PROBLEMS AND MAIN DIRECTIONS OF DEVELOPMENT OF THE ELECTRIC POWER INDUSTRY OF UZBEKISTAN

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ABSTRACT

Based on the analysis of the current state of the electric power industry, the article identifies the main problems of industrial, organizational and managerial development. The main ways of solving the problems identified in the development of the industry are identified.

KEYWORDS: *Electric Power Industry, Hydroelectric Power Plants, Thermal Power Plants, Fixed Assets, Production Costs, Investments, Profit, Alternative Energy.*

INTRODUCTION

Climate change in the world, population growth, the development of industrial production lead to an increase in demand for fuel and energy. Therefore, fuel and energy companies must ensure the growing consumption of energy resources and thereby contribute to the growth of the global economy, which has an average annual growth rate of 3.5-4%, and this, in turn, will increase energy consumption by 1.3-1.5 times by 2030. In the scenario of sustainable development of the World Energy Agency (IEA), the share of coal consumption in the global energy balance by 2040, compared with 2017, should decrease to 60%, oil - to 71%, natural gas will increase by 10%, the share of electricity produced by nuclear power plants - by 88%, hydroelectric power plants - by 50%, and renewable energy sources - by 220%. **[1].**

DISCUSSIONS

As a result of the accelerated development of the national economy in Uzbekistan, the improvement of the social sphere, the growth in the number and standard of living of the population, the demand for electricity is increasing. According to forecasts, by 2030, electricity consumption in the economy of our country will increase by 1.8 times **[2].** Therefore, at present

and in the future, firstly, the problem of energy supply to the population and production will worsen. Because of this, the solution of this problem has become one of the main and important tasks facing the state, secondly, the solution of this problem urgently requires reforming the energy sector of Uzbekistan and defining a further strategy for its development aimed at forming a reliable, efficient and stable power supply system in our country.

In the Decree of the President of the Republic of Uzbekistan No. 4947 dated 7.02.2017 "On the strategy of actions for the further development of the Republic of Uzbekistan" identified priority tasks for "further modernization and diversification of industry by transferring it to a qualitatively new level,.. mastering the production of fundamentally new types of products and technologies, ...reducing the energy intensity and resource intensity of the economy, widespread introduction of energy-saving technologies into production, expanding the use of renewable energy sources, increasing labor productivity in economic sectors." **[3]**

Since 2017, a consistent process has been underway in the Republic of Uzbekistan aimed at the strategic sustainable development of energy industries. One of the most important steps in this direction was the creation of the Ministry of Energy of the Republic of Uzbekistan in accordance with the Decree of the President of the country dated 01.02.2019 No. UP-5646 "On measures to radically improve the management system of the fuel and energy industry of the Republic of Uzbekistan".

In order to reform the energy industry, three joint-stock companies have been organized on the basis of Uzbekenergo JSC: JSC "Thermal Power Stations", JSC "National Electric Networks of Uzbekistan" and JSC "Regional electric Networks". An important milestone in the development of the state's energy sector was created by the Atomic Energy Agency Uzatom and JSC UzHydroenergo. Considering the current shortage of electricity. On February 7, 2019, the Decree of the President of Uzbekistan No. PP-4165 "On approval of the Concept for the Development of nuclear Energy in the Republic of Uzbekistan for the period 2019-2029" was adopted, which provides for the construction of generation III+ nuclear power plants consisting of two power units with an installed capacity of 1.2 GW each.

One of the successful steps towards the transition to market relations in the energy sector was the implementation of generation projects, including renewable energy on a fundamentally new model for the Uzbek energy sector - public-private partnership (PPP). Today it has become the basis for almost all power plants under construction and planned. Thus, the commissioning of new power plants, including thermal (TPP), solar photovoltaic (FES), wind (WPP), is in many ways an example of the market changes that are taking place in the country's energy sector.At present, alternative energy is becoming in most cases the main solution to energy consumption, especially in rural areas remote from transmission lines.

The favorable geographical and climatic conditions of Uzbekistan make it possible to actively use the energy of the sun to produce electric and thermal energy on an industrial scale. This is not only a promising source of renewable energy from a practical application point of view, but also very convenient and easy to use **[4].**

Projects based on Public private partnerships are conducted on a tender, that is, a competitive market basis, while technical assistance to bring the best international experience in conducting tenders is provided, in particular, by the International Finance Corporation, a member of the

World Bank Group, the Asian Development Bank, the European Bank for Reconstruction and Development.Uzbekistan is interested in further receiving support from international financial organizations in the form of a flexible set of analytical and advisory services and certain priority investment projects in order to implement key reforms. The cooperation program should depend primarily on co-financing, and international financial institutions should provide, not only finance, but above all, their analytical and technical experience, as well as experience in project management. Uzbekistan is developing such partnerships with the World Bank, which would respond to both the main problems of the country and its capabilities **[5].**

To date, a total of 13 electricity purchase agreements have been signed, which is a significant step in creating a competitive environment for the energy sector. Among the independent energy producers are such companies as: Total Eren SA (France), Abu Dhabi Future Energy Company - Masdar (UAE), Aksa EnerjiSetim A.Ş. (Turkey), ACWA Power (Saudi Arabia) and others.

