

OBSTACLES TO THE DEVELOPMENT OF THE RENEWABLE ENERGY SECTOR IN UZBEKISTAN

Saydazimov Muxriddin Botirjon o'g'li

Toshkent davlat yuridik universiteti magistranti mustaqil tadqiqodchi

Annotation: *This article reflects on the current state of the energy sector of Uzbekistan, the possibility of renewable energy sources, the reforms carried out in the energy sector, as well as the reserves of fossil fuel resources. In addition, proposals have been put forward to address the problems and shortcomings that are impeding the development of renewable energy in Uzbekistan.*

Key words: *hydropower, oil equivalent, biomass, wind power, fossil resources, diversification, Dutch disease, subsidy, Atomic Energy.*

Uzbekistan, rich in natural resources, has one of the largest energy markets in Central Asia, the demand for energy is 14.1 million kWh. 85% of the demand for this energy comes from thermal power plants. For this reason, natural gas is the main means of supplying the country with electricity.

Uzbekistan is one of the countries with renewable energy potential as well as the availability of natural resources. Uzbekistan can produce energy equivalent to 50 billion tons of oil from solar energy. Current technologies are estimated to produce 175 million tons of oil equivalent, three times the amount of fossil fuels the country produces each year. In addition, the studied hydropower potential of Uzbekistan is estimated at 27.5 billion kWh per year. Currently, the country uses only 39 percent of its technical hydropower potential.

The wind and biomass potential of Uzbekistan exceeds 520,000 MW of the installed capacity and makes up 6.3 billion m³ of natural gas, respectively. Despite independence in the field of energy, aging infrastructure leads to shortages of electricity, inefficiency, and high losses. At the same time, the increase in domestic demand for gas and oil exports requires the country to take urgent measures to diversify energy production and effectively use renewable energy potential.

Despite having such a high potential for renewable energy, Uzbekistan lags behind other countries in the region in diversifying energy production. Compared to other types of renewable energy sources, only hydropower can be considered significant, and it accounts for almost 12% of the total energy production in Uzbekistan. However, this type of renewable energy sources accounts for only 39% of the total estimated potential. At the same time, other types of renewable energy sources do not make up even 1% of the total production.

The factors hindering the development of the renewable energy sector in Uzbekistan were analyzed, taking into account the possible solutions to overcome these obstacles and the future directions of the renewable energy market, the latest actions and plans of Uzbekistan.

The reasons for the delay in the development of the renewable energy sector in Uzbekistan:

The abundance of fossil fuels can be one of the main reasons that prevent the development of the renewable energy sector in Uzbekistan. The proven reserves of Uzbekistan are estimated to be 1.8 trillion cubic meters of gas, 0.6 billion barrels of oil and 1.9 billion tons of coal. Most of the country's gas and oil reserves are located in the southwestern part of the country. At current production rates, proven reserves are estimated to last 31, 22, and 95 years, respectively. According to estimates, the total amount of undiscovered resources significantly exceeds the available resources.

According to the analysis of the obtained data, some signs of the "Dutch disease" are found in the energy sector. Due to the high prices of natural gas in the world market, Uzbekistan has continuously increased natural gas production instead of developing renewable energy sources and diversifying energy production. However, most of the revenue from natural gas exports has been used to exploit natural gas resources and further increase natural gas production. At the same time, the state paid little attention to research and development in the field of renewable energy sources in order to develop this sector.

Low price of electricity - Uzbekistan is one of the countries that offers its customers the lowest price of electricity compared to other countries of the CIS. Due to the low cost of natural gas in the country compared to international prices, the electricity tariff is extremely low (\$66 per 1000M³, which is much lower than its export price). The real cost of producing one kilowatt-hour of electricity is much higher than its cost due to transmission and distribution losses, which account for almost 20 percent of total production. To ensure control over prices and limit their growth, the government subsidizes its vertically integrated company Uzbekenergo. Therefore, any other energy source cannot compete with the low prices of government subsidized electricity. From the perspective of the private sector, promising investments in alternative energy sources (KTEM) are very poorly developed.

