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SECTION: MANAGEMENT AND PUBLIC ADMINISTRATION

THE ROLE OF GREEN LOGISTICS IN ENSURING SUSTAINABLE DEVELOPMENT OF THE TRANSPORT INDUSTRY

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The transport and logistics sector plays an important role in the functioning of the European Union (EU) economy, contributing a significant share of gross domestic product and employment. At the same time, this sector is one of the largest sources of CO_2 emissions, which necessitates the implementation of sustainable development principles and the transition to green logistics [1].

The concept of sustainable development was formed on the basis of the scientific works of T. Malthus, V. Vernadsky, D. and D. Meadows, G. H. Brundtland, and H. Daly. Its essence lies in ensuring a balanced combination of economic growth, social well-being, and environmental protection. In modern conditions, this concept is implemented through ESG approaches that integrate environmental, social, and governance aspects into business activities.

The EU is actively implementing a policy of green economic transformation through a system of regulatory instruments. Of particular importance are the European Green Deal, the EU Taxonomy, and the Corporate Sustainability Reporting Directive (CSRD).

The European Green Deal establishes the strategic objective of achieving climate neutrality by 2050. The EU Taxonomy defines criteria for environmentally sustainable economic activities, while the CSRD ensures transparency and standardization of corporate non-financial reporting. Together, these instruments create a regulatory framework for the development of green logistics [2-3].

An important outcome of the study is the development of a sustainable logistics hierarchy model, which demonstrates the relationship between the United Nations Sustainable Development Goals, European regulatory mechanisms, ESG principles, corporate decarbonization technologies, and the economic performance of enterprises (Fig. 1).

The proposed model illustrates a consistent transition from global sustainable development goals to specific corporate solutions and the outcomes of their implementation, which ultimately create competitive advantages for logistics companies.

Figure 1. Sustainable Logistics Hierarchy Model

The conducted SWOT analysis revealed that the key strengths of green logistics include government support, the development of innovative technologies, and access to green financing. The main weaknesses are high investment costs and insufficient infrastructure development. The most significant opportunities involve the growing demand for environmentally friendly transportation and expanded access to international markets. At the same time, threats are associated with the risks of greenwashing and volatility in energy prices.

Germany is one of the European leaders in implementing sustainable logistics principles. The practical experience of Hapag-Lloyd, DHL Group, and DB Schenker demonstrates the effectiveness of a comprehensive approach to the decarbonization of logistics processes. One of the key areas of development is transport electrification. DHL Group operates more than 39,000 electric vehicles and plans to increase the share of electrified first- and last-mile transportation to 66% by 2030. DB Schenker actively uses electric trucks for regional transportation, while Hapag-Lloyd focuses on the electrification of port infrastructure and terminal equipment [4].

Another important direction is the use of alternative fuels. Hapag-Lloyd invests in biofuels, green ammonia, and methanol for maritime transport. DHL Group implements Sustainable Aviation Fuel (SAF), which significantly reduces the carbon footprint of air logistics. DB Schenker uses biodiesel and hydrotreated vegetable oil (HVO) fuels and is testing hydrogen technologies for freight transport. The use of SAF and biofuels can reduce greenhouse gas emissions by 80–90%, depending on the fuel type [5-6].

Digitalization also plays a crucial role in the development of green logistics. Companies actively employ artificial intelligence, Internet of Things (IoT) technologies, route optimization systems, and automated logistics processes. These solutions help reduce fuel consumption, minimize empty runs, and improve supply chain efficiency. An additional factor supporting sustainable development is the implementation of circular economy principles, including the reuse of packaging materials, optimization of reverse logistics, and waste recycling [7].

A comparative analysis showed that Ukraine is still at an early stage of green logistics development. The main challenges include insufficient infrastructure, limited access to green financing, and the absence of systematic environmental requirements for most enterprises. However, the adaptation of German experience could contribute to the modernization of the transport system, the reduction of environmental impacts, and the integration of Ukrainian companies into European logistics networks.

Thus, green logistics is an important instrument for implementing sustainable development principles and achieving the climate goals of the European Union. Germany’s experience confirms that the adoption of electric transport, alternative fuels, digital technologies, and circular economy practices not only delivers environmental benefits but also enhances the competitiveness of enterprises. For Ukraine, the application of European experience may become an important step toward economic decarbonization and integration into the modern European framework of sustainable development.

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ЦІННІСНИЙ ВИМІР ЕКОЛОГІЗАЦІЇ ПУБЛІЧНОГО УПРАВЛІННЯ В КОНТЕКСТІ СТАЛОГО РОЗВИТКУ

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У сучасних умовах, які характеризуються загостренням екологічної кризи в Україні, процес екологізації публічного управління повинен мати ціннісне наповнення. Ціннісний характер такого управління формують управлінські рішення, що приймаються його суб'єктами, пріоритети державної екологічної політики та ступінь інтегрування екологічного аспекту у діяльність організацій публічної сфери.

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