

# **INNOVATIVE APPROACH TO ECONOMIC AND ENVIRONMENTAL DEVELOPMENT OF FUEL AND ENERGY COMPLEX**

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## **Abstract**

*The article deals with the main activities to ensure environmentally sound sustainable development in order to conduct effective environmental policy of the state in terms of economic modernization. We analyzed the current issues of the innovation process in the fuel and energy complex of Uzbekistan - as a factor in economic and environmental development. Studies on the economic and environmental development of the industry, and analyze the factors that characterize modern economic condition of the fuel and energy complex. Based on this analysis, we have determined that further development of the processes of innovation and investment in the energy sector is expedient to take investment decisions and to ensure the reproduction equipment, technical re-equipment industry, as well as identifying priority investments and technical modernization of the economic and environmental development.*

*Keywords: Ecological safety, innovation, modernization of economy, economic development, environmental development*

## **INTRODUCTION**

In modern conditions, any state shall regulate the national economy, with varying degrees of state intervention in the economy. Transforming economic systems, developing a large scale production, the company itself leads to a crisis of a different nature - the ecological crisis. Historically, each time starting a new cycle of reproduction, people turned to new natural resources. Production was open and the output - it is built on the principle of recovery of the natural systems of the nature of the case. Modern human civilization is also based on open systems of production, that is built on the basis of extensive nature.

In the energy sector, according to some sources, only the burning of coal ash and waste gases into the environment receives more than mined from the bowels of: magnesium - 1.5 times, molybdenum - 3 times, arsenic - 7, uranium, titanium - 10, aluminum, iodine, cobalt - 15, mercury - 50, lithium, vanadium, strontium, beryllium, zirconium - hundreds of times, helium, germanium - thousands of times, yttrium - tens of thousands of times greater than (Fursova, 1991).

## THEORETICAL FRAMEWORK

Problems in the rational and full utilization of mineral resources in the Republic of Uzbekistan is given the highest priority and in various documents indicated that their solution requires complex processing of raw materials, improve the quality of the extracted mass, intermediate intermediates and waste reduction in the useful components of loss (mining and enrichment), wide the use of secondary resources (waste rock and tailings enrichment plants) for the production of building materials and so on. Environmental security is closely linked with the economy. These interactions occur in several ways:

- The technical means to prevent and eliminate the environmental damage to the natural environment require a direct cash outlay;
- Attempts to save these costs give rise to environmental damage;
- To compensate for these losses and damages a person is forced to find new sources of resources, the development of which requires new, additional costs;
- A person improves their quality of life, gradually replacing - good or bad he manages - the natural habitat of human, which takes a significant portion of its available investment funds (Astahov, Dikolenko and Harchenko, 2003).

Efficiency of the extensive forms of nature factor is extremely low. Suffice it to consider that today is utilized in the final product of about 1% by weight of natural resources used. The remaining 99% is almost irretrievably lost. Modern production technology is based on that in relation to the rational use of natural resources are extremely backward. And if in the past the balance was broken only in respect of land and forest resources, today covers pollution river resources, air, soil, wildlife, oceans, ozone shell of the Earth climate.

The relationship of economic and environmental crises are now beyond doubt. Thus, reforms in the economy and the socio-political sphere of influence on all aspects of society, including the state of conservation work. Not to say that environmental problems in the Republic of Uzbekistan can not be solved. At the same time, there was a paradoxical situation. On the one hand, we received dozens of laws, regulations and instructions governing the consumption of natural resources and limiting the extent of environmental contamination at the level of the

country's leadership of the environment; active in national and local environmental organizations.

## **DISCUSSION OF EXISTING RESEARCH**

In the context of modernizing the economy, the policy carried out by the Republic of Uzbekistan's policy of modernization, aimed at the development of innovative economy. Fuel and energy complex of the country is a leading element of the national economy, which connects all major industries. The share of fuel and energy complex of the country is in total industrial production is about 25%.

In the energy sector for the years 2005-2012 the growth of natural gas production (104.5%) and coal (128.3%) was achieved, liquefied gas production (129.4%), electricity production (110.1%). There is a decrease in the production of thermal energy (66.6%) and diesel fuel (71.0%), crude oil production, including gas condensate (57.7%), motor gasoline (88.2%). Compared with the previous year increased coal production (100.2%), production of electricity (100.2%) and heat (102.1%), liquefied natural gas (105.8%) (Statistical Yearbook of the Republic of Uzbekistan for 2005-2012 yy., 2013).

