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DEVELOPMENT OF THE LOGISTICS SYSTEM OF THE ECONOMIC REGION "POLISSYA" IN THE CONTEXT OF THE GREEN ECONOMY: ECOLOGICAL PROBLEMS AND PERSPECTIVES

Mariia Hryhorak, Nataliia Trushkina. *«Development of the logistics system of the economic region "polissya" in the context of the green economy: ecological problems and perspectives».* Modern business conditions require the implementation of the financial support mechanism for the transformation of transport and logistics systems using non-traditional sources of funding, including "green" investments. The key instruments of "green" financing for transport infrastructure modernization, which are effectively used in different countries, include: "green" bonds, "green" loans, grants, guarantees, technical assistance, money of "green" investment funds.

This paper is devoted to the analyzes of the dynamics of environmental indicators of the regional logistics system taking as an example the economic region "Polissya". On this basis, modern environmental problems of the district's logistics system have been identified. An analysis of the development of world markets for "green" bonds, "green" loans and sustainable investment assets is made. Peculiarities and characteristic features of "green" financing instruments for the development of logistics systems of different levels are considered. As a result of the research it is established that in the Ukrainian realities it is expedient to apply the advanced international experience of realization of the "green" financing of infrastructure projects mechanism in economic areas. This will successfully transform regional logistics systems in the context of the green economy and achieve sustainable development of transport infrastructure.

Keywords: regional economy, economic region, logistics system, ecological component of logistics, green economy concept, transformation, modernization, "green" investment, financing instruments, "green" projects, foreign practice.

Марія Григорак, Наталія Трушкіна. *«Розвиток логістичної системи економічного району «полісся» в контексті зеленої економіки: екологічні проблеми та перспективи».* Сучасні умови господарювання вимагають реалізації механізму фінансового забезпечення трансформації

транспортно-логістичних систем з використанням нетрадиційних джерел фінансування, серед яких «зелені» інвестиції. До ключових інструментів «зеленого» фінансування модернізації транспортної інфраструктури, які ефективно використовуються у різних країнах світу, віднесено: «зелені» облигації, «зелені» кредити, гранти, гарантії, технічна допомога, кошти «зелених» інвестиційних фондів.

У статті проаналізовано динаміку екологічних показників розвитку регіональної логістичної системи на прикладі економічного району «Полісся». На цій основі виявлено сучасні екологічні проблеми функціонування логістичної системи району. Виконано аналіз розвитку світових ринків «зелених» облигацій, «зелених» позик і активів сталого інвестування. Розглянуто особливості та виявлено характерні риси інструментів «зеленого» фінансування розвитку логістичних систем різного рівня. У результаті дослідження встановлено, що в українських реаліях доцільно застосовувати передовий міжнародний досвід реалізації механізму «зеленого» фінансування інфраструктурних проектів в економічних районах. Це дозволить успішно трансформувати регіональні логістичні системи в контексті зеленої економіки й досягти сталого розвитку транспортної інфраструктури.

Ключові слова: регіональна економіка, економічний район, логістична система, екологічна складова логістики, концепція зеленої економіки, трансформація, модернізація, «зелене» інвестування, інструменти фінансування, «зелені» проекти, зарубіжна практика.

Марія Григорак, Наталя Трушкіна. «Развитие логистической системы экономического района «Полесье» в контексте зеленой экономики: экологические проблемы и перспективы». Современные условия хозяйствования требуют реализации механизма финансового обеспечения трансформации транспортно-логистических систем с использованием нетрадиционных источников финансирования, среди которых «зеленые» инвестиции. К ключевым инструментам «зеленого» финансирования модернизации транспортной инфраструктуры, которые эффективно используются в разных странах мира, отнесены: «зеленые» облигации, «зеленые» кредиты, гранты, гарантии, техническая помощь, средства «зеленых» инвестиционных фондов.

