ECONOMICS

The sequence of the working out the eco-logistic strategy of enterprise development

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Abstract: The article analyzes the key stages and directions of the development of ecologization of logistic process in the world. Considers the basic interpretations of concepts – eco-logistic, green logistic, reverse logistic and formulates specific practical recommendations for Ukrainian enterprises development.

Keywords: *ecologistics, green logistics, reverse logistics, greening of production, eco-greening strategy*

Introduction. Adaptation of Ukrainian legislative and regulatory regimes to the European Union legal system, such as Acquis communautaire, with the purpose of strategical implementation state political purposes concerning guaranteeing of including Ukraine to the European political, economic, security and legal space provides new perspectives for the development of the Ukrainian enterprises [1]. The implementation of preffered foreign political direction requires the agreement with existing state programms particullarly with a state ecological politic strategy of Ukraine [2].

The scope of industrial activity is closely linked with problems in terms of coordinates "man – nature" and "society – environment", updating of which is the result of the effects on the environment. Entrepreneurship ecologization has global trends, is popularizing and has become the practice of many Western and multinational companies. The experience of EU involved countries shows that a priority of the ecological approach is obvious as in reorganization and improvement of existing production systems, as well as in new busines projects planning and new established enterprises performance.

Analysis of recent researches and publications. A large number of foreign scientists were engaged in the research concerning interaction between ecological and logistics processes within finding new prospective areas of the development of enterprises. The treatments concerning ecologistic concept were presented by: J. Weber, H. Blum [5], G. Kummetsteiner [6], A. Korzeniowski [7], E. Mate, D. Tyksie [8], N. Edwarczyk, A. Stachowiak [9]. In study of green logistics issues such authors were engaged, namely: P. Murphy [10], D.S. Rogers, R. Tibben-Lembke [11], Li Yanbo, Liu Songxian [12], M. Thiell, J. Zuluaga, J. Montanez, B. van Hoof [13], J-P. Rodrigue, B. Slack, C. Comtois [14]. Researches related to the study of reverse logistics are described in the works D.S. Rogers, R. Tibben-Lembke[11], K. Hawks [15], R. Harrington [16], V. Gailen [17], L. Molinari [18], J. Sarkis, M. Helms, A.A. Hervani [19].

Domestic scientists are engaged in research of many modern logistical problems associated with ecologization of production processes and enterprise work optimization as a whole, however the above mentioned areas are partially researched.

Previously unsettled problem constituent. Analysis of the natural management in Ukraine while administrative-command system functioning shows high concentration level of industrial production, inefficient use of natural resources, financing of nature oriented measures due to residual principle. But today, because of the concept of sustainable development of society , it is necessary to reorganize the economy so that the industrial activities of enterprises effectively exist and consistent with the relevant ecologization processes.

EU experience shows that the modern enterprise, which is able to integrate the economic benefits, social and environmental aspects using ecological oriented logistic management methods achieves a significant reduction of logistics costs, image improvement, meets the expectations of consumers and gets substantial competitive advantages. However, the problem associated with the working out of the effective ecologistic strategy of the development of enterprise, in terms of intensive Ukrainian European integration, is studied insufficiently, and the obtained result of research can be practically used by domestic enterprises while planning appropriate corporate strategy.

Main purpose of the article. Analyze the key stages and directions of the development of ecology in the world and to formulate practical recommendations which in an integrated form disclose the essence of the greening processes of Ukrainian production systems through the formation and development of ecological strategies.

Results and discussions. In the scientific literature (table. 1) and journalism the concept of ecologistic, green logistics, reverse logistics considered by many researchers, entrepreneurs and community activists and means complex processes, which are often based on the concepts of production sustainable waste management [13], and stable development and environmental management.

