

СЕКЦІЯ

ЗАХИСТ НАВКОЛИШНЬОГО СЕРЕДОВИЩА ТА РОЗВИТОК СУЧАСНИХ ЗЕЛЕНИХ ТЕХНОЛОГІЙ. ЦИВІЛЬНЕ БУДІВНИЦТВО.

GREEN LOGISTICS: INITIATIVES AND PRACTICES TO REDUCE ENVIRONMENTAL IMPACT

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In the world, the problems of environmental pollution due to transport infrastructure are acute. Among all vehicles, motor vehicles remain the main source of environmental pollution. Motor transport is a source of dangerous chemical pollution of atmospheric air, water bodies, agricultural areas, as well as noise and vibration, which can affect the health of the population. Each automobile, when burning 1 kg of gasoline, uses 15 kg of air, particularly 5.5 kg of oxygen [1]. In addition, cars affect air quality by emitting greenhouse gases that lead to global warming and climate change. To combat these problems, it is important to implement effective environmental strategies such as green logistics.

"Green" logistics is a concept that involves the use of advanced logistics technologies and modern equipment to minimize pollution and increase the efficiency of the use of logistics resources. The main principles of "green" logistics are:

1. Minimization of emissions and pollution: reducing the negative impact of logistics operations on the environment by minimizing emissions of harmful substances, dust, and other polluting factors.

2. Energy efficiency: improving energy efficiency in all aspects of logistics operations, including transportation, storage, packaging, and warehouse management.

3. Optimization of resources: rational use of natural resources and materials in logistics processes to minimize losses and waste.

4. Use of environmental technologies: implementation of the latest technologies and innovations aimed at reducing the negative impact on the environment, such as electric

cars, solar panels for powering warehouse equipment, etc.

The advantages of "green" logistics include:

- minimization of waste: green logistics contributes to the effective management of waste and its further processing, which allows to reduce the amount of waste that ends up in the landfill;

- reduction of packaging costs: involves the use of biodegradable or reusable packaging or materials. Although more expensive to purchase than single-use materials and components, recycling can save businesses money in the long run. These include: cardboard instead of wooden pallets, reusable polyethylene film, etc. Packaging accounts for almost half of the world's plastic pollution, and much of it is never recycled. Therefore, it is important to use this resource correctly.

- reduction of carbon emissions: reduction of greenhouse gas emissions through transportation and storage;

- reduction of energy costs: the use of energy-efficient technologies and optimization of logistics processes allows to reduce costs of electricity and fuel;

-improving the company's image: companies that actively apply green practices in logistics can have an advantage in the market and a positive image among consumers.

In general, green logistics not only contributes to the preservation of the environment, but also has a direct positive impact on the financial performance of enterprises. But despite the fact that green logistics has many advantages, it also has some disadvantages namely: high implementation costs, limited availability of technologies, complexity of integration, and the possibility of new environmental problems. Although even with all these disadvantages, green logistics remains an important tool for reducing the negative impact of logistics processes on the environment and achieving sustainable development. Green logistics can be achieved through environmentally friendly and sustainable practices in the logistics industry. Such practices include:

- Green transportation
- Green supply chain management practices
- Environmentally friendly packaging/green packaging

- Green warehousing

Efficient transportation can be achieved by:

1. Delivery route optimization: the utilization of specialized software and algorithms to identify the most optimal delivery routes results in a decreased number of journeys and carbon dioxide emissions.

2. Use of green vehicles: replacing old and less green vehicles with alternative energy vehicles such as electric or hybrid vehicles.

3. Idle Reduction: reduces unnecessary engine idling. It is necessary to turn off the engine if the car stops for a long time.

4. Regular maintenance of vehicles.

5. Load optimization: involves the management of cargo loads transported by vehicles, ensuring that vehicles do not carry excessive weight, which results in higher fuel consumption.

6. State-of-the-art fleet management systems: help control and increase the productivity of vehicle fleets.

Green supply chain management practices include:

1. Waste reduction: implementation of reuse and recycling of already used resources. The main goal is to implement a waste-free process.

2. Optimization of energy consumption: utilizing renewable sources such as solar, wind, or hydroelectric power, thereby diminishing reliance on resources having environmental impacts.

Use of environmentally friendly packaging materials such as plant-based, recycled and biodegradable. Eco-friendly packaging reduces overall waste and conserves resources. This helps prevent environmental pollution, supports recycling processes and reduces environmental impact.

Green warehousing involves optimized use of warehouse space and equipment, which reduces the number of unnecessary operations and thereby reduces carbon emissions. Ecological warehouses ensure energy efficiency of warehouses. The use of LED lighting, energy-efficient HVAC systems, and turning off lights and machines when not in use contribute to energy efficiency as well as economic benefits [2].

Here are some examples of successful implementation of green initiatives in large logistics companies:

1. FedEx, implementing a green logistics program aimed at reducing carbon emissions and using environmentally friendly vehicles. The company is also investing in electric and hybrid vehicles for urban delivery, which helps reduce environmental impact. The company is estimated to have saved 200 million liters of fuel, avoided 548,076 metric tons of CO₂ emissions, and introduced 4,091 electric and alternative fuel vehicles [3].

2. Amazon. Working on the introduction of electrification programs for vehicles and the use of sustainable packaging materials. In addition, the company actively uses renewable energy to power its warehouses. The company is innovating and investing to be net zero carbon by 2040 and run on 100% renewable energy by 2025. The company also has purchased 100,000 fully electric delivery vehicles [4].

Ukraine also has examples of successful implementation of green initiatives in such large logistics companies as Nova Poshta, actively implementing green practices, such as the electrification of the car fleet and the use of biofuels. It also invests in improving delivery routes and implements programs to reduce the use of packaging materials [5]. "Epicenter K" a group of companies using energy-saving technologies throughout its network. For example, installing solar power plants (SPP) on the roofs of own shopping centers. In order to preserve the environment, the company regularly collects and sends cardboard and other paper packaging for recycling. Epicenter introduced the sale of reusable eco-bags and an ecological alternative to plastic bags - modern biodegradable bags made of corn starch of Ukrainian production [6].

Accordingly, it can be concluded that green logistics is an important step in the direction of sustainable development, which helps to preserve the environment and ensure an ecologically clean future. Green logistics contributes to the reduction of emissions into the atmosphere, as well as the processing of waste by optimizing the processes of transportation, inventory management and the use of resources. The prospects for the development of green logistics in Ukraine promise positive changes not only for enterprises, but also for the entire society, contributing to sustainable

economic growth and conservation of natural resources.

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ECOLOGY OF TRANSPORT

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Today, the problems of environmental pollution from transport infrastructure are quite acute in Ukraine. This is the direct impact of road, railway, aviation and water transport, as well as anthropogenic impact on the environment during the design, construction and operation of linear transport facilities.

The first creators of vehicles were not concerned about how road, sea and air transport can affect the environment. Unfortunately, we have to face consequences that the inventors did not even suspect or think about [1].

Transport ecology is an intensively developing branch of applied ecology. It is characterized by its own concepts, terminology, axiomatics, research methods of interaction of transport processes with the environment. Among all means of transport, motor vehicles remain the main source of atmospheric air pollution and disturbance of the ecological balance. Living and non-living nature in many cases feels the impact of transport and its infrastructure. Areas of natural habitat for various species of mammals, birds, amphibians, etc. are decreasing. As a result of road works, trees and bushes are constantly cut down or uprooted. These plants produce oxygen and provide shelter for birds, insects, etc. The more roadside greenery we destroy through clearing and salinization, the greater the risk that more species of plants and animals will become