В статье проанализирована динамика экологических показателей развития региональной логистической системы на примере экономического района «Полесье». На этой основе выявлены современные экологические проблемы функционирования логистической системы района. Выполнен анализ развития мировых рынков «зеленых» облигаций, «зеленых» займов и активов устойчивого инвестирования. Рассмотрены особенности и выявлены характерные черты инструментов «зеленого» финансирования развития логистических систем различного уровня. В результате исследования установлено, что в украинских реалиях целесообразно применять передовой международный опыт реализации механизма «зеленого» финансирования инфраструктурных проектов в экономических районах. Это позволит успешно трансформировать региональные логистические системы в контексте зеленой экономики и достичь устойчивого развития транспортной инфраструктуры.

Ключевые слова: региональная экономика, экономический район, логистическая система, экологическая составляющая логистики, концепция зеленой экономики, трансформация, модернизация, «зеленые» инвестирования, инструменты финансирования, «зеленые» проекты, зарубежная практика.

Introduction. At present, modern economic conditions require the modernization of regional logistics systems in the context of the green economy and the introduction of a mechanism for sustainable development.

This is due to the fact that the field of transport and logistics, on the one hand, has a negative impact on the environment (third in

the world in terms of carbon emissions), and on the other - has significant potential for the model of "green" growth [1; 2].

Annually, the total loss from the negative effects of the transport industry is 7-10% of GDP. For example, vehicles generate about 25% of the total greenhouse gas emissions in the European Union. According to official Eurostat data, air pollution from road

transport causes more than 400,000 premature deaths each year. Therefore, EU countries are actively implementing large-scale investment programs to modernize transport and infrastructure by "greening" them in order to minimize the negative impact on the environment and to maintain a competitive position. Such programs are usually based on the technologies of the third and fourth industrial revolutions. The significant advantages of the third industrial revolution include the "greening" of transport systems through the transition to hydrogen and electric transport, which contributes to a dramatic improvement in the quality of the environment. The EU Transport Strategy envisages a reduction of greenhouse gas emissions by approximately 20% of their level in 2008, and in general by 2050 - by 80-95% below the level of 1990 [3].

It should be noted that the modernization of logistics systems of various levels in Ukraine should be carried out within the framework of the European transport policy TEN-T, aimed primarily at resource efficiency and reduction of greenhouse gas emissions. This corresponds to the main provisions of Chapter 7 "Transport" of the Association Agreement between Ukraine and the EU, Sustainable Development Strategy "Ukraine - 2020" (transport infrastructure reform and environmental protection program), 2030 Sustainable Development Goals in Ukraine (creation of sustainable infrastructure), State Regional Development Strategy for the period 2021-2027 (formation of a cohesive country in social, economic, environmental and spatial dimensions).

According to the National Transport Strategy of Ukraine for the period up to 2030, it is necessary to take into account such a global trend of transport development as the usage of "green" modes of transport, priority of environmental protection and preservation of valuable protected areas during transport infrastructure development. The strategy records the plan to reduce greenhouse gas emissions into the air from mobile sources to 60% of the 1990 level.

However, it should be noted that the share of capital investment and current expenditures on air protection and prevention of climate change in most regions of Ukraine has been reduced. Consider this on the example of the economic district "Polissya", which includes Zhytomyr, Kyiv, Cherkasy, Chernihiv regions.

Analysis of recent researches and publications. In the scientific literature there are many approaches to the environmental component of logistics. The concept of green logistics began to form in the world in the mid-80's of XX century with the emergence of the terms "sustainable development" and "corporate social responsibility". Researchers have proven that the origin, formation and subsequent structuring of green logistics is closely intertwined with logistics principles. Actually the greening of logistics activities in the future will be a key vector of business development, as most consumers prioritize those companies that carry out carriage of freight with "green" transport and use technologies that conserve natural resources. The use of "green" technologies in logistics has become as necessary as the introduction of a quality management system. As a result, according to The Green Trends Survey in Towards Sustainable Logistics [4], 59% of businesses estimated that green transportation of their products was considered a crucial factor in attracting consumers. Based on a survey by PE International (UK) [5] identified key benefits in implementing the concept of green logistics, which include reducing emissions (33% of managers and top managers of companies); attracting new customers or developing new products (26% of respondents).

