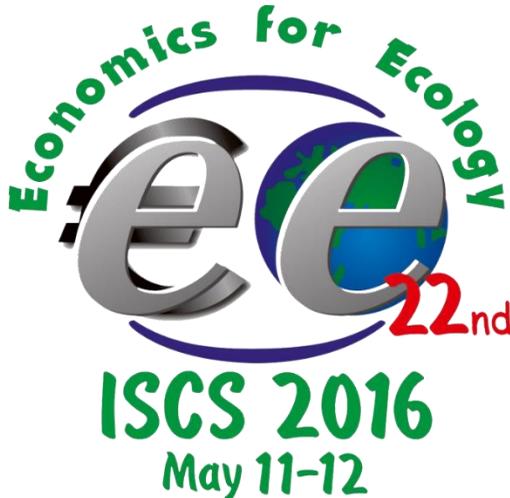


Ministry of Education and Science of Ukraine
Sumy State University
Oleh Balatsky Academic and Scientific Institute of Finance,
Economics and Management

22nd International Scientific Conference
"Economics for Ecology"
ISCS'2016



Економіка для екології

Матеріали
XXII Міжнародної наукової конференції
(Україна, Суми, 11-12 травня 2016 року)



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**"ECONOMICS FOR ECOLOGY"
(ISCS'2016)**

May 11-12, 2016, Sumy, Ukraine

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- Problems of Education, Ecological Education
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- Informational Economics
- Greening Economy, Greening People
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- Regional Ecology
- Ecological Economics and Marketing in the Context of Globalization
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- The Role of NGOs on the Way towards Sustainable Development

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INTERNATIONAL ENVIRONMENTAL POLICY

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Humanity constantly faces a lot of problems which need to be solved as soon as possible. The growing impact of human activities causes environmental changes: air and water pollution as well as natural resource depletion on a global scale. These disturbances in ecosystem inflict considerable harm on all living creatures, including humans. Despite the rapid scientific and technological development, the role of natural and anthropogenic factors that cause emergencies and constitute a threat to the world ecological safety is constantly growing. Common environmental problems force countries to unite in order to protect the environment and conduct international environmental policy.

In the middle of the 20th century there was no country that would have well-defined environmental policy. The Stockholm Conference, held in 1972, can be considered as the beginning of the international cooperation in environmental issues. This conference has attracted public attention to environmental problems and affirmed the people's right to normal living conditions in the environment that would ensure their dignity and well-being.

International environmental policy has been formed, it consists of two levels:

1. International global environmental policy that includes development and implementation of international political, juridical and economic campaigns, taking into consideration ecological constraints in socio-economic development as well as natural resource stocks and their distribution among regions and countries. Its purpose is to preserve global integrated resource of the planet.

2. International regional environmental policy that unites the interests of countries of one continent, united by natural geographical environment, and sometimes – the same sea (the Black Sea, the Mediterranean Sea, the Baltic Sea) or river (Dnieper, Danube, Rhine) [3].

Methods of conducting environmental policy are different in every country. There is a fair amount of organizations that deal with environmental issues. So, I find it necessary to consider the main objectives of some of these organizations such as NATO and the EU.

NATO environmental policy is aimed at achieving the following goals:

- to reduce the influence of military activities on the environment;
- to reduce air pollution with chemical and biological contaminants;
- to conduct regional researches, in particular cross-border ones;
- to prevent conflicts due to the lack of resources;
- to use landscape sciences for environmental assessment;
- to overcome risks that appear every year to the environment and society and, as a result, can continue economic, political and cultural instability;
- to counter non-traditional security threats [2].

So, NATO environmental policy is aimed at preventing and overcoming the risks that appear in the environment and can do great harm. In 1991 Ukraine and NATO started cooperation. This cooperation has been focused on the environmental problems in the field of defense as well as the IT development, cell biology, new materials and the efficient use of natural resources.

Let us also consider the main objectives of the European Union activities aimed at solving the environmental problems:

- to protect, preserve and improve the quality of the environment;
- to use natural resources efficiently;
- to protect human health;
- to contribute to the implementation of measures at the international level to deal with regional or global environmental problems as well as climate changes [1].

According to the association agreement, Ukraine and the EU entered into cooperation, the important point in this cooperation is the gradual approximation and compliance of the Ukrainian legislation with the EU one.

It is reasonable to consider what goals Ukraine has set for environmental conservation:

- to raise the level of public environmental awareness;
- to improve environmental situation and raise the level of environmental safety;
- to achieve a favorable state of the environment for the human health;
- to integrate environmental policy and improve a system of integrated environmental management;

- to contribute to stemming the loss of biological and landscape diversity and to the formation of ecological networks;
- to ensure environmentally balanced natural resources utilization;
- to improve regional environmental policy [4].

To improve its environmental policy, Ukraine should take into consideration the experience of foreign countries, however, the simple emulation of the principles of these countries will not give a good result and improve the efficiency of natural resources utilization, since every country should take into account its own peculiarities of formation and development of the environmental space.

In view of this, the evolution of international environmental policy has formed distinct approaches to setting and dealing with the environmental problems. As we go forward, international environmental policy will have to get focused on new environmental issues, but not to forget about long existing problems and to find optimal solutions to them, because each of these problems can cause irreversible environmental changes.

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THE ECONOMY DEVELOPMENT OUTLOOK OF RENEWABLE ENERGY SECTOR

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Today the renewable energy sector continues to be one of the most an attractive market for public and private investors.

According to the Renewables global future report [1] world gets about 17–18% of its energy from renewables, including about 9% from “traditional biomass” and about 8% from “modern renewables.” In 2011, about 30 countries were getting 20% or more of their total energy from renewables, and some as high as 50%. Countries in this category include Austria, Brazil, Chile, Denmark, Finland, Iceland, New Zealand, Norway, Peru, the Philippines, Portugal, Romania, Sweden, Uganda, and Uruguay. The share of energy from renewable sources in gross final consumption of energy reached 15.0% in the European Union (EU), compared with 8.3% in 2004, the first year for which the data is available (Table 1).

Table 1 – Share of energy from renewable sources (in % of gross final energy consumption) [2]

	2004	2010	2011	2012	2013	2020 target
Denmark	14.5	22.0	23.4	25.6	27.2	30
Germany	5.8	10.4	11.4	12.1	12.4	18
Spain	8.3	13.8	13.2	14.3	15.4	20
France	9.4	12.8	11.2	13.6	14.2	23
Croatia	13.2	14.3	15.4	16.8	18.0	20
Austria	22.7	30.8	30.9	32.1	32.6	34
Poland	6.9	9.2	10.3	10.9	11.3	15
Finland	29.2	32.5	32.9	34.5	36.8	38
Sweden	38.7	47.2	48.9	51.1	52.1	49
Norway	58.1	61.2	64.7	65.9	65.5	67.5

It is also noticed that during the 1990s, projections of renewable energy that were considered most credible. For example by the International Energy Agency (IEA), foresaw shares of modern renewables reaching no more than 5–10% into the far future, given the policies and

technologies existing at the time. As a result of the market, policy, and technology developments of the past 15 years, those early projections have already been reached.

Also many finance experts say that private investment in renewables could exceed \$500 billion annually by 2020. A few experts cited figures as high as \$1 trillion by 2020.

However, while most experts were generally optimistic about the opportunities for scaling up and extending many existing investment sources and mechanisms, it is necessary to understand that there will be a clear need in the future to go beyond current financing sources. Consequently utility balance-sheet finance, bank lending, private equity, and venture capital are only scalable to a certain point, and would not support \$500 billion-plus annual investment levels. To reach these levels would require the involvement of other institutional investors, implementation of the new economic (financial) mechanisms and new equity sources at both small and large scales.

According to the European practice should be implemented and used some general principles for the implementation of various policy options:

- flexibility in implementation of an economic instrument;
- ensuring an appropriate balance between regulatory and economic instruments;
- responsibility for distribution (spending) the revenues (investment);
- providing a clear policy framework;
- fully taking into account the economics of the waste management sector;
- requiring reporting and controlling.

Consequently, the benefits of implementing and maintaining of the new economic (financial) mechanisms in renewable energy sector should:

- increase productivity through the use of innovative and environmental technologies and equipment;
- reducing costs and product cost based on the reduction of energy intensity and resources;
- increase the competitiveness business entity and the possibility of entering new markets etc.
- increasing duration of life and reduce the level of morbidity;
- improve the living standards and the working conditions;
- reduce the destructive impact on the environment;

- gradual restoration of ecological balance and reduction of anthropogenic load
- improve the quality resource consumption.
- reducing the level of political dependence on foreign suppliers resources;
- widening the opportunities to the use of international agreements for activation quota trading, environmentally oriented products.

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ENERGY EFFICIENCY AND THE ECONOMIC CRISIS

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At this stage of the Ukrainian economy development the problem of energy shortages has escalated, as a result of resources of energy-intensive production, inefficient use of fuel and energy resources (FER), reducing own sources and increasing prices for imported ones. Economic growth in Ukraine depend on the amount of own available resources, potential of energy efficiency and energy intensity of leading industries.

The problems of ensuring economic security, energy saving and enhancing competitiveness have been investigated in the works O.S.Vlasyuka, T.V.Serdyuka, V.O.Barannika. Basic theoretical and practical achievements of V.M.Heights, S.F.Yermilov, N.V.Mytsu, V.P.Rosen, J.P.Yaschenko were devoted to the problems of reducing energy intensity of Ukraine's economy, providing industry with energy resources, substantiation of the energy efficiency.

The level of energy sector development of every country has a decisive impact on its economy and social sphere, the standard of living. Extraction of energy resources, energy production and consumption of humanity is continuously increasing with the growth in the world population, economic development and technological progress. For the last

100 years, world population has increased almost four times, and the annual extraction of the energy resources - 21 times [3].

At this tempo of growth of energy extracting resources in the next 100 years almost all fossil fuels (primarily oil and gas) in the world will run out. One of the ways to improve the situation may be managing demand for fuel and energy. Demand Management is understood in the broad sense, namely, energy management system, which includes production, transportation and consumption of fuel and energy resources (FER) to reduce their needs for the economy and population and formation of policy of promotion efficient production and energy efficiency. In other words, on the basis of reducing of demand, the energy intensity of the economy and rational use of energy by people is decreased.

Energy security is an important component of national security. In the modern world it is not enough to have the resources, for the development it is also necessary to manage them most economically and effectively. The more own energy resources the country has and effectively use them, the more she independent from other exporting countries. Often energy dependence of some countries could lead to international conflicts, wars, crisis.

Energy efficiency may become driving force at the going out of crisis, because the introduction of energy-saving decreases the cost of manufactured products. Thus, the national producers will be more competitive not only on the domestic market, but also will be able to conquer foreign markets. That will increase exports, GDP and as a result, the economic crisis will recede.

However, low indicators of energy efficiency of economy can cause significant losses, especially for countries with a significant share of energy-intensive production in creating the GDP.

Economy of Ukraine has inherited its features from the Soviet Union material-intensive and very energy-intensive manufacturing, extremely unbeneficial for its structure of energy consumption, which got complicated after independence. Our country not only lacks enough fuel and energy resources, resulting of imports of large volumes of resources. There is also the problem of outdated equipment in the most of energy-intensive industries. Now the structure of energy balance of Ukraine does not meet the structure of primary natural energy resources, which it owns.

Ukraine belongs to the countries that are not able to fully satisfy their needs for energy resources at the expense their own production, so we must import expensive resources.

Taking into consideration the production and consumption of primary energy resources and the level of coating needs PER by domestic production for the years 2012-2014 appear following conclusions (table 1).

Ukraine almost completely covers the amount of consumption of coal and peat by domestic production. However, the dynamics of production has an ambiguous character. In 2013, extraction increased by 407 toe and managed to cover 98.16% of the needs in this resource. And in 2014 there was a significant decline - in 8772 toe and the need for coal and peat by domestic production covered only by 89.64%. Reduce production arose because of temporary occupation of the eastern regions of the country, where the main deposits of coal were, the largest mines were closed, or working conditions get dangerous and are not at full capacity.

Table 1 - The level of coating needs PER by domestic production in Ukraine for the years 2012-2014

Data	Production, toe			Consumption, toe		
	2012	2013	2014	2012	2013	2014
Coal and peat	40256	40663	31891	42718	41427	35576
Crude oil and petroleum products	3414	3167	2817	11609	9906	10688
Natural gas	15403	16022	15022	43018	39444	33412
Total	59073	59852	49730	97345	90777	79676

Table 1 (continuation)

Data	The level of coating needs PER by domestic production,%			Growth,%	
	2012	2013	2014	2013-2012	2014-2013
Coal and peat	94,24	98,16	89,64	3,92	-8,51
Crude oil and petroleum products	29,41	31,97	26,36	2,56	-5,61
Natural gas	35,81	40,62	44,96	4,81	4,34
Total	60,68	65,93	62,42	5,25	-3,52

Note: compiled by the author based sources [4]

The dynamics of energy consumption for the 2012-2014 years has decreased. Because in this period the crisis began to develop, the occupation of the eastern regions enlarged, where the focus is not only production, but also the most energy-intensive industry that is a major consumer of coal - metallurgy.

Also Ukrainian Eastern region of oil and gas getting contains about 85% of natural gas reserves and nearly 61% of recoverable reserves of oil in Ukraine. The occupation of these territories spawned the energy crisis.

Ukraine has the reserves of crude oil, but we have a small number of oil refineries, leading to imports of petroleum products. During the 2012-2014 years oil production decreased, in particular due to loss of control of the Autonomous Republic of Crimea and the Eastern region.

Despite the fact that oil consumption has ambiguous character dynamics, it remained at a high level, so it is impossible to satisfy it by domestic production. In 2013, consumption decreased and own resources could cover 31.97% of oil consumption. In 2014, the satisfaction of needs of oil and oil products by domestic production decreased by 5.61% and amounted to 26.36%. This reduction is connected with increasing in consumption and a decreasing in production.

The efficiency of energy resources that are used in the economy and in the social sphere for all the years of independence Ukraine is very low and

deteriorating with the times. A significant deterioration of efficiency and capacity utilization of most facilities of power engineering and lack of investment in the renovation of causing significant costs of raw materials (coal, oil and gas, electricity), low efficiency of thermal power stations, significant energy losses in heat and electric networks. These circumstances, as well as large proportion of the energy consumption in energy-intensive industries and wasteful use of energy in all areas of economic complex of Ukraine and the people causing considerable energy gross of domestic product (table 2).

Table 2 - Changing in the power consumption of energy resources in Ukraine in 2012-2014 years

Data	Year		
	2012	2013	2014
Consumption of energy resources, toe	73107	69557	61460
GDP mln.USD	175781	183310	131805
The energy intensity of GDP, %	41,59	37,95	46,63

Note: compiled by the author based sources [4, 5]

The evolution of the GDP energy intensity had ambiguous character. In 2013 this indicator decreased by 3.64% comparing to the previous year when energy consumption was 0.38 kg of fuel (oil equivalent) per thousand dollars GDP. In 2014, energy consumption increased to 46.63% of GDP. The primary factor of influence on energy capacity - consumption during this period has downward trend. This indicator decreased because in this period we have ambiguous character of GDP of the country, including a significant decline in 2014 (to 51 505 million USD), which caused the wrong numbers of energy intensity.

Effective and efficient end-use in the social sphere is essential for the energy-saving (table 3).

FER consumption per capita decreases every year. Thus, in 2012 the per capita consumption is 1.60 kg of oil equivalent, and in 2014 - 1.35 tonnes of oil equivalent. Consumption is reduced due to a rise in price of imported fuel resources. The government began not only to understand the problems of energy efficiency in Ukraine, they began to move to action by stimulating the leading industries to reduce resource consumption,

particularly by renewal of the old and capacious assets to new energy-saving. Great attention was paid to the consumption of the population, explanatory work was carried out and sometimes forcibly people were forced to save energy.

Table 3 - Changing in the consumption of energy resources in Ukraine in 2012-2014 years

Data	Year		
	2012	2013	2014
Consumption of energy resources, toe	73107	69557	61460
Population, thousand people	45634	45553	45426
FER consumption per capita	1,60	1,53	1,35

Note: compiled by the author based sources [4, 6]

In order to improve energy efficiency in Ukraine on the way out of the economic crisis, we suggest the following measures:

- optimization of the country's energy balance;
- carrying out audit of the main energy consumers in order to implement energy efficiency measures;
 - encouraging the implementation of accounting devices using PER;
 - introduction to energy efficiency requirements for equipment, goods and services;
 - attracting significant and long-term investments for modernization, introducing energy saving technologies in the way of sustainable development, competitiveness and security of the state;
 - development programs implementing energy saving measures, including improved access to credit and the removal of legal restrictions on investment in energy efficiency for both the industry and to the public;
 - development of measures based on the experience of leading countries to stimulate energy management in energy-intensive industries;
 - approximate of energy management in Ukraine to the principles and EU legislation

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ENVIRONMENTAL PROBLEM AS THE COMPONENT OF IRRATIONAL FUNCTIONING OF THE GLOBAL ECONOMY

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One of the main factors that affect the preservation and development of society is a clean living environment on the planet. However, in the process of inefficient functioning of the global economy one of the first items in the list of global problems is environmental issue.

Conflicts concerning this matter took place even in the beginning of civilization, but today this range of problems is quite essential and urgent. Exploring the environmental problem in the global economy should take into account all the peculiarities of society at contemporary stage of development, the regularity of biospheric processes and their impact on the development of industrial activity, pressure on the environment [1].

The purpose of the study is to determine the aggravation of environmental problems due to the inefficient functioning of the global economy.

The environmental problem in the global economy is caused by several factors:

- the increasing number of emergencies, disasters and environmental accidents of industrial and man-made character (nature);
- the manifestation of anti ecological tendencies of nature usage;
- the attraction of new areas into (production) manufacture by removing them from the natural ecosystems;
- mining of raw materials in various branches of economy;
- the shortage of drinking water;
- air pollution;
- waste reclamation;
- water pollution;
- the alteration of social values.

These days, humanity actively begins to interact with the environment and extensively uses its resources. This leads to the escalation of the environmental conflict. Thus, for instance, ecodestructive nature of the attraction and the usage of natural resources in manufacturing processes and consumption have negatively affected the quality of ecosystem services:

- providing. These include fresh water, mineral resources, fuel and energy resources, etc.;
- regulating. They are such as: atmospheric gas, climate, water resources, and other;
- supporting. These services include circulation of water and energy in the nature, soil formation processes, etc.;
- cultural. They incorporate ethnic culture and aesthetic values [2].

