and the increase in the number of chemicals transported by water was analyzed. The authors believe that environmental consequences and potential synergistic effects should be taken into account when planning. Modern technologies and environmental practices that reduce the impact on the environment were examined

in [5], in particular, the limitation established from January 1, 2020 by the IMO, which is responsible for regulating maritime transport. This means that carbon dioxide and sulfur emissions from ships should be reduced from 3.5% to 0.5%. The new rule will reduce sulfur emissions by about 77%, which is equivalent to about 8.5 million tons of sulfur dioxide, in addition to the residues generated from its combustion. In the article by Gerliand T. [6] the expediency of forming the environmental competence of shipmasters, affecting the state of sea waters and protection against pollution, for the sustainable development of shipping companies is substantiated.

To face climate challenges and achieve a sustainable future, countries are guided by global agreements: the United Nations Framework Convention on Climate Change (1992) [7] and the Paris Agreements. In 2015, in Paris, representatives of 195 countries (Ukraine among them) approved the UN Agenda for Sustainable Development until 2030 [8] and the Paris Agreement on climate change [9], where it is stated that one of the three ways of confronting climate threats in the context of sustainable development is to ensure the consistency of financial flows with the direction of low-carbon and climate change-resistant development. In March 2021, the Cabinet of Ministers of Ukraine approved the National Economic Strategy for the period until 2030 [10], according to which the country plans to achieve climate neutrality no later than 2060.

Formulation of the goals of the article. The goals of the article are improvement of the methodological and methodical foundations of the development of the corporate strategy of sea transport companies taking into account the environmental criteria of sustainable development, on the base of the analysis of practical experience of shipping and logistics companies, and investigate new approach for investing in projects related to solving environmental problems in the shipping industry.

Presentation of the main research material. ESG reporting is an important tool for shipping companies to secure access to capital and the future of their business. According to Deloitte, many of them are missing opportunities to improve their chances of attracting financing [11]. A study of 38 shipping companies found that only 63% publish their ESG reports (Figure 1).

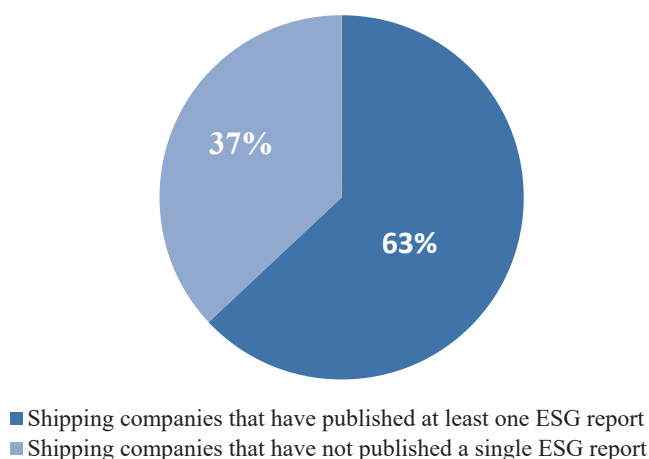


Fig. 1. Statistics of ESG reporting publications by shipping companies, 2023

For a deeper understanding of the concept of the implementation of ESG factors to ensure the sustainable development of companies in the maritime transport sector, the strategies and goals of well-known global transport companies, in particular, A.P. Moller – Maersk, Kawasaki Kisen Kaisha LTD and Höegh Autoliners, were considered.

In 2022 Maersk had share of ocean freight transported with green fuels: 2%; carbon intensity (ocean) increased by 7% compared to 2020 baseline; reduction of emissions in terminals 5.4% since 2021 [12]. Maersk will deliver on their customer commitment to decarbonize their supply chains in time. Strategic targets are for end of year: 2030: aligned with the Science Based Targets initiative 1.5°C pathway; industry-leading green customer offerings across the supply chain; 2040: net zero across the business; 100% green solutions to customers.