Based on the analysis of literature sources (Janbo, Songxian [6]; Brdulak, Michniewska [7]; Sbihi, Eglese [8]; Mesjasz-Lech [9]; Ubeda et al. [10]; Lai, Wong [11]; Dekker et al. [12]; Ćirović et al. [13]; Harris et al. [14]; Jedliński [15]; Seroka-Stolka [16]; Zhang et al. [17]) generalized scientific views on the interpretation of the essence and the meaning of the concept of "green logistics".

As a rule, scientists understand this term as: scientific direction and one of the factors of environmental protection; a new direction, which involves the use of advanced logistics technologies and modern equipment to minimize pollution; logistics based on resource-saving and environmentally friendly technologies; type of logistics, in which scientific and practical activities take into account environmental aspects at all stages of the movement of material and other relevant flows in order to reduce the destructive effects on the environment and optimize the use of natural resources; an effective approach to resource flow management in order to reduce environmental and economic losses; a set of actions related to the assessment and minimization of environmental consequences of logistics activities; increasing environmental responsibility in the transport and logistics sector, etc.

In addition, to date, researchers and practitioners have not identified a single approach to the classification of funding instruments for "green" projects, including those in the transport sector. Therefore, it is extremely important and necessary to develop and implement a mechanism for financial support for the transformation of global, national, regional and local logistics systems using non-traditional sources of

funding (eg, "green" investment), marketing tools, qualitatively new management approaches, digital technologies in the context of Industry. 4.0 [18-31].

The aim of the article is to analyze the features of the logistics system of the economic region "Polissya" development and determine the prospects for its further operation, taking into account the environmental component.

The main material. According to statistical analysis, emissions of pollutants from mobile sources in the economic region increased by 20% in 2000-2019 as a result of an increase in volumes in Kyiv region by 50.3% and Zhytomyr region - by 27%. But the emissions of pollutants from mobile sources in the Chernihiv region decreased by 13% and Cherkasy - by 3.7%. During this period, the share of emissions in Kyiv region increased by 8.9 percentage points or from 35.5 to 44.4% of total emissions of pollutants from mobile sources in the economic region of "Polissya", and in Zhytomyr - by 1.2 percentage point or from 20.2 to 21.4%. However, the share of emissions in Cherkasy region decreased by 5.2 percentage points or from 26.3 to 21.1% of these emissions in the district, and in Chernihiv - by 4.9 percentage points or from 18 to 13.1% (Table 1).

Table1– Dynamics of pollutant emissions from mobile sources in the "Polissya" economic region, thousand tons

Year	"Polissya" economic region	<i>Including region:</i>			
		Zhytomyr	Kyiv	Cherkasy	Chernihiv
2000	244,5	49,5	86,7	64,3	44,0
2005	265,1	59,1	97,0	63,1	45,9
2010	358,0	69,1	162,2	77,4	49,3
2011	359,3	67,8	165,0	78,0	48,5
2012	370,5	67,2	178,6	77,0	47,7
2013	360,8	71,2	165,4	76,9	47,3
2014	337,8	66,5	155,9	69,9	45,5
2015	288,4	60,7	125,5	62,8	39,4
2016	274,9	61,2	112,0	62,6	39,1
2017	276,7	61,8	113,8	62,3	38,8
2018	278,8	62,4	115,7	62,1	38,6
2019	293,4	62,9	130,3	61,9	38,3

Compiled on the basis of information materials of the Main Departments of Statistics in Zhytomyr, Kyiv, Cherkasy, Chernihiv regions.

During 2017-2019, the volume of emissions of pollutants into the atmosphere from the activities of the transport and warehousing decreased by 18.3% in the

economic region. This is due to a decrease in emissions in Zhytomyr region by 24.9%, Chernihiv region - by 23.5%, Cherkasy region - by 22.7%, Kyiv region - by 12.1% (Table 2).