Among the number of global issues related to the process of economic development, to the most pressing problems are included depletion of natural resources, pollution and rapid population growth. These problems are quite interconnected. For example, currently there are very limited natural resources but the number of population and its material needs tend to increase. At the same time we can observe a range of other negative consequences, such as soil degradation, reduction of forest areas, pollution of seas, inland waters, rivers and air. This list can be continued, but then the question arises: ‘Are these vital resources inexhaustible?’ Maybe they are not.

In confirmation of this is inseparable process that is associated with the industrialization of production processes based on the use of NTP, increased amount of usage of natural resources. All this eventually leads to

the excessive deterioration of social relations with the environment and amplification of the resource and ecological crisis in almost all regions of the world [3].

Moreover, exacerbation of political, national, social and economic contradictions between countries and nations regarding the use of resources of the biosphere is another significant reason. In future this problem is able to generate unpredictable global social and international conflicts and potential disasters.

In general, depletion of natural resources' potential, reduction of minerals, entail a negative impact on the ecosystem. Owing to this, the strategic task for the whole world, of how to settle ecological problems, should be the development of approaches that will be built upon adequate and effective mechanisms of regulation of sustainable development. For the further, all activities of the society should not contradict natural laws, in order not to lead to irreversible processes in the ecosystem.

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INNOVATION ECOSYSTEMS FOR SUSTAINABLE DEVELOPMENT

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Among the main issues we face today dynamics of changes and unpredictability of transformation trajectories should be definitely mentioned. As a result of even just these two our own lives are faster and working conditions are more and more demanding. From personal micro-level to socio-economic macro-level we can see human creativity and its innovative outcomes. And at all that levels different socio-economic

systems obtain more and more self-organising potential. In addition, having much less material limits both intelligence and creativity are very promising in the context of sustainable development in times of our “information age” and “knowledge society”.

We can consider the industrial sector of Sumy Region and dynamics of its “innovativeness” as an example (see Figure 1). Two common and very simple statistical indicators that can show a lot: share of industrial enterprises which were involved in so called innovative activities and the ones which implemented innovations. First obvious conclusion is that in this century less than a quarter of industrial enterprises are involved in obtaining and/or implementing innovations. Second less obvious assumption is that self-organisation of local industry in Sumy Region may be analysed in more detail as the shares of enterprises involved in obtaining and implementing innovations are very close year by year and varies from less than 5% to more than 20%.

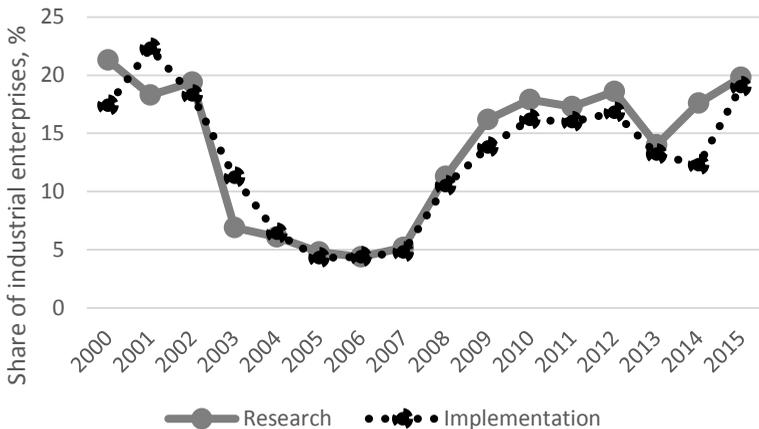


Figure 1 – Innovation Intensiveness in Industry, Sumy Region

In the sustainability context we also need to take into account along with general innovation activity indicators the way natural resources are preserved and used. According to our assumption it may be sufficiently determined by the direction and intensity of the intellectual and innovative activities within regional economy (corresponding socio-eco-economic system).

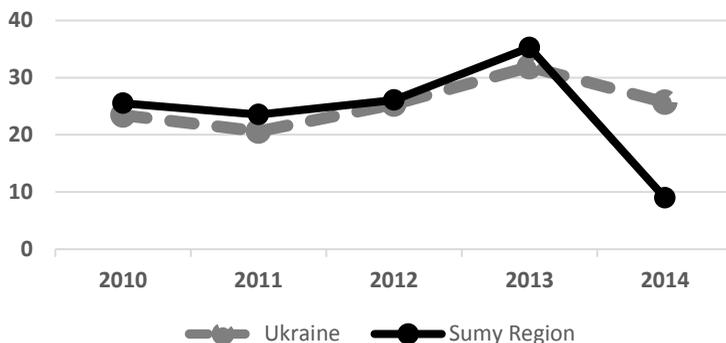


Figure 2 - Resource-saving technologies implemented, %

In case of Sumy Region (see Figure 2) we can see that only about one of three or even four new technological processes implemented in local industry sector is resource-saving. Also in 2010 - 2013 it is a bit higher than Ukrainian level and in 2014 it drops much lower. Innovation activity intensiveness in times of crises is separate topic of great interest. But in mentioned above sustainability context environmental state of the region indicators and their dynamics may be added to form complex evaluation instrument for intellectualisation process in the region and local innovation ecosystem potential.

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CURRENT TRENDS AND MANAGEMENT FEATURES OF THE REGIONS ECOLOGICALLY SAFE DEVELOPMENT

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The current state of the environment, without exception, all regions of Ukraine is characterized by accelerated industrial growth, deterioration of the natural environment, rapid consumption of resources reproducible excess capacity of natural systems of the Earth, lack of financial resources and a relatively small set of methods of financing ecologically events. That is why the analysis of international experience of economics incentives construction is necessary for ecologically activities.

The issue of financial security in Ukraine remains one of the most urgent and requires immediate resolution in today's unstable operating conditions, when foreign expertise and technology business is not always the driving force in the process of improving the environmental safety of the region.

In view of the above, among experts more attention is paid to countering the main threat to the environmental security of regional development in recent years, such as the problem of providing water, food and energy, air pollution, waste.

The analysis of the changes in the environment in recent years shows the significant aggravation of the ecological situation in the country. Thus, evaluating Ukraine's ranking on the index of environmental performance as one of the most common indicators makes it possible to quantify the effectiveness of environmental policy, we can conclude the deterioration of the environment in all its components, which leads to the need to assess the effectiveness of the public funding policies in the region and compliance the objectives of sustainable development [2, p. 11].

During the analyzing trends in statistical indicators we can see the follows: exhaustion of land, water and forest resources, significant amounts of air pollution, water resources, substantial energy and specific resource consumption economy. The growth of these indicators is the main source of threats to level of national and environmental safety. According the information from the organization «Global Footprint Network» ecological footprint in Ukraine during 2010 - 2012years grew by 14% and amounted 3,19 hectares per capita. According to the report «Living Planet Report

2014» in 2014 the figure is 2.9 hectares per capita, exceeding the average value of 0.8 times. It includes: environmental carbon footprint - 1.4 hectares, Built-up land - 0.5 hectares of arable land - 0.9 hectares, et al. [10].

The main indicator of the closeness of public policy to the requirements of sustainable development is the amount of financing costs aimed at the environment. Every year there is a significant decline in the share of costs from the state budget and in accordance focus solely on private investment in the process. The development of human society depends on determining the quality and size of the available resources of the environment, especially air, drinking water, food, energy. Over the past three decades the world has undergone considerable changes: population growth (from 5 to 6.9 billion of people), increasing the annual growth of GDP per capita (about 2%), and growth in trade and CO₂ emissions of agricultural surfaces. There is obvious interrelatedness and interdependence of these processes [1, p. 6-7].

The relatively small part of the Earth's surface with increased intensity of natural processes (seismic, meteorological) undergoes many risks, most large-scale disasters in the future will be on these areas, and the risk will increase with population growth (as an example the coastal city placed on areas threatened tropical cyclone). Developed countries are constantly improving the institutional and organizational basis to prevent and respond to emergencies, create a more effective system for early warning and preparation for natural disasters, forecasting models and system response that would reduce risks.

It is important for the country's leadership in scientific - technological development is strategically important divisions combining scientific organizations with state-owned scientific - technical complex that will have a leading position in its industry focus. These systems have significant mat and human resources to ensure the development and implementation of the latest advances in science and technology. On the basis of the data systems necessary to create national centers of science and high technology, which will include universities and industrial structures that can support all the research and innovation cycle from basic research, training, applied research and development to manufacturing and delivery of new products and services.

You must use the new tools of science funding efficiency and stimulate its development. It is also possible such financing system in

which spending on science should be at least 2.5% of GDP and will be directed to the state budget.

However, good risk management is a challenge, since natural disasters cause risks of economic and social issues.

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ECOLOGICAL AND SOCIAL-ECONOMIC ASPECTS OF SHW MANAGEMENT IN THE KHERSON REGION

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Solid household waste (SHW) include waste generated in the course of human life and activity in the residential and non-residential buildings and are not used at the place of storage.

The problem of SHW management for the Kherson region, as well as for others regions of Ukraine, remains unresolved. In localities of Kherson region according to statistics was organized removal of waste sites (landfills and dumps) as of 2013 there are 300 places waste with total area of 457 ha. However, these data should be clarified and completed.

Table 1 - Reporting data on of SHW in Kherson region

Indexs	Units	2010 year	2011 year	2012 year	2013 year
Total generation	m ³	1632855	755054	639000	983947,9
	t	389985	175508	159654	218103,9
General number landfills and dumps		300	300	300	300
General area landfills and dumps	ha	457	457	457	457
Overload landfills and dumps		3	3	3	3
Need for new landfills		21	21	21	21
	ha	75	75	75	75
Per capita generation SHW	t per capita	0,0028	0,0062	0,0068	0,0049
Quantity of SHW in hectare of land	t per ha	0,0012	0,0026	0,0029	0,0021

Table 2 - The main characteristics of the dynamics of the time series of per capita generation SHW

Year	Per capita generation SHW (tons/person)	Absolute increase (10 ⁻³)		Growth factor		Growth rate		Increment factor		Rate of increase	
		base	chain	base	chain	base	chain	base	chain	base	chain
2010	2,800*10 ⁻³										
2011	6,192*10 ⁻³	3,4	3,4	2,2	2,2	221	221	1,2	1,2	121	121
2012	6,777*10 ⁻³	4,0	0,6	2,4	1,1	242	109	1,4	0,6	142	64
2013	4,937*10 ⁻³	2,1	-1,8	1,8	0,7	176	72	1,8	0,3	176	31

Table 3 - The main characteristics of the dynamics of the time series of quantity of SHW in hectare of land

Year	Quantity of SHW in hectare of land (tons per ha)	Absolute increase (10 ⁻³)		Growth factor		Growth rate		Increment factor		Rate of increase	
		base	chain	base	chain	base	chain	base	chain	base	chain
2010	1,171*10 ⁻³										
2011	2,603*10 ⁻³	1,4	1,4	2,2	2,2	222	222	1,2	1,2	122	122
2012	2,862*10 ⁻³	1,7	0,2	2,4	1,1	244	110	1,4	0,6	144	65
2013	2,095*10 ⁻³	0,9	0,7	1,8	0,7	179	73	1,8	0,3	179	32

The analyze treatment system of SHW can be concluded as:

- the quantity of the SHW generated in a region is not only a function of the living standard and lifestyle of the local inhabitants, but also of the abundance and type of the local natural resources;
- data in various the reporting documents do not match;
- there is the presence of numerous violations of environmental and tax legislation;
- most of the of SHW landfills depleted their potential, their average load is around 80%;
- do not keep records of waste;
- at most landfills are no documents which certifying the rights to use the land has not been developed construction documents, no positive conclusions of the state ecological expertise is received environmental permits, monitoring of the environment is not made;
- there is a decrease in the amount acquisition of SHW, maximum amount - 2010, the smallest – 2012;
- the augmentation of base rate of increase quantity of SHW in hectare of land and of per capita.

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DECENTRALIZATION OF THE NATURAL RESOURCES GOVERNANCE

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Values aspects of natural resources and environmental quality, which are the property of the Ukrainian people cause search of balance, the optimum ratio of centralization and decentralization of powers, rights and obligations that will provide sustainable nature use for satisfy existing needs and not create threats to the interests of future generations.

Decentralization is an effective approach to solving environmental problems, particularly at the local level. However, the decentralization of authority is not sufficient reason to consider that all the functions of governance of natural resources and nature use should be implemented by decentralized way at the local level. In general the main reasons for the decentralization of the public sector consists in the necessity improving its overall efficiency and effectiveness by providing local governments to improve quickness, accountability and efficiency of the administration. Decentralization is an important element of ensuring an active and significant role of local authorities in the process of local governance.

In order to properly decision of tasks of natural resource governance and nature use is necessary to differentiate that into the following – regarding each individual property owner of natural resource or by nature user, and solution of which requires collective participation by negotiations between private or public organizations or direct government intervention in the face of the central government.

Transfer of responsibility of central government for the execution of certain functions concerning natural resources and nature use to institutions at the local level determines the necessity formation of new sustainable sources of local revenues. Providing good governance of natural resources and nature use is difficult tasks for local authorities that as usually have at their disposal limited tax base in contrast to the central authorities.

Property taxes are often considered urban taxes due to the concentration in urban areas of real estate other than land, but they can be extremely important for rural communities. Taxation of agricultural land and production can be an important source of “own” revenues of local communities [3].

Decentralization of authority must be accompanied by revenue to adequately fund governance functions. It is necessary to balance revenue sources – which of them should be the exclusive available to the local authorities, and which – to come to the central budget. Revenues as intergovernmental transfers play a significant role in the budget of local communities in most countries. However in order to ensure a real local fiscal autonomy is necessary that a significant proportion of total revenues was considered “own revenues” i.e. under local control. Local taxes are an important source of revenue generated within the region [3].

The taxation of real estate (in the part of the land tax and rent) – effective local tax because the object property is fixed within the jurisdiction of a particular local authority. Only some taxes are characterized by the same advantages in the context of the predictability and stability of income, as a real estate tax. Taxation of land and real estate of agricultural enterprises and other economic entities in rural areas could become an important source of revenue of local communities [3].

Motivation and forms of decentralization in the system of governance of natural resources and nature use designed to take into account features governance of natural resources (land, water, forest) and nature use in general at the local level in the context of improving the welfare of local communities and provide: awareness of the rights of local residents, delegating to them (their representatives) governance and management functions; strengthening the participation of stakeholders; stabilization of the number of rural population; improving the efficiency of economic activities in rural areas.

Decentralization in Ukraine is defined as the transfer of significant powers and budgets from the state agencies to local governments [1].

Declared essence of transformation that offers by the reform of decentralization of power [1]: executive authorities and local governments fulfill their inherent functions; local authorities at various levels shall have the authority and corresponding to them resources; the election of local authorities in the community, district and region will provide representation local residents and responsibility for governance results.

In Ukraine, the main natural resource payments, and therefore one of the sources of well-being of local communities as owners of natural resources is the land tax. The land tax has the largest share in the revenue structure of fees for special use of natural resources in the budget of Ukraine – about 44 % in 2013. The unsatisfactory identification of the real base of land tax, revise the rates of land tax and rent, granting privileges to certain categories of landowners led to inefficiency of fiscal instruments regulating the usage of the main territorial base of the productive forces of society – land are found in the study [2]. Much of the total land fund of Ukraine not taxed or used hybrid tax and quasi fiscal instruments regulating the possession and use of land assets, which does not identify the actual database of fiscal payments for the possession and use of agricultural land, forest land and so on. Abrupt growth of revenues of the land tax to the Consolidated Budget of Ukraine, especially in the period 2007 to 2012, due to the indexation rates of land tax, revision rental rates (first of all urban area). Analysts point out that real growth of this fiscal payment to the Consolidated Budget of Ukraine did not happen [2, p. 8]. Dynamics of the structure of this fiscal payment are showed the potential for increasing financial providing communities as owners of the territorial resource. In 2013 compared to 2002, to town and village budgets have received almost twice as much the volume of land tax. Experts at this point out inflationary basis fiscal impact of the use of certain types of land assets, as evidenced by the significant gap between the rates of increasing in nominal and real value of the land tax [2].

There is considerable potential for increasing inflow of fees for special use of natural resources to local budgets in the process of decentralization, especially land tax provided real institutionalization whole bunch of ownership of the natural resources of local communities.

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BUSINESS RISKS AND OPPORTUNITIES IN THE MANAGEMENT OF ECOSYSTEM SERVICES

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Issues connected with value of ecosystems got wide discussions during recent years in context of its goods and services providing, but also improving social and economic welfare. From an economic point of view, ecosystems provide economic agents with significant advantages, or so-called "ecosystem services". For example, forests provide raw materials for wood processing industry, genetic resources give materials for breeding and genetic engineering, rivers provide freshwater for household needs, and wetlands reduce the impact of flooding and enable the development of commercial fisheries. Therefore, the degradation of ecosystems entails not only a number of risks for business activities, but will also jeopardize the position of economic agents in the market.

Degradation of ecosystems and their natural potential are very important issues for business, as economic agents can not only affect ecosystem services but fully depend on their qualitative and quantitative composition. If we talk about the use of resources such as wood, coal, the value of these ecosystem services is obvious enough. If we consider ecoservices of water purification or reduction of consequences of floods, these benefits are not often accounted in the financial statements and become apparent as soon as the service becomes scarce or disappears.

The expert assessment of the losses of the banking system of the Netherlands from investments in the agricultural sector, which directly depends on pollination, may reach billions of euros, in case of extinction of

honey bees. This is an example of business risk from the indirect connection with ecosystem service [2].

On the basis of the research conducted by the authors [1; 4] five main business risks for the company (operational, regulatory, market, reputational, financial) were formed, as well as new opportunities for business, which provide a basis for development management of ecosystem services in the context of the economic activity growth were identified (table 1).

Table 1 - Business risks and opportunities associated with the ecosystems services management [1; 4]

Risks and opportunities for commercial enterprises	The goal and purpose of the corporate assessment	
Operating	Recording and calculation of new sources of revenue	Strengthening the effectiveness and financial outcomes
	Cost savings	
Regulatory and legal	Tax cuts	
	Income support	
Reputation	Revaluation of assets	Ensuring compliance with external requirements
Market and commodity	The valuation of liabilities and compensations	
Financial	Measurement of company value and shareholder value	
	Reporting on results and performance	

Each threat or risk are the prerequisite for the emergence of new opportunities. Any innovations, new technologies aimed at reducing losses or the elimination of existing ones, create new opportunities for entrepreneurial activities (e.g. new products, new markets).

Ecosystem services provide a wide range of opportunities that contribute to improving the financial condition of the company and therefore improve the efficiency of business administration. For example, today the financial flows of the international market of compromises and compensations of biodiversity are estimated in several billion dollars, while

the financial flows of the global trade quotas on emission of carbon dioxide can reach hundreds of billions of dollars a year. The flows of sustainable opportunities for commercial enterprises based on natural resources are estimated in trillions of dollars [3].

