

**DEVELOPING OF THE CONCEPT OF "GREEN" LOGISTICS IN TRANSPORTATION
AND FORWARDING ACTIVITIES OF THE ENTERPRISE**

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This topic aims to introduce logisticians to green logistics and encourage them to think in "green" terms, to highlight the challenges and to indicate some advantages of "green" logistics.

It's impossible to imagine an activity of economic entities without logistic processes. Most often it is considered that the logistics purpose consists in minimization of expenses and maximizing of profit. Attention of the companies to "green" aspect of their logistic operations is caused by such tendencies as increase in knowledge of consumers, increase in demand for specialists in questions of environment protection, growth of importance of maintenance and environment protection factors and also the growing political influence and regulation in this direction. The term "green" logistics means methods of management of delivery chains and strategy which reduce ecological and resource impact of streams distribution. Green logistics based on environmentally friendly "green" technologies.

The negative impact of logistics and of all transport and its infrastructure on ecology is very extensive, and it also includes a current international problem of greenhouse emissions in the atmosphere and change of climate. Statistically up to 28% of emissions falls on transport.

Transport emissions are distributed as follows: 87% of the general emission falls on the motor transport, about 8% — on railway, 3% — on air transport and 2% — on river and sea.

Air pollution by transport results from combustion of fuel. The chemical composition of emissions depends on a type and quality of fuel, the production technology, a way of burning in the engine and its technical condition.

One car on average burns annual norm of oxygen for each 1000 km of a way. The waste gases of ICE (Internal combustion engine) contain about 200 components. The period of their existence lasts from several minutes to 4-5 years.

Mitigation of consequences of technogenic impact on the nature demands serious financial investments. The general budget of the project European Union Water Initiative Eastern Europe for six countries (Azerbaijan, Armenia, Belarus, Georgia, Moldova, Ukraine) makes 24 million euros. Purposes and tasks of the program are to improve water resources management in the countries of the Eastern Partnership. The budget of Environmental protection of the international river basins (EPIRB) is 7 million euros. Prevention, Preparedness and Response to Natural and Man-made Disasters in the Eastern Partnership Countries demands 6 million euros [1].

More than 300 international acts regulating standard and legal base of relationship in the field of transport with 131 foreign countries are signed for reduction of pollution of atmospheric air. In 1992 the United Nations has accepted the program action plan of sustainable development in the 21st century. The purpose of The United Nations Conference on Sustainable Development (UNCSD), also known as Rio+20, is to achieve the quality environment and healthy economy for all people of the world.

As a result of Rio+20 all countries have confirmed obligations for stage-by-stage refusal of subsidies for fossil fuel. Participants of Rio+20 have urged The United Nations Statistics Division to develop new indicators of sustainable development to expand membership in council of The United Nations Environment Programme (UNEP) [2]. Thereby actually the countries have assumed liabilities to realize transition to "green" economy.

The "green" logistics first of all is directed on improvement of innovative activity and also on rise of efficiency in the sphere of the heavy industry, for example, in mechanical engineering, oil production and in many other leading sectors of economy. Synthesis of economy, society and environment is one of the key moments for introduction of such logistics. In other words green economy is a basis for development of green logistics.

Development and deployment of initiatives on decrease in negative ecological impact of transport takes place at various levels, and it is a result of decisions of The Kyoto Protocol, and nowadays specially adopted The Paris Agreement.

The ISO 14001 standard involves the use of a strict environmental management system and, like the related ISO 9001 quality standard, it requires that an organization monitor improves its performance. The standard encompasses all of the environmental effects of a manufacturing site, including energy use, water treatment, waste disposal, noise and air quality [3].

ISO 14001 certification is one step being taken under a new Ford Environmental System that is designed to provide a globally consistent set of environmental management procedures, yet allow each local plant to identify its own environmental needs and objectives. Ford Motor Company's North Penn facility, near Lansdale in Montgomery County, has been certified under the international environmental standard ISO 14001. North Penn is the fifth facility in North America to achieve the standard. The other four also belong to Ford.

The western countries have begun to finance replacement of old motor transport. Laws on utilization of retired vehicles are adopted in 50 countries of the world. In 2009 Germany has allocated 3 million euros for these purposes.

This country is considered as the homeland of an autorecycling. The law "about an economic recycling" has played an important role in Germany since 1996. The efficiency of this law can be proved by an example of the BMW company. The company has developed the concept which considers need of utilization at a stage of car design. In other words, it is possible to reuse almost for 95% of each car. In Germany raw materials of one half trillion euro cost are processed every year. The share of material cost in cost of production in the German manufacturing industry has already reached 45 percent. Meanwhile the share of expenses on salaries has decreased to 18 percent.

More than 11 million cars are annually processed into the USA. Here processing is supported with the ban on the organization of dumps and burial and burning of waste is more expensive than processing.

The company of express delivery DHL has started the GoGreen service which means that DHL counts the number of emissions of CO₂ from transporting of each freight from the moment of his reception and until delivery to the recipient. The client can pay 3% high of standard rates, and DHL invests the raised money in protection climate programs.

