# OPPORTUNITIES FOR THE FORMATION OF THE ELECTRICITY MARKET IN UZBEKISTAN

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**Annotation.** In this article, the opportunities for the formation of the electricity market in Uzbekistan have been studied and analyzed. The cases of electricity generation capacity, electricity generation capacity, population and geographic location in the Central Asian countries were analyzed. Existing problems in the formation of the electricity market in the region have been investigated, proposals and recommendations for the development of the industry have been developed.

**Keywords:** electrical power engineering, competitive environment, transmission, market principles, management mechanism, thermal power plants, thermal power centers, regional energy market, management methods

**I. Introduction.** Uzbekistan is a state with an independent energy system. In the economic development of any state, the system of electricity plays an important role.

Companies operating in the field of power engineering of developed countries, in order to have their consumers in the electricity market, are constantly improving their traditional management principles. In particular, long-term strategies for the development of the industry are being developed, incentive schemes for the implementation of pre-payment for electricity are being introduced, programs based on effective innovative ideas for improving the system of access to capital investments and customer service are being developed in the field.

The formation of a competitive electricity market in the Republic of Uzbekistan, of course, creates an opportunity to effectively meet the demand for electricity in this region, that is, the countries located in the Central Asian region. In other words, there are specific advantages of the formation of the electricity market in the territory of Uzbekistan.

Of course, we all understand well that the low cost of basic energy resources in our country does not justify itself in the conditions of a market economy. For example, the cost of 1 megawatt hour of electricity for residents and industrial enterprises in Uzbekistan is 25 US dollars. In Germany, this price is 332 dollars for the population, for enterprises – 144 dollars. In Russia, respectively, it costs 47 and 51 dollars, in India 68 and 87 dollars. In addition, the cost of 1000 cubic meters of natural gas is 32,9 dollars in Uzbekistan, 1552 dollars in Sweden, more than Portug 1132 dollars in Portugal ,aliyada 1045 dollars in it, 785 dollars in Germany and more than 770 dollars in England. This number is more than 83 dollars in Russia, more than 45 dollars Inistondaistan. It turns out that energy and natural gas resources in our country are several times cheaper than in developed countries. But as a result of lack of rational use of resources, it is difficult to achieve a decrease in the cost, an increase in the volume of products [1].

The introduction of a new energy policy in the field of electricity production in Uzbekistan, the formation of a competitive environment in the production of electricity, the creation of an electricity market based on modern market principles in the region, the analysis of potential and opportunities, is one of the main topical topics of today.

**II. Analysis of literature on the topic.** Problems and shortcomings in the field of electricity, the production and transmission of electricity, effective organization of management methods in the field, risk management in the field, ways to organize and use the electricity markets more effectively, the relationship between the processes of economic analysis of the industry, the following scientists studied and conducted the research.

The physics of electricity makes the characteristics of the product electricity different from those of other products [2]. The electric grid has no substantial storage capacity, so there has to be an instantaneous balance between generated electric power and stochastic demand. This balancing is difficult because a modern grid has thousands of power plants and millions of consumers and has to be rebalanced every few seconds [2]. The lack of storage capacity makes electricity delivery a just-in-time process at its extreme [3].

The production of electrical energy has to equal the demand, including transportation losses and auto consumption, at any time. In a liberalized market, grid users try to balance their portfolios and the grid operator balances the system real time [4],[5]. Both face a difficult balancing task because of three problems.

The reliability of electricity supply and its guaranteed maintenance at the required high level is one of the most important prerequisites for the effective functioning of the country's economy and the well-being of its citizens, maintaining the energy and overall economic security of the country [6].

**III. Research methodology.** In the course of the study, scientific research, comparative analysis and synthesis, risk determination methods and other methods were widely used.

**IV. Analysis and results.** Through a comprehensive analysis of the object under study, its internal and external factors are studied. As an object of the research topic, based research was carried out to determine the internal and external capabilities of power grid organizations.

The statistical data, forecasts, strategies and results related to the electricity sector of Uzbekistan, the strategy for the development of renewable energy sources, the published economic data and rules, as well as the data obtained from renewable energy producers and potential users, as well as the latest information in the field of wind and solar energy, aimed at studying the cases of electricity production, were.

In the countries that are members of the Commonwealth of independent states, the installed capacity for the production of electricity is indicated in Table 1.