Unfortunately, business structures often do not fully understand and realize the consequences of their interference in the integrity of the ecosystem. The economic activity of enterprises aims at the elimination of risks, the creation of new administrative instruments of control, but it does not provide new business opportunities which can become new sources of income, projects investments and opportunities of entering new markets for ecosystem services.

The concept of ecosystem services assumes that ignoring the economic significance of natural resources is a major factor that leads to the destruction of ecosystems and loss of biodiversity that, in turn, determines economic and human losses. Therefore, economic agents should: reconsider traditional approach to business activity ("business as usual"), identify and assess its impact on biodiversity, learn how to manage and predict business risks, not miss new opportunities based on new technologies and models of doing business. One of the most important indicators of business management should be a synergistic effect, i.e. the maintenance of some ecosystem services should bring profits to other services or interested persons. For example, forest protection for the purpose of preservation of biological diversity can reduce the flow of carbon and increase their water conservation functions.

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RESTRUCTURING THE FINANCING OF SOCIAL INFRASTRUCTURE IN RURAL AREAS AS A TOOL TO IMPROVE THE ENVIRONMENTAL SITUATION OF TERRITORIES

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Marketplace requires priority development of social infrastructure, which implemented the socio-economic interests of different gender and age groups, the relationship of man and society, met the material and spiritual needs, to create adequate conditions of life. Social infrastructure is an important factor in the development of environmental impact on the area. Rational use of solid waste is not possible without the teamwork of all parts of the social infrastructure. The use of innovations in the operation of the components of social infrastructure is an effective direction of the improvement of ecological areas.

One of the main factors of poor rural development remains inadequate level of functioning social infrastructure.

Today the vital question of financing social infrastructure of rural areas. Local governments unable to fully fund the social infrastructure due to lack of funds. In Ukraine, the local budgeting depends largely on the efficiency of production activities of enterprises located in its functioning. With the economic crisis payments to local budgets decreased significantly , generating their deficits, and consequently - the lack of funding for social infrastructure. Inadequate economic development at the national and local levels has created unfavorable conditions for the development of social infrastructure in rural areas, leading processes of destruction and closure. Over the past five years, significantly reduced the number of houses recreation, libraries, film projectors, hospitals, commercial and consumer services. The level of security institutions in rural social infrastructure does not meet social standards. Constant price increases for social services affects the living standards of the rural population. Although consumption of paid services increases, a significant constraint on its rapid growth is the increase of real incomes of farmers [2, p. 16-17].

The defining element of social infrastructure is the system of financial support, which is a set of financial resources and mechanism of rational

allocation and effective use. Basics of financial provision of social infrastructure essentially inherent in determining the object of research. There are various interpretations of social infrastructure. Up to 90 years in Ukraine are mainly based on Marxist theory, according to which all social production is divided into two areas: production and non-production. In the field of industrial material products are created, and the non - performed their exchange and consumption. Thus social infrastructure is identified with non-productive. Hence, the main source of funding for the social sector budget allocations were that redistributed via a mechanism from the sphere of material production. With the deepening market reforms division of production and non-production areas did not meet today's realities. The relations of production, exchange, distribution and consumption of GDP covering the whole of society, all its members. Social infrastructure, which produced a specific product - social services, organic part of the overall system of economic relations. Moreover, its role is growing, as in science and technology education, medicine, culture, social security occupy a key position in ensuring the high efficiency of social production. It is necessary to change the order and social infrastructure business relationship with the budget. Their rational is such a scheme:

- a) determining the amount of budgetary funds necessary for the development of public utilities;
- b) calculate the total amount of tax and duties that have to pay the company;
- c) the calculation of the balance of relations with the budget as the difference between budget allocations and tax payments. This budget funding should take the form of grants and subsidies.

In the social infrastructure along with enterprises (institutions) that operate on the basis of commercial calculation, a large number of institutions that are engaged in non-profit, public vital activity - health care and education, culture and art, basic science, environmental protection and so on. The functioning of these institutions and organizations can not be focused on commercial criteria and therefore they form a non-market economy.

Total budget financing of social infrastructure sectors is steadily decreasing, thus being extremely lacking funds for normal social and cultural services. However, neither at the national nor at regional level have been revised terms and scope of educational and cultural services for free or concessional basis. It is necessary to clearly identify the use of budget

funds and are calculated to cover the necessary expenses for the effective functioning of the branches of the social sphere [1 p. 6-10].

For the success of its initial phase to be grouping of social infrastructure in rural areas, depending on the possible change of ownership:

- I group (commercial) - includes institutions which operate on the basis of private property , the purpose of which is profit ;

- II group (communal) - includes institutions which operate on the basis of communal property and require government subsidies and support for additional sources of funding;

- III group (state) - includes public schools , district hospitals and outpatient clinics to be recognized as strategic and social facilities to be financed from the state budget [1 , p. 114].

In the current economic conditions, the formation of an effective social infrastructure needs special needs coherent funding process. The scope and level of services social infrastructure has a significant impact not only on the harmonious development of demographic processes, but also the level of industrial development areas.

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ECONOMY AND ECOLOGY: INTERACTION MECHANISM

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Presently the problems of humanity are intensified that all greater part of resources has to be outlaid not on development of production, but on the rescue of environment. Otherwise its contamination begins to brake growth of gross national product and efficiency of investments in his increase falls. However to take the liberty the scale programs of rescue of environment

while the most rich countries of the world can only. To the poorest countries it not on a pocket. As a result humanity appeared before the necessity of one choice of variants of economic policy: or economic growth acceleration and increase of financial welfare of people at the decline of duration and quality of their life from contamination of environment; or improvement of the state of environment and increase of life-span people at deceleration of rates of growth of their financial state.

In modern terms, all economic schools in a different degree pov'yazuyut' economic development with ecological problems. Researches of economists are create fundamental bases of effective prirodokoristuvannya and guard of environment. At the same time, problem of complex estimation of increase of efficiency of co-operation sub'ektivnoy economic activity and state as a control organ after the improvement of ecology, in scientific literature so far did not find the proper confession.

Only during the last fifty years on Earth produced more products, what for all period of existence of civilization to 1950g. From data of the World commission of UNO on an environment and development, presently annually the 6 million, 20 milliards hectares of the processed earths grow into the desert loses the productivity. Annually 30 milliards of tons of nefteproduktov, 50 000 tons of pesticides, 5000 tons of mercury, get in a world ocean [4].

The example of the ineffective use of natural resources is intensification of agriculture, increase of the technogenic loading, on the landed resources, uncontrolled application of facilities of khimizacii in the conditions of low technological culture results in speed-up degradation of soils, their fertility.

For the estimation of influence of structural changes in an economy on an ecological situation and developments of recommendations in relation to perfection of mechanisms of state administration prirodokoristuvannyam important there is finding out of maintenance of forms and methods of co-operation of economy and ecology and role in its providing of public, ecological policy. Research of these questions testifies that for modern a theory such moments are characteristic: natural factors are examined only as one of elements of production; a second-rate role is taken a natural factor in the economic system. Essence of macroeconomic policy of the state in relation to the management of prirodokoristuvannya is taken to the optimum use of natural resources and internalizacii of external charges by taxes or trading in rights on extrass. As for structural transformations to the

economy or state administration, the ecologically oriented innovations in a neoclassical theory are not examined.

By virtue of the unusual character, ekonomiko-ecological problems require non-standard decisions. Except for economic decisions, cooperation of economy and ecology must be directed on achievement of primary objective is providing of favourable environment of dwelling for all company, that possibly only at harmonious ekonomiko-ecological approach, based on the humanism and moral beginnings. Such approach is already developed and carries the name of conception of steady development.

In the last years in the management of prirodokoristuvannya processes quite a bit new accents were abroad reflected, pov"yazanikh not only with developments of more perfect methods of management of prirodokoristuvannya separate spheres but also with the change of going near state administration. A clear tendency was determined in relation to support of idea of limitation of direct state administration of prirodokoristuvannya and gradual passing a sphere to more wide use of market methods of management, that allows to extend participating of citizens and enterprises in the guard of environment. The tool of ecological policy of the state, which can be attributed to the economic methods of state administration broadened considerably. As evaluated by some scientists, only over 200 different instruments of management are used in the European countries [3].

Most suitable mekhaniz must be based on the «theory of a zero cycle». Agree it, an unique exit consists of stopping or, at least, stabilizing of the economy growing at some optimum level, not threatening environmental conditions. Adaptation of mechanism is arrived at by the purposeful change of external environment in accordance with the future purpose of guard the rational use of natural resources.

The examples of such mechanism is wide application of alternative sources of receipt of energy, second processing, propaganda on the use of more effective technologies, waiver of the use of phosphates etc.

Conclusions. Modern ecological problems are descendant to a certain extent lag of development of economic opinion of company on the whole. Not enough attention spared the decision of questions from a removal and warning of consequences of economic activity of enterprises as contaminations and degradation of environment and resources.

Subsequent perfection of technique must be carried out recognition it negative influence on the state of natural environment. In the conditions of the structural re-erecting of economy of Ukraine, replacement of ramshackle technique and technology, the new are open wide possibilities for the noticeable diminishing of negative influence of production activity on nature.

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**IMPROVEMENT TOOLS OF ORGANIZATIONAL AND
ECONOMIC EVALUATION OF INVESTMENT
ATTRACTIVENESS OF THE REGION**

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Developing innovative model of national economy of Ukraine in the regions and industries is a strategically important task, the solution of which depends not only the economy but also its economic growth.

Assessment of investment attractiveness of regions (IAR) dedicated their scientific work such well-known domestic and foreign scholars as: Blank I.A, Gomel V.V, Vasilieva T.A, Gritsenko L.L, Kuzmenko V.V, Stechenko V.M., Chernyavska T.A and others who have made outstanding contributions to the development of theoretical bases of assessment IAR, identified a number of factors influence the conditions to ensure its preservation.

The impact of investment in the region depends on the conditions created for business and investment attractiveness of the region of the property investment.

Investment attractiveness of the regions - is an integral characteristic of every region of the Ukraine's investment climate, the extent of the investment market, opportunities to attract investment capital and taking into account other factors [3].

At present there is no single approach to the evaluation of investment attractiveness of regions and system of statistical indicators that would adequately reflect the benefits of alternative region.

The investment attractiveness of the region according to the concept of sustainable development is an important indicator territory. Applying the concept involves the use of socio-economic benefits of the region and the development of special features that ensure competitive advantages of the territory of different target groups, namely: location, proximity key markets, demographic characteristics, infrastructure development etc [4, p. 57-65].

Evaluation of investment attractiveness of the region includes the following steps:

1) Estimated values of investment attractiveness factors - factors determining factor for a partial index of investment attractiveness. Moreover, if the indicator more desirable (figure stimulator), the formula used

$$k_i = \frac{x_i - x_{min}}{x_{max} - x_{min}} \quad (1)$$

where k_i – factor for the i -th partial indicator;

x_i – value and the second partial indicator;

x_{max}, x_{min} – minimum and maximum value and the second partial indicator.

If the growth rate has a negative impact on the overall factor (rate-destymulyator), the formula used

$$k_i = 1 - \frac{x_i - x_{min}}{x_{max} - x_{min}} \quad (2)$$

To facilitate the calculation qualitative individual performance evaluated on a 3-point scale where 3 describes the maximum attractiveness of the area.

The coefficients scaling ranges from 0 to 1 and describes the position territory regarding the best and worst values of a single index.

2) Determine the weight of each factor performance by pairwise comparison.

3) Aggregation coefficients of partial indicators in the overall rate factor affecting the investment attractiveness of the territory Π_j :

$$\Pi_j = \sum_{i=1}^n k_i * V_i, \quad (3)$$

V_i – weight and the second partial indicator j -th factor appeal;

n – estimates of the number of indicators j -th factor appeal.

4) Determination of complex integral index of investment attractiveness of all factors. It is calculated by the formula:

$$I_j = \sum_{j=1}^m \Pi_j * V_j, \quad (4)$$

Π_j – general index j -th factor attractiveness;

m – number of factors that make up the base of investment attractiveness assessment [4, p. 57-65]:.

Researchers have isolated a structure competitive advantages of Sumy region:

- low wages (45.0%);
- developed trade and services sector (30.0%);
- availability of mineral and land resources (25.0%)

Impediments to investment in the region:

- High level of competition (65.0%);
- frequent changes in economic legislation (55.0%);
- High pressure regulator (50, 0%).

We conducted a SWOT-analysis shows that the region has significant flaws that weaken its level investytsinoyi activity.

To improve the investment attractiveness of Sumy region necessary measures in the following key areas:

1. Fighting corruption: establishing mechanisms to monitor the implementation of laws and regulations aimed at combating corruption; facilitation of business; create mechanisms of public examination bodies.

2. Improving investor protection: ensuring effective communication between investors and management area to improve the protection of property rights of investors, support of investors.

3. Simplification of administrative procedures, attracting investors to the analysis of administrative procedures to identify opportunities to simplify and implementation; centers of administrative services.

4. Attracting investment in high-tech manufacturing: development of innovative and high-tech production to production with high added value and improve the ecological condition.

5. Support the development of financial infrastructure: development of the network of financial institutions; programs to credit [4].

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ECONOMIC SYSTEMS ADAPTATION TO RESOURCE FLUCTUATIONS THROUGH ECO-INNOVATIONS¹

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The "greening" of the economy implies a targeted process of economic transformation aimed at reduction of ecological impact on the environment. The concept of greening is realized through a system of organized measures, innovations, restructuring, technological transformations, and environmental policy activities at macro- and micro levels. Special attentions in greening the economy is devoted to the environmental innovations, as they both profitable and environmentally friendly. Fluctuations in availability, prices of natural resources and objective necessity of maintaining ecological balance, forces society to bear out cost of natural parks creation, ecological monitoring, conservation of species, etc. In market system, people's needs are the main driving force of social development and production. The structure in so called "demand-consumption market structure", is considered to be a powerful engine, which stimulates long chain of decisions. The EU countries due to stricter environmental legislation, high dependence on natural resource fluctuations have already passed the first stages of sustainable development and currently working on more efficient goods and sustainable life style. There are basically three main market strategies of greening and eco-innovations fostering: 1) Influence on demand, called "*push-strategy*". The idea of this

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strategy is to create a system of motivational influence (ecological standards, economic instruments, information supply) which will push the producer to manufacture "green" products; 2) Influence on supply, "*pull-strategy*" the "production-consumption train". Influencing the supply, one can pull the links of production "greening". The essence of this strategy lies in the necessity to convince a consumer both psychologically and economically to use ecologically friendly products; 3) Influence upon the communication between producers and consumers, called "*interface-strategy*" (Kubatko, 2013).

The demand side factors of green industries development directly depend on the per capita incomes of population. Thus treatment of environmental protection and ecological quality as 'luxury good' means that as the incomes of economies and populations increase, they are prepared to spend more on protecting the environment. As an example, the EU countries are more effective in implementation of environmental regulations because enforcement agencies are often better funded and more transparent.

As for the resource fluctuations, according to the Ida Auken (2013), Europe currently shifts to renewables. The main reason is high hidden costs of traditional energy sources, volatile resource prices, resource fluctuations (resources can come from politically unstable regions) and climate risk. It is stated that Denmark works on both a short-term and long-term perspective and aims to be using 100% renewable energy by 2050. As emphasized by Frondel et al. (2007), innovation in clean technology tends to be driven both by cost savings, in terms of energy and material savings, environmental management systems and by regulation. The demand side determinants are mainly seen on areas with visible effect and customer benefits such as food or baby clothes. Consequently, individuals' willingness to pay a premium for organic food or organic baby clothes is substantial. Finally, also environmental process innovations create customer benefits such as less water, material or energy use. Government intervention in green industries may be justified as a strategy to increase the supply of public goods. There are several works that tested the efficiency of different policy instruments in green industries. Thus, it is reasonable to analyze the EU countries experience of such activities. According to Daugbjerg et al. (2011) the Danish government has intervened intensively in the wind turbine industry and organic farming sector mainly for environmental reasons but with very different impact, also it should be

noted that different policy instruments were used. That is to some extent such governmental interventions can be treated as a “pure experiment” within one country green industries. While the market share of wind energy reached 20 per cent in 2007, organic food consumption lags behind with a market share of approximately 8.5 per cent in 2007. The reason is that government intervention in the wind turbine industry has emphasized the use of policy instruments designed to increase demand for wind energy, whereas organic farming policy has put more emphasis on instruments motivating farmers to increase supply. That is demand mostly represents an engine that drives innovations in green industries.

According to Demirel et al. (2010), the amount of resources invested into the eco-innovations depend both on internal characteristics of firm and external characteristics of environment. Thus firms less inclined to innovations in general try to meet minimum market requirements established by consumer demand. Amount of resources invested by such firms is not big because the main purpose of production mainly profit with minimum concern to eco-innovations. Forever the stringency of economic conditions and price resources fluctuations do promotes higher levels of innovations; the main explanation of such behavior is survival of the firm on the market. If the firm does not meet environmental standards it is more inclined to higher punishments and payments. More innovative firms do not necessarily need the regulatory push for eco-innovation.

Conclusions. Success in sustainable economic development greatly depends on human ability to effectively transform economic systems towards their permanent perfection and a decrease of nature intensity use. Specification of "greening" allows us to formulate local objectives for transformation of the economies as follows: restructuring of the economy, restructuring of enterprises, removal of needs with respect to not environmentally friendly products or services, change of ecologically non-friendly technological processes and lowering of the resource capacity of the products. Among most valuable factors that promote eco-innovations are cost savings motives, productivity improvements, supply chain pressure, networking activities, environmental management systems, extended producer responsibility, R&D activities, and industrial relationships.

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ECONOMIC AND ECOLOGICAL FACTORS INFLUENCE ON POPULATION HEALTH IN UKRAINE

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One of the indicators that characterize social policy efficiency is the population health; the last is heavily depends on the state of the environment. Environmental pollution influence health quality resulting in increased diseases and mortality. Prolonged exposure to air pollution may lead to irritation, bronchitis, asthma, heart diseases, cancer at al. (Brunekreef et al., 1995; Hammitt et al., 2006; Neidell, 2004; Pope, 2007).

Human health depends on the state of the environment. According to the World Health Organization (WHO, 1994): "Environmental health comprises those aspects of human health, including quality of life, that are determined by physical, biological, social and psychological factors in the environment". Environmental health is related to the theory and practice of adverse factors influence minimization.

Factors that determine human health are very diverse. However several papers (Glouberman and Millar, 2003; Bilyavsky, 2004) reveal that health quality is on 50% determined by the way life (nutrition, work and household condition, sports etc.); 20% are attributed to the quality of the

environment and climate factors; 20% are due the genetic endowments and the rest 10% are attributed to the quality of healthcare system. In other words, all but genetic endowments are directly or indirectly related to economic factors.

