

1. Introduction

The economy has a common human foundation with ecology. They are closely interrelated. The development of all living, human civilizations and states of each member of society directly or indirectly depends on the concentration, availability and use of natural resources. At the initial stage of human development, the impact on nature was harmless. But gradual development was accompanied by the involvement of natural resources in operation in ever increasing volumes and scales: land for agricultural production, animal husbandry; production and non-production construction; water resources for industrial and domestic needs, irrigation of agricultural land, electricity production; forest resources, bowels of the earth; energy and mineral resources [1]. The industrial period of economic development is characterized by unlimited and uncontrolled intrusion of man into the natural environment. To mechanize work in huge quantities, energy resources are consumed, natural landscapes change, and artificial landscapes arise due to waste storage, hydrogeological regimes of rivers, lakes and territories change, climate changes and the reverse effect of the forces of nature. Urbanization of the population tears man from its natural sources, distorts the notion of a single essence of nature and man. All this causes the need to develop, move from the raw material economy to the service-technological one, to use natural resources reasonably. The best way to do this is to form an environmentally friendly economy. Such economy will become a real factor in humanizing economic growth. Neoinstitutional direction in the economic theory of R. Coase – the lack of clearly established ownership of resources and environmental benefits [2]. If this defect is eliminated, and if a number of other rights are observed (they are formulated as R. Coase's famous theorem), then it is possible to provide an optimal quality of the environment on a market basis, and the state should only establish these market rights. The humanization of the economy will lead to economic growth without harming the environment.

2. Methods

The problem of ecology began to attract the attention of economists of various schools and directions in the second half of the twentieth century [3]. One of the main world problems of our time is the deterioration of the environment as a consequence of human industrial activity. 81.1 % of the world's energy is on the so-called dirty energy – oil, gas and coal. The world's larg-

INVESTIGATION OF SYNTHESIS OF MODERN TECHNOLOGIES AND ECOLOGY. ECONOMIC ECOLOGY

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Abstract: The article deals with the problems of ensuring environmental safety and environmental protection, economic prerequisites for irrational nature management. The economic development of terrestrial civilization is associated with the accelerating growth of consumption of natural resources of the planet, as a result of which depletion of stocks of non-renewable types of natural raw materials and deterioration of the state of the environment as a result of intensive nature management and its environmental impact. To mechanize work in huge quantities, energy resources are consumed, natural landscapes change, artificial landscapes arise due to waste storage, hydrogeological regimes of rivers, lakes and territories change, climate changes and the reverse effect of the forces of nature. Development is accompanied by the involvement of natural resources in operation in ever increasing volumes and scales. The necessity of rethinking the technogenic and ionosphere civilization concepts of human development from the point of view of ecological safety is considered. The effectiveness of the approach to the management of ecological and economic systems is that there will be stabilization and improvement of the ecological status, preservation of unique natural objects, environmental safety of the population, sanitation of environmentally harmful and hazardous industries will be ensured. The transition to low-waste and non-waste technologies will become more real.

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est economy (the USA) and the world's largest energy country (PRC) are building virtually all of their coal industry. This coal is often mined from open quarries, disfiguring the land from which it is cut down, leaving in it significant ozone holes in the atmosphere, where the normal biogeocenosis will be restored, at least not in the lifetime of the generation that the coal extracted from it will burn. All because coal from open quarries is cheap: 4 cents per kilowatt-hour in China and 6–8 – in the US. The sad outcome is that after 100–150 years, we left our children with a commercially successful geo-wash. Modern technologies allow reducing the level of environmental pollution almost to zero. But economically this will mean the collapse of our civilization [4]. The concept of sustainable development is the result of a rethinking of man-made and ionospheric civilizational concepts of human development. As a consequence, the word “sustainable” in the term “sustainable development” carries a double burden. On the one hand, it is economic development that ensures a stable state of the environment, on the other hand, stable, constant economic growth. It follows that the ecology and the economy should be viewed in the system and properly managed by this system. Ecological and economic system is the economy of any region; the elements of its

structure are the economic, social, technological and natural processes taking place in it [5]. The management of the ecological and economic system is an integral set of methods and tools for socio-economic and environmental management. But the specific methods of managing the ecological and economic system are determined by the peculiarities of the sphere of nature management and environmental protection [6], namely:

- infrastructure character of products and services in the environmental sphere;
- the duration of the main reproductive processes in nature management and the intertwining of economic and natural processes;
- specificity of property relations to natural resources;
- specificity of market relations in the environmental sphere and the significant role of the state in environmental management.