Work is underway to improve the energy efficiency of economic and social sectors. Currently, the energy intensity of the national economy, according to expert data, is 2-2.5 times higher than that of developed countries. If the housing sector accounts for about 23% of energy consumption in the world, then in Uzbekistan - 40%. In particular, the energy consumption per square meter in Europe is 120-150 kWh per year, while in Uzbekistan this figure exceeds 390 kWh.

Carrying out work to improve energy efficiency, in 2020, due to the implementation of organizational and technical measures in the sectors of the economy, savings of 917.5 million kWh of electricity were provided.

THE CURRENT STATE OF THE POWER SYSTEM OF UZBEKISTAN

In recent years, some work has been carried out to modernize existing thermal power plants and hydroelectric power plants, that is, technologies have been introduced and equipment installed based on the latest achievements in the field of energy efficiency. The production capacity of the Uzbek energy system in 2000 was 7 thousand 750 MW, and in 2016 – 10 thousand 830 MW. Thus, over the past period, only 3 thousand MW were practically introduced in the electric power industry. Currently, the available production capacity of the power system has increased from the 2016 figure to 14 thousand 131 MW. That is, the next 3,300 MW of capacity has been introduced in just the last 4 years. Thus, as of January 1, 2020, the installed capacity of electric power stations of the unified electric power system of Uzbekistan is more than 15.1 GW. The power system of Uzbekistan includes 11 thermal power plants with a total installed capacity of 12468.2 MW and 28 hydraulic power plants with a capacity of 1439.2 MW (11.5%).

The Uzbek energy system is based on large thermal power plants: Syrdarya TPP (with a capacity of 3000 MW), Tashkent TPP (1860 MW), Novo-Angren TPP (2100 MW), Navoi TPP (1250 MW), etc. In the scenario of long-term development of the electric power industry of Uzbekistan, taking into account the measures taken to improve energy efficiency in all sectors of the economy, it is expected that the growth rate of energy consumption from 3.0% in 2015 will exceed 4.5% by the end of 2021 with a slight decrease to 4.3% by 2030.

Such a sharp increase in production capacity in 2017-2021 was achieved mainly due to the commissioning of new combined-cycle gas plants (CCGTs) at Navoi, Talimarjan, Tashkent thermal power plants. At the same time, due to the introduction of modern energy-saving

technologies and equipment, the conditional fuel consumption at thermal power plants has been reduced from 375.8 g/kW.h in 2016 to 333.9 g/kW.in 2020, or by 11% (- 41.9 g/kWh).

Thus, it can be concluded that in the development of the electric power industry of Uzbekistan in 2017-2020, a number of measures were taken to modernize the industry, improve its structure and the technical and technological state of production, management system. However, we must admit that this is only the beginning of a radical modernization and reform of the industry.

Currently, the energy intensity of the country's gross domestic product (GDP) is twice the global average**.** This suggests that there are problems in this area. In particular, the energy sector as a whole, and its enterprises individually, are insufficiently efficient in production, organizational and managerial aspects, which naturally requires solving these problems from the point of view of ensuring efficiency and competitiveness.

In order to ensure the functioning of the energy industry on an innovative basis, it is necessary to once again analyze the existing problems in the development of the industry, the solution of which will have a positive impact on its intensification, increasing efficiency and competitiveness.

One of the main problems of the national economy of Uzbekistan is that most of the equipment in the electric power industry is physically and morally outdated. Most of this equipment was introduced back in the 60-70s of the last century. The problem of obsolescence of installed equipment is particularly acute in the heat and hydropower industry. In particular, the share of obsolete fixed assets in the system of Uzbekenergo JSC (operated for more than 30 years) it is 62.4%. At the same time, a significant part of the facilities of the electric grid economy have an operational life of more than 30 years, these include 66% of main and 62% of distribution networks, 74% of substations and more than 50% of transformer stations. This is one of the factors contributing to the increase in the level of technological losses of electric energy during its transportation and distribution. The average level of technological losses of electric energy in the main networks is 2.72%, in distribution networks - 12.47%. **[6]** Outdated infrastructure leads to large losses of electricity, which accounts for about 20% of the total electricity production. In addition, the existing lack of regulatory capacity leads to daily additional restarts of thermal power units, respectively, fuel overspending and additional wear of technological equipment. At the same time, there are a number of problems, the main of which are: low efficiency (25-35 percent) of TPP power units introduced more than 25 years ago and high specific fuel consumption compared to modern CCGTs (by 2 times); high level of wear of distribution networks and transformers, which leads to supply disruptions and deterioration of electrical energy quality indicators; low throughput of a significant part of existing power lines and transformers limits the ability to supply electric energy to consumers in the required volumes; the low level of automation and digitalization of electric power facilities negatively affects the ability to prevent and quickly eliminate technological violations.