The interaction between economic variables (basically economic growth) and human health are also multidirectional. Economic growth of the society promotes improvements in health care system, sanitation, medicine researches etc. However, some consequences of economic growth are life shortening ones. Economic growth is usually related to the energy consumption growth, which requires more fossil fuel combustion and/or more nuclear stations construction. Thus, energy productions as well as some other economic activities (chemical, metallurgical industries) do produce different negative externalities which are life shortening. Also, treating food sector as an industrial one requires the use of preservative technologies, nitrates in agriculture, GMO etc.

Economic growth and sophistication of social life do change modern health hazards comparing them with traditional ones. Thus, *traditional health hazards include*: disease and infectious viruses, housing and shelter, drinking water and sanitation, dietary deficiencies and reproduction, indoor air pollution from cooking and injuries in agriculture, etc. *Modern health hazards include*: tobacco smoking and alcohol consumption, water and outdoor air pollution, transport and workplace hazards, use of chemicals, complexities with food safety and security, growing urbanization, unhealthy work environment etc. Comparing traditional and modern health hazards, modern ones are not so aggressive and their negative effect is more lasting in time.

Our results indicate that the increase in radiation of thyroid gland on 30 cGy (radioactivity level) causes an increase of endocrine system illness by 30%. Also emissions do positively affect the number of endocrine diseases (increased pollution correlated with growing incidence). Relatively richer regions suffer from diseases of the endocrine system less than the economically weaker regions. Annual dummy variables in the endocrine system are significant and each year diseases of the endocrine system are increasing compared to the baseline in 2000

The average number of endocrine diseases in Ukraine is 13 people per 1000 population; the coastal regions suffer 6 people less per 1000 population. It requires deeper research (omitted variable bias, etc.) but still regions with sea access do suffer average 40% fewer endocrine diseases

than in the whole Ukraine. Also the average wage growth in 100 USD (in prices base 1999), is associated with a decrease in endocrine system by 16%. We estimated the health impact of pollution (Kubatko, 2011).

It was found, that pollution factors do influence health of population in Ukraine. The following results were received: first of all, the air emissions in tons per square kilometer are statistically significant and increase the number of cancer and cardio-vascular (heart) diseases. Secondly, influence of wages and other economic indicators, together with the social (e.g., the number of doctors) should be analyzed carefully due to the endogeneity and multicollinearity.

Table 1 - The estimated health impact due to the ecological factors

<i>1 endocrine diseases</i>	Economic interpretation
<i>1.1 due to air pollution</i>	
Average regression coefficient of <i>air pollution impact on endocrine diseases</i> (slope from the dose-response curve for health impact Appendix A) is 0,000007. Average illness among population is – 0,01267 (per 1000 of population). The endocrine diseases estimated health impact due air pollution is as follows: $dH_{endocrice(air)} = 0,000007/0,01267 = 0,00055$ or 0,055%	That is an increase in average regional emissions of air pollution on 100 thousand tons does increase endocrine diseases on 5.5%.
<i>1.2. due to radiation</i>	
<i>Average regression coefficient of radiation impact on endocrine diseases</i>) (slope from the dose-response curve for health impact table 2) is 0,000087. Average illness among population is– 0,01267 (per 1000 of population) $dH_{endocrice(radiat)} = 0,000087/0,01267 = 0,007$ or 0,7%	Also an increase in average regional radiation on thyroid due to Chernobyl disaster on 10 cГp in 1986 do increase endocrine diseases on 7% in analyzed period 2000-2006 .

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RENEWABLE ENERGY IN INDIA

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Renewable energy in India comes under the purview of the Ministry of New and Renewable Energy. India was the first country in the world to set up a ministry of non-conventional energy resources, in early 1980s. India's cumulative grid interactive or grid tied renewable energy capacity (excluding large hydro) has reached about 42 GW, of which 66% comes from wind, while solar PV contributed nearly 14.59% along with biomass and small hydro power of the renewable energy installed capacity in India.

The development of wind power in India began in the 1990s, and has significantly increased in the last few years. Although a relative newcomer

to the wind industry compared with Denmark or the US, domestic policy support for wind power has led India to become the country with the fifth largest installed wind power capacity in the world. As of December 2013, the installed capacity of wind power in India was 20149.50 MW, mainly spread across Tamil Nadu (7162.18 MW), Maharashtra (3021.85 MW), Gujarat (3174.58 MW), Karnataka (2135.50 MW), Rajasthan (2684.65 MW), Madhya Pradesh (386.00 MW), Andhra Pradesh (447.65 MW), Kerala (35.10 MW), West Bengal (1.10 MW), other states (3.20 MW). Wind power accounts for 6% of India's total installed power capacity, and it generates 1.6% of the country's power. In its 12th Five Year Plan (2012-2017), the Indian Government has set a target of adding 18.5 GW of renewable energy sources to the generation mix out of which 11 GW is Wind Energy. Indian Wind Energy Alliance (IWEA) is the apex body for the wind energy industry in India [2].

Table 1.Total Renewable Energy Installed Capacity (31 Nov 2015) [3].

Source	Total Installed Capacity (MW)
Wind Power	26,744.0
Solar Power (SPV)	6,763.0
Biomass Power (Biomass & Gasification and Bagasse Cogeneration)	4,550.0
Small Hydro Power	4,161.0
Waste to Power	127.0
Total	42,345

India is densely populated and has high solar insolation, an ideal combination for using solar power in India. Much of the country does not have an electrical grid, so one of the first applications of solar power has been for water pumping, to begin replacing India's four to five million diesel powered water pumps, each consuming about 3.5 kilowatts, and off-grid lighting. Some large projects have been proposed, and a 35,000 km² area of the Thar Desert has been set aside for solar power projects, sufficient to generate 700 to 2,100 gigawatts [4].

The Indian Solar Loan Programme, supported by the United Nations Environment Programme has won the prestigious Energy Globe World award for Sustainability for helping to establish a consumer financing

program for solar home power systems. Over the span of three years, more than 16,000 solar home systems have been financed through 2,000 bank branches, particularly in rural areas of South India where the electricity grid does not yet extend.

Table 2. Largest wind farms in India [5]

Wind Farm	Producer	State	Current Capacity (MW)
Muppandal Wind Farm	Muppandal Wind	Tamil Nadu	1500
Jaisalmer Wind Park	Suzlon Energy	Rajasthan	1275
Brahmanvel Wind Farm	Parakh Agro Industries	Maharashtra	528
Dhalgaon Wind Farm	Gadre Marine Exports	Maharashtra	278
Chakala Wind Farm	Suzlon Energy	Maharashtra	217
Vankusawade Wind Park	Suzlon Energy	Maharashtra	189
Vaspeta Wind Farm	ReNew Power	Maharashtra	144

India is ranked number one in terms of solar electricity production per watt installed, with an insolation of 1,700 to 1,900 kilowatt hours per kilowatt peak (kwh/kwp). As of 31 March 2016, the installed grid connected solar power capacity is 6762.85 MW and India expects to install an additional 10,000 MW by 2017, and a total of 100,000 MW by 2022 [1].

Every year, about 55 million tonnes of municipal solid waste (MSW) and 38 billion litres of sewage are generated in the urban areas of India. In addition, large quantities of solid and liquid wastes are generated by industries. Waste generation in India is expected to increase rapidly in the future. As more people migrate to urban areas and as incomes increase, consumption levels are likely to rise, as are rates of waste generation. All cities anywhere have garbage disposal as a major problem. It is produced in large quantities, and has nowhere to go, except mostly in landfills. This is attracting attention of city planners lately and measures are being

considered towards making the garbage disposal fruitful and productive. One of the major areas of interest is the use of garbage for energy.

India had a long involvement with anaerobic digestion and biogas technologies. Wastewater treatment plants in the country have been established which produce renewable energy from sewage gas, however there is significant un-tapped potential. Also wastes from the distillery sector are on some sites converted into biogas to run in a gas engine to generate onsite power.

Investments in India's Renewable Energy

Over \$1 Billion PE Investment Recorded In India's Renewable Energy Sector In 2015.

Global investors and renewable energy project developers have responded with optimism to the change in regulatory and financial environment in India.

By 2022, India aims to have 100 GW of solar power, 60 GW of wind energy, and 15 GW of other renewable energy capacity. This means that over the next 7 years around 140 GW capacity needs to be added across the country.

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ECONOMIC DEVELOPMENT AND ENERGY PROCESSES: DRIVERS AND MUTUAL INFLUENCE

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In the article is investigated the process of developing of the energy sector in individual countries and globally. It was established that the peak intensity of growth of consumption of energy resources accounted to the period of active economic growth and a downward trend to reach a sufficient level of welfare and economic development. Found that global energy process is uneven and a phase of energy transition in countries with different levels of development is going on with a deviation in decades.

Keywords: *energy resources, economic development, energy consumption, energy process*

Economic growth in the world economy creates increased demand for energy resources. The quantity of production and the generation of primary and secondary energy resources increase every year as a response to the need for industrial growth in newly industrialized countries. An analysis of energy consumption of world economy over the last 40 years can serve as a proof of this assertion. The positive upward trend in energy consumption is consistent with the change of the basic determinants of economic development. However, the increase in demand for energy resources has a heterogeneous structure and diverse origin that require additional research and study.

Economic growth creates increased need to providing energy resources. The development of industry in the country is always accompanied by a corresponding development of energy. The intensity of growth in the energy sector has a strong dependence on the basic level of economic development. Energetics develops nonlinear and unevenly both in terms of time and in terms of countries. Factors that contribute the intensity of increasing of energy consumption are: the current state of the world economy (phase of the business cycle), the condition of global markets of energy resources (global energy crisis), the availability and usage of energy efficient technologies in industry and everyday life, migration of centers of consumption of energy resources to the newly industrialized countries and developing countries. Unlike the first two

factors form the short-term fluctuations in the energy supply, long-term trend in energy development determine the third and fourth factors.

Energy development on the industrial phase of development is qualitatively different from pre-industrial and post-industrial from previous periods. Concentration of different types of energy in the human activity that leads to its intensification and differentiation, until the formation of new species, which makes changing technological structures, increase installed power of labor and production processes, and the creation of industrial-type economy is characteristic for modern energetics. Key indicators of the energy process at all its phases are diversification and differentiation of energy resources. The highest phase of energy process - the energy transition is characterized with additional quality characteristics: rising share of highly efficient energy and transformed energy in the energy balance, radical change in the role and place of the energy sector in the socio-economic system, the increasing influence of energy productivity and culture of everyday life.

On the one hand, energy transition forms infrastructure of the economy and has a significant impact on the efficiency of its sectoral and territorial organization. On the other hand, any more or less significant changes in the economy, structural, technical and technological improvements in production and non-production areas effect on the quantity, level and the structure of production and consumption of energy resources. In other words, the energy transition is a process that integrates all facets of socio-economic system, including the energy basis of production, a system of location of production and direction of energy flows, social structure, the structure of employment and more. The energy transition can be described as a complex modernization process that involves extremely high by historical rates radical transformation of all aspects of social life based on "energy" principles: production, settlement and social structures. It goes on innovative qualitative change in all material, social and cultural foundations of society and its productive forces of radical changes in lifestyle and mentality of society.

As each country is on a different level of economic development, it is obvious, and the need for energy resources of each country is different. Migrating centers of developing of industry makes appropriate changes in the structure of world energetics. Particularly in developed countries there is a decrease of the growth rate of energy consumption, accompanied by a decline in economic growth. As is known, this effect is caused by the

gradual exhaustion relatively available economic resources and approaches the maximum of potential domestic production at its current technological structure. At the same time, energy consumption growth centers are countries that actively develop domestic production, and therefore require a significant increase in energy supply. Energy efficiency of technologies that used in these countries is usually lower than it is in the developed countries. Therefore, it is appropriate to allocate a tendency in shifting of centers of growth of global energy consumption.

A common trend appears slowdown rate of use of energy resources that is a affection of the combined effect of several factors, including: the slowdown of economic growth in industrialized countries; spreading the ideas of energy saving and forming of vision of energy efficient type of the national economy; increasing volatility of market of energy resources while maintaining the overall upward trend of price level; reducing of technological availability of energy resources, increased costs of their extraction and moving to the centers of consumption; changes in the structure of the energy sector for the growth of the share of alternative methods of obtaining energy resources, for which, currently, is typical understated the level of technological and economic efficiency. Such global changes are part of the energy process and become the basis of the energy transition.

As a result, the study found that countries with different levels of economic development are at different levels of the energy process. This fact leads to uneven development of the energy sector in different regions, including effect on varying intensity of energy consumption. The period of active growth is accompanied and provided by mainly extensive type of the development of the energy sector of the national economy, replaced with mostly intensive type of development in process of economic development. The concept of energy development of the country lies in the formation and implementation of objectives that correspond to the current phase of economic development. Research and forecasting of energy markets requires taking into account the features of the current period of economic development around the world.

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INTEGRATED WATER RESOURCES MANAGEMENT (IWRM) FOR SUSTAINABLE DEVELOPMENT

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Water is an essential resource for sustainable development, however it is not often taken into account. In order to find effective and lasting solutions to the problems related to water resources, it is required a new form of governance and management paradigm. This new paradigm is included into the concept of Integrated Water Resources Management (IWRM), which has been defined by *Global Water Partnership GWP*, as "a process which promotes the coordinated management and development of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of ecosystems". Thereby, the IWRM is a systematic process for the development, operation and monitoring of the uses of water

resources. IWRM is based on the concept that water resources are limited and their uses are interdependent.

IWRM challenges the conventional sectoral systems management, giving an emphasis on holistic approaches that promote decision making among different sectors and levels. Furthermore, it recognizes that the "top-down management" focused on the supply with little interest in the beneficiary demand and the emphasis on technical aspects and conventional sectoral approaches have imposed and currently impose high economic, social and ecological costs to the society and the environment. It is commonly known that the way that water is managed nowadays is not sustainable from an environmental point of view, nor is in financial and social terms. IWRM is defined as a process of change, which aims to transform the existing water management, this is why, it has not a starting point nor one end. The global economy and society are dynamic, as well as the environment, this is the reason why the different systems that will be based on IWRM, must know how to respond to new changes and be able to adapt to new conditions and/or to economic, social, environmental variations and human values.

IWRM is not an ultimate goal by itself, but a means by which meet three strategic objectives:

- Efficiency for greater durability of water resources.
- Equity in the provision of water resources between different socioeconomic groups.
- Environmental sustainability to protect water resources and the associated ecosystems.

It could be said that government actors, faced with the prospect of drastic changes, which involve the implementation of IWRM in their regions, might conclude that this challenge is complex, since it includes many difficult policy to create, as well as decision-making. Without any doubt, it is much easier to leave the system as it is, so it could be avoided confrontations of those who benefit from the current situation. However, keeping the existing policies and practices is not an option, because the problems will be worse and further the solution process will be complicated.

IWRM is an ongoing process that responds to changing situations and needs (translated from GWP 2004).

Integrated Water Resources Management (IWRM) should be seen as a dynamic, continuous and iterative process with long-term results and

having a vision for the future, as distinct from a linear and static process. It should take as a fact that the perfect IWRM does not exist and finding perfection can lead to stagnation of actions.

Stages of planning and implementation of IWRM:



IWRM is based on four principles - these are the Dublin principles:

Principle 1: The water is a finite and vulnerable resource of the WHO, essential to sustain life, development and the environment.

Principle 2: The development and water management should be based on a participatory approach, involving users, planners and decision makers at all levels.

Principle 3: Women play a central role in the supply, management and protection of water.

Principle 4: Water is a public good and has a social and economic value in all its competing uses.

Integration of the 3 E

The integrated water resources management is based on the notion that water is an integral part of ecosystems, which is a natural resource and a social and economic good, whose use depends on its quality and quantity.

The IWRM framework, as was developed by *GWP*, is the integration of *the* three E: economic efficiency, social equity and ecology and environmental sustainability (adapted from *GWP* 2008):

- Economic efficiency in water use: Water should be used with maximum efficiency considering the increasing scarcity of water, its fragility and vulnerability, and its growing demand.
- Equity: The basic right of all the people to access to a water supply with a sufficient quantity and quality must be universally recognized.
- Ecology and Environmental Sustainability: The current use of the resource should be managed so that systems sustaining life do not

deteriorate and may ensure that future generations can make use of this resource.

Models for local government engagement in IWRM processes

There are two main paths or models through which local government can start engaging:

1. *Engaging with new IWRM institutions.* In many countries, implementation of IWRM has been taken up through the adoption of new policies, revision of water laws and establishment of new institutions for water resources management. These reforms aim to manage water in a fully integrated way, largely based upon the catchment or the river basin as a unit of management.

The principles underlying IWRM include an inherent tension between the appropriate levels of centralisation and decentralisation of water control. On the one hand, the catchment or river basin is considered as the most effective unit for water management (linked to the first Dublin principle). This will normally include several or tens of municipalities or local governments. On the other hand, the second Dublin principle makes a strong call for management at the lowest appropriate level without specifically saying what it means: community, local government etc.

Centralised approaches, because of their higher level of scale, may be well-positioned to oversee externalities caused by different uses. They also may have sufficient hierarchical clout to enforce water resources management rules. However, there are also arguments in favour of decentralisation of water control in many contexts. Local management can then be better adapted to the local context.

2. *Implementing IWRM principles through local actions.* A second way in which IWRM can be implemented is by adopting and following the underlying principles in the implementation in the day-to-day water business in which local governments are engaged.

Principle-based approaches aim to develop guidelines, based on the application of IWRM principles at all stages of projects and programme cycles. The idea behind taking a principle-based approach, is that if all sub-sector and all stakeholders in water management try to apply good IWRM practice at their own level, in their own work, this will in turn lead to the emergence of better local level water resource management, and will be an important first step in the process of IWRM.

Conclusions

Integrated Water Resources Management (IWRM) can be described as the coordinated development and management of water, land, and related resources to maximize the resulting economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. The Dublin principles adopted at an international conference in Dublin in 1992 promotes a participatory approach to integrated resource management on a watershed basis and promotes the recognition of the economic benefits of managing water and related resources.

IWRM is one form of the *ecosystem approach* as a strategy for the integrated management of land, water, and living resources that promotes conservation and sustainable use in an equitable way (Millennium Ecosystem Assessment 2005). IWRM promotes the management of water and related resources (land, biodiversity, etc.) on a watershed basis. This allows IWRM to be a relevant framework for both small catchments and transboundary basins.