In 2014, in comparison with the previous year increased coal production (110.0%), electricity production (102.2%) (Statistical Yearbook of the Republic of Uzbekistan for 2005-2014 yy., 2015).

Today, stable and uninterrupted supply of economy and population with fuel is an important factor in the successful implementation of the country economic and social reforms. The main factor of the priority development of the fuel and energy complex acts feasibility of replacement of natural gas and oil used for electricity production, increasing the share of coal in the energy balance of the Republic.

In our view, it is possible to highlight the most important issues currently existing in the environmental sector:

1. The funds allocated for environmental measures, are often used for other purposes. Their formation depends on the ability of enterprises and organizations to pay "green taxes".
2. As a result of wear and tear of most industrial enterprises of the republic has increased dramatically the extent of environmental risks. The ecological situation in large industrial cities - critical.
3. Due to a shortage of financial resources, many enterprises suspend environmental programs, postponing them indefinitely.

4. In practice, the environmental policy of the state has a specific focus, as the legislative and legal framework exists. But in industry regulation of natural resources and environmental protection processes ineffective.

The presence of these problems indicates that the state of the economy and environmental activities are in direct proportion. Pollution, have a significant impact on economic development, defined in economics as negative external effects (negative externalities). The most common method of public exposure to environmental pollution is an administrative regulation, consisting in direct prohibitions and requirements of the implementation of a number of economic entities activities that reinforced the power of the state apparatus of coercion. However, practice shows that the established standards and emission standards, allow significantly reduce the size of externalities and, as a consequence, does not lead to an optimal allocation of resources, because it does not take into account the individual characteristics involved in such a situation of economic subjects. Market methods to combat pollution, used in conjunction with the executive in recent years, also does not provide tangible practical results. The main activities to ensure environmentally sound sustainable development include:

- Environmentally sound distribution of productive forces;
- The environmentally sound development of the industry, energy, transport and public utilities;
- Environmentally friendly agriculture;
- Not exhausting use of renewable natural resources;
- Rational use of non-renewable natural resources;
- Increased use of secondary resources, recycling, disposal and disposal of waste;
- Improving governance in the field of environmental protection, environmental management, emergency management (Pevzner, Malyshev, Melkov and Ushan, 1997).

Analysis of the experience of developed countries in solving environmental problems shows that the world's environmental situation is complex and ambiguous. We distinguish three main groups of countries in which environmental pollution is directly related to economic development.

The first group - industrialized countries implementing an active environmental policy.

The second group - the state, developing on the principles of a mixed economy, resource extraction.

The third group - the economically backward countries. Here, the environmental problems are caused by poverty, disease, underdevelopment (Nigeria, Angola, Chad and the like).

If the countries of the first group (the US, Japan, Denmark, Sweden, Finland, England, France) economic policy contributes to the implementation of environmental programs and projects in the countries of the second group of environmental activities carried out by the

introduction of specific, often small programs that do not have a special weightiness and the state environmental policy is under development. There have not paid enough attention to environmental policy (Russia, China, Thailand, UAE and others). For example, in China, rapid economic development contribute to a sharp deterioration of the ecological situation. Here are undertaken persistent attempts to at least partially compensate for the effects of human activity. Huge interest is the first group of countries, since there are currently the most effective administrative and market-based mechanisms to combat pollution. At the end of the 80s in many European countries and the United States on the basis of economic mechanism of environmental management has been introduced administrative and legislative systems. It is possible to increase the profits of producers of environmental goods and services, to replenish the state budget and partially solve the problem in some disadvantaged areas.

## **METHODOLOGY**

For the analysis of the goals, this study uses an array of statistics for production of selected products data fuel and energy complex, the structure of investment in fixed assets by industries at the expense of all sources of funding. Data were obtained from the State Committee on Statistics of the Republic of Uzbekistan for the period 2005-2014 yy. For the analysis of the submitted data benchmarking methods were used.

## **ANALYSIS AND FINDINGS**

Uzbekistan has proven coal reserves in the amount of 1832.8 million tons, including brown – 1786.5 million tons, stone - 46.3 million tons. Inferred resources amount to 323.4 million tons of coal. The main tasks in the framework of the priority development of the coal industry are:

- Gradual increase in coal production through the use of modern mining and transport equipment, modernization, reconstruction and technical re-equipment of the coal industry, the increase in the share of coal in the structure of electricity generation;
- The choice of priorities of the processing of coal to produce end products with high added value;
- An increase in production volumes and the quality of coal supplied to the population and budget organizations;
- Ensuring the financial sustainability of the coal industry, the introduction of financial mechanisms that make it possible to reduce transaction costs, receivables and payables;
- An increase in the resource base of coal raw material on the basis of geological exploration in promising areas;
- Provision of the coal industry with qualified personnel.