The purposes in the field of environmental protection in Vision 2050 of Kawasaki Kisen Kaisha, Ltd shipping company (“K” Line) include transition to low-carbon activity for 2030: reduction of CO₂ emissions by 50% compared to the level of 2008; support for the development of a low-carbon society; transportation and supply of new energy for a low-carbon society; decarbonization “K” Line for 2050: the challenge of achieving zero greenhouse gas (GHG) emissions; support for the decarbonization of society; to be a transporter and supplier of new energy.

Components of risk and opportunity management system of “K” Line in the field of environmental protection include the following [13]. In the field of equipment and technologies: installation of energy-saving equipment to increase shipping efficiency; launching vessels with low-carbon or decarbonized new fuels and propulsion technologies; improving the hull of ships to achieve greater physical strength.

In the field of safety and trainings; improving digital and automated technologies to ensure security and improve operational efficiency; raising the awareness of employees and conducting training on the use of new technologies; building a corporate structure capable of flexibly responding to needs.

In the field of business activities: development of new businesses for energy supply and transportation; fleet preparation for new transportation technologies; increasing the capacity of green recycling of ships; participation in the collection and research of marine plastic pollution; expanding dialogue with administrators responsible for improving port facilities, roads and infrastructure; expanding participation in policy-making with governments, the UN and NGOs.

Höegh Autoliners (global provider of ocean transportation services within the RoRo segment) uses biofuel that reduces emissions compared to traditional fuels: Well-to-Wake (WTW) reduction: biofuel provides an 85% reduction in carbon dioxide equivalent (CO₂e) emissions compared to conventional fuels; Tank-to-Wake (TTW) reduction: biofuel virtually achieves a 100% reduction in CO₂e emissions [14].

Financial tools for solving environmental problems play an important role in shipping taking into account high capital intensity of the industry. The Poseidon Principles are widely recognized by the largest financial institutions in the shipping industry and reflect environmental criteria. The Poseidon Principles Association was formed in 2019. Signatories to the Principles automatically become members of the Poseidon Principles Association [15]. The four basic Poseidon Principles are shown in figure 2.

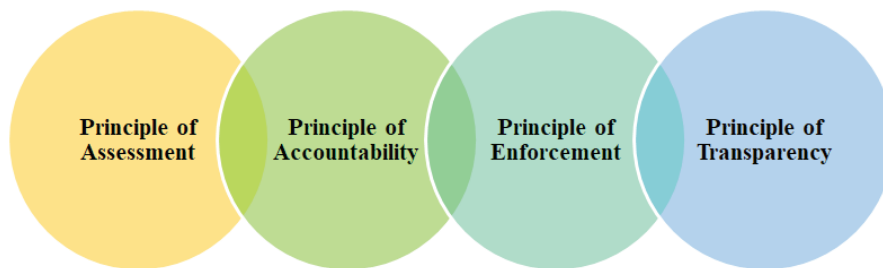


Fig. 2. The four basic Poseidon Principles

The Principles are consistent with the policies and ambitions the IMO, including its revised 2023 GHG Strategy which aims for net-zero emissions from international shipping by 2050. The members of the association measure the concentrations of carbon emissions to determine whether they meet the global goals of reducing such emissions (Principle of Assessment). The members undertake to use means and tools approved by bodies such as the IMO to carry out the necessary assessments (Principle of Accountability). The members carefully describe the objectives set in the loan agreements so that they can be more accurately measured (Principle of Enforcement). The members publicly commit to these principles, monitor and report the results of the annual assessment of their maritime portfolios to the Poseidon Principles General Secretariat and publish these reports on an annual basis (Principle of Transparency).

The Poseidon Principles are applicable to lenders, lessors, and financial guarantors globally. Currently, 34 financial institutions are members of Association, representing a bank loan portfolio to global shipping of over 80% of the global ship finance portfolio [15]. The members commit to implement the Poseidon Principles in their internal policies and standards and to work in partnership with their clients.