Local government is facing increasing responsibilities in a number of areas, including new roles relating to services delivery (like more regulatory functions), development planning and environmental management. In fulfilling its roles in each of these areas, water resources should be a key factor of consideration, as these will have impact on local government's performance. Yet, local government is not at the forefront of engaging with integrated water resources management.

THE ADVANTAGES AND DISADVANTAGES OF THE TRANSITION TO GREEN TRANSPORT IN UKRAINE FROM THE POINT OF VIEW OF ORGANISATION AND ECONOMY

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Air pollution from the point of view of chemical hazards to human takes the first place. According to scientific research, the contribution of air pollution is from 80 to 90% of the total carcinogenic and non- carcinogenic risk which is associated with the influence of the pollution of other contaminants in the environment. Transport consumes a huge amount of

energetic natural resources. A third of all oil produced in the world is spent to ensure the work of transport and automobile transport is the most energy intensive if compared with all other kinds of transport.

The development of transport systems is accompanied by environmental and economic contradictions. From the technical and economic point of view the efficiency of transport systems and the level of satisfaction of population and business in transport services are maximized. At the same time the level of negative environmental impact increases especially in large cities. This contradiction can be solved with satisfaction of the following criteria:

$$PV = \frac{V_o}{t} \rightarrow \max, \quad (1)$$

$$E = \frac{V_m}{V_o} \rightarrow \min, \quad (2)$$

where

PV - efficiency of cargo (passenger) traffic, tons / year;

$V_o = V \cdot S$ is turnover of cargo, tons,

V - volume of cargo per year, tons;

S - average length of route of cargo per year, km;

t - time in which cargo transportation was carried out;

E – ecological capacity of transportation, t / ton;

V_m – volume of transport emissions, tons.

The efficiency of cargo transportation (1) can be represented in the inverted form (t / V_o). Time t is quite a significant factor from the standpoint of economy. Not only the turnover of goods, but also their quality, especially the quality of food depends on this parameter. The average time of overcoming of 1 ton per km in Ukraine is higher than in well-developed countries due to the imperfection of transport infrastructure and the significant degree of vehicles deterioration.

Ecological capacity index (2) is presented in a simplified form without considering the damage from noise pollution, water pollution, utilization of vehicles, and so on. Today one of the most promising areas of its decline is a massive transition to electric cars. Electric cars market in the US and Europe increases twice a year. This helps to improve air quality in cities and reduce fuel consumption. Environmental organizations support these

trends and encourage governments to create new preferences for the leading electric car producers, manufacturers of batteries and charging stations. They also support mass purchases of electric cars and transfers of electric car production enterprises to their countries.

The main advantage of electric cars is the possibility to charge them from ordinary electrical network. However it takes 6-8 hours to charge modern batteries and this time is rather long. At the same time, networks of fast charging stations such as CHAdeMO and Tesla are being built in well-developed countries. These stations produce direct current and use the newest standards which allow to charge an ordinary electric battery for 15-30 minutes. This technology is not available in Ukraine yet. By the way, all electric charging stations are free in Ukraine now. Building a network of charging stations in Ukraine will accelerate the transition to electric cars. We can use the excess electricity, which is currently available in Ukraine due to the crisis in industry.

From a technical position motor efficiency of the electric engine is 70-95%, while the efficiency of the internal combustion engine barely reaches 50%. So an electric car is able to convert almost all energy in batteries into useful work or in other words into passed distance. It is about 10 times cheaper to drive 1 km along the road in Ukraine by an electric car than by an internal combustion engine car, taking into account only the operating costs.

The main competition in the electric car market is between manufacturers of draft batteries but not electric car manufacturers. Modern lithium-ion batteries are heavy, overall and quite expensive. The main competitors in the production of draft batteries are chemical hyper-factories LG Chem, Panasonic, American company Tesla and Chinese BYD. They compete for capacity, compactness and cost. Ukraine could also enter this relatively young market, considering high level of chemical technology development and a considerable proportion of chemical industry professionals. Ukraine could introduce some preferences to such companies.

The main drawbacks of electric cars are their operating conditions. In cold weather about 30-50% of the battery is spent for heating a saloon which significantly reduces motion stock of an electric vehicle. The effect of low temperatures on modern batteries needs additional research. This makes unsuitable to use these cars in cold seasons, for example for taxi services in standby regime.

The network of charging stations is insufficiently developed in Ukraine. This restricts the use of electric vehicles outside the city, creating zones of inaccessibility to their owners. Electric battery replacement is quite a difficult task from organizational and technical point of view and is rather expensive. The recycling of big-sized lithium-ion batteries of electric cars is also a problem from the environmental point of view.

THIRD INDUSTRIAL REVOLUTION AS A WAY FOR GREEN ECONOMY FORMING¹

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Transition to sustainable economy through the Third Industrial Revolution occurs through a three united system of interaction of material and energy, information and synergistic factors. In its course prerequisites for the formation of green economy - "Economy of spacemen" are formed.

There are several key areas of transformation of material and energy base. One of the essential ones is the transition to renewable resources. First of all we are talking about energy resources. "Green" energy (solar, wind, geothermal heat, tidal energy) allows do without fuel and chemical processes of burning it. It means that from production cycles entire industry links that ensure the extraction of mineral resources, reclamation of disturbed landscapes, transportation of raw materials (cars/dry cargo ships - in the case of charcoal or tanks/pipelines/tankers - in the case of oil and gas), fuel combustion in power plants; production, manufacturing of purification equipment and waste management, as well as the processes of creation of engineering and construction companies, which generated power for the realization of all these processes are eliminated. Although, of course, we must not forget that the creation of own installations for generating renewable energy, also require considerable costs.

Talking about the transformation of the information base, we are referring to changes in the content of information principles of the formation of the productive forces and the production systems of

¹ Material is prepared within the framework of SRW "Development of fundamentals of the reproductive mechanism of green economy in the information society" (registration #0115U000684), financed by the State Budget of Ukraine.

consumption. This involves the development of new information algorithms used for new technologies, the construction design of products, the formation of consumer patterns and lifestyles.

In the Third Industrial Revolution synergetic factors took the leadership. They will integrate the individual components (assets, means of production, performers, etc.) in the holistic local economic systems and combine the latest in a single unit system - the global economy "spaceship Earth". This will be another step towards naturalization (approximation to the natural principles) of economic systems. After all, in a similar way in the nature individual biological components are integrated into ecosystems, which unite to form a single biosphere of the planet.

In modern conditions the creation of smart operating systems that will not only take the optimization function of production processes in space and time, but also serve as an integrating principle, unifying activity of many business units is the reality. In particular, the "intelligent" Internet successfully solves the logistic problems of industrial enterprises, including the problem of finding the best suppliers of resources, optimization of delivery routes, etc.

In contrast to the traditional energy, which is based on large-volume processing capacity, "green" energy uses a huge number of small generating plants. This suggests a significant deconcentration of energy sources. These sources of energy can be a real productive force only on condition that they will be combined into a single system and will be in information order. In the EU, such a system already exists - it is EnerNet.

Formation of virtual enterprises allows realizing the principle of concentration in time of the processes decentralized in space. Through the establishment of networks of production plants located in different spatial conditions - often in different parts of the globe - can integrate its activities into a single production cycle.

One of the features of the modern development of the productive forces is the formation of horizontal links that connect directly (i.e., without intermediaries) producers and consumers of goods and services.

"Cloud» technologies allow the use of network technology to implement various manufacturing processes associated with the processing of information, beyond the capacity of a particular company (including a specific computer or IT system).

The third Industrial Revolution is realized in the course of the triune interaction transforms of three key groups of factors: material and energy,

information and synergy (communication). As a result of these processes the basis of a new type of economy is being formed.

GREEN ENERGY FOR SUSTAINABLE DEVELOPMENT IN UKRAINE¹

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To ensure energy independence of Ukraine on the way to sustainable development one of the priority areas is the implementation of alternative energy projects.

Rising energy demand raise the issues of a gradual shift from traditional technologies that involve the use of mainly energy assets and passive energy networks to fundamentally new solutions, focused on the widespread use of renewable energy sources (RES) and active networks that can provide services for transfer, storage and conversion of electricity.

Such network is EnerNet. EnerNet is an information-energy active system for the collection (from separate sources), transfer, storage, conversion and use of electric energy in the most efficient manner. It performs the following functions: power generation, transmission, collection, storage, rental, control, billing, sales, operations optimization, protection, providing of power quality, power system stability.

The Law of Ukraine "On Electric Power ", dated 01.01.2014 allows domestic private households fixing on theirs roofs photovoltaic panels, which power does not exceed 10 kW and connect them to the local grids.

Ukraine provides economic incentives to private households for green energy production using a Green Tariff for the period up to 01.01.2030. It refers to those economic agents (private households) that produce electricity from RES. Oblenergo will purchase from private households electricity produced from renewable energy sources.

It should be noted that promising and cost-effective energy projects are being realized with the use of a Green Tariff and in accordance with the terms of the Law of Ukraine "On Electric Power". It allows selling energy

¹ Material is prepared within the framework of Jean Monnet program "Using best EU practices for sustainable economy forming in Ukraine" (UBEUP) 553185-EPP-1-2014-1-UA-EPPJMO-MODULE).

from alternative energy sources to Oblenergo, and payment is done according to the wholesale Green Tariff prices of the electricity market [1].

Ukraine has established the following levels of a Green Tariff for private households that generate electricity from solar power, power not exceeding 30 kW:

- 01.01.2016 - 31.12.2016: 4.6476 UAH / kWh (excluding VAT);
- 01.01.2017 - 31.12.2019: 4.4237 UAH / kWh (excluding VAT);
- 01.01.2020 - 12.31.2024: 3.9761 UAH / kWh (excluding VAT);
- 01.01.2025 - 12.31.2029: 3.5416 UAH / kWh (excluding VAT) [2].

For example, Table 1 shows the performance of an individual household project using a Green Tariff. It presents calculation and economic efficiency of the project for solar power with the capacity of 10 kW*.

Table 1 - Indicators for economic efficiency of the project for solar power [1]

Efficiency of photovoltaic power plant of 10 kW per year **, kWh **	10000
Energy consumption by a household per year, kWh., To 250kVt-hours per month	3000
Electricity surplus transmitted to the network, sold under a Green Tariff, kWh per year	7000
Green Tariff by the end of 2015, 0.18 € per kWh	0,18
Total income per year, EUR	1800
The cost of photovoltaic equipment for network stations for private households*, EUR	11850
Payback, years	6,58

* Calculation conducted by Photovoltaic Geographical Information System (PVGIS-CMSAF).

** equipment: 40 to 250W PV modules, inverters, system fasteners, components and related materials. The cost of the kit is specified at the time of delivery.

Today there are some problems that prevent private owners from active use of renewables. Here belong high cost technologies; inadequacy of government policy; difficulty in joining such facilities to Oblenergo power grids, etc. Such mechanisms as taxes, tariffs, subsidies, administrative mechanisms, etc. can encourage energy efficiency and alternative energy production in Ukraine.

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**MACROECONOMIC BASIS OF DOMESTIC BUSINESS
DEVELOPMENT: PROBLEMS AND RISKS**

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Any organization is located and operates in the environment. Macroenvironment creates general conditions of organization being [1]: as it can provide opportunities of expansion, it can also be a cause of restriction and forced changes in the company. The events in Ukraine since 2013 and till the present have been significantly changing, complicating the functioning of many businesses – Russian military aggression in Crimea and Eastern Ukraine has become a key factor in the destabilization of economic system and transformation of foreign economic activity of our country. It can be noted that Russian aggression has become a factor of significant strengthening of negative trends in the dynamics of basic macroeconomic indicators (GDP, exchange rate, inflation, budget deficit, foreign exchange reserves, strategic reserves of certain types of resources). Accordingly, the current situation in the country is a source of challenges for businesses.

Considering political and economic instability in the country, the most important factors of the macroeconomic environment that have determining influence on Ukrainian enterprises are further devaluation of hryvnia; increasing of inflation and reducing consumption in the domestic market;

pressure from regulatory authorities; corruption; government instability, possibility of early elections; constant changes in legislation, its inconsistency and ambiguity in the interpretation; dual effects of reforms, that were carried out for International Monetary Fund (IMF) request.

Deterioration of macroeconomic situation in the country is proved by statistics: inflation in Ukraine in 2015 (Dec. 2015 to Dec. 2014) was increased to 43.3% in comparison with inflation at 24.9% in 2014 and was reached its maximum value over the past 20 years. The fall in GDP of Ukraine, in general, for 2015 in comparison with the previous year (at constant prices of 2010), without occupied areas of Crimea and ATO, was increased to 9.9% from 6.8% [2].

As appeared, the most sensitive to the political situation are investments. Foreign and domestic investors are hesitating to invest their capital in the Ukrainian economy, because there are no political and legal stability, therefore – no security guarantees for investors and high probability of risk.

Changes in exchange rates also have impact on the competitiveness of enterprise, especially if it exports products to the world market or buys raw materials there. After all, when the value of hryvnia in relation to other currencies is low, the goods, produced in Ukraine, are relatively inexpensive, that reduces threat of market capture by foreign competitors. However, considering that unstable national exchange rate is always changing: in the first days of January 2016 exchange rate on the interbank market fluctuated around the level of 23.5 UAH / USD, then on April 22 it reached to 25.35 UAH / USD [2]. So, falling of national currency causes reduction in sales in the companies, as with increasing prices for raw material the cost of production will be higher and as a result – higher selling price.

Also the other significant factor, that affects business, can be double consequences of reforms, which are carried out at the request of the IMF, as guarantee of getting a new loan. In particular, the reform of fiscal and tax policy, which main purpose was to optimize state budget, so, in general, it was scheduled to reduce unnecessary costs and embezzlement. However, in the end, everything was erected to higher taxes and cuts in payments from the state budget. Actually with low sales producers will not be able to manage increased taxes with their own resources, so, they will be laid in the price of goods, and therefore this will fall on the consumer, whose purchasing power have been already low.

Reforms in banking system also gave a double result. The main objectives of this reform was "cleaning" of banking sector, increasing its transparency, reducing level of connected lending, increasing banks capitalization and improving creditors protection [3]. However, implementation of this reform was accompanied by massive closure of Ukrainian banks, and as a result, the banking system of Ukraine had collapsed: problems with lending and a large number of Ukrainian businessmen have lost their money in banks. And if banking system can not function properly, the business can't either.

Also a big hit for business are high prices for energy resources in Ukraine. There were several consequences of implementation of energy reforms: 1) increasing energy tariffs for households to market levels until April 2017; 2) formation of very high prices for using energy and its further increasing in five stages [2], that just kills domestic business and making it unprofitable.

Thus, the analysis of modern macroeconomic climate, which is formed in Ukraine, shows a number of macroeconomic challenges and risks that have a negative impact on business activity. Enhancing of economic crisis, armed riots in the east of Ukraine and sometimes wrong government decisions are leading to instability and increasing levels of risks, and this, in turn, plays a decisive role in the normal functioning of enterprises in our country. Identification of these threats will allow domestic businesses to adapt better and survive in the current unstable environment.

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STUDENT EVALUATION OF TEACHING (SET): PERCEPTIONS OF STUDENTS AND FACULTY

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Quality assurance and focus on performance management is the urgent need of time in today's business environment. Among the quality assurance, student evaluations of teaching (SET) is always debatable by researchers and academicians. Keeping in consideration the need of high quality education this paper tends to investigate the perception of faculty and student about the Student Evaluations of Teaching (SET). The study typically examines the perceptions of students and faculty of higher education institutes in the context of Pakistan. The institute for the study is Institute of Management Sciences, Peshawar, Pakistan. The perception is to be mainly studied and analyzed from validity, policy and objectivity point of view. Furthermore, the study tends to highlight the ambiguities about the process, its validity and policy. Student evaluations were found to be given importance by both faculty and students. However, difference of opinion is highlighted about the effectiveness of the SET. The finding of the study is different from the literature which mostly identified that student rate the likeness of a faculty member. Whereas, this study identified that as the GPA improves the student gets more objective in the evaluation. The findings of the study can provide valuable insights into the quality of higher education. Moreover, the findings of the study can be utilized by authorities and Higher Education Commission (HEC) to develop a unanimous and comprehensive performance management system (PMS) for Higher Education Institutes of Pakistan.

Keywords: Performance Management, Faculty Evaluations, Student Evaluations of Teaching (SET), Higher Education, Key Performance Indicators, Higher Education context.

CALCULATOIN OF ECONOMIC LOSSES OF UNINTENTIONALLY PRODUCED PERSISTENT ORGANIC POLLUTANTS (POPs) FROM CENTRALIZED HEATING IN ODESSA

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Persistent Organic Pollutants (POPs) are a set of toxic chemicals that are persistent in the environment and able to last for several years before breaking down. POPs circulate globally and chemicals released in one part of the world can be deposited at far distances from their original source through a repeated process of evaporation and deposition. This makes it very hard to trace the original source of the chemical [1].

Many people are familiar with some of the most well-known POPs, such as PCBs, DDT, and dioxins. POPs include a range of substances that include:

- Intentionally produced chemicals currently or once used in agriculture, disease control, manufacturing, or industrial processes. Examples include PCBs, which have been useful in a variety of industrial applications, and DDT, which is still used to control mosquitoes that carry malaria in some parts of the world.
- Unintentionally produced chemicals, such as dioxins, that result from some industrial processes and from combustion (for example, combustion in the thermal power station) [2].

The main international instrument which regulates the handling of POPs is Stockholm Convention on Persistent Organic Pollutants (May 21, 2001) [3]. It was ratified in Ukraine in 18 April, 2007 [4]. Unfortunately it is the only one document that regulates exclusively the handling of POPs in Ukraine for today. As a result, we can conclude that in Ukraine there is no separate legal basis for dealing with POPs.

In this article are discussed evolution of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) as the main pollutants that are formed during fuel combustion in Odessa, 2012.

The polychlorinated dibenzo-para-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) are two series of almost planar tricyclic aromatic compounds with very similar chemical properties. The most toxic and most extensively studied representative of the chlorinated

dioxins (PCDDs) is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) [5]. The threshold limit value (TLV) for this pollutants is 0,1 ng/m³ in European Union and 0,5 pg/m³ in Russia.

According to [5] to [6], we calculated the formation PCDDs and PCDFs from central heating in Odessa by burning coal, fuel oil and natural gas (table 1).

Table 1 – The Evolution of PCDDs and PCDFs from Central Heating in Odessa, 2012

Type of fuel	Coal	Fuel oil	Natural gas	All
Emission	0,011	0,002	0,0008	0,0138

According to method [7], based on information [5], we calculated the amount of losses from the TCDD/F emission for Odessa, 2012. Since the value of the specific damage to this pollutant has not calculated yet, for the example we used the size of the environmental tax on the substance of the 1st class of danger [9]. As a result, we received payments of 0.058 Ukrainian kopecks.