**1-table. Dynamics of total installed capacity of electric power stations in the Commonwealth of Independent States Member States, MWt**

| **Name of countries** | **2000** | **2005** | **2010** | **2015** | **2017** | **2020** |
|---|---|---|---|---|---|---|
| Azerbaijan | 5046 | 5721 | 6449 | 7200 | 7172 | 6706 |
| Armenia | 3190 | 3207 | 3522 | 3524 | 3314 | 3314 |
| Belarus | 7838 | 8024 | 8427 | 9741 | 10143 | 10098 |
| Kazakhstan | 18361 | 18572 | 19440 | 21307 | 21673 | 22936 |
| Kyrgyzstan | 3781 | 3742 | 3746 | 3635 | 3930 | 3932 |
| Moldova | 2996 | 2988 | 2994 | 2994 | 2994 | 3057 |
| Russia | 204600 | 210500 | 220290 | 243188 | 246864 | 252031 |
| Tajikistan | 4424 | 4355 | 5024 | 5346 | 5713 | 6406 |
| Turkmenistan | 2652 | 2931 | 4104 | 5179 | 5450 | 6408 |
| Uzbekistan | 11583 | 12359 | 12474 | 15946 | 14140 | 15044 |
| **Total** | **264471** | **272399** | **286470** | **318060** | **321399** | **330035** |

**Source:** https://unece.org/sites/default/files/2021-01/

If we pay attention to the data of Table 1, the largest installed capacity for the production of electricity in the countries of the Commonwealth of independent states in 2000-2020 years corresponds to the Russian state. In particular, in 2020, electricity production capacity of 252031 MW was installed in Russia in the first place, in second place in Uzbekistan in 10098 MW, in third place in Uzbekistan in the amount of 15044 MW. Uzbekistan is in second place among the countries of Central Asia. The minimum installed power for the production of electricity is 3057 MW in the Moldovan state.

The state of production of electric energy in the member states of the Commonwealth of Independent States is indicated in Table 2.

**2-table. The volume of electricity production in the member states of the Commonwealth of Independent states, (billion. kW. clock)**

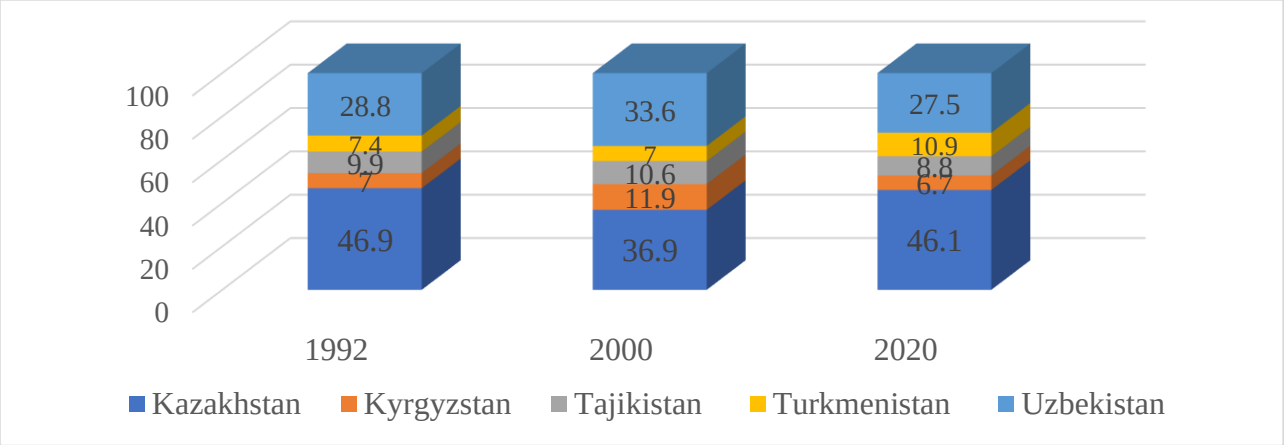
| Name of countries | 2000 | 2005 | 2010 | 2015 | 2017 | 2020 |
|---|---|---|---|---|---|---|
| Azerbaijan | 18,6 | 22,3 | 18,4 | 22,5 | 22,3 | 23,8 |
| Armenia | 6 | 6,3 | 6,4 | 7,8 | 7,8 | 7,6 |
| Belarus | 26 | 30,9 | 34,8 | 34,1 | 34,3 | 40,3 |
| Kazakhstan | 51,6 | 67,6 | 82,3 | 90,7 | 102,4 | 106 |
| Kyrgyzstan | 14,9 | 14,9 | 12,1 | 12,8 | 15,3 | 15 |
| Moldova | 3,23 | 4,2 | 6,01 | 5,8 | 4,7 | 5,6 |
| Russia | 877,8 | 935,6 | 1025,4 | 1049,9 | 1073,7 | 1096,5 |
| Tajikistan | 14,2 | 17,1 | 16,2 | 17 | 17,9 | 20,5 |
| Turkmenistan | 9,9 | 12,3 | 16,1 | 22,4 | 26 | 22,9 |
| Uzbekistan | 46,9 | 47,6 | 51,9 | 58,9 | 60,7 | 66,5 |
| **Total** | **1069,1** | **1158,9** | **1269,6** | **1321,9** | **1365,2** | **1404,8** |

**Source:** https://unece.org/sites/default/files/2021-01/

In Table 2, the indicators of electricity production of CIS member states in 2000-2020 are presented. The highest figure is 1096.5 billion in the Russian state in 2020. kW.the clock produced electricity. According to the CIS member states, 77.6 percent of the total produced electricity corresponds to the Russian state. In second place in the Republic of Kazakhstan 106 billion. kW.in third place in the Republic of Uzbekistan 66.5 billion. kW.the clock produced electricity. The minimum in 2020 year in the state of Moldova was 5,6 billion. kW.the clock produced electricity.