In order to develop and expand production, technical and technological re-equipment of the coal industry decision of the Government of Uzbekistan has approved a program of modernization of the coal industry, calculated until 2018.

Indisputable is the fact that one of the factors motivating the further economic and environmental development of the fuel and energy sector is innovative-investment processes. The purpose of this article is to examine the characteristics of the innovation process in the energy sector, industry, identification of problems and identification of the main ways of increasing the efficiency of the fuel industry in accordance with the policy of modernization of the economy of Uzbekistan.

Analysis study of the dynamics of production of certain types of fuel and energy complex for the 2010-2014 years. It shows that the stable development of the industry (Table №1), but with an increase in production capacity of the fuel and mineral resources could increase environmental impacts. It is therefore advisable to carry out innovation and investment processes to integrate with the economic and environmental activities.

Table 1. Dynamics of production of selected products fuel and energy complex

Branches	Units	2010 y.	2011 y.	2012 y.	2013 y.	2014 y.
Electric power	bln. kW / h	51,9	52,8	53,0	54,6	55,8
Heat	million Gcal	27,7	27,1	29,3	27,8	31,9
Oil, including gas condensate - all	thousand tons	4037,4	3737,2	3337,1	3167,2	2867,1
including:						
<i>Oil</i>	thousand tons	2017,9	1901,6	1571,7	1279,8	1031,3
<i>gas condensate</i>	thousand tons	2019,5	1835,6	1765,4	1887,4	1835,8
Gasoline	thousand tons	1413,8	1323,2	1237,2	1164,3	1068,1
Diesel fuel	thousand tons	1127,9	1052,0	1009,3	1125,3	982,1
Fuel oil	thousand tons	321,7	278,3	255,2	202,3	143,7
Liquefied gas	thousand tons	369,8	365,4	382,1	559,6	606,8
Coal	thousand tons	3629,4	3844,8	3753,0	4090,0	4396,8

*Source: Elaborations of the author based on the data obtained from State Committee on Statistics of the Republic of Uzbekistan*

To date, market conditions fuel and mineral resources is very unstable. The reason is not only in the sharp fluctuations of oil, but also the growing shortage of energy (Matveev, 2011). In terms of economic and environmental development of the current economic condition of the fuel and energy complex of Uzbekistan characterized by the following factors:

- Lower depth of processing of fuel and mineral resources;
- Availability of innovative deficit for the reproduction and development of recycling of secondary raw materials extracted.

Fuel and energy complex - very inert industry, investments in energy assets - long-term investments, which are characterized by prolonged periods of return. The economic and environmental development of the industry depends primarily on investment:

- By updating the industry on the basis of modern technologies;
- To increase production capacity of power plants, effectively combining different types of fuel;
- In the coal-mining industry as a source of fuel for electricity in the future (Semenov, 2012).

If we look at the structure of investment in fixed assets by industries at the expense of all sources of financing the investment power and fuel industry increases year after year (see table №2).

Table 2. Structure of investments in fixed assets by industries at the expense of all sources of financing (in percentages)

Industry	2009 y.	2010 y.	2011 y.	2012 y.
<b>The entire industry</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
electric power industry	10.8	16.7	13.6	10.7
Fuel	38.7	23.4	31.0	39.1
Metallurgy	14.5	17.9	13.0	8.2
chemical and petrochemical	6.5	4.2	3.0	6.7
engineering and metalworking	9.4	11.2	13.6	11.8
Forestry	0.7	1.2	1.4	1.0
building materials industry	5.9	8.3	4.4	5.3
Other	13.5	17.1	20.0	17.2

*Source: Elaborations of the author based on the data obtained from State Committee on Statistics of the Republic of Uzbekistan*

## CONCLUSION

Moving innovative resources in the economic system takes place in the course of carrying out investment activities. In connection with which there are two interrelated issues to further promote innovation and investment processes in the fuel and energy complex for the purpose of economic and environmental development:

- At the expense of investment and ensure reproduction equipment and modernization of the sector;
- To identify the characteristics and priorities in matters of investment and technical upgrading.

Thus, summing up the research, it should be noted that the ongoing innovation and investment processes in the fields of national fuel and energy complex will allow the maintenance of production facilities, the level of production and reserves of mineral resources, the most important economic and environmental development of the industry as a whole.

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