Since TCDD/F are substances that are dangerous to the human body at any concentration and the MPC is $0.5 \cdot 10^{-12}$ g, it can be concluded that the amount of tax on the substance of the first class of danger is too small for a sufficient compensation from these pollutants. That is why it is very important to create a separate State Control System of POPs, which is currently unavailable in Ukraine.

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POPULATION HEALTH AND ENVIRONMENTAL TAX POLICY IN UKRAINE

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Power engineering today is the most vulnerable point of Ukraine economy. Energy Strategy of Ukraine aims to increase the share of domestic fossil fuels in the energy balance of the country to 91.8% until 2030 (Energy Strategy of Ukraine till 2030).

High dependence Ukrainian industry on fossil fuels leads to significant industrial and transport emissions. The carbon dioxide CO₂, carbon monoxide CO, nitrogen oxides NO, NO₂, sulfur dioxide SO₂ and hydrocarbons are discharged into the air as a result of combustion are. The largest contribution to greenhouse gas emissions by economic sector carries out power industry. Its share is 76,06 % in 2011.

It is obvious that Ukraine intends to continue to use fossil fuels. Therefore, the dependence on fossil energy sources and high prices on fuel required revision of energy policy.

Therefore, natural question arises to motivation the enterprises and the public to find alternative energy sources. We conducted the study in Ukraine as a whole and as an example examined the state of disease in the Poltava region.

As the results of correlation analysis the strongest correlation of the variables is noted for SO₂ and nitrogen oxides and diseases of respiratory organs.

The correlation analysis of variables indicative there is a close connection between respiratory diseases and SO₂ emissions and nitrogen oxides emissions from stationary sources 0.80 and 0.84. These components' emissions from mobile sources have not any relations with

respiratory diseases. Thus, the largest source of air pollution is the energy sector and enterprises.

Although, the most toxic emissions are the nitrogen oxides and sulfur dioxide, at the same time the CO₂ emissions are the most voluminous. Carbon dioxide, at first glance harmless to health, but it brings the global burden because they accumulate in the atmosphere it creates the greenhouse effect. At the same time we have seen that these three substances are constant companions. That is, if to deliver a target to reduce CO₂ emissions, so, would be reduced and accompanying components.

The Ukrainian legislation and tax policy need improvement. One of the directions of environmental policy for Ukraine is to introduce an effective mechanism for collection and use Ecological Tax. Tax management should include firstly differentiated Carbon Tax rate and benefits for encourage consumers to save energy generated from fossil fuels, and for use carbon-free clean technology. Secondly should be created an effective mechanism for the redistribution of the tax to compensate for the damage caused by carbon pollution that would have provided compensate fees to citizens and funding for development of forestry. The effective tax management can stimulate enterprises to use energy saving technologies, it will decrease greenhouse gases emissions in atmospheric air and moreover could be incentive to high forestry development.

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KYIV ENVIRONMENTAL SAFETY FINANCING: PROBLEMS AND WAYS OF THEIR OVERCOMING

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The state of natural-technogenic and environmental safety of Kyiv is extremely complicated. The natural component of the hazard is caused, primarily, by the complex relief. Thus, among natural threats and risks are landslide processes, flooding, complex meteorological phenomena, etc. The relatively small territory of the city is oversaturated with complex engineering structures and production (radiation, chemical, hydrodynamic, explosion fire hazard) and has one of the highest population density. At the risk of emergency situation (ES) there will be a few million people in the affected area. According to the State Service of Emergencies of Ukraine, during 2014 the death toll as a result of emergencies accounted for 3 people and 33 people suffered. In 2013 there were 7 ES, the number of sufferers and dead were 95 and 3 people, respectively.

The volume of material losses was significant; moreover, funds were attracted to overcome consequences of emergencies. The implementation of preventive measures in supporting natural-technogenic and environmental safety of Kyiv is funded mainly within the framework of the state and region target programs of civil protection. However, during 2014 funds for these measures were not allocated. In addition, capital investment and operating costs for the protection and rational use of natural resources for Kyiv were unstable and ranged from 223 million (2014) to 1.374 billion USD (2013), and the share of government expenditures of these amounts was about 10%.

Today, due to the accumulated problems of organizational and systemic chronic underfunding of prevention measures of pollution, regions and cities have actually lost the leverage to limit the environmental threats and risks. At the same time, active work on approximation of the environmental legislation in compliance with EU Directives on Environmental Protection requires search for new, alternative forms and

instruments to obtain funds for prevention of security measures. Along with the “horizontal” directives, an important instrument for regulating relations in the field of prevention of pollution within Europe is the Cohesion Fund, the costs of which can be distributed among countries whose GDP is below 90% of the average EU GDP. The countries preparing to join the EU get assistance through the fund “Instrument for Structural Policies for Pre-Accession» (ISPA) to finance environmental and transport projects.

According to the statute of the Cohesion Fund, 63.4 billion euros is allocated for investing projects in a number of categories, including: support of the development of low carbon projects; promotion of climate change adaptation, risk prevention and management, including investment projects to address specific risks, ensuring stability, as well as development of disaster emergency management systems; environmental conservation and protection and increase in efficiency of use of resources by promoting sustainable operation of transport and elimination of deficiencies in key network infrastructures.

Using investment grants, subsidies, tax incentives and compensations as main mechanisms, for the period 2007-2014 the Cohesion Fund money supported 20 programs in 14 European countries. Most of them were co-financed (including ERDF), and related TEN-T optimization or development and infrastructure in the country with observance of requirements of environmental protection. The effectiveness and success of the development fund is measured by a set of taken indicators, among which are indicators of the environmental state, development of recoverable energy and climate change, the state of the transport network. For the period 2014-2020 the Cohesion Fund aims to promote development and optimization of the environment in Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia. Unfortunately, Ukraine today does not have a legal possibility to fully use the money to fund projects of risk prevention and overcoming threats to the population and territory of the border regions, even under condition of common-funded cross-border programs with one of the EU countries. The issues of this direction of cross-border cooperation are revealed in of Ye. Matviishyn’s works, where the author analyzes the causes of poor activeness of border regions communities in projects preventing environmental pollution or overcome its consequences.

Any economic activity and especially the one that is on the densely populated areas can cause appearance and distribution of ecological and natural-technogenic threats and dangers. Therefore, special attention in the implementation of hazardous economic activity for Kyiv should be paid to observance of a number of principles, including: prevention, due diligence, compliance with international environmental laws and so on. Today enterprises of large cities is a potential source of contamination for the territories of Ukraine and neighboring countries as a result of a number of economic, technical, technological, organizational and other reasons. Our own funds and reserves for prevention are unfortunately not enough (it is confirmed by underfunding the leading state target programs to prevent risks and dangers of emergencies).

The EU structural funds have an organizational and economic potential (which is not yet available for Ukraine) in solving the above problems and especially, the Cohesion Fund that provides investments for overcoming territorial disparities, including the environmental field through the whole system of mechanisms. Given the intensification of the interaction policy “Ukraine-EU”, a priority in the future should be both state support of strategies for regional and urban development taking into account ecological component (including Kyiv) and extension of powers of local authorities to identify and finance joint international environmental projects with the active involvement of local authorities in the development and implementation of policy documents in the field of environmental protection.

FEED-IN TARIFF LIKE AN INCENTIVE INSTRUMENT TO ENLARGE RENEWABLE ENERGY USING BY HOUSEHOLDS

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The ongoing economic situation in Ukraine, the energy dependence from Russia, the prices increasing for the energy resources and as the consequences the snowballing increasing for the household's utilities bills are actualized the developing of renewable energy. Moreover, the experts declared that the fossil fuels age had already died. That is why it is

necessary to research and implement the practice mechanism to spread the using of the renewable energy resources by the households. The results of analyzing showed that the European Countries provide a lot of incentive economics instruments to stimulate the using of the renewable energy in the household. Thus, the feed-in tariff (FIT) for electricity produced from renewable energy source is the most effective instrument to encourage the renewable energy. FIT uses in more than 60 countries of the world.

It is necessary to underline that Ukraine also provide such instrument. According to the Ukrainian energy strategy by 2030, Ukraine must increase the energy production from the renewable sources almost by 20 times [2]. Unfortunately, the Ukrainian Law doesn't correspond to the ongoing national economic development and as a consequence Ukraine has a lot of barriers such as unbalanced tariffs for various types of renewable, a problematic local content requirement, a restrictive definition of biomass, etc. Besides, we have not had the real practice mechanisms of using the FIT yet.

According to Law of Ukraine on Electric Power Sector, FIT is the special tariff, whereby make a purchase energy which is made by on energy object which be used the renewable sources of energy (save as blast-furnace gas and coke oven gas) [1]. The goal of FIT in Ukraine is the stimulating of Ukrainians to use the renewable sources of energy instead of conventional energy sources.

FIT is approved by National Commission on Regulation of Electric-Power Industry. According to Ukrainian legislation the rate of FIT had approved for every economy entity, which utilizes electrical power with using of the renewable sources of the energy, for every electricity generation facility and for a piece renewable energy type [3]. It can't be lower than ensure the minimum FIT on date establishment of retail tariff, which is converted from euro into hryvnia according to official rate of National Bank of Ukraine.

Generally, rates of FIT calculated under the following formula provided by Article 17 of the Law of Ukraine on Electric Power Industry (the Power Industry Law):

$$FIT = RP \times C,$$

where: RP is a retail electricity price for the second class consumers as of January 2009, which is established in accordance with Resolution of National Energy Regulation Commission No.1440 of 23.12.2008;

C—coefficient established by Article 17 of Power Industry Law. It depends on type of alternative energy source and station capacity[4].

Besides of that, FIT depends upon date of commissioning of electricity generating industry. FIT will be reduced by 20%, 30% if the electricity generating industry place into service after 2019 and 2024 as applicable.

As an example, we had considered FIT for private households, which generate electric power with power at that do not to exceed 30 kW. The result of analyzing showed that the electrical generation from the solar energy is the most popular in Ukraine. But development of solar energy can be stopped, because the FIT will be reduced according to the Ukrainian Law. Thus the FIT for solar power show in the table 1 [5].

Table 1 - The changing of FIT for solar power for households, (EUR)

Type	Capacity (kW)	Commission date				
		01.07-31.12.2015	2016	2017-2019	2020-2024	2025-2029
Solar power for private household	<30	0.2003	0.1901	0.1809	0.1626	0.1449

No doubt, in Ukraine FIT is one of the Europe's biggest. For example, in Germany FIT spectrum has from 39 kop/kWh (object of hydroenergetics higher 50 MW) to 448.15 kop/kWh (planetary system for 30kW). Ukraine has the highest FIT because an investor can come with hurdles of higher economic risk [6].

As we write above the decreasing of FIT can restrict the development of the solar energy. From the other side, the increasing of Electricity tariff for household should stimulate to use the renewable energy by households. Thus, according to the Ukrainian legislation the electricity tariff will have increased more than 3 times by 2017 March [7].

Table 2 - The electricity tariff's changing from 2016 to 2017

Consumption rate, kW/h	Electricity tariff, in kop. for 1kW/h		
	01.03 - 1.09.2016	01.09.2016 - 1.03.2017	from 01.03.2017
<100	57,0	71,4	90,0
100-600	99,0	129,0	168,0
>600	156,0	163,8	168,0

Despite the outlook of using FIT is obvious, but the investors put money in the alternative energy very deliberately. Consequently the using of alternative energy in Ukraine by household hasn't spread yet. The reason of it is the political and economical spottiness in Ukraine. Besides, the higher FIT is the essential payments for higher risk of the investors. Also, people can't see the real mechanism of using the FIT. That is why it is necessary to create and implement the practice mechanism of FIT using. Moreover, it is very important to enlarge the results of using the FIT's mechanism through the civil society.

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VIOLATION OF ECOSYSTEM IN THE DEVELOPING COUNTRIES DUE TO THE RELOCATION OF HARMFUL MANUFACTURES INTO THEIR TERRITORIES

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Among the number of global problems related to the processes of economic development, to the most critical and major problems are included depletion of natural resources, pollution and rapid population growth. Nowadays the major trend of world development is globalization of international economic relations, and therefore one of the distinctive features of the world economy is its transnationalization. One of the key subjects of global transformation of the world economic field became transnational corporations, which significantly affect violation of ecosystems of various countries, due to the relocation of harmful manufactures into their territory [3].

The purpose of the study is to determine the causal relations concerning environmental pollution, which is caused by the relocation of harmful manufactures of TNC.

TNCs are agents of the global economy and have a huge production potential, they direct their investments to new branches, spheres, scientific-and-technological development, that has lead to the increase of pressure on the environment.

The development of TNCs without taking into account environmental requirements leads to the conflict between two important areas: ecology and economy. There is one aim: safety of the environment or economic growth. When one goal is reached, another is not [4].

Mistakes in TNC strategies caused a double negative impact on the environment. The direct impact associated with the proximate use of natural resources by companies, failure to comply with environmental safety norms when building their enterprises in the territory of the host country. Indirect impact includes foreign trade, companies' purchase of 'exotic products', infraction of law in natural recreational area and others [5].

Currently, there is the harmful impact of production on the ecosystem almost in every country. However, there are such cities which are life-threatening. The US Environmental Fund Blacksmith Institute has

compiled a list of such cities. In the early 20th century in Kabwe were found huge deposits of lead and cadmium. There were built large enterprises for the processing of these metals. These days air pollution with heavy metals is four times higher than the permitted limit. Infected people whose number exceeds 250,000 suffer acute blood poisoning. We can observe the same situation can in Peru in La Oroya. 95% of the 35,000 people are infected with serious diseases due to the high content of lead in the blood. There are American plants which deal with the extraction of minerals such as lead, copper, zinc in this area. Not better situation can be observed in India in the Sukinda city. There are situated the world's largest chrome mines and there live more than 2.5 million people. The majority of companies' wastes are thrown into the water of rivers and lakes. About 90% of the population is susceptible to cancer. Tianjin is one of the most polluted cities in the country where the lead is produced. The concentration of the lead in the air and in the ground is almost 10 times higher than the permitted limit. The content of lead in crops is 24 times higher than normal. In the city of Sumqayit in Azerbaijan children are born with genetic deviances such as mental retardation and bone diseases. All this is due to the location of chemical industry of former Soviet Union [1].

At present, the largest environmental polluters are companies that are engaged in the fuel industry. The famous American researcher Thomson Reuters investigated this topic for a long time and published a top 12 transnational corporations that have the greatest emissions. Number one is the 'Gazprom' - 1 260 million metric tons of actual emissions equivalent to the emissions of carbon dioxide. The second is 'Coal India' - the company for the extraction of coal, emits 820 million metric tons of actual emissions equivalent to the emissions of carbon dioxide - 7%. The third is the Anglo-Swiss raw material trader 'Glencore Xstrata' - the world's largest company involved in the mining industry, its revenue amounted to 220 billion dollars by 2014, and emissions - 811 million metric tons of actual emissions equivalent to the emissions of carbon dioxide - 6.9 %. [2]. The list also includes British Petroleum; Shell Oil, which, in fact, occupied Nigeria in Africa; Exxon Mobile – the spill of 11 million gallons of oil near the coast of Alaska; Procter & Gamble - use animals for experiments, each year about 50 thousand of animals are killed; and others.

However, transnational corporations have begun to take various codes and measures aimed at improving the ecological state of the environment. Among them are: the publication of the recommendations and 'codes of

behavior' with a help of the Responsible Care Program, the role of environmental audits is growing, implementation of more stringent tax system on emissions, transnational corporations began more frequent contributions to various funds of environmental protection, hoping to increase their reputation and obtain tax or other benefits. In 2015 70 international investment companies with total assets valued at \$ 3 trillion initiated a unique project on renewable energy sources, which is coordinated by experts of Ceres and Carbon Tracker organizations. According to the EIR Center for almost 60% of large transnational corporations of the Fortune Global set ambitious goals of transferring their businesses to renewable energy sources to reduce greenhouse gas emissions [6].

Consequently, the activities of TNCs in 20 years increased their impact on the environment. Transnationals use the 'environmental benefits' placing their investments in different countries, but in turn, they themselves the most actively influence the environmental situation of the host countries. The activity of TNCs has 2 different contradicting sides. The negative impact became the result of traditional and outdated strategies, but with the transition to a strategy of lasting development identified the new approaches and methods of management of the TNC's activity, that in the future will guarantee environmental and economic balance.

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ECONOMICS AND ENVIROMENTAL PROTECTION IN THE INDUSTRIAL REGION

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Formation of regional environmental and economic policies must be accompanied by a rise in the role of environmental factors in the development of individual regions that are in crisis, given the integrated assessment of natural assimilation of anthropogenic emissions and waste, available natural resources, the level of development of productive forces and geographic location. Condition of ecology in some industrial cities that are situated in the central and eastern regions of the country, continues to deteriorate as a result of depreciation of fixed assets and nature and lack of funding for environmental protection.

Dniprovsky industrial region is one of the most polluted in Ukraine. Emissions from industrial enterprises exert a significant impact on the environment. The most severe contamination observed in Dnipropetrovsk, Dniprodzerzhynsk and Kryvyi Rih. Dniprodzerzhynsk has a special place, where in the area of 152 km² and the number of residents 252.0 thousands people, emissions of harmful substances are >490 kg / human., which is 25 times more than in the Dnipropetrovsk region.

One of the most effective ways of solving environmental problems of the city is fundamental renewal of existing production facilities, commissioning of new modern technological equipment including in him the aspiration-gas treatment devices.

Iron&Steel Works is the main pollutant of the city, with the number of emissions 110 thousand tons/year (93% of the citywide) of which 76,7 tonnes/year takes sinter plant.

Sinter plant is the largest polluter of the environment by emissions (82% of all emissions in the plant) and therefore the most attention in the

future plans of the technical development of the plant is paid to its reconstruction and new construction.

Construction of a new sinter plant is planned with capacity of 11 mln. tons/year of high-quality sinter with auxiliary facilities and the reduction of emissions to 8-10 thousands tons/year. The existing sinter plant consisting of 6-sinter output of operation and dismantled. Thus eliminated the main source of harmful emissions.

Construction of the complex expected in stages in 3-phase with the provision of modern aspiration-gas cleaning equipment (system gas cleaning MEROS*), which will provide the concentration of harmful substances in the gases emitted below the permissible limits and will make up: the solids on average 5-25 mg/nm³ and sulfur oxides by - 500 mg/nm³.

Emissions of lead, mercury, dioxide, furan and volatile substances will be reduced by 97-99%, which meets the requirements of ISO 1400, EU BAT and other regulations.

Ukraine has a system of charges for air pollution (stationary and mobile sources), water, solid waste placement, damage to plants and animals, natural areas, emergency environmental pollution and so on.

