THE CONCEPT OF ENERGY SECURITY AND THE FACTORS AFFECTING IT

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Annotation. This article examines the concept of energy security and the risks that may arise from internal and external threats, in terms of the factors affecting it. Proposals and recommendations have been developed to ensure energy security.
Keywords: electrical power engineering, energy security, thermal power plants competitive environment, market principles, management mechanism, management stages.

I. Introduction.

The problem of energy security is determined by the uneven distribution of natural fossil energy resources on earth and the regional discrepancy between energy consuming and energy producing countries in the socio-economic development of the countries. Within the framework of ensuring energy security, countries are divided into two groups. In the first group – energy exporters, that is, energy producing countries, in the second group - energy importers, that is, energy buying countries. The countries that are included in both groups strive for economic development.

Energy security and energy efficiency are the main strategic objectives of any state energy policy. In order to increase the level of energy security, it is necessary to introduce the following into the main components of the state energy policy: introduction of effective management in the use of resources extracted from the subsoil of the country; constant structural changes in the energy sector; establishment of the energy market on the basis of market principles; rational development-formation of the; development of modern scientific and technical policy in the field of energy; formation of a competitive environment in the regional energy market and a regulatory and legal framework that complies with international standards.

In this regard, a number of works are being carried out in our country, in particular, according to the decision of the president of the Republic of Uzbekistan "on the strategy of further development and reform of the electric power network in the Republic of Uzbekistan"on March 27, 2019 [1], on the basis of "Uzbekenergo" JSC, JSC "Thermal power station", JSC "National Electric Networks of Uzbekistan", JSC "Regional Electric Networks"

The reforms carried out to ensure energy security in our country are aimed at satisfying the needs of the population for energy resources, effectively meeting the demand of all sectors of the economy for energy.

II. Analysis of literature on the topic.

On the concept of "Energy security", scientific research is carried out by several economists scientists. Energy security is currently considered one of the most discussed topics. But there is no generally accepted single definition of "Energy security". Therefore, both the concepts of "Eenergy security" or "Energy security" are often used in practice.

Energy security refers, first of all, to the availability of energy necessary to accelerate economic growth: accordingly, Energy Security – provides the sectors of the economy with energy [2,3]. Later, this definition was studied by several studies over time. Some studies have attempted to isolate safe and dangerous levels by introducing some concepts such as energy prices. Based on this, it was established that "security of energy supply" ensures uninterrupted availability of energy resources at affordable prices [4]. At the same time, there is no special international standard for energy efficiency, which is studied between countries by gross domestic product, inflation rate and per capita [2].

Factors that have a significant impact on the energy security of the regions can be divided into factors that are currently and within the framework of the strategic development of the region - management problems (energy scarcity, equipment deterioration, financial aspects) and long-term and indirect (environmental problems, limited resources, etc.) [5].

Despite the fact that there are many studies, there is no single general definition of the term "Energy security". For the first time this concept was used in the field of national security, in the USA in 1947 as a legislative act regulating Public Policy [6]. However, the concept of "Energy security" appeared after the oil crisis in 1973 year. Bunda was quoted by the International Energy Agency as saying: "Energy security is the assurance that energy will be available in the quantity and quality required in given economic conditions" [7].

The problem of security occupies a central place in the theory and practice of international relations. From the point of view of researchers and public figures, this problem is complex in nature, its meaning and methods of support depend on the historical stage of the development of society [8].

III. Research methodology.

In the course of the study, a wide range of methods were used to study and research the potential of energy production, comparative analysis and synthesis, risk determination methods and other methods in order to ensure electrical safety.

IV. Analysis and results.

The most important task of ensuring energy security is to achieve the energy independence of the state. A state that does not have independent energy can never be independent. To achieve this goal, it is necessary to carry out the following:

- organize a reliable supply of energy needed for the real sector of the economy and the needs of the population;

- ensure the reliable operation of thermal power plants that generate electricity, substations that transmit enegria and organizations that belong to the field of power engineering;

- energy efficiency-reduce harmful environmental impacts by making wide use of modern technologies in the energy sector;

-development of organizational and economic policies to increase state guarantees in order to attract foreign investments to the energy sector.

In order to ensure energy security, the first steps have been taken in our republic. The main ones of which are entrusted to the "Thermal power station" Joint-Stock Company in the field of electricity production, to the "National Electric networks of Uzbekistan" Joint-Stock Company on the supply of electricity through the main electric networks and to the "Regional electric networks" Joint-Stock Company on the supply of electricity by consumers. This, of course, is a structural change, which is carried out with the thought of the present and future prospects. These changes are aimed at ensuring energy security, satisfying the growing needs of the population in the fields of Economy, Energy Resources, the production of electricity and the supply of electricity to consumers, the formation of a competitive environment in the field.

Of course, the country's energy resource potential plays an important role in ensuring energy security. Potential energy resources include: coal, oil, gas, uranium, wind, water, solar and renewable energy sources. The greater the amount of these sources in the country, the higher the level of energy security will serve. The energy resource potential of Central Asian countries is shown in Table 1.

1-table. Energy resource potential of Central Asian countries [9]

Countries / year		Coal* billion tons.	Petroleum* million tons.	Gas* billion. m^3	Ratio** thousand tons	Hydroelectric power *** billion kW.s/y	REC**** billion. kW.s/y
Kazakhstan	2000	34,1	2760	1841	601	27	66
	2020	34,1	2760	1841	601	27	66
Kyrgyzstan	2000	1,34	11,5	6,54	-	52	-
	2020	1,27	1,2	6,2	-	99	-

Tajikistan	2000	0,67	5,4	9,2	-	317	18,4
	2020	1,0	10	10	-	317	18,4
Turkmenistan	2000	-	75	2860	-	2	-
	2020	-	75	2860	-	2	-
Uzbekistan	2000	2	350	2000	83,7	15	-
	2020	2	350	2000	83,7	15	-
Central Asia	2000	38,11	3261,9	6716,7	684,7	413	84,4
	2020	38,37	3205,2	6716,2	684,7	460	84,4

** given the volume of renewable reserves approved for coal, oil and natural gas;*
*** World Energy Council (WEC) rated proven uranium reserves with production costs up to 30 doll/kg;*
**** Hydropotential-cost-effective. Uzbekistan-technical hydropotential;*
***** REC-renewable energy sources.*

Analyzing the data presented in Table 1, the largest number of coal reserves Inistondaistan is 34,1 billion. it makes up tons. The largest number of oil reserves in Uzbekistