

# Logistics Schemes in the Development of Integration Processes of the Formation of the Global Economy

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**Abstract** — The global economy is a process of combining national economies into a single economic world system. The role of the national economy in this system will be determined solely by the perfect organization of the logistics components as an objective process. The article defines logistic schemes in the modern economic system as the beginning of the integration processes of the global economy. The economic consequences of the development of transnational logistic hubs for the national economies are analyzed. The information and financial component in the formation of a unified logistics system of the global economy is characterized. Submitted regional logistics systems in the development of global logistics. Logistic schemes of hydrogen energy in Western European countries. The provision of competitiveness of the domestic economy through the implementation of logistic schemes as part of a unified logistics system of the global economy is noted.

**Keywords**—*Logistics, energy logistics, global logistics*

## I. INTRODUCTION

Successful operation in the international trade space today is impossible without the active introduction of the concept of logistics, continuous development of the functions, methods and tools of global logistics. The globalization of the markets for products determines the nature and volume of flows that are realized at synchronized work of various types of transport, as well as spatial concentration transport and warehouse complexes, oriented to minimize the costs associated with transportation and storage of material resources. Explaining the relevance of the use of principles and methods of logistics and their impact on energy supply, it is necessary to take into account the fundamental changes that have taken place in the last decade in the field of energy production.

To substantiate the relevance of the use of principles and methods of logistics and their impact on energy supply, one should take into account the fundamental changes that have taken place in the last decade in the field of energy products. These include: the transformation of the seller's market into a buyer's market (which is characterized by an excess of supply over demand), increased competition between

economic entities, the gradual spread of the concept of marketing with its "consumer orientation" and as a result of the growth of energy flows of the state. Demand forecasting became more complicated, energy reserves increased, costs of transmission of energy resources and electricity increased. The problems of rational planning of production and supply of energy resources and electricity, which should be oriented towards meeting the demand with minimal costs, were acute. There was a need for increased coordination between interrelated activities, that is, the organization of production, sales, procurement and transportation of energy resources and electricity as a single energy stream. Consequently, the solution of energy supply problems that have arisen in recent times, is associated with the spread of the use of the concept of logistics and its impact on energy supply.

In the modern world economy, international transportation is impossible without a developed logistics infrastructure, both at the national level and internationally. At the same time, during the service of the international commodity flow in the process of supply often involve several national logistics infrastructures.

In general, they form an international logistics transport infrastructure, which is mostly used by multinational corporations. A specific type of logistics infrastructure is represented by logistic terminals / parks (hubs), or transport and logistics centers, which are nodal multimodal centers at the intersection of international commodity flows.

The objects of logistics infrastructure are divided into three main groups: local, regional and international, where the latter are complex integrated infrastructure facilities serving the international transportation process. Separation is based on the depth of division of labor, that is within the framework of infrastructure outsourcing, which promotes rational allocation of enterprise resources; concentration on those kinds of business, in which the company has certain advantages; shortening the terms of product development, increasing the efficiency of distributive mechanisms; increasing the speed of adaptation to market changes.

In the construction of international logistics systems solve the following issues:

- creation free market of transportation without restrictions on its capacity and load;
- application of "floating" tariffs recommended by the general regulatory authorities;
- development of rules that promote and at the same time protect the general market of logistics operations;
- liberalization of transport and customs procedures when crossing borders with goods across borders;
- coordination of transportation capacity and productivity of railway and warehouse equipment;
- compliance with internationally applicable rules, forms and standards binding on members of the community.

It should be noted that globalization has significantly influenced the development and widespread use of the logistic approach in the formation of international trade relations in the world market. It is globalization that helps to optimize the allocation of resources, expand the range of goods and improve their quality, while stimulating the development of the entire international transport and logistics infrastructure serving the international logistics infrastructure.

Consequently, international logistics has become the stimulus of globalization, and global logistics is designed to institutionalize the processes of global production, distribution and consumption, including - on criteria of sustainable development of the world farms In this context, we formulate conceptual the basis of global logistics as a set of theoretical, methodological and institutional support for the processes of regulation of material flows of the world economy in order to harmonize global supply chains of industrial, commercial, military and humanitarian global commodity exchanges and eliminate the negative effects of globalization and development of tools for sustainable development of the world economy based on the regulation of global consumption of resources.

## II. GLOBAL LOGISTICS AS A RESULT OF THE INTEGRATION PROCESSES OF THE MODERN ECONOMY

The goal of global logistics is to eliminate the negative effects of globalization on the ineffective use of natural resources and the prevention of environmental threats, as well as to develop tools for ensuring the sustainability of the development of the world economy, based on the regulation of global consumption of these resources. Achievement of this goal should occur in several directions [1]:

1. Determination of the maximum allowable volumes of use of world stocks of exhaustive non-renewable resources and creating tools for monitoring compliance.
2. Planning global material flows.
3. Regulation of global supply chains.
4. Creating and maintaining a global logistics infrastructure.

5. Formation of a global system of standards for logistics services on the basis of ecologization of the world economy/

6. Formation of an open global information system providing logistics processes in the global economy.

Consequently, the problem is the creation of a new model for managing the national logistics system, which should include tools for influencing the dynamics and content of global logistics infrastructure, ie take into account both spheres of transient inconsistencies: the change of management paradigm and communication changes. Activation of structural transformations is impossible without institutional changes in the logistics industry at the state level. In particular, a significant transformation requires the normative and organizational provision of logistics activities, as well as the investment environment for modernizing the transport and logistics infrastructure, including the creation of a network of international logistics centers, the renewal of the fleet of vehicles and the development of logistics outsourcing.

The potential of global logistics should be aimed at achieving the strategic objectives of economic entities. These objectives are specified in the tasks of global logistics [2]:

- optimization of the functional cycle of global logistics (shortening its duration by accelerating international traffic, reducing the number of intermediary structures);
- development of logistics infrastructure in the foreign economic space;
- development of information provision of global logistics processes;
- creation of global logistic production marketing unions.

The main drivers of globalization in the field of logistics are [3]:

- the continuing growth of the world economy;
- expansion of the latest technologies;
- development and integration of macro-regional economic structures;
- new opportunities for the formation of global logistics chains;
- implementation of deregulation procedures.

Global logistics is subject to the laws that are domestic, but the world market dictates the features of global logistics:

Firstly, the functional cycle of global logistics is more prolonged due to the more distant distances to be crossed, the greater the number of intermediaries and the need to use slow ocean transport for many freight operations. Secondly, the logistics operations themselves on the world market are more complicated due to the greater diversity of storage units and stocks in general, which have to deal with, more documentation, more storage capacity and less developed logistics services (in particular, transport and warehouse) . Thirdly, global requirements for information systems are increasing, as there is a growing need for extended communication channels, the use of different languages and

support for the flexibility of logistics processes. Fourth, the global market can not do without global production, logistics and marketing unions, the creation and development of which is also a difficult task.

As for international unions and organizations, they can be divided into two groups according to the directions of activity:

1. International organizations having an indirect influence on the regionalization and globalization of logistics processes:

- a. Organizations designed to solve complex political, economic, social and environmental problems (organization of the UN system, OECD, Council of Europe, etc.);
- b. Organizations that regulate world financial markets and international monetary and financial relations (IMF, World Bank Group, etc.);
- c. Organizations regulating commodity markets and international trade relations (WTO, OPEC, etc.);

2. International organizations having a direct impact on the regionalization and globalization of logistics processes:

- a. The European Logistics Association, registered in 1984 in Bern (Switzerland) and has more than 20 countries;
- b. Regional international organizations:
  - NAFTA is a South American Free Trade Area, which was established in 1994 and united by three countries - Chile, Mexico and Canada;
  - CIS is the Union of Independent States;
  - EFTA - European Free Trade Association, functioning in the Euro-Asian space;
  - APEC - Organization of Asia-Pacific Economic Cooperation;
  - Mercosur Trade Pact concluded by Argentina, Brazil, Uruguay and Paraguay for the purpose of establishing a customs union and a "free trade zone";
  - ASEAN - Association of Southeast Asian Nations;
  - The EU is the largest trade bloc in the world, called the European Union, and was created in 1991.

Consequently, global logistics reflects a tendency characterized by the movement of entrepreneurial activity from its specialization in individual countries and regions to a multi-organized world market economy.

The process of further globalization of logistics requires [8]:

- 1. Reduction of logistics costs and improvement of logistics service;
- 2. The emergence of international logistics intermediaries with a developed global infrastructure;
- 3. Further development of international trade;
- 4. Development of international transport;
- 5. Introduction of innovations in the infrastructure of global logistics networks.

So, global logistics is becoming an important strategic tool in providing competitive advantages on the global market for products. The success is first of all due to rapid adaptation of commodity producers to constantly changing conditions of the market environment and demand for

products, as well as lowering the level of logistics costs and improving the level of service.

### III. CURRENT STATE AND PERSPECTIVES OF LOGISTICS IN UKRAINE

Logistics is especially important for Ukraine, where international trade forms a significant part of GDP. Location of Ukraine at the intersection of main transport routes from Europe to Asia and from the Scandinavian countries to the Mediterranean region creates unique opportunities for the development of transit services. The development of the transport sector of Ukraine is also an integral part of the Association Agreement between Ukraine and the EU.

Despite the importance and potential of logistics services, transport capacity in Ukraine insufficient use, infrastructure and services available to shippers and shippers suppliers of logistics services are lower than the standards available in EU countries, and the cost of the logistics faced by end users is high. For example, the cost of transportation of grain, the main export product of Ukraine, from agricultural enterprises to the Black Sea ports about 40% more than the cost of similar services in France and Germany. Ukraine only takes 66th place from 160 countries according to the logistics performance index (LPI), calculated by the World Bank (table 1, Fig. 1).