Table 2 –Emissions of pollutants into the atmosphere from the activities of transport and warehousing in the "Polissya" economic region, tonnes

Regions	Year		
	2017	2018	2019
"Polissya" economic region	8368,8	10425,9	6839,3
<i>including:</i>			
Zhytomyr region	1097,1	1449,5	823,5
Kyiv region	3819,8	3878,2	3357,5
Cherkasy region	2400,0	3953,3	1854,1
Chernihiv region	1051,9	1144,9	804,2

Compiled on the basis of information materials of the Main Departments of Statistics in Zhytomyr, Kyiv, Cherkasy, Chernihiv regions.

For the researched period, the amount of carbon dioxide emissions into the atmosphere from the activities of transport and warehousing in the economic region increased by 27.1% due to an increase in

emissions in Cherkasy region by 127%, Kyiv - by 13.4%, Chernihiv - by 13.3%. However, the volume of such emissions in the Zhytomyr region decreased by 53.5% (Table 3).

Table 3 – Emissions of carbon dioxide into the atmosphere from the activities of transport and warehousing in the "Polissya" economic region, tonnes

Regions	Year		
	2017	2018	2019
"Polissya" economic region	584322,2	630111,4	742501,2
<i>including:</i>			
Zhytomyr region	52336,5	67474,6	24361,7
Kyiv region	396718,6	390688,7	449908,7
Cherkasy region	101091,3	128504,7	229509,4
Chernihiv region	34175,8	43443,4	38721,4

Compiled on the basis of information materials of the Main Departments of Statistics in Zhytomyr, Kyiv, Cherkasy, Chernihiv regions.

The analysis shows that the share of current expenditures on environmental protection in the field of transport and warehousing in the economic region in 2019 was only 0.4% of the total Ukrainian expenditures (in 2010 - 0.2%). At the same time, the share of current expenditures on environmental protection in the field of transport and warehousing in Kyiv region increased by 15.3 percentage points or from 78.6 to 93.9% of total current expenditures in the region. Meanwhile, there is a reduction in

the share of these costs in the Zhytomyr region by 8.7 percentage points (from 9.8 to 1.1%), Cherkasy - by 4.7 percentage points (from 8.3 to 3.6%), Chernihiv - by 1.9 percentage points (from 3.3 to 1.4% of total current expenditures in the economic region). In addition, the share of capital investment in environmental protection in the field of transport and warehousing in the economic region is insignificant and in 2019 amounted to 0.7% of all-Ukrainian capital investment in this area (in 2010 - 0.8%). Investments in

environmental protection in the field of transport and warehousing took place only in Kyiv region, but to a small extent (Table 4).

Table 4 – Current expenditures and capital investments for environmental protection in the field of transport and warehousing in the "Polissya" economic region, UAH thousand (at actual prices)

Indicators / Regions	Year		
	2017	2018	2019
Current expenditures			
"Polissya" economic region	1272,0	2533,3	2712,4
<i>including:</i>			
Zhytomyr region	125,0	587,6	29,5
Kyiv region	999,7	1773,5	2547,2
Cherkasy region	105,3	123,1	97,0
Chernihiv region	42,0	49,1	38,7
Capital investments			
"Polissya" economic region	529,2	498,7	468,2
<i>including:</i>			
Zhytomyr region		No data	
Kyiv region	529,2	498,7	468,2
Cherkasy region	–	–	–
Chernihiv region	–	–	–

Compiled on the basis of information materials of the Main Departments of Statistics in Zhytomyr, Kyiv, Cherkasy, Chernihiv regions.