The Japanese shipping company To Line has installed on separate crafts computer system which on the basis of continuous monitoring of weather and hydrographic conditions optimizes operation of the engine that, in turn, leads to reduction of volumes of harmful emissions in the atmosphere.

The operator of express delivery UPS has bought 130 cars with hybrid engines which will consume 66 thousand gallons of fuel (35%) less in a year than transport with the internal combustion engine. Emissions of CO₂ will also become 671 ton less. The amount of the "saved" emissions is equivalent to the volume of exhausts which is the share of 128 cars in a year.

The German carrier of Deutsche Bahn Schenker Rail for the first time in the European railway branch has offered the way of a transportation of freights which is completely excluding emission of carbon dioxide. Within the Eco Plus project the company receives electricity for the electric locomotives from renewables. In total within the program for protection of climate by 2020 the exhaust of carbon dioxide from the operations intends to reduce by 20% in comparison with the 2006.

The Green Cargo company, service provider of logistics, has realized signs of the times too. For a number of years the company invested the capital in locomotives with low consumption of energy.

About 60 million euros have been saved during construction of Nord Stream thanks to the developed concept of "green" logistics. Nord Stream became the safest and eco-friendly way of transportation of gas in the world. According to the experts, reduction of emissions of CO₂ in the atmosphere within 50 years of operation of the gas pipeline will count 200 million tons.

In the logistic center "Toyota" in the Belgian city of Zebryugge at the beginning of 2013 two wind turbines have appeared. Each of them will develop 3 MW of the electric power. Their annual productivity was 17,1 MW/h. Besides, solar panels for power production are installed at the Toyota plants in Great Britain and France.

Decrease in level of ecological danger from influence of transport is possible by implementation of the comprehensive program, but there are certain contradictions of ecological and economic targets and tasks of logistics that complicates expansion of green logistics (shown in Table 1).

The presented contradictions can be solved by tools of the state regulation, for example, "zones of limited entrance" and special routes of cargo transfer. It is possible to create special ecological funds (means from which go for improvement of nature protection activity), to use system of preferential crediting for implementation of nature protection actions and also system of penalties for ecodestructive influence.

After the progressive world our country has declared that it chooses "green" economy as a model of the further development too. Belarus has instilled values of green economy on the example of the European Union programs which include a number of components. The "Assistance to Transition of the Republic of Belarus to "Green" Economy" project financed by the European Union (EU allocates to Belarus 5 million euros).

In the sphere of power engineering due to modernization of the generating sources of a power supply system and introduction of modern energy efficient technologies, energy saving the equipment and materials in 2014 it was succeeded to reach saving 1730,3 thousand tons of conditional fuel. And the share of local fuel and energy resources has increased up to 146,3 thousand.

Economics

Table 1 – Contradictions of ecological and economic targets and tasks of logistics

Disagreement subject	Contradictions of ecological and economic targets and tasks of logistics	
Expenses	Need of allocation of considerable funds for nature protection actions	Minimization of expenses
Organization of supply system and selection of suppliers	Selection of suppliers of environmental friendly raw materials	Optimization of capital investments and procuring expenses
Time, accuracy and reliability of delivery	Development of the optimum routes and ways of cargo transfer which aren't creating traffic jams	Use of vehicles and routes that allow to minimize time of delivery
Production system	Account and reduction of an environmental pressure from production, reduction of environmental risks, use of modern power- and resource-saving technologies and equipment	Decrease in production expenses including due to economy on nature protection actions
Organization and flexibility of systems of distribution	Organization of the systems of distribution consuming smaller quantity of the resources, occupying smaller space, using smaller quantity of infrastructure	Providing general-system efficiency and expansion of coverage with the distribution systems of the markets and territories
Warehousing system	Placement of warehouses out of settlements	Placement of warehouses in the territory of the enterprise including places of disposal of ecologically harmful and toxic raw materials and waste
Ways of transportation	Quick transportation in small lots by modern means of transport, consuming smaller amount of fuel, using biofuel and producing smaller quantity of irritants	Transportation by economical means of transport in large lots

Example of the Belarusian logistic company with ecologically directed policy is AsstrA Associated Traffic AG. AsstrA has implemented the system of ecological management for the purpose of controlling harmful effects on the environment and also for increase in efficiency of activity of the company, for reduction of expenses by implementation of ecological programs. According to environmental policy AsstrA has integrated requirements of ISO 14001 into a quality management system. The company has realized tasks as decrease in emissions of harmful substances (such as nitrogen oxide, carbonic, solid waste), decrease in the noise level, reduction of energy and raw materials expenses. Certified audit on compliance of ISO 14001 has been booked by the largest company for certification Bureau Veritas Certification. The transport conforms to the Euro-4 and Euro-5 standards – the environmental standards regulating the content of harmful substances in exhaust gases.

Each logistic company has to understand and take the responsibility for the damage caused to the environment. In spite of the fact, that the concept of sustainable development and green logistics demands considerable financial and social resources, in the long term it will bring productive results. All of us have to try to keep the natural resources and to prevent irreversible consequences of reckless acts of humanity.

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