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EFFECTIVE USE OF INVESTMENTS IN THE DEVELOPMENT OF THE ELECTRIC POWER INDUSTRY

Abstract: *In achieving positive results in the electric power industry, it is of great importance to attract investments in the process of technical and technological renovation and modernization of the network.*

This article analyzes the importance of investments in the electric power industry and analyzes the current state and attracted to the power industry in Uzbekistan. The regression equation analyzes the factors that affect the potential of the power sector in Uzbekistan, and is formulated as a result of the analysis.

Key words: *investments, investment projects, efficiency, factors, financial losses, capital resources.*

Language: *English*

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Introduction

The power industry is one of the key sectors of the economic system. The level of socio-economic development of the country depends significantly on the development of this sector.

Since the power industry is one of the key sectors of the economy of Uzbekistan, the energy policy of the early years of independence has been emphasized to ensure the country's energy security and use of national energy resources to address social and economic problems of society.

From the very first years of independence, Uzbekistan's energy policy has been focused on ensuring energy security of the country and the use of national energy resources to address social and economic problems of society. Particular attention was paid to the power industry, which is an important national energy policy.

As a result of large-scale reforms in the power industry, the main strategic goals of the national energy policy, which were envisaged in the first years of independence, were to achieve energy independence and to solve social problems.

Literature review

Many compatriots and foreign economists have dealt with and evaluated the issues of investment efficiency and their evaluation, in particular V.Veits, E. Lieberman, P.Vilensky, K. Hofmann, M.Agoshkova, V.Livshits, I.Smith, I.Alexandrov, T. Khachaturov, B. Vedeneev, D. Lvov, M. Rymer, V. Berens, A. Notkin, A. Lurie, A. Astakhov, N. Fedorenko, R. Holt, S. Strumilin, L. Abalkin, S. Sitaryan, etc. Among domestic scientists on this topic, such economists as Bekmurodov A.Sh., Karrieva Y.K., Nematov I.U., Nabiev D. , Kattaev N.T. [9], etc. The results they obtained are fundamental from the point of view of methodological and economic analysis and decision-making on investments. At the same time, previous work did not exhaust the range of problems related to improving the methodology for assessing the effectiveness of investments and developing a set of measures to improve them.

Current state of Uzbekistan's electricity industry development and investment attraction

At present, the installed capacity of the power plants of Uzbekistan is $ 12.4 million. kWh and accounts for about 50% of the total production capacity of the entire United Energy System of Central Asia. [10]

Total installed capacity is 12.0 mill. kW, which includes 39 power stations, Uzbekenergo is the main producer and supplier of electricity in the country. In the production capacity, the share of the company's power stations is less than 3 per cent (320MW).

The installed capacity of the power plants is enough to meet the growing demand for electricity in the republic, fulfill its commitments to supply electricity and ensure energy security of our country.

The total capacity of the power system of Uzbekistan is US $ 10.6 million. kilowatt per year (IES). Five large TPPs installed power units from 150 to 800 MW. These are large thermal power stations such as Talimarjan, Sirdaryo, New Angren and Tashkent TPS and produce more than 85% of electricity.

All hydroelectric power stations of the company are mainly connected to the cascades of hydropower stations and operate in the flow of water. The largest hydroelectric power station (Chirchik, Khojikent, Gazalkent) located on the upper Chirchik river has reservoirs. These reservoirs allow you to work in power regulation mode.

The share of gas in the primary energy resources required for the production of electricity is 90.8%, mazut - 5.3%, coal - 3.9%. This tendency will remain in the foreseeable future - the main fuel will remain natural gas and the share of coal in the fuel balance will increase by 10-12%.

Obviously, the power industry is directly linked to the national oil and gas and coal industry and operates on a very complex technological chain. This raises the issue of technical and technological innovation renewal and modernization of the electric power industry and the attraction of investments to these processes.