Since greening should be implemented all-in with regard to the integrated production system, the implementation of appropriate ecologistic strategy on the enterprise is important. For a better understanding of the ecologistic strategy role for modern enterprise lets consider three conditional phases of eco-greening in world practice:

Table. 1. In the scientific literature and journalism the concept of ecologistic, green logistics, reverse logistics

Concept	Author	Interpretation
Eco-logistic	A. Kozhenovski, M.Skshypek	Different waste processing and making the optimal decisions in the sphere of their collection, accumulation, utilization distribution or burdensome for society and environment process of their liquidation [7].
	E. Mate,D. Tyksie	A new movement that emerged due to variations in demand [8].
	N. Edvarchyk, A. Stakhoviak	After-sales stage of logistics chains, part of flow after the sale of the product. Producer responsibility for production as at the time of sale as well as after it has been sold [9].
	Iy. Chortok	Products flow management subsystem from the primary source to the end user with minimal ecological destructive environmental impact. [21]
Green logistics	P. Merphy	A new method in logistics, which directs standard logistic requirements to rationality, efficiency, processing speed and movement of goods, and takes into account measures for environmental protection [10]
	Ds. Rogers, R. Tibben-Lembke	The set of actions from the assessment of minimization logistics activities environmental effects [11].
	L. Yabno, L. Songian	Scientific direction that involves the use of advanced logistics technologies and modern equipment to minimize pollution and improve the efficiency of logistics resources. Planning, design and management system using advanced logistics technology and methods of environmental planning in the area of reducing pollution and resources usage, that is dictated by ecological principles. [12]
	M. Tiel, J. Zuluaga, J. Montenez, Tubert B. van Hoff	Provides opportunities for assessment and minimizing the environmental impacts of logistics activities. This concept includes all kinds of activity, namely, direct and reverse flow of products, information and services between the departure and consumption points [13].
	J.-P. Rodrige, B. Slak, K. Komtoys	Strategies and methods of management that reduce the environmental impact and energy consumption in the distribution of goods. It is concentrated on handling, waste management, packaging and transportation [14].
Reverse logistics	K. Gavsk	The process of planning, implementation and monitoring by cost effective flow of raw materials, production equipment, final goods and appropriate information from point of consumption to the starting point for the return of the value or proper disposal. [15].
	R. Garington	The process of moving goods from the typical final destination in order to return value or proper disposal. Also, the definition of reverse logistics can may include reorganization and modernization activities [16].
	V. Geilen	The scientific process of asset management in each department and in all industries [17].
	L. Molinari	A relatively new concept, which aims to return the partial cost of products. It is oriented on those goods that are returned from a customer due to defects and damage [18].
	D. Rodgers, R. Tiben-Lembke	This is combined stages of planning, implementation and monitoring costs of raw materials, production equipment, final goods and information related from point of consumption to point of origin[11].
	J. Sarkis, M. Gelms, A. Gervani	A historically underestimated component of supply chain management, which now attracts attention due to the obvious effect on the level of income and image of the company and is the overwhelming trend of corporate social responsibility. First of all, it includes sorting, testing, repairing and disposal [19].

Table 1 is based on the sources [7-19, 21]

I stage (1960-1990) – The period logistics which is related to the processing and disposal of waste, at this time it became public known about public environmental security concerns and certain systematic appeals of business to environmental problems and ecological restructuring processes was first time recorded. There was an emphasis on the logistics of the production process and recycling;

II stage (1990-2000) – The implementation of the first ecologistic business projects, the first attempts to combine enterprise's corporate goals of environmental protection, the introduction of the first logistics strategies on environmental basis. Also, at this period first environmental standards and regulations were introduced, for example, the development of a series of international standards for environmental management system was adopted after the Uruguay Round negotiations from World trade agreement and the Conference on Environment and Development in Rio de Janeiro (1992), which functionally change the applying of ecologistic while creating wealth (ISO1400);

III stage (2000-up to date) – The implementation of integrated supply chains, the stage is characterized by increasing energy and environmental efficiency and limitation of harmful emissions (cars with the norms of Euro 5 and Euro 6) [22, 23]. Financing, development of innovative strategies for "friendly" to the environment economic and logistics trends, the struggle for leadership in ecological competition between enterprises and most importantly – a parallel increase in demand for environmentally friendly products and services by end consumers (Certified products as ISO, IEC, WSC, ITU, etc.). Directing public attention to the environmental characteristics of goods and services, identifying them by eco-label.