In the "Polissya" economic region the situation with investment in measures aimed at protecting the air and climate change is deteriorating. Thus, according to the State Statistics Service of Ukraine, the share of capital investment in air protection and climate change in the economic region in 2019 was only 0.12% of total capital investment in all types of environmental measures, down compared to 2010 almost by 21 percentage points. The relative share of capital investments in the region decreased in 2010-2019 by 2.2 percentage points or from 2.4 to 0.2% of the total volume of capital investments in the relevant type of environmental measures. The largest share of capital investment in air protection and climate change is in the Kyiv region (76.8% of the total in the region); followed by Chernihiv region (17.1%) and Cherkasy region (6.1%). In the Zhytomyr region, the value of this indicator in 2010 was 4% of the volume of capital investment in air protection and climate change in the "Polissya" economic region. And starting from 2018, the

investment of this environmental measure in the region was not carried out. The relative share of capital investments in air protection and climate change in the Kyiv region decreased by 12.3 percentage points or from 12.4 to 0.1% of the volume of capital investments for all types of environmental measures in the region; in Cherkasy - by 42.4 percentage points or from 43.9 to 1.5%; in Chernihiv - by 10.2 percentage points or from 13 to 2.8% (Table 5).

During 2010-2019, the share of current expenditures on air protection and climate change in the economic region decreased by 8.1 percentage points or from 11.6 to 3.5% of total current expenditures for all types of environmental measures. For this period, the relative share of current expenditures in the area decreased by 2.5 percentage points or from 4.7 to 2.2% of the total Ukrainian current expenditures for the relevant type of environmental measures. The largest share of current expenditures on air protection and climate change problems falls on the Chernihiv region (61.8% of the total in the

region); followed by Kyiv region (30.4%), Zhytomyr region (4.2%) and Cherkasy region (3.6%).

Table 5 – Capital investments in air protection and climate change problems in the "Polissya" economic region, UAH thousand

Regions	Volume of capital investments by years			
	for all types of environmental measures		<i>including</i> air protection and climate change	
	2010	2019	2010	2019
"Polissya" economic region	128186,3	7035373,3	27110,2	8200,2
<i>including:</i> Zhytomyr region	11507,4	6864,9	1077,3	–
Kyiv region	53400,0	6945708,4	6622,4	6300,2
Cherkasy region	36114,6	33100,0	15876,3	500,0
Chernihiv region	27164,3	49700,0	3534,2	1400,0

Compiled according to data: [32, p. 169, 187].

The share of current expenditures on air protection and climate change in the Chernihiv region decreased by 14.5 percentage points or from 25.8 to 11.3% of the unit costs for all types of environmental measures in the region; in Kyiv - by 3.6

percentage points or from 5.6 to 2%; in Zhytomyr - by 2.5 percentage points or from 4 to 1.5%; in Cherkasy - by 1.1 percentage points or from 1.7 to 0.6% (Table 6).

Table 6 – Current expenditures on air protection and climate change problems in the "Polissya" economic region, UAH thousand

Regions	Current expenses by years			
	for all types of environmental measures		<i>including</i> air protection and climate change	
	2010	2019	2010	2019
"Polissya" economic region	534688,9	1853695,1	61858,1	64412,5
<i>including:</i> Zhytomyr region	59028,0	181573,9	2361,9	2724,5
Kyiv region	239400,0	965021,2	13517,8	19589,0
Cherkasy region	61962,9	354600,0	1028,0	2300,0
Chernihiv region	174298,0	352500,0	44950,4	39800,0

Compiled according to data: [32, c. 172, 188].

The relative share of investments in capital repairs of fixed assets for environmental protection in the "Polissya" economic region decreased in 2019 compared to 2010 by 6.8 percentage points or from 9.2 to 2.4% of the total volume of such investments in Ukraine. At the same time, the share of investments in capital repairs of fixed assets for environmental protection in Cherkasy region increased by 40.2 percentage

points or from 36.6 to 76.8% of their volume in the economic region, and in Chernihiv - by 4.1 percentage points or from 11.4 to 15.5%. But the share of investment in the major maintenance of fixed assets in Kyiv region, by contrast, decreased by 33.6 percentage points or from 37.3 to 3.7%, and in Zhytomyr - by 10.7 percentage points or from 14.7 to 4% of their volume in the economic region (Table 7).