The fees for air emissions from stationary sources of pollution (Π_{ar}) at the limit defined by the formula [1, 2]:

$$\Pi_{ar} = \sum_{i=1}^n (H_{in} \cdot M_{i\phi} + K_{in} \cdot H_{in} \cdot M_{ib}) \cdot K_r \cdot K_{ind}$$

- a) fee for dust emissions into the atmosphere by the old sinter plant:

$$\Pi_{ar} = (111,26 \cdot 700 + 5 \cdot 111,26 \cdot 13300) \cdot 1,69 \cdot 1,2 = 15162691,0 \text{ UAH/year}$$

- b) fee for dust emissions into the atmosphere after the launch of a new sinter plant:

$$\Pi_{ar} = (111,26 \cdot 700) \cdot 1,69 \cdot 1,2 = 157945,44 \text{ UAH/year}$$

Mass emissions of old and new sinter plant using CO combustion in the boiler CHP, partial capture SO₂ i NO₂, and payment for environmental pollution are shown in the table 1.

Reduction (using combustion CO):

$$G = G_n - G_s = 76700 - 16100 = 60600 \text{ tones/year}$$

Environmental and economic benefits from reduced payments for air pollution:

$$E_{ar} = E_n - E_{\phi} = 183673759 - 27768330 = 155908429,0 \text{ UAH/year}$$

Table 1 - Weight reductions and fee for pollution

Substance and collection, UAH/tons	Emissions to the atmosphere after purification, tons/year*	The fee for emissions - old sinter plant, UAH/year	The fee for emissions - new sinter plant, UAH/year
Dust - 111,26	14000 / 700	15162691,0	157945,0
CO - 74,17	52000 / 10400	4824758,0	1564334,0
SO ₂ -1968,65	7700 / 3500	97814344,0	13973478,0
NO ₂ -1968,65	3000 / 1500	65874966,0	12072633,0
Total	76700 / 16100	183676759	27768330,0

*Numerator - an indicator of old sinter plant; denominator - an indicator of a new sinter plant.

Enlarged economic damage caused by industrial emissions of pollutants into the atmosphere is determined by the formulas [1,2]:

$$Y = \gamma \cdot \sigma \cdot f \cdot M, \text{UAH} / \text{year};$$

$$M = \sum_{j=i}^n A_j \cdot m, = \text{tones} / \text{year}$$

The mass of old sinter plant emissions:

$$M_c = 100_{\text{num}} \cdot 14000 + 16,5_{\text{SO}_2} \cdot 7700 + 41,1_{\text{NO}_2} \cdot 3000 = 1650305,0 \text{ cond.tons} / \text{year}$$

The mass of emissions after the launch of a new sinter plant

$$M_n = 100_{\text{num}} \cdot 700 + 16,5_{\text{SO}_2} \cdot 3500 + 41,1_{\text{NO}_2} \cdot 1500 \approx 189400,0 \text{ cond.tons} / \text{year}$$

Reducing emissions reduced mass:

$$G = M_c - M_n = 1650305 - 189400 = 1460905,0 \text{ cond.tons/year}$$

a) economic damage created by the old sinter plant:

$$\sum Y_c = Y_n + Y_r = 396084000 + 6008400 = 390075600,0 \text{ UAH/year}$$

b) economic loss after starting a new sinter plant:

$$\sum Y_n = Y_n + Y_r = 45456000 + 2865600 = 48321600,0 \text{ UAH/year} \quad (10)$$

c) reducing the economic loss:

$$E = E_c - E_n = 390075600 - 48321600 = 342054000,0 \text{ UAH/year}$$

The total environmental benefits of the release of a new sinter plant:

$$\sum E = E_n + Y_{\text{at}} = 342054000 + 155908429 = 497962429,0$$

UAH/year

Conclusions

1. Building a new sinter plant provides for: consistently high quality sinter and higher productivity.
2. Smaller desired area plant compared to conventional sinter plant.
3. Reducing the volume of waste gas by 50% and consumption of water from the Dnipro river.
4. The ability to utilize sinter plant more than 50 tons/year contaminated ferrous materials, low energy consumption and coke.
5. 70% reduction of harmful and organic components in the exhaust gases.
6. Significant savings in environmental costs associated with treatment and disposal by traditional technologies.
7. Compliance with all environmental requirements, even with their stricter in the future.
8. Reduction of initial concentration of harmful substances in exhaust gases sintering process; low emissions, including: dust $<10 \text{ mg/Nm}^3$; $\text{SO}_x <50 \text{ ppm/nm}^3$; Dioxins $<0.1 \text{ mg/Nm}^3$; $\text{NO}_x <50 \text{ ppm/nm}^3$; NO_x content can be reduced to $<50 \text{ ppm/nm}^3$; a significant reduction in emissions of particles from the current $300\text{--}400 \text{ mg/nm}^3$ at least 50 mg/nm^3 .
9. Reducing the economic damage is 155,908,429.0 UAH/year, and the total economic benefit is 497,962,429.0 UAH/year.

Due to this, will be significantly reduced not only the degree of pollution, and the resulting total eronomo-economic benefit that is not only in the technical and economic effect as in a social effect - the preservation and increase duration of life.

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COMPETITIVE OPPORTUNITIES OF REGION: PERSPECTIVE OF DETERMINATION

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Complication of managerial problems in condition of intensification of interregional competition and influence on processes of globalization sets tasks before state and regional authorities in order to improve system of management, including mechanism's search and methods of state regulation of territory, focused on its competitiveness. Regions of Ukraine are in need in modernization of system's management of social and economic development, indicators of efficiency which are not quantitative indexes but qualitative ones in new developments' conditions. The basis contains particular politics, directed to transformation of competitive potential of region into a factor of its stable development, providing a transition economic system into qualitatively new level of economic progress. There are actual investigations, which are connected with definition of structure and functions of competitive potential of territory, its influence on regional competitiveness.

Nowadays in Ukraine regions are different according to the level of economic development, which is a result not only a preservation of differentiation of their industrial, resource and innovative potential, but also its force. Main reason of effective economic politics as in national so in regional level has not decided yet. In connection with there is a problem of formation of effective and adequate regional competitive politics, directed to provision of region's competitiveness. From these positions an investigation of competitive potential of region is a primary task, solution of which will allow improving competitive positions of a region on national and international levels.

It is known competitive potential of region includes variety of components, which is a component of a structure and performing definite functions, which will change according to strategic purposes of development. There will be different a result obtained in the process of realization of competitive potential of region. Basic structural elements of competitive potential of region are economic, human, innovative,

investment, infrastructural. Such scientific approach is the most traditional and widely used [1].

While increasing competition between territories and regions will cause an usage of new resources and abilities, which are situated in the sphere of management, enterprise, and integration and отображают modern современные organizational and economic relationships of region. That is why the structure of the competitive potential of the region along with other elements, it is necessary to consider to potential of enterprise, a potential of internationalization, diversification, restructuring and clustering.

Competitive potential is a reserve, which can use the region, modifying and adjusting strategic development priorities and implementation High competitive potential of the region allows you to save or increase the rate of development and stop the negative effect of external and internal factors [2].

So, the competitive potential of the region and its functional structure determine its competitiveness and there is a source of competitive advantage of territory. The complexity and variety of this category is confirmed by its structure and functional purpose.

A determination of the functional structure of the competitive potential of the region is necessary to construct and improve the use of its competitive advantages by choice more efficient rates of development, investors mobilization etc. An analysis of the competitive potential allows identifying regions which have succeeded in the development of a competitive factor. Such information may be useful to create different kinds of formal and informal associations' areas in which the most important goal will be to cooperate through the exchange of experience and transfer of innovation in all spheres of social and economic development of the territory.

Besides, the results of investigation can become competitive potential of the information base for the formation of a regional competition politics and the adoption of regional authorities informed decisions in the management of steady development of the territory.

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ENVIRONMENTAL ECONOMIC PROJECTS IN UZBEKISTAN

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The Republic of Uzbekistan is located in the central part of Central Asia. Neighbouring states: in the east - Kyrgyzstan; in the north-east, north and north-west - Kazakhstan; in the south-west and south - Turkmenistan; south - Afghanistan and the south-east - Tajikistan.

The country's territory is desert (Kyzylkum desert), steppes (Hunger Steppe) and mountains (Hissar mountains, Tien Shan and Chatkal mountain ranges).

Cities of Uzbekistan, which is centered around the lives of the people of this country are in the valleys of the rivers (the Amu Darya and Syr Darya).

In the north-east of the country is located Aydarkul freshwater lake - a large (3000 square kilometers) an artificial reservoir in Aydar-Arnasay lakes system, which occupies a total area of 4,000 km². In the north - the border runs through the middle of the former Aral Sea (lake), now dried part - Southern (Big) Aral Sea.

To date, we implemented several environmental projects in the Republic.

At the political level, the largest project is the Ecological Movement of Uzbekistan (Uzbek O'zbekiston ekologik harakati.) - Public Association of Uzbekistan, created by scientists-ecologists and public figures having a permanent faction in the Legislative Chamber of Oliy Majlis of the total of 15 seats. The main objectives of the movement is to increase civil activity of the population in matters related to the environment, including through legislative, social and educational activities.

The largest environmental disaster in the history of mankind disaster Aral Sea was the fourth largest inland sea in the world, acting as a factor affecting the humidity and the dry land. From 1960-x years when misuse of the Aral Sea water began, it has shrunk to less than 50% of its former area and decreased in volume threefold. Most of the water has been and continues to be used for irrigation of cotton fields, crop requires a large

amount of water to grow. Because of the problems of the Aral Sea, high salinity and soil pollution with heavy elements are especially widespread in Karakalpakstan and the regions of Uzbekistan adjacent to the Aral Sea. Most of the water resources of the country is used for agriculture, which accounts for about 84% of water consumption, and contributes to high soil salinity. The intensive use of pesticides and fertilizers for cotton growing further aggravates soil pollution. According to the UNDP (UN Development Programme) for climate risk management in Uzbekistan must take into account its environmental safety.

To date, the Aral Sea is carried out the implementation of two major projects.

1. Yes, recently, the Aral Sea was considered lost without back and revenge with it the loss of the gene pool of flora and fauna, and other environmental impacts of fishing and shipping, too, came to an end. But now everything has changed thanks to a joint project of Uzbekistan and Kazakhstan the project of regulation of the Syrdarya channel and save the northern part of the Aral Sea. At this time we managed to create a man-made Small Aral Sea water came back with vengeance fish. And this is one of the sources of income according to region.

"I saw the Aral Sea 20 years ago. Then there was a desert, and the funeral on it ships. Today, everything is different. There was a lot of beautiful places. This is the first case in the world, when it was possible for people to save the people of the whole sea. This is amazing! "- Said an employee of the French national broadcaster Isabel Magland. [2]

2. Draft Sudoche. Creating an artificial lake of chicken with the support of UNPO at saving the Aral Sea.

To date, it failed to negotiate with the governments of Turkmenistan and Tajikistan at the expense of regulation of the Amudarya river bed.

At present, there is a realization associated not only saving the Aral Sea, as well as many environmental projects in Uzbekistan.

1. Reduction of cotton fields at the expense of an increase in cotton yield with drip irrigation method. Today, productivity increased an average of 15 quintals per hectare (1993) to 38 quintals per hectare (2015). The government set a target to reduce the cotton fields of 950 thousand to 700 thousand hectares by 2020.

2. Implementation of the project for the construction of solar photovoltaic power in the territory Pastdargom and Nurabad districts is provided in accordance with the Republic of Uzbekistan presidential decree of March 1, 2013 "On measures for further development of alternative energy sources" and the Decree of the Head of State on June 4, 2014 "On measures to realization of the investment project of construction of a solar photovoltaic power plant of 500 MW in the Samarkand region." [1]

The project is financed by a soft loan of the Asian Development Bank and the Fund for Reconstruction and Development (FRD) of the Republic of Uzbekistan. Total project cost - 310 million US dollars. In particular, ADB funds is - \$ 110 million, FRDU funds - \$ 130 million, the contribution of the Government of the Republic of Uzbekistan - \$ 44 million and own funds of "Uzbekenergo" - 26 million USD.

3. Intensive orchards. For the annual expansion of the areas of the gardens, they are created in a program specifically targeted measures has been developed and farms by our government. To date, in all regions of the country, on an area of 5.3 thousand hectares of dwarf and semi-dwarf established orchards. Including in the Samarkand region under their allotted 1300 hectares, in the Tashkent region - 1000, in Navoi - 750, in the Kashkadarya - 600, in Surkhandarya, Namangan and Andijan regions - 400 hectares.

4. Iization of the project with the agency KOICA Well construction windy power Dehkanabad District Kashkadarya region the amount of 50 million US Dolar moshostiyu with 100 megawatts.

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SUSTAINABLE DEVELOPMENT, DELAY OR REGRESS?

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Since the report of the World Committee in 1987 “Our Common Future” (Brundtland et al., 1987) the idea of Sustainable Development had conquered the minds of the scientists and politicians all over the world and changed the perception of the development vectors for the leading companies. The idea – revolutionary in 1987 – was so splendid in its significance, orientation and scale, that more and more people became the adepts of the new theory, and becoming the adepts they started to criticize it.

Among all the problems with the Sustainable Development concept, which are presented at paper of Beckerman (Beckerman, 1994), I’d focus on the problem of implementation and practice of it.

The practice embraces all the activities on defining the concept, establishing goals, creating indicators and asserting values. An of course, it includes “developing social movements, organizing institutions, crafting sustainability science and technology, and negotiating the grand compromise among those who are principally concerned with nature and environment, those who value economic development, and those who are dedicated to improving the human condition” (Kates et al, 2005).

But in fact, the big companies choose to reallocate the resources and production sites to the countries of third world or with a weak and unaware government. For example, social movement against the GMO production and the producer Monsanto, in particular (Humanite.fr, 2015), brought the France’s refusal to produce GMO products in the 21 regions (21 regions declared free GMO zone). And as a result, “Monsato” – global producer and trader of GMO seeds in the world, known by its destructive impact on the environment and economics in many countries, - offers the support of the sustainable development programs for the communities and social entrepreneurship in Ukraine, as from 2013 the resources are reallocated (official site of Monsato). These failures of the system and “fake sustainability” shook the faith into the morality of the sustainable development.

And now the sustainable development fashion led to unfavorable results, such as promotion by the big companies of the green or BIO labels

as healthier products, which are not. Using the law of informational asymmetry, the producers try to increase the sales in that way.

As for the National strategy for Sustainable Development in Ukraine (Sustainable Development Strategy of Ukraine – 2020), I would say that it is artificial construction, which was made for declaration, not for the realization. This is in fact government program of crisis-management steps, but the interests of communities and business are ignored. It does not correspond to the definition of the strategy, and does not meet the criterions of sustainability. There are no measurement tools which are recommended to use for understanding, are we there yet? Did we reach the goal?

For example, the strategy has 25 indicators, and among them – No 16, where it's written “the life expectancy by World Bank calculations will increase by 3 years” [ibid]. How? The response is below: “The means of the strategy are the preconditions of the strategy implementation through the social contract between institutions, business and community” [ibid].

However, I strongly believe that Sustainable Development Strategy is reality and it's achievable for our country, but now I should admit that there is a delay in sustainability, or rather to say – a regress.

All the decisions on Sustainable Development need to be made by the actors, who are strongly concern and responsible for its realization. It becomes possible under conditions of the decentralization of the state power and distribution of bigger authorities to the communities or municipal forces to the city and regional levels. The dialogue between scholars and practitioners, big companies representatives and representatives of social movements is the source of the future rational decisions and future sustainable results.

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APPROACHES TO MANAGING CORPORATE SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

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There are several managerial approaches that can be applied for social and environmental responsibility issues: functional, system, process, integrated, administrative, situational, marketing and program approach.

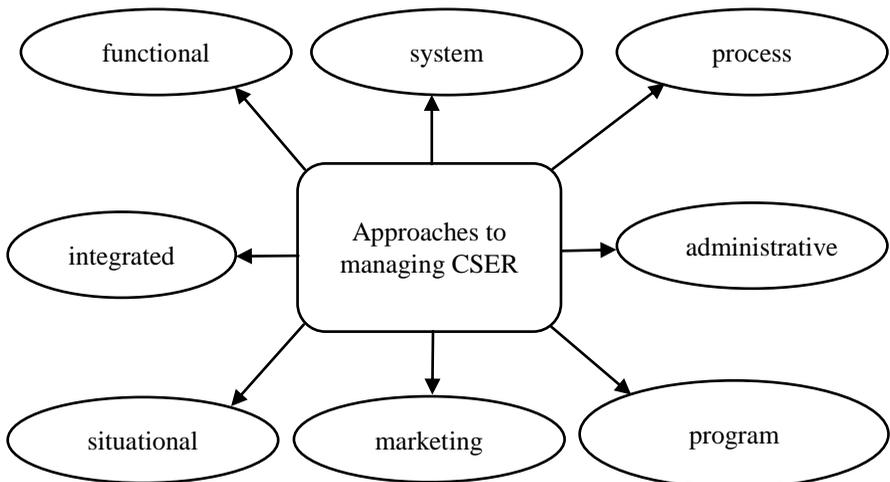


Figure 1 – The main managerial approaches to corporate environmental responsibility

Functional approach to managerial decision-making considers the business firm from the position of its basic function. Social and environmental responsibility functions can be assigned to one or more structural units and they will be responsible not only for creating a report on social and environmental responsibility, but also for its implementation.

System approach involves consideration of the object as a set of interrelated elements (with each other and with the environment). The systems approach can be used for social and environmental responsibility at the enterprise when the enterprise has not only profit as its mission but also principles of sustainable development of a territory its allocated.

The basis of the process approach is the principle of operations regulation consistency. Company processes are, in their essence, a tool for monitoring and coordination of temporal and spatial aspects of the tasks. Here we mean process under complete sequence of logically interrelated necessary for economically significant processing facility [1].

In terms of corporate socio-environmental responsibility, process approach can be applied primarily for improving cleaning systems that dangerous substances. That is the way to change the production process to reduce its negative impact on environment.

Another approach to managerial decision-making including social and environmental responsibility is integration. It aims to strengthen ties between different subsystems and levels of governing.

Administrative approach is one of the most rigid and bureaucratic. It means developing and implementing the rules, norms, regulations to structuring business unit's activities.

The situational approach uses different methods of managerial decision-making depending on the situation. Situational approach can be used to improve the image of the company in the short term. But the most appropriate method is marketing approach.

Marketing approach assumes targeting the consumer and in case of social and environmental responsibility, targeting the stakeholders. The marketing approach to corporate social and environmental responsibility of appears in instruments of social marketing.