The international score uses six key dimensions to benchmark countries' performance and also displays the derived overall LPI index. The scorecard allows comparisons with the world (with the option to display world's best performer) and with the region or income group (with the option to display the region's or income group's best performer) on the six indicators and the overall LPI index.

The logistics performance (LPI) is the weighted average of the country scores on the six key dimensions: 1) Efficiency of the clearance process (i.e., speed, simplicity and predictability of formalities) by border control agencies, including customs; 2) Quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology); 3) Ease of arranging competitively priced shipments; 4) Competence and quality of logistics services (e.g., transport operators, customs brokers); 5) Ability to track and trace consignments; 6) Timeliness of shipments in reaching destination within the scheduled or expected delivery time.

TABLE I. LPI GLOBAL RANKS 2018

Country	LPI Rank	Customs	Infrastructure	International shipments	Logistics competence
Germany	1	1	1	4	1
Sweden	2	2	3	2	10
Belgium	3	14	14	1	2
Austria	4	12	5	3	6
Japan	5	3	2	14	4
Netherlands	6	5	4	11	5
Singapore	7	6	6	15	3
Denmark	8	4	17	19	9
United Kingdom	9	11	8	13	7
Finland	10	8	11	16	15
Ukraine	66	89	119	68	61

The scorecard demonstrates comparative performance of all countries (world), regional and income groups.

The Logistics Performance Index is reported by the World Bank in every two years.



Fig. 1. Logistics performance index 2018

The LPI is based on a worldwide survey of stakeholders on the ground providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade. They combine in-depth knowledge of the countries in which they operate with informed qualitative assessments of other countries where they trade and have experience of global logistics environment. Leadership in the ranking in Germany with a total score of LPI Score at 4.2 points. She is followed by Sweden, Belgium, Austria and Japan. The Netherlands is the second best in the five, followed by Singapore, Denmark, the United Kingdom and Finland. The US is ranked 14th, Russia is 75th. The total rating includes five areas of research: customs procedures (Ukraine scored 2.4 points), infrastructure (2.2 points), international cargo transportation (2.8 points), logistic competence (2.8 points), cargo tracking (3.1 points) and timeliness of delivery (3.4 points). Moreover, the higher the score, the stronger the position of the country in this category (Fig. 2).

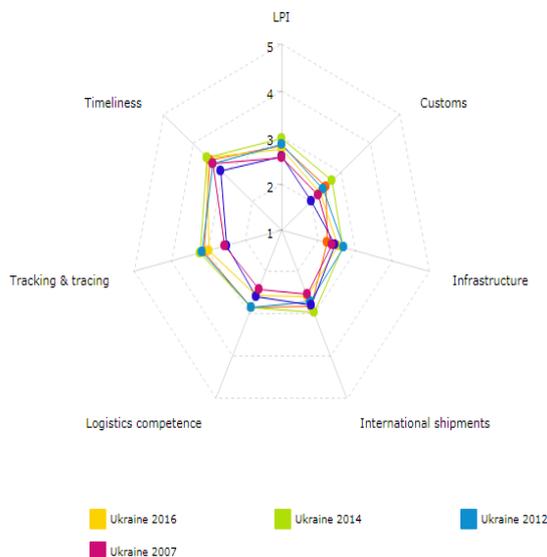


Fig. 2. LPI in Ukraine in 2007-2018

Ukraine is considerably inferior to the development of the countries of the European and American region. Thus, according to the Ukrainian Logistics Association (ULA), the revenue from logistics in Germany is 170 billion euro annually, while in Ukraine it is only 300 million, with an estimated potential income of 300 billion dollars.

According to studies by the European Logistics Association, Ukraine's gross logistical costs transactions on average account for 35% of the total cost of production (in the US the figure reaches 25%, and in Europe it is 8-12%).

This, in turn, is conditioned by the presence of the following problems:

- lack of proper transport infrastructure - low quality
- roads, insufficient number of them, considerable physical and moral wear transport, which makes it impossible to shorten the delivery period of products from manufacturer to consumer;
- shortage of nodal logistics centers - lack of coordination in the management of material flows and in the distribution of stocks;
- inefficiency of the use of the fixed assets - increased costs during transportation and storage due to downtime, underloading equipment, irrational use of the work area;
- unsatisfactory level of communication system - difficulties in the process tracking goods on the road;
- lack of interconnections between enterprises and logistics firms;
- lack of enterprises producing packaging and packaging;
- legislative irregularity;
- shortage of highly skilled specialists

These factors suppress the development of the logistic concept, and their leveling in the short run is rather dubious, so it needs long-term development strategy. Primary reform is needed legal aspect of development, because in the logistics there are practically no laws and by-laws. Ukrainian legislation does not reflect the exact requirements for meet the needs of logistics.

Thus, on the basis of a positive trend towards an increase in the LPI index, one can draw a conclusion on the revival of interest in the development of logistics, which is due to the actualization of the problem of survival and increase Competitiveness in a buyer's market, since it is logistical an approach is an important component in ensuring microeconomic adaptability systems.

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