To date, Regional Development Strategies until 2027 have been developed and approved, in which the creation of a safe

living environment and increasing the level of environmental safety are mostly recognized as priorities.

Table 7 – Investments in capital repairs of fixed assets for environmental protection in the "Polissya" economic region, UAH million

Year	"Polissya" economic region	Including regions:			
		Zhytomyr	Kyiv	Cherkasy	Chernihiv
2010	45,6	6,7	17,0	16,7	5,2
2015	34,1	17,9	1,0	14,9	0,3
2017	11,5	3,0	3,3	4,2	1,0
2018	25,0	6,4	3,6	12,6	2,4
2019	35,4	1,4	1,3	27,2	5,5

Compiled according to data: [32, c. 182].

These strategic documents are consistent with the main aspects of regional development, namely: the approximation of life quality to European standards and the

development of human potential; increasing the competitiveness of the region's economy; sustainable development territories of settlements and communities (Table 8).

Table 8 – Analysis of regional development strategies for the period up to 2027 in terms of environmental aspects in the field of transport and logistics

Region	Strategic goal	Operational goal
Zhytomyr	Creating a modern comfortable and safe living environment in local communities	High-quality local roads (bridges and overpasses), proper landscaping, clean and safe environment
Kyiv	Development of human potential, approximation the life quality closer to European standards.	Ecological safety and environmental protection.
	Sustainable development of settlements and communities	Development of region road and transport infrastructure
Cherkasy	High quality of life: ecology, safety, infrastructure	Environmental safety and environmental protection. Infrastructure development and modernization
Chernihiv	Comfortable and safe living conditions	Development of transport infrastructure. Protecting ecosystems and preserving the environment on the basis of sustainable development

Compiled by the authors

As emphasized in the Development Strategy of Zhytomyr region for the period up to 2027, the choice of the operational goal "High-quality local roads (bridges and overpasses), proper improvement, clean and safe environment" determined the content of the following tasks to achieve it: local roads construction, reconstruction and repair; ensuring the quality of landscaping elements; optimization of waste management; involvement of community residents in

solving landscaping problems and improving their environmental culture; ensuring the ecological and economic balance of communities.

The Development Strategy of the Kyiv region for 2021-2027 states on effective waste management; support for innovative developments and introduction of the latest technologies in the field of waste processing and return of resource-intensive materials to economic circulation; ecological monitoring

and informing the population about the state of the environment; development of ecological network and recreational areas; introduction of environmentally friendly modes of transport.

The key tasks set out in the Cherkasy region Development Strategy for the period 2021-2027 include the following: implementation of comprehensive environmental monitoring systems; introduction of modern mechanisms of waste management; increasing transport accessibility, development of logistics potential of the region.

The Strategy of Sustainable Development of Chernihiv region for the period up to 2027 refers to the development of high-quality and accessible transport infrastructure, including environmentally friendly modes of transport; protection of the natural environment, preservation and development of protected areas; creating conditions for safe living and livelihoods of the population; formation of ecological consciousness and ecological culture of citizens.

Thus, the results of previous studies [33-39] and the conducted statistical analysis

indicate inefficient modernization of the regional logistics system in the "Polissya" economic region in the context of green economy and sustainable development. This is primarily due to limited funding for the creation of transport infrastructure and insufficient implementation of green technologies.

Given that, it is advisable to develop and implement a mechanism for "green" investment in infrastructure projects, which means financing investments that provide environmental benefits in the broad context of environmentally sustainable development of various areas of economic activity. According to expert estimates, only 1% of global bonds are marked as "green", while 1% of investments of institutional investors belong to the category of "green" infrastructure assets [40].

To date, among foreign and domestic researchers and practitioners there is no single approach to the classification of funding instruments for "green" projects, including the transport sector (Table 9).