In 2017, total power plants will receive 60.7 billion cubic meters of gas in Uzbekistan. kWh, which is 2.9% more than in the previous year. Uzbekenergo JSC is the main producer and supplier of electricity in Uzbekistan. In particular, in 2017, Uzbekenergo produced 52.1bn cu.m. kWh of electricity was generated and accounted for 85.8% of the total electricity produced in the country (Table 1).

Table -1

Electricity generation and distribution in Uzbekistan in 2017

The amount of electricity generated		
Total electricity generated, billion kWh	Power stations of "Uzbekenergo" JSC, billion kWh	Other blockbands, billion kWh
60,7	52,1	8,6
Electricity distribution		
Different sectors of the economy, billion kWh or hours %	To the people, billion kWh or%	Export, billion kWh or%
35,5; 71%	12,5; 25%	1,85; 4%
Amount of investments in the electric power industry, UZS billion		
Owned capital of Uzbekenergo	Foreign loans	Commercial banks' funds
337,5	254,3	62,6

Source: Estimated by the author on the basis of annual reports of Uzbekenergo.

The total volume of electricity produced was 35.5 billion cubic meters. kWh or 71% in different sectors of the economy, 12.5 bn. kW or 25% of the population, and 1.85 bn. kW or 4% (Table 1). At the same time, Kazakhstan has received 1.2 billion euros. kWh of electricity was imported.

As a result of the rising living standards of Uzbekistan's economy and living standards, the demand for electricity in the country is increasing. In order to meet this need, the energy system capacity has been significantly increased. A number of investment projects aimed at increasing the volume of energy production are being implemented in this direction. In particular, in 2017, utilized funds for total investment projects amounted to 654.4 billion soums, including own funds of Uzbekenergo JSC - 337.5 billion soums, foreign loans - 254.3 billion soums, and commercial banks - 62.6 billion soums (Table 1).

Uzbekenergo has implemented 17 projects in the framework of the Investment Program for 2017. In particular, the following key investment projects are being implemented:

- a new combined-cycle plant with a capacity of 370 megawatt was launched at Tashkent TPP;
- a 220 kW air line with 89.4 km long Kandym gas processing plant on external power supply was commissioned;
- The first stage of the 110 kV air line with the length of 85.6 km in the cement plant in Sherabad district of Surkhandarya region was launched;
- Construction of two steam and gas plants with a capacity of 230-280 megawatt at Takhiatash thermal power station and construction of a second combined cycle gas turbine with total capacity of 450 megawatt at Navoi thermal power station is underway with attraction of foreign investments;
- Implementation of the project on introduction of high-efficiency cogeneration gas turbine

technology with construction of a gas turbine unit with a capacity of 17 megawatt at Fergana thermal power plant and construction of Ferghana Boiler-3 with a capacity of 7 megawatt.

Moreover, if low prices lead to excessive use of extortion, limited use of natural resources, high prices may lead to slower social development.

A number of research works have been undertaken to improve investment in the development of the electric power industry.

Some economists believe that investments in energy projects are characterized by a decrease in their total value and non-return. These are investments in the wind generator tubes and solar panels as their residual value is close to zero until the energy is generated. [1]

It is important to make investment decisions for the Enegetika network. Accordingly, according to economists, the possibility of financial loss due to investment cycles increases the uncertainty of the future value of energy projects. Prior to making investment decisions, the investor may choose to invest or wait for the investor to invest afterwards. [2] In our opinion, in some cases the waiting or extension of an investment decision may result in an uncertainty about the investor's costs and incomes.

According to other economist scientists, the increase in profit depends on the industry's growth. The use of investments for industry expansion, direct attraction of foreign investments and export growth. Examples of such factors as gross domestic product, direct foreign investment, or local sources of income can be used to increase the income of the space. [3]

There is also a growing demand for energy technology, producing advanced, efficient and low energy worldwide. Markets provide significant conditions for beneficiaries to invest in emerging new energy technologies.