Having scientific literature examined, we suggest to distinguish two priority areas of ecologistic strategy development in the enterprise.

1. Reduction of harmful emissions within the production facilities and the environment. The optimization of logistics processes focused on the following, will work for the above mentioned purpose:

• minimizing the negative impact of noise, vibrations, dust [24];
• reducing emissions of ozone-depleting, harmful substances, greenhouse gases (CO2, N2O, CH4, SF6, CHF3, CH2F2, NOx, SO2, CF4, C2F6, NH3,);
• recycling of waste (glass, paper, aluminum, asphalt, rubber, iron, textiles and various types of plastic). [20]

2. Reducing the consumption of non-renewable and partially renewable natural resources in the logistics chain through:
• promoting logistics processes aimed to use alternative energy sources to substitute energy resources such as coal, oil, natural gas, uranium;
• ecologically oriented logistics management of such partially renewable natural resources as water, wood and land areas.

The analysis of the causes of "greening" of logistics and major benefits that enterprises receive, shows their image character, improving business processes effectiveness, reducing costs or their partial return (especially the transnational companies and large organizations that implement the concept of corporate social responsibility). The example of it might be the results obtained by small agricultural enterprise (Ltd Victoria in Sumy region), which until recently has been spending from 400 to 500 thousand hryvnias on gas during the heating season. Crushed sunflower stems that remain after processing and previously were considered as waste for disposal and industrial waste, are now using innovative equipment and optimizing logistics processes, learned to be dried, compressed and used as fuel. Today the company produces 150 bags of fuel pellets per day. The part of it goes to heat the building of agricultural company, and the rest is sold to local people. When investing in equipment 1,5 mln. UAH for heating costs decreased to 300-400 thousand, that is up to 100 thousand during the heating season. Thus the company received a huge economic impact by implementing a well-thought-out ecologistic strategy [25].