Table 9 – Approaches to the classification of funding instruments for "green" projects proposed by various scientific schools

Scientific schools representatives	Types of funding instruments
S. Venugopal A. Srivastava C. Polycarp E. Taylor [41]	- mechanisms of public support; - public financing instruments: loans, share capital, investment instruments that exclude risks
N. Lindenberg [42]	- instruments through which direct financing is carried out: shares, credit lines, loans and grants; - instruments that do not provide direct funding, but can transfer knowledge or reduce risks: guarantees and technical assistance; - instruments used to attract additional private resources transferred to "green" projects through one of the above instruments: green bonds and structured funds
M. Voica M. Panait I. Radulescu [43]	- green shares; - green bonds
V. Kazlauskienė A. Draksaite L. Melnyk [44]	- green bonds; - green shares; - green loans; - budget financing instruments
O. Nykyforuk N. Kudrytska I. Dulcka [45]	- taxation; - infrastructure: corporate or municipal bonds; mechanism of concession relations; - securitization of assets;

- crowdfunding: royalties, public lending, equity crowdfunding

Compiled by the authors

Thus, the key instruments for "green" financing the modernization of transport infrastructure, which are effectively used in different countries around the world, include:

"green" bonds - bonds of any type, income from the placement of which are aimed exclusively at full or partial financing or refinancing of new and launched "green" projects that meet the established requirements (France, Brazil, China);

"green" loans - loans of any type, provided exclusively for full or partial financing or refinancing of new and launched "green" projects that meet the established requirements;

green investment funds - a mutual investment fund or other investment

mechanism that provides investments only in companies that are considered socially conscious in terms of their business activities or directly contribute to the development of social responsibility using standardized "green" assets (France, Switzerland, United Kingdom).

Statistical analysis shows that the global volume of sustainable financing assets increased in 2016-2018 by 34.1%, including in Europe - by 17.5%, the United States - by 37.9%, Canada - by 54.5% , Australia and New Zealand - by 40%. The largest share of sustainable financing assets falls on Europe (45.9% of global assets) and the United States (39.1%) [46] (Table 10).

Table 10 – Global distribution of sustainable investment assets, trillion dollars USA

Regions	Year	
	2016	2018
Europe	12,0	14,1
USA	8,7	12,0
Japan	0,5	2,2
Canada	1,1	1,7
Australia and New Zealand	0,5	0,7
Total	22,9	30,7

Compiled according to data: [46].

At the same time, as noted in the analytical report [47], in European countries, the most widely used investment approach is "negative screening"; in the USA, Canada, Australia and New Zealand - "integration of ESG-factors"; in Japan - "corporate interaction and shareholder action".

There is a growing trend of investment in some "green" investment approaches in the

world. Thus, the volume of thematic sustainable investment increased 3.7 times in 2016-2018; positive screening - 2.3 times; targeted investment - 2 times; integration of ESG-factors - 1.7 times; negative screening - 1.3 times; corporate management and actions of shareholders - 1.2 times (Table 11).

Table 11 – Volumes of investment in some "green" investment approaches in the world, billion dollars USA

Approaches	Year	
	2016	2018
Targeted investment	224,5	444,3
Thematic sustainable investment	276,2	1017,7
Positive screening	818,0	1841,9

Screening within normal limits	6195,4	4679,4
Corporate management and actions of shareholders	8385,2	9834,6
Integration of ESG-factors	10353,2	17543,8
Negative screening	15063,6	19771,0

Compiled according to data: [46].

Conclusions. Thus, based on the above, we can conclude that it is appropriate to apply in modern Ukrainian realities the best international experience in implementing the mechanism of "green" investment in infrastructure projects. This will successfully transform regional logistics systems in the economic regions of Ukraine in the context of the green economy and achieve sustainable development of transport infrastructure through the implementation of investment-attractive "green" projects.

To do this, it is necessary to make changes and supplements to the National Transport Strategy of Ukraine 2030 and the State Regional Development Strategy for the period 2021-2027.

Prospects for further research are to analyze and generalize conceptual approaches to the definition of "circular economy" and "green logistics", as well as to determine the prerequisites for the development of the concept of circular logistics.

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