China, for instance, invests in the chosen electro-energy resource and technology markets with such conditions as they need substantial energy, and markets are ready to accept that innovation. Many of the emerging economies have a "first-ever" competitive edge in the energy market, and they are at a high level in the global energy competitiveness competition. For example, investments made by China in the development of solar panels have brought it to the forefront in the global competition of solar panels. [3]

At the same time, energy demand will increase 1.48 times by 2030, ie by 1.6% per year. The needs of developing Asian countries make up 38% of the world's need. According to the International Monetary Fund, by 2030, the energy sector will be directed to 52% of total investments and 45% to the oil and gas industry. More than 65% of investment demand is in developing countries. Finding such big investments is a huge global problem in developing countries, so they need to invest in.

According to other economist scientists, private investment in the energy sector has diminished in the recent past and, accordingly, the deepening of the problems [4]:

1. The ongoing global financial crisis slows down the flow of loans and has a negative impact on the global capital markets.

2. The financial difficulties of national energy companies, especially those of poor electricity prices, poor management and the impact of political factors on decision making.

1. Reducing government budgets' return to energy sector projects and focusing on the social side of the state.

2. The transitional period of many of the energy sector's ineligible reforms is steadily rising, and states are pushing for private investment and their private investment comes to a standstill. Investment attraction can not wait for reforms, but the political process does not permit it.

3. In many countries, the need for energy security is growing due to political and other conflicts. This is a problem for investment reliability.

Also, some researchers believe that there is a high competition in the electricity sector, but the creation of electricity generating capacities requires substantial investment and is associated with a large number of administrative documents, resulting in the problem of attracting private investors to electricity. [5]

At the same time, according to other economist scientists, the construction of new power facilities, reconstruction and modernization of existing ones, development of the scientific basis of the sphere will be carried out. [6] Electricity is a major area in which large-scale investment is needed because of the technological re-equipment of its fixed assets, and new energy-building projects. The Investment Implementation Decision is made after analyzing investment efficiency calculations, project targeted towards social goals and their financial effectiveness. [6]

At the same time, investment assessment is important. In particular, some economists believe that "the development of production should reflect the economic, social, political and strategic effects of investing in the assessment of economic benchmarks. They can be evaluated in value or value. "[7]

The economist in Uzbekistan said that in order to increase the investment unit's economic growth, it should be directed to the advanced sectors of the economy and focus on the introduction of new technologies. This means that these investments will be directed to novations, ie introduction to innovation. [8]

Indeed, if investments are invested in old technologies, its efficiency will be low, as output and services will be lower than the resource

consumption, resulting in reduced production efficiency.

Scientists from other Uzbek economists also say that investment is the main tool for modernization of weapons, scientific-technical, production and mental capacities with modern technology and technology [9].

It should be noted that investments are the main means of modernization, technical equipment and technology assortment, diversification of production, which in turn creates new jobs, improves the quality of products, increasing competitiveness of enterprises.

Methodology and Data

The development of the electrochemical industry of Uzbekistan will be addressed by the following regression equation:

$$Y = a + b_1x_1 + b_2x_2 \quad (1)$$

(1) We create a system of normal equations of Regression equation:

$$\begin{cases} \sum y = na + b_1\sum x_1 + b_2\sum x_2 \\ \sum yx_1 = a\sum x_1 + b_1\sum x_1^1 + b_2\sum x_1x_2 \\ \sum yx_2 = a\sum x_2 + b_1\sum x_1x_2 + b_2\sum x_2^2 \end{cases} \quad (2)$$

(2) the coefficients of the equation system (based on Table 2) by the least squares method:

Table-2.