Lack of development of a legislative mechanism for independent electricity producers - the state enterprise Uzbekenergo controls the production, transmission and distribution of energy in Uzbekistan. Local and foreign investors prefer not to invest in the energy market due to the existence of a state monopoly, healthy competition and lack of investment attractiveness in the energy market of Uzbekistan. Every investor basically defends specific rules and wants their rights

to be protected by law. Unfortunately, the country does not have a clear legal regime that protects the rights of investors and the requirements and conditions for connecting to the grid and selling the energy produced by independent energy companies. Local utilities can enter into individual contracts for the supply of electricity, but this makes it difficult for project developers to plan and finance projects according to known and consistent rules.

Lack of financing opportunities and qualified professionals - consumers or project developers cannot use renewable energy sources due to low access to credit for purchase and investment and lack of capital markets. In rural areas of Uzbekistan, there are no microcredits for renewable energy sources at the household level. Project developers are having trouble securing bank financing because of uncertainty over whether utilities will buy the power. Qualified personnel for maintenance, installation, operation and repair of equipment using renewable energy sources are not sufficiently formed in Uzbekistan. Consumers, managers, engineers, architects, lending institutions or planning authorities lack information about renewable energy technologies, geographic resources, operational experience, maintenance requirements, financing sources and benefits of installation services. Lack of skills and information can increase uncertainty and hinder decision-making.

Uzbekistan's efforts to improve the situation

Recognizing the existing obstacles to the development of the renewable energy sector in the energy market and the need to diversify energy production, Uzbekistan is implementing measures to promote the wider use of renewable energy sources.

In particular, in May 2018, Uzbekistan held negotiations with the Russian company "Rosatom" on the design, construction and operation of two units of the 2.4 Gigawatt VVER_1200 nuclear power plant in Jizzakh region. The construction is planned to be completed in 2029 and it is reported that it may cost 10 billion dollars. After the launch of this project, the nuclear power plant is expected to produce 15% of the total electricity. On June 19, 2018, Uzbekistan established the Atomic Energy Development Agency under the Cabinet of Ministers.

In addition, on February 1, 2019, the President of Uzbekistan signed a decision on the establishment of a new Ministry of Energy. These innovations are aimed at reforming the country's oil, gas and energy sectors. One of the decisive steps was to liberalize the energy market. The newly established ministry will develop and implement a unified state policy in the oil, gas and energy sectors in order to ensure energy security in the country. In addition, it is the state for the production, transmission, distribution, consumption of electricity, heat and coal, as well as the extraction, processing, transportation, distribution, sale and use of processed products of oil and gas. implements the standards.

In order to continue the latest reforms in the energy sector, the President has prepared the conditions for the privatization of the energy market in accordance with the decree of March 27, 2019 "On the Strategy for the Further Development and Reform of the Electric Power Industry of the Republic". It can be assumed that companies that generate and distribute electricity can be privatized, retaining control over the transmission of electricity.

CONCLUSION

In short, all the energy needs of Uzbekistan, which has a huge potential in the field of renewable energy sources, can be met only through renewable energy sources. However, Uzbekistan is still not using its potential because it is highly dependent on fossil fuels as a source of energy. This article provides an overview of the main obstacles that have caused Uzbekistan to lag behind its competitors in the development of the renewable energy sector. Below are some recent improvements and future development plans and prospects.

Uzbekistan is already realizing the need to take urgent measures to eliminate the above-mentioned obstacles that prevent the development of the renewable energy sector. We can say that the first steps have already been taken, as a market regulator (Ministry of Energy) has been created and the energy sector has been reorganized for the generation, transmission and distribution of electricity. The decrees and decisions of the president on future plans for the development of the renewable energy sector of Uzbekistan are a good recommendation for future investors and can stabilize the market and determine the right direction. The following recommendations can be made for the further development of the renewable energy sector and the elimination of obstacles:

- First, the regulator should create a legislative mechanism that defines all market rules and protects the rights of independent electricity producers. This, in turn, eliminates all volatility in the market.
- Instead of building large infrastructure facilities at the expense of the state budget, public-private partnerships can be used to attract foreign investors;
- In order to reduce the initial cost of technologies, the government should pay more attention to the production of technologies in the country, because Uzbekistan has all the necessary components of renewable energy technologies;
- In order to make the project more attractive, the regulator should create incentive programs both for the population (preferential tariffs, clean metering, rebates) and for large electricity producers (tax breaks, credits for the production of renewable energy sources).
- Technical assistance, trainings and master classes with the participation of highly qualified specialists can be organized in cooperation with international organizations (International Energy Agency, World Bank, Asian Development Bank) to improve the qualifications of specialists.

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