And the last one, and the most interesting approach to corporate social and environmental responsibility is program approach. It is based on developing of programs to meet specific goals that are by top clearly defined management of a company. That is the development of such programs that is mostly appropriate for environmental issues. This follows from a nature of such activities: they are usually targeted to solve concrete environmental problems of the territory, but not on carrying out certain works or using funds. In addition, some environmental problems cannot be solved in isolation from another one [2].

Thus, program approach to corporate social and environmental responsibility can be implemented as construction and implementation of programs for social and environmental responsibility of the company.

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GREEN HOUSES AS A WAY FOR GREENING THE ECONOMY¹

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In recent years the deterioration of the environment has become really influence on the quality of life of the population limiting the possibility of social and economic development of countries and regions. In this context, political decisions are needed for greening economic activity, which is defined as the process of creation, development and use of scientific and technical, technological, administrative, legal and socio-economic innovations in the production and consumption sectors [1]. Green economy is recognized as one of the main trends of the XXI century. It integrates environmental and economic interests of countries and regions. One of the main directions of green economy is energy efficiency (EE) activity which helps to save energy resources and therefore to reduce environmental contamination levels.

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The housing sector is a priority area for EE not only because it consumes a huge amount of energy, but also because this sector is still characterized by extreme extravagance. Although the level of current technology provides opportunities to reduce energy consumption significantly in the residential sector, this sector, especially in Ukraine, actually continues to use outdated inefficient methods that cause even higher levels of resource consumption [2].

Economic aspects of sustainable development, greening business and EE are actively investigated by domestic scientists. Among them are B. Burkinsky, T. Galushkina S. Gerasimchuk, B. Danylyshyn, R. Zayats, P. Krugman, L. Melnik, V. Reutov, A. Harichkov, E. Khlobystov, M. Hvesik and others. Experts consider greening business and EE as key factors of improving the strategy of social and economic development of countries and regions with regard to ensuring ecological safety of living. The scientists propose organizational and economic mechanisms for greening economy implementation in all spheres of our life, but their practical realization impede by different reasons. Thus, today there is urgency for further development of strategies and policies for inclusive growth and well-being of society that would ensure sustainable development, environmental preservation and saving energy resources in order to provide the appropriate level of energy independency for territories [3].

Thus, the research objective is to review the modern problems of sustainable development and greening economy and to propose economically feasible ways for greening the residential sector of Ukraine on the base of EE measures.

Greening economy and sustainable development are based on the active use of innovations. Advanced (radical) innovations change production capabilities, they allow increasing the production of new products and services while using fewer raw materials and involving secondary raw materials. Innovations help to increase economic growth not due to the depletion of natural resources and environmental pollution, but due to use of new technologies, in particular, resource-saving and environmentally friendly ones.

Because of urgency of innovations implementation especially in the ecological sphere we may see the active development of the ecological market not only in foreign countries, but also in Ukraine. The ecological market is a market of environmental technologies, works, goods, services,

knowledge and environmental information [4]. In recent years structural and geographical changes are observed in this market. Concerning the residential area traditional sectors of the ecological market obtain further development, which include water supply, water purification and wastewater drains (about 40% of the market), disposal of solid and hazardous wastes (also 40%), utilization of secondary resources and protection of the surrounding air. New market sectors also evolve rapidly; the examples of these industries are eco-tourism, organic agriculture, ecological automotive industry, production of medicines, cosmetics and other environmental goods, construction of green houses (GHs).

The last direction – GHs – allows constructing modern buildings with low energy consumption from the outside. It is very prospective concept from the point of achieving sustainable development. GH (passive or energy efficient) is a building with a small power consumption that is about 10% of the regular house energy consumption. The main feature of GHs is their possibility of maintaining the air temperature inside at the same level as in summer as well in wintertime. Thus, there is a high level of the comfort with a maximum consumption of heating or cooling no more than $15 \text{ kW}\cdot\text{h}/\text{m}^2$ in comparison with Ukrainian regular house, where energy consumption can reach $400 \text{ kW}\cdot\text{h}/\text{m}^2$ [5]. GH is an energy efficient building, which helps not only to save money, but also to live in a safe, eco-friendly environment. No less important peculiarity of these houses is their ability of renewing the energy that the house receives from the light bulbs, washing machines, computers and even from human work.

Despite the novelty of GH concept for Ukraine, there are some successful examples of its implementation on Ukrainian territory. GHs are located in Kyiv, Chernihiv, Vasylkiv, near Kaniv, Odessa, Yavoriv city (near Lviv) and near Vyshgorod [6]. The construction of such buildings is based on the principles of their compact form, internal finishing of the building by diffusion-open materials, presence of massive parts for better accumulation of heat and cold, controlled ventilation system with heat recovery, availability of cooling and heating systems of the building by means of radiating surfaces and others. Everything should work for ensuring the effective functioning of the house. It must be environmentally friendly and safe for the environment, as well as comfortable and cozy for its residents.

Also, important factors in the design of the house are the correct orientation of building to the cardinal points, the maximum tightness and

wind-tightening of the house, proper glazing of construction, the use of a clot-walls, openness from the south side (no shading) and so on. These seemingly simple factors make it possible to achieve efficient and economical using the planet's resources along with inflicting no harm. The homes of this type do not have any harmful effects on the environment as well as it is the particular place, where a person can have a great time. There is environmental, healthy and comfortable atmosphere, which is achieved by using environmentally friendly natural materials. Furthermore, heating, ventilation and natural materials provide permanent maintenance of a healthy home humidity, lack of emissions in the inner space and comfort of living.

Of course, extra advantages of living in such GHs cost some additional money. For the case of Ukraine we can compare the price of already built passive house (the first passive house in Ukraine, Kyiv) with the price of traditional, not green, house in order to understand whether the construction of such GHs is efficient. Assume that the passive house has three separately functioning parts (total area of which is 328.5 m²): house (for a family of 5 people) with a library, swimming pool and sauna; own flat with a separate entrance from the garden; office with a separate entrance from the street. So, the costs of the entire home fully finished and equipped totaled 340,000 USD. As for the usual house, which has the same parts, its price is around 250,000–270,000 USD [6].

Thus, the difference in price is near 70,000–90,000 USD, but if you are the owner of GH, you have a number of advantages. For example, for the house of 200–300 m² the annual savings of natural gas expenditures for heating is 350–500 USD, for electrical heating is 2000 USD. The residents of the GH annually pay 150 USD for maintenance, including heating, cooling, water heating and heating the pool, electric sauna, electric lighting, electricity etc. Monthly expenditures for maintenance of the ordinary house reach 200–250 USD. As a result, the payback period of additional investments in GH compare to the usual building is about 10-15 years. In addition, that is not taking into account. living in the GH has favorable effect on human health.

Thus, in many ways, the construction of energy efficient GH is a promising industry. Its main usefulness is saving the limited resources on all stages of building. A passive house is effective not only for its durability (more than 150 years), but also because of its useful influence on human's health. Therefore, due to constructing the GH society obtains a various

kinds of benefits, such as saving resources, reducing the negative technological impact on the environment, as well as increasing life expectancy of humanity and enable sustainable development.

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THE INFLUENCE OF ECOLOGICAL FACTOR ON THE FUNCTIONING OF ECONOMY OF UKRAINE

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There are a lot of factors which have influence on the functioning of economy of Ukraine, and we can divide them into internal and external. The influence of external factors is beyond control of government, but internal, which functions inland, can be regulated by a state. However, we

need to remember, that these two groups of factors are connected. Ecological factor is a part of internal factors.

In Ukraine, ecological management in general is realized with help of constitutional regulation of ecological legal relationships, ecological legal regulation based on legal prescriptions and codes of Ukraine, and international legal regulation. In particular, Constitution of Ukraine circumscribes the rights of citizens and state's duties to environment (articles 13, 16, 50). Economical and legal regulation based on norms of The Law of Ukraine "About environmental defence" explains organization of environmental defence in legal, economic and social aspects, in other words, it is a certain regulator of relations in defence, using recreation of natural resources, takes into consideration the aspects about providing ecological safety, foreseeing and prevention of negative influences of business activity on environment, keeping natural resources and so on. According to this law, a lot of other laws, and regulatory and legal acts are developed, that concretize correlation between certain kinds of activity and environment more. International legal regulations consist of international conventions, agreements and protocols [1]. Ukraine has signed 20 international conventions, several agreements, protocols and memorandums that have to do with ecology [2].

Important problems in ecological management appear as an inability of Ukraine in fact to fulfill some signed conventions or agreements and inefficient control of their fulfillment. For example, we can take into attention Kyoto protocol, according to which Ukraine had to eliminate emissions of hotbed gases in comparison to the year of 1990. That protocol became the source of getting revenues from trade of quotas, because countries that signed that agreement became obliged to correlate their emissions to the year of 1990, and if their rate is bigger than latest, a country is obliged to compensate the increase of emissions by buying appropriate amount of quotas of members of Kyoto protocol, which have unused "store" of hotbed gases, and Ukraine, because of sharp economic recession, has never reached the rate of 1990, so it became able to sell quotas. During 2009-2010, the state budget of Ukraine got 470 million euro because of selling surplus of quotas. The problem is that in Kyoto protocol, there were not any rules about reporting and transparency of the money used, which would have to be used to eliminate emitted hotbed gases. Since Japan became the biggest buyer of Ukrainian's quotas, so for not

fulfillment of that protocol, it can demand returning of all sum of the money invested [3].

Besides, the Aarhus Convention created certain problems. Committee on compliance with the Aarhus Convention, on July 25, 2015 addressed the Ministry of Ecology and Natural Resources of Ukraine with a proposal to respond to the facts and allegations contained in the appeal of public organization "Ecology. Right. Human Being" for 5 months on shale agreements, but after the five-month period, no reply has emerged, demonstrating irresponsibility of the Ministry of Environment to agreements that it signs.

Equally important for the economy and Ukraine in general is environmental tax, the mechanism of determination of which is specified in section VIII titled "Ecological tax" of the Tax Code of Ukraine. There are many problems associated with this aspect. The low fiscal efficiency affirms that fact that during 2006-2012 the proportion of payments for the resources of the consolidated budget of Ukraine amounted to less than 5%, while the share of environmental tax was about 1%, while in foreign countries this figure is much bigger. This can be conditional on several factors, which include not enough high tax rate and the number of taxes, inefficient accounting of emissions, and due to the fact that the environmental tax on emissions is calculated by the taxpayer independently, possibility of manipulation of data on emissions, and imperfect system of fines for environmental violations etc.

A well-known indicator of sustainable economic development is the so-called "green" GDP, i.e. GDP that is focused on environmental factors. In general, it is defined as the difference between GDP and economic losses from pollution. The economic losses include environmental taxes and penalties for violations of environmental laws, and the costs of environmental protection (table 1) [4].

Table 1 - Dynamics of "green GDP" in Ukraine for the years 2007-2012 [5]

	2007	2008	2009	2010	2011	2012
GDP, mln UAH	720,731	948,056	913,345	1,082,569	1,302,079	1,408,889
Economic losses from environment pollution, mln UAH	10,266.1	13,247.4	12,283.1	14,636.8	20,597	22,561.9

Table 1 (continuation)

	2007	2008	2009	2010	2011	2012
"Green" GDP, mln UAH	710,464.9	934,808.6	901,061.9	1,067,932.2	1,281,482	1,386,327.1
The share of spending on environmental measures in relation to GDP, %	1.35	1.28	1.21	1.21	1.42	1.46

Having analyzed this table, we can conclude that every year the situation interaction between economics and environmental factor exacerbated because the share of spending on environmental measures tends to increase.

In order to improve the impact of environmental factors on the economy Ukraine should:

- increase the effectiveness of environmental control to comply with environmental legislation;
- improve the accounting control emissions and the amount of environmental tax;
- increase the amount of environmental tax and its types;
- develop indicators of environmental image of the country that would reflect the potential of business in guiding investments in environmentally attractive territory;
- improve the statistical reporting system of nature;
- to participate in international conventions and agreements, only if we have an ability to fulfill and to obtain benefits for Ukraine.

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INFORMATIVE ECONOMY FOR VIABLE DEVELOPMENT: MODERN TENDENCIES

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In the second half of XX of lawsuit information technologies (IT) were absorbed in itself by the avalanche-type achievements of electronics, and also mathematics, philosophy, psychology and economy. An appearing as a result viable hybrid marked a revolutionary jump in history of information technologies, that counts hundreds of thousands of years. Modern society is gap-filling and pierced by the streams of information, that need treatment. Therefore without IT, equal as without power, transport and chemical technologies, it is normal to function does not can. Socio-economic planning and management, production and transport, jars and exchanges, mass and publishing house medias, defensive systems, social and law-enforcement databases, service and health protection, educational processes, offices for processing of scientific and business information, finally, Internet - everywhere IT .

An informative saturation not only changed the world but also created new problems that were not envisaged in the known vault of prognoses on 2 (XX) . Dangers outgoing from power, transport and chemical technologies as air, marine, underground and surface catastrophes are well known, as contamination and infection of habitat with far going global consequences. Humanity forces to bear with this cruel paying for the development, but all the time searches the ways of defence and minimization of damage.

The internet today gives to possibility for the acceleration of rates of development to both withstand and new, entering the market companies and becomes the priority factor of international competitiveness, changes

the scales of outer space. On the estimations of firm "Price Waterhouse", more than 80 % leaders of the largest transnational companies consider that electronic commerce radically changed the mechanism of competition in corresponding industries.

The generation of young enterprises working in the Internet at once got access to outer informative space. The role of pioneers in the newest information technologies initially determines global, transnational strategy of companies. It is constrained, foremost, with mushroom growth of electronic network. Phenomenally high rates of development of network the Internet explained by that the economy of modern informatics is based on two processes: reduction of prices of facilities of informatics, foremost computers, and reduction of cost of services in an information transfer. Both these factors conduce to avalanche-type growth of number of computers and incredibly rapid excrecence of computer networks, that, in turn, conduces to reduction of prices of their use.

So, according to the data got a research firm "Network Wizards", the number of the computers plugged in the Internet from 1996 to 2000 was tripled. Today he unites 90 thousand network structures in 100 states of the world. In the USA by users the Internet there are already about 130 million persons, or almost 50 % population 2. Number of users the Internet increases with a fantastic quickness, and it is already possible to consider formed the new association of people binding to the Internet the professional activity and everyday life. The circle of these people grows quickly, taking all intellectual and business elite of the world.

Presently, as an analysis of scientific literature showed, complex researches of factors of forming of informative economy, criteria that would allow to estimate the degree of her development are practically absent. Existing in the theory of informative economy going near determination of factors and criteria carry the some disconnected character and does not give clear presentation, that causes a sharp requirement in their classification and systematization.

The next fully steady tendencies of dynamics of economic indicators of development of these three basic components showed up in the last decade of the XX century.

1. In the field of production of facilities of informative technique there is a continuous price-cutting on an equipment at the simultaneous increase of his functional possibilities and reliability, decline of weight and sizes, and also energy consumptions. At the same time this sphere of

production remains very advantageous for the investment of capital and investment in this area of production, both from the side of public organs and from the side of private sector of economy, proceed very actively. So, for example, in the structure of world informative market a stake of this sector of economy in 1995 was 25 % at the level of annual height about 8 %.

The stake of services in an informative economy increases more quickly, abandoning far behind her other components. So for example, in 1995 a stake of services in the world informative market was almost 60 %. Thus 40 % was on services of the telecommunication systems and 19 % - on other types of services (maintenance of facilities of informatization).

ENVIRONMENTAL SAFETY OF UKRAINE

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The environmental situation in the world and especially in Ukraine is becoming more threatening. Ukraine is an industrial state which holds a significant place in the global economy that directly causes significant pollution.

Today, the ecological situation in the country is characterized by a deep ecological crisis and is extremely tense since the Chernobyl disaster, due to the influence of the command economy of the Union of Soviet Socialist Republics, depreciation of fixed assets of industrial and transport infrastructure, insufficient knowledge among society and noncompliance with environmental legislation.

In the conditions of globalization of all countries the attention to the concept of "national economy" is greatly enhancing in the environmental safety component. Analyzing the systemic nature of environmental problems, their interaction with all political, social and economic factors, the ecological safety of Ukraine is one of the fundamental components of national security.

According to the Law of Ukraine "On National Security of Ukraine", national security is protection of the most significant interests of man and citizen, society and the state, protection that provides the sustainable development of the society, early detection, prevention and neutralization

of real and potential threats to national interests in different areas [2]. Among those are foreign policy related, governmental, military, economic, social, humanitarian, political, scientific, technological and informational threats.. Environmental safety lies in the interaction with these areas of national security, namely:

- in the field of foreign policy security the task is to create effective international cooperation in regulation of the protection of the environment and in ensuring the conditions of human existence;

- in the field of state security is about protection ecologically dangerous objects (nuclear power plants, nuclear reactors, etc.) that can be used as subjects of terrorists' attacks and other criminal acts in the modern world;

- in the field of military security is about minimizing the environmental impact of weapons of mass destruction, which includes the latest bacteriological, radiological, chemical weapons, and conventional armaments;

- in the field of economic security is about satisfying vital requirements, ensuring environmentally sound allocation of productive facilities, safe and excellent development of industry, energetics, agriculture, guaranteeing sustainable development of the country and at the same time preserving the natural resources of Ukraine;

- in the field of social and humanitarian security, it consists in the guarantee of the environmental rights of every citizen of the state, in creation of appropriate conditions for the environmental education of the population and in the improvement of environmental education for the specialists;

- in the field of scientific and technological safety, it depends on the creation of legal and regulatory measures for the sustainable development of the country, the identifying of new methods for evaluating and implementing the industrial and technological security, and so on.;

- in the field of information security it depends on the providing of free public access to environmental information, the clear explanation of people's rights and duties according to environmental protection, etc [2].

In Ukraine, the definition of a comprehensive evaluation of the state of environmental protection as a part of national security doesn't exist. However, the development of such indicators is being provided by international organizations, including the UN Commission on Sustainable Development, the International Institute for Sustainable Development, Yale

University and the Center for International Earth Science Information Network (CIESIN) at Columbia University in collaboration with the World Economic Forum and the Joint Research Centre of the European Commission.. They define the so-called "index of environmental quality" (Environmental Performance Index). The Environmental Performance Index (EPI) ranks countries' performance on high-priority environmental issues in two areas: protection of human health and protection of ecosystems. Regarding the position of Ukraine, we can observe that in 2012 our country occupied the 102 position, in 2014 - 95, and in 2016 we entered the 44th position [3].

Thus, problem of environmental safety is an important part of implementation of national security of Ukraine. The main derrection of state activity should be setting priorities of state environmental policy and providing with effective monitoring of threats, risks for guaranteeing environmental preservation for public and sustainable development of the country.

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