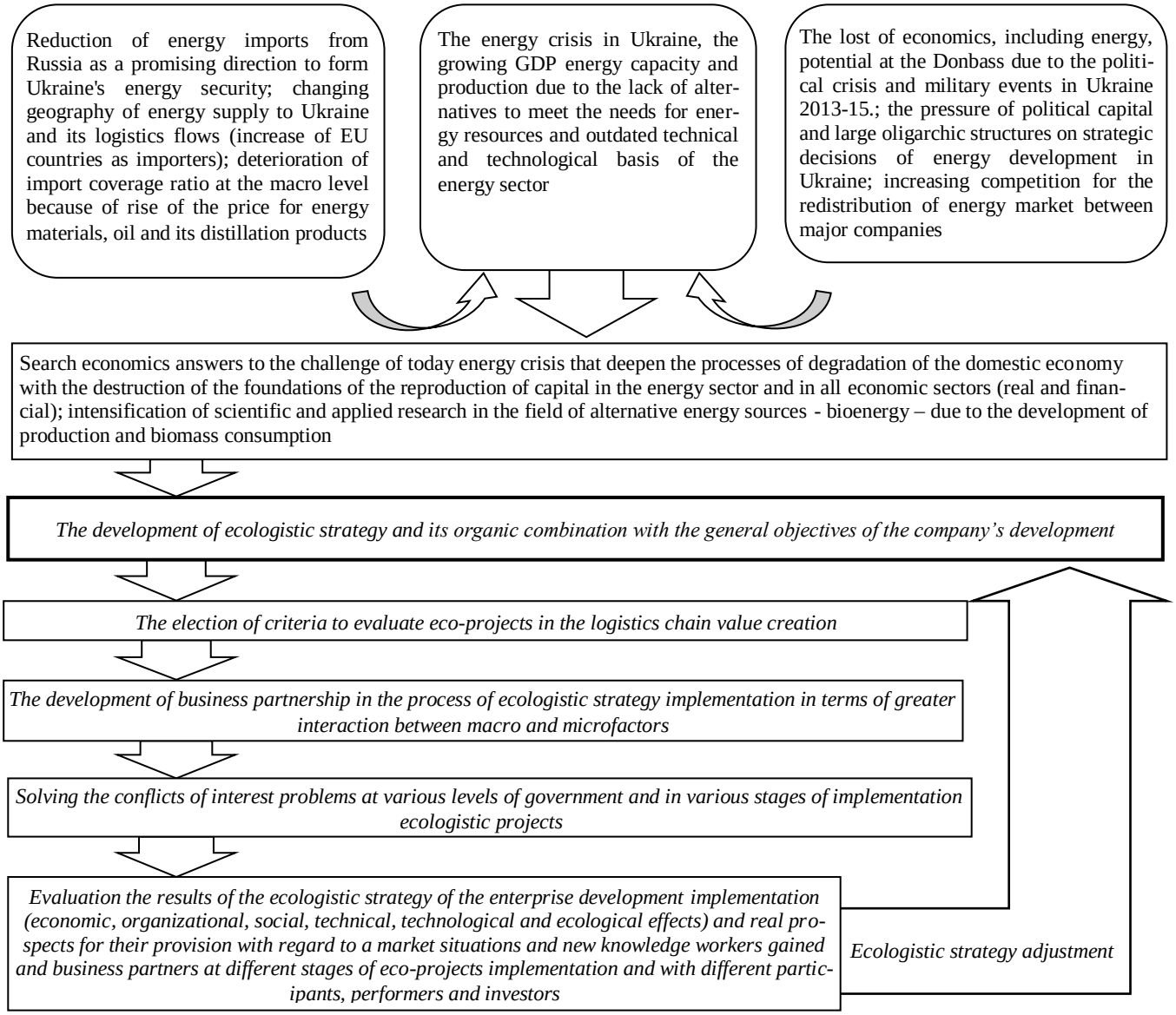

Fig.1. The sequence of the working out of ecologistic strategy of the enterprise development and evaluating its results (own development)

Energy crisis in Ukraine aggreviation, the growth of energy intensity of GDP and production and also obsolete technical and technological base of the energy sector requires finding a solution to these problems in scientific circles. Methods and tools of ecology-oriented logistics management and also the field of usage of alternative energy sources, including bioenergy, specify the importance of the eco-greening strategy development (Fig. 1).

While developing and further implementing the appropriate eco-greening strategy in the enterprise, such factors should be considered:

- orientation of "green" innovations in spatial and continuous optimization of the logistics system and its elements (units, channels, circuits, networks);
- reduction of resources' capacity and waste capacity of logistics system; providing with energy and resource conservation in the enterprise as a whole, waste recycling and focusing on the alternative energy sources, including the use of bioenergy potential;
- implementation and monitoring of standards and norms system related to emissions into atmosphere, its charges into waterways, soil contamination and other direct and indirect effects on the environment (environmental management and audit);
- association of commercial, governmental and public interest around population eco-culture and personnel eco-education, the cooperation of business, governmental and public organizations in solving environmental problems;
- Cooperation with suppliers focused on environmental strategy; stimulation for producing eco-products and providing with ecological services that would be most loyal to the environment.

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Conclusions and further researches directions. Prospects for greening production systems development and logistics processes are expanding and today are already very important for Ukrainian companies. In terms of European integration of Ukraine, the number of consumers who make their choice in favor of environmentally friendly products and services is rapidly growing. Thus the competitiveness level of those domestic enterprises, which effectively operate by eco-greening approaches and are guided by foreign companies' experience gained in in making practical management decisions to minimize negative impacts on environmental components.

Obviously, the implementation of effective ecologistic strategy and appropriate "green" innovations in the company, will be a key competitive advantage in today's business environment. That is why we suggest to work out ecologistic strategies of the development of enterprises and assess the effectiveness of their implementation using the sequence that we have described above.

Relevant areas for further research in our view are: education and personnel training in the context of ecologistic; methods of long-term planning greening policies at the enterprise; improving methods of evaluating the ecologistic innovative projects effectiveness; improvement and adaptation to the Acquis communautaire – the regulatory framework for the ecologistic regulation; development of the mechanisms for effective interaction between business and government to provide resources for ecologistic, green logistics, reverse logistics; improvement of the information system of the above categories.

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