In general, an effective approach to managing environmental and economic systems should take into account these features and rely on both administrative-control, economic, and socio-political, psychological and moral management tools. The approach to managing the ecological and economic sys-

tem requires personnel, scientific, technical and information support subsystems. Within the framework of administrative and control tools, it is necessary to improve environmental legislation taking into account the benchmark for sustainable development, to analyze and, if necessary, to revise environmental standards, methods and tools for forecasting, planning and programming of environmental activities, licensing systems, environmental monitoring, projects, environmental audit, environmental certification [7]. Economic leverage can be the sale of emission quotas, the creation of environmental insurance funds, environmental leasing, collateral, compensation policies, the method of accelerated depreciation, tax benefits, payment for environmental pollution and waste disposal, compensation payments for the retirement of natural resources from the target use them, for deteriorating their quality and payment for the use of natural resources [8]. There is a need to develop a program of development of ecological and economic systems at the state level. To do this, it is necessary to analyze and assess the state of ecological and economic systems in the region, conduct environmental and economic monitoring. At the next stage, identify environmental problems and develop a project of environmental and economic programs that help eliminate problems and develop ecological and economic systems. To assess the effect of the program on the environment and the economy and, taking into account the adjustments, to adopt programs for implementation. As a result of the successful implementation of the programs, economic growth and production of environmentally friendly products will be achieved. There will be stabilization and improvement of the ecological state; preservation of unique natural objects. Ecological safety of the population will be ensured; sanitation of environmentally harmful and dangerous productions [9]. The transition to low-waste and non-waste technologies will become more realistic, and the population will be provided with environmentally friendly products and clean drinking water, which is a national security issue. Support from the state will contribute to the development of research projects that support the development of environmental activities and improve the management of environmental and economic systems. Due to support at the state level, environmental education and education will meet European standards [10]. Successful implementation of programs for the development of environmental economic systems also depends on organizational support. At the moment, there are such problems of management systems: a low percentage of targeted research and design work in order to implement various directions of environmental policy; weak information and analytical support of the environmental management system; a low level of implementation of international cooperation in the field of protection and use of natural resources.

3. Results

The main obstacle to preserving the planet’s environment is the economy. The basis of any modern economy is the market. The market itself is self-sufficient, coping well with its tasks. But, along with this, the market is almost unaffected by external influences. The Scottish economist Adam Smith published his work in 1776: “Research on the nature and causes of the wealth of nations”, in which he formulated the concept of “invisible hand of the market” and showing how much the market occupies an important place in the economy of the state of Fig. 1 [11].

At the moment, the world market is a closed and self-sufficient system, and this principle is based on the principle of maximizing profits. The ultimate goal of any economically oriented enterprise lies in maximizing the possible profit at the

lowest cost. In such conditions, any other phenomena of the external world are secondary and often neglected. Budgets go to the spheres from which they return, multiplying many times. Therefore, as a result of research, we came to the conclusion that in order to realize the economic ecology, first of all, we must start from the market. The introduction of the idea of economic ecology into the foundations of the modern market will give an irreversible impetus to the development of this direction in other spheres of state activity, which ultimately lead to the globalization of this theory and a new direction of human development.

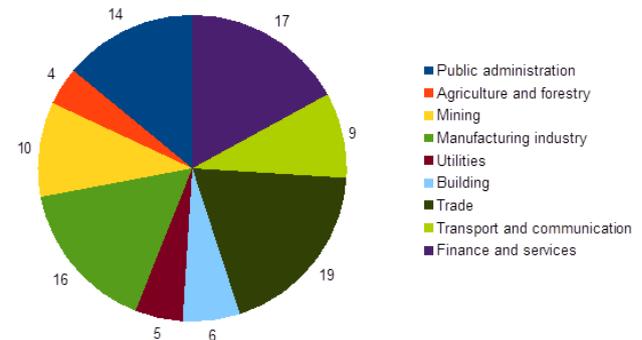


Fig. 1. The main components of the country’s economy

4. Discussion

Ecology needs an economic perspective on the problem of the relationship between man and nature, based on the system of categories of economic theory as a science on the principles of rational choice in conditions of limited benefits and resources. To develop a holistic economic mechanism for managing the ecological system, it is necessary to form a system of environmental instruments and impacts on sustainable development, including the formation of environmentally-oriented national accounts. The creation of an environmental and economic mechanism based on innovation and the development and harmonization of the mechanism of international relations on global environmental impacts will lead to the subsequent consideration of the factors of acceptable environmental risk in decision-making. And also the formation of a system of economic impacts on the ecologization of production, stimulating the creation of markets for environmental services, products, technology and equipment.

Studies show that the world is dying, the environment is deteriorating and most likely it is an irreversible process. All that is at this stage in our power is only to slow down these processes. And the main enemy of this is the economy, which at the moment just does not allow thinking about anything, except about profit. The modern alternative energy sector allows to extract energy from almost anything, but the price is worth a stumbling block here. Few people think about how his actions will affect the world picture of the years through 200. For modern man the main goal of providing for himself and his family. Therefore, to expect from humanity that each of its individual is aware of its place in history and all the consequences that its actions bear while it is meaningless. The only effective lever of influence on the current situation, at the moment, is the state apparatus, and it suffers defeat in this field. But if, for example, the states of Europe and other developed countries can afford to think not about economic efficiency and the solution of immediate problems, but about the long-term consequences of their actions and spend impressive budgets on preventive measures, then the developed countries are not.

On the other hand, modern scientific and technological progress shows huge leaps of efficiency from year to year, both physically and economically. Solar energy has increased its capacity by 10 times in the last five years. And according to the forecasts of the World Energy Agency, by 2050 hydropower will be able to provide a third of Asia and Africa with energy. In general, current trends show that the clean energy sector

does not stand still and in some places is gaining power at a tremendous rate. It is necessary to take into account historical experience, which shows the following: when people begin to observe with their own eyes how the deterioration of the environment will seriously worsen the level of their life, then serious measures will be taken to prevent the ecological end of the planet.

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