As a result of physical and moral deterioration of most of the equipment and high energy intensity, production costs in the industry are still high. In principle, the fact that currently the energy intensity of the country's gross domestic product is twice the global average confirms the thesis of high costs for electricity production. This situation has a negative impact on the financial condition of enterprises. As a result, most state-owned enterprises are currently placing a heavy burden on the state due to financial instability **[7].** The fact is that the high cost of

production is a factor that reduces the amount of profit received, and this, in turn, leads to a decrease in the retained earnings of the company. As you know, retained earnings are reinvested in the production of a joint-stock company, and its decline will reduce the volume of internal investments (savings) of joint-stock companies in the industry.

At the same time, modernization of production, updating of equipment require large investments. In a market economy, investments are the basis for the development of any modern company. In order for potential investors to agree to invest their investments, firstly, Uzbekenergo JSC must be able to show that it is stable, reliable, profitable and competitive, and secondly, to show potential investors real profits and future prospects after investing in the company.

One of the most pressing problems is to ensure its long-term dominance in the market through the introduction of innovations in the management of existing joint-stock companies "Thermal Power Plants", "National Electric Networks of Uzbekistan" and "Regional Electric Networks".

CONCLUSIONS AND SUGGESTIONS

For further development, a transition to strategic management of the industry is necessary. It is important to emphasize that the strategy for the development of the electric power industry should be based on the Strategy for the Development of the Energy Sector of Uzbekistan. This is due to the fact that it is an integral part of the fuel and energy complex of the country. A feature of Uzbekistan's Energy Development Strategy is its intersectoral nature. Coordinated actions in the oil and gas, coal, electric and thermal power, nuclear industries, as well as mechanical engineering, transport, and issues of interstate water and energy exchanges are important for its implementation.

The objectives of the development of the electric power industry should be defined as: improving the quality of life of the population, meeting the growing demand for electric energy at competitive prices, and the dynamic development of the electric power industry of the Republic of Uzbekistan on the basis of rational and maximally efficient use of natural energy resources and the introduction of innovative technologies.

It should be emphasized that the development of the electric power industry in the future is connected with ensuring the transition from resource-based to resource-innovative development. To do this, it is recommended:

- to introduce innovations in management based on new principles radically different from traditional management methods; to ensure that innovations include a wide range of methods and processes and are systematic; to create the necessary conditions for the introduction of innovations, innovations that eventually lead to improvements in order to become part of a continuous process.

- to introduce modern highly efficient innovative technologies and equipment into the network, which will save fuel and energy resources and reduce the impact of energy production on the environment;

- carrying out works on technical re-equipment, reconstruction and modernization of power plants in order to increase their capacity, improve their technical and economic indicators aimed at maintaining the installed capacity in specific economic conditions.

The above measures require the addition of funds for their implementation, therefore it is necessary to interest investors. To ensure the investment attractiveness of companies, it is necessary to analyze in detail all its technical and economic indicators, the level of turnover of existing assets, the real return on capital, the level of financial stability and liquidity of assets. It is also necessary to activate financial revenues by collecting payments for used electricity in a timely and full manner. For this purpose, an automated system for monitoring and accounting of electricity consumption is being implemented.

Increasing the level of energy saving and reducing the cost of electricity generation through the formation of a competitive electricity market remain urgent tasks. To do this, it is necessary to determine the stages of transition to a competitive market system, taking into account foreign experience, study market rules and develop a holistic concept in this direction.

The main purpose of the transformation process is to solve the tasks of modernizing stations, improving energy efficiency, the quality of services provided, and ensuring competitive prices for manufactured products, that is, for electricity and heat. The transformation of enterprises should be carried out using the experience of foreign countries. At the same time, it is important to expand the scale of the introduction of digital technologies.

The main principle of the development of the electric power industry in the present time and in the future is efficiency. If there is no culture of consumption in the whole process of generation, distribution, supply and use of electricity, it will become difficult to achieve the expected results. And in this regard, it is important to intensify work on the introduction of an automated system for accounting and control of electricity consumption in the republic.

Thus, the solution of the tasks presented in the article will improve the management system of companies in the electric power industry, and its flexibility and efficiency will provide companies with a long-term advantage in the market, which, in turn, will contribute to strengthening the economic situation, inflow of foreign investment, renewal of fixed assets in the network, efficient distribution of generated electricity, improving the efficiency of supply to consumers, sustainable supply of electricity to the population and the economy as a whole.

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