In terms of electricity production and installed capacity within the countries of Central Asia, the second place is the Republic of Uzbekistan, while the first place is the Republic of Kazakhstan. If we form the Electricity Market on the territory of Central Asia, then in the Republic of Kazakhstan electricity is produced a lot, but the possibilities of the Republic of Uzbekistan are broader.

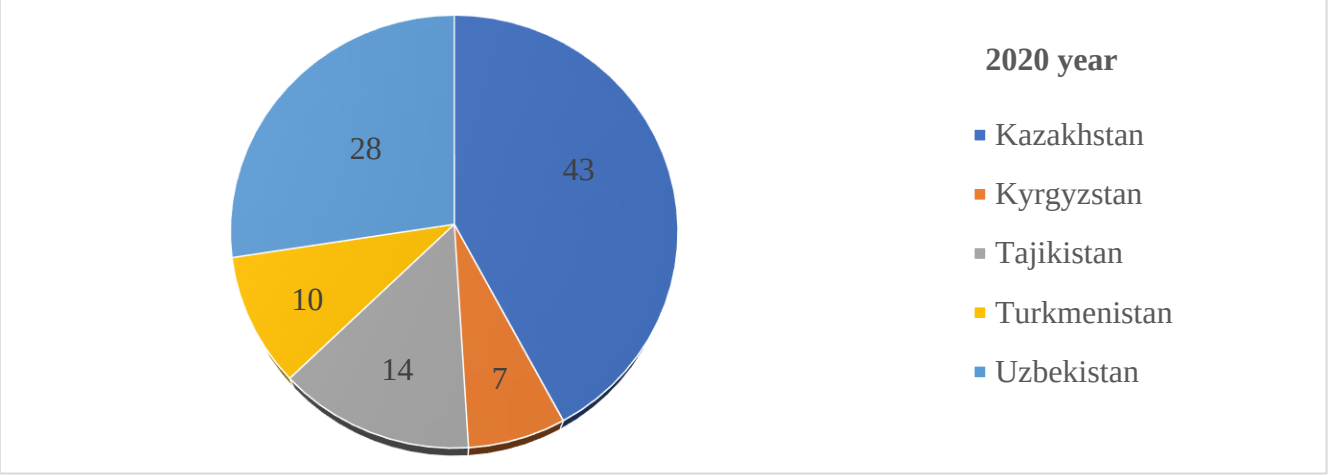
The dynamics of electricity production in the countries of Central Asia, in percentage terms, is presented in Figure 1.




**1- Figure. The state of electricity production in Central Asian countries, in percent [7]**

If we pay attention to the information presented in Figure 1, then in 1992 year, 2000 year and 2020 year, the predominance in the production of electricity in the countries of Central Asia coincides with the Republic of Kazakhstan. In 2020, 46.1 percent of the total electricity produced by Central Asian countries in the Republic of Kazakhstan, 27.5 percent in the Republic of Uzbekistan, 10.9 percent in the Republic of Turkmenistan, 8.8 percent in the Republic of Tajikistan and 6.7 percent in the Kyrgyz Republic was produced.

In 2020, the installed capacity for the production of electricity in the countries of Central Asia is shown in Figure 2.




**2 - Figure. In terms of electricity production in Central Asian countries, the composition of installed capacity in 2020, in percent [7]**

If we pay attention to the information presented in Figure 2, then the installed capacity for the production of electricity in the countries of Central Asia is presented. According to the Central Asian countries, in 2020 year installed capacity accounts for 43 percent in the Republic of Kazakhstan, 28 percent in the Republic of Uzbekistan, 14 percent in the Republic of Tajikistan, 10 percent in the Republic of Turkmenistan and 7 percent in the Kyrgyz Republic.

When there are at least three close to each other in the electricity market in terms of power, when there is an organization that produces electricity, a real competitive environment is formed in the market. If there are two power plants in the market that produce electricity, the chances of fully forming a competitive environment in the market are reduced. Because in the electricity market, there will be a high chance that two power stations will agree with each other about the price. It has the capacity to produce sheep and wind power plants, seasonal electricity, specializing in renewable sources. Sheep and wind power plants can not continuously generate the same amount of electricity throughout the year.

**V. Summary and suggestions.**

We consider it necessary to carry out the following on the formation of the electricity market in the territory of Uzbekistan:

- To reduce the risk associated with excessive dependence on energy supply in Uzbekistan;
- Maximizing the advantages of geographical location as a country where the transit of electricity transmission is carried out in the territory of Uzbekistan;
- production of electricity thermal power plants protection of interests of sheep power plants, wind power plants and hydroelectric power plants in accordance with international standards;
- develop programs to improve the individual financial situation of all electric power plants operating in the field;
- strengthening the country's image of efficient and reliable transit of electricity;
- to develop a regional concept of disclosure of information in the field and implementation of international corporate governance principles;
- in order to formulate a competitive environment in the field, to constantly update the rules of Organization of electricity on the basis of public and private partnership, to develop laws stimulating the interests of private owners.

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