The main indicators of the power industry of Uzbekistan

Rates	Years													
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Share of Investments into Power Industry by Investments in Republican Industry (%)	9,4	9,5	7,9	4,6	6,4	5,7	10,8	16,7	13, 6	10, 7	10,8	10,3	11,3	11,2
The share of fixed assets of the electric power industry in the main funds of industrial enterprises of the republic (%)	11,0	12,9	13,4	14,2	13,7	13,1	13,8	13,6	12,4	12,8	14,8	14,7	14,6	14,3
Share of the electric power industry in the structure of industrial output of the republic (%)	9,1	10,9	11,3	10,0	9,4	8,6	8,7	8,1	7,9	7,7	7,1	7,3	7,4	7,6
Growth Rates of Electricity Industry Products (in% to previous year)	98,5	99,1	97,8	106,4	101,8	97,7	101,7	102,7	101,1	103,0	101,3	102,2	105,8	104,7
Growth rates in the average number of employees listed by sectors of the electricity industry (in% to previous year)	102,0	101,7	116,4	101,7	96,6	98,6	94,5	101,7	107,2	99, 8	102,2	102,7	102,7	102,9
Share of employed in electric power industry in total industry (in percent)	6,4	6,7	7,1	7,2	6,9	7,0	6,9	6,6	6,7	6,9	7,0	7,1	7,3	7,5

$$\begin{cases} 39{,}6 = 12a + 46{,}3b_1 + 89{,}7b_2 \\ 205{,}5 = 46{,}3a + 268{,}4b_1 + 485{,}4b_2 \\ 389{,}6 = 89{,}7a + 485{,}4b_1 + 980{,}2b_2 \end{cases}$$

From now on , $b_2 = 0{,}126$, $b_1 = 0{,}39$, $a = 0{,}86$ is formed. So, the model we are looking at looks like this:

$$Y = 0{,}86 + 0{,}39x_1 + 0{,}13x_2 \quad (3)$$

Analysis and results

Based on the above, the correlation coefficient of the ratio between the volume of production and the fixed assets is as follows:

$$r_{x_1,y} = \frac{n\sum_{i=1}^{n} x_{1,i}y_i - \sum_{i=1}^{n} x_{1,i}\sum_{i=1}^{n} y_i}{\sqrt{n\sum_{i=1}^{n} x_{1,i}^2 - \left(\sum_{i=1}^{n} x_{1,i}^2\right)^2}\sqrt{n\sum_{i=1}^{n} y_i^2 - \left(\sum_{i=1}^{n} y_i\right)^2}} \quad (4)$$

From now on $r_{x_1,y} = 0{,}96$ is formed.

(4) the value of the parameters of the regression equation was 0.96. This means that there is a strong link between the volume of production and fixed assets in the electricity sector of Uzbekistan.

Now, we find the link between production volumes and investment. We use the following formula for this:

$$r_{x_2,y} = \frac{n\sum_{i=1}^{n} x_{2,i}y_i - \sum_{i=1}^{n} x_{2,i}\sum_{i=1}^{n} y_i}{\sqrt{n\sum_{i=1}^{n} x_{2,i}^2 - \left(\sum_{i=1}^{n} x_{2,i}^2\right)^2}\sqrt{n\sum_{i=1}^{n} y_i^2 - \left(\sum_{i=1}^{n} y_i\right)^2}} \quad (5)$$

From now on $r_{x_2,y} = 0{,}91$ is formed..

(5) As the outcome of the regression equation shows, the ratio of production volumes to investments in the power sector of Uzbekistan by 0.91 indicates high density among them.

Conclusion

1. Taking into account the fact that one of the factors influencing the capacity building of the Uzbekenergo sector, technical and technological modernization of the network, as well as improvement of management processes, training of specialists contributes to the further development of the sector.

2. In the power sector of Uzbekistan, the ratio of investments and correlation coefficient varies, that is, the link between them is strong. $r_{x_2,y} = 0{,}91$ It means that the investment attractiveness of the industry will allow to improve the quality of products and equip with new technologies. This, in turn, leads to technological innovations in the industry.

3. Further improvement of organizational and economic mechanism of attraction of investments to the sphere leads to the expansion and modernization of production. This will increase the export potential of the sector, while meeting domestic needs.

4. It is possible to achieve the development of the sector's modernization through the efficient use of resources and investments by optimizing the cost of the product cost by supplying electricity.

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