A new tool for investing in projects related to solving ecological problems in the shipping industry has emerged recently. Japan shipping company Mitsui O.S.K. Lines (MOL) has announced that it will issue “blue bonds” (5-year duration) through a public offering in Japan’s domestic market in 2024 [16]. A blue bond is a type of green bond issued to finance green projects that aim to solve environmental problems – prevention of marine pollution, sustainable marine resources, and so on. The bonds are the world’s first blue bonds in the shipping industry. The bonds received the highest rating of “Blue 1(F)” from the Japan Credit Rating Agency (JCR) based on its expectation that they will have a positive environmental impact. The company set a total of 650 billion yen to be invested in resolving environmental issues over the three years from FY2023 to FY2025 [16]. Taking into consideration the capital intensity of projects related to solving environmental problems in shipping, attracting financing based on long-term bond loans is a promising method of debt financing. It will raise funds to finance these initiatives.

The universal structure of environmental criteria of sustainable development for transport and logistics companies, built on the base of analysis the experience of considered companies, should include following (figure 3).

- 1. Establishment of principles of environmental policy, development of plans, periodic reviews of intermediate goals in accordance with dynamic changes in the situation*
- 2. Creation of the Environmental Management System*
- 3. Establishing periods for achieving goals in accordance with the requirements of international organizations and state legislation*
- 4. A commitment to use only fuel that meets standards and an active focus on reducing fuel consumption*
- 5. Development and implementation of programs for hull modifications and conversion of ships*
- 6. Improvement of operational efficiency*
- 7. Energy-efficient and decarbonization technologies and equipment.*
- 8. Promoting a recycling-based society using the 3R concept (reduce, reuse and recycle), including ship recycling. Green recycling (the commitment to green and responsible recycling of ships is based on the Hong Kong International Convention on the Safe and Environmental Recycling of Ships (IMO) 2009)*
- 9. Development the ballast water treatment systems (BWTS) that minimize the risk of spreading harmful organisms between sea regions*
- 10. Support for research, financing, development and implementation of ship facilities to increase the energy efficiency of ships, which leads to a reduction of greenhouse gas emissions and prevention of atmospheric pollution*

Fig. 3. The universal structure of environment criteria of sustainable development for transport and logistics companies

Conclusions. The main environmental factors for shipping and logistics companies include reduction of emissions, sewage treatment system, decarbonization of supply chains, green fuels and ship recycling issues.

The Poseidon Principles are widely recognized by the largest financial institutions in the shipping industry and reflect environmental factors. The practical benefit of the Principles is that all signatory organizations must annually measure their emissions and publish the results, indicating the degree of compliance of specific measures with the strategic commitment to gradually reduce gas emissions. To finance projects related

to solving environmental problems, it is advisable to attract long-term investments by issuing green corporate bonds with a specific purpose.

The universal structure of environment criteria of sustainable development for shipping and logistics companies should include establishment of principles of environmental policy, plans, periodic reviews of intermediate goals in accordance with dynamic changes in the situation, creation of the Environmental Management System; establishing periods for achieving goals in accordance with the requirements of international organizations and state legislation; a commitment to use only fuel that meets standards and an active focus on reducing fuel consumption; development and implementation of programs for hull modifications and conversion of ships; improvement of operational efficiency; energy-efficient and decarbonization technologies and equipment; promoting a recycling-based society using the 3R concept, including green recycling of ships; development ballast water treatment systems that minimize the risk of spreading harmful organisms between sea regions; support for research, financing, development and implementation of ship facilities to increase the energy efficiency of ships, which leads to a reduction of greenhouse gas emissions and prevention of atmospheric pollution.

Ecological aspects have a significant impact on achieving business sustainability, and play an important role in establishing relationships with investors, consumers, government bodies and the public. Their integration into the strategy and management of sea transport companies helps ensure a balance between achieving profit and preserving nature, improving the lives of employees and meeting high standards of corporate responsibility. The implementation of environmental criteria in the strategic management of shipping and logistics companies marks a significant step towards creating a more sustainable and ethical industry, which determines further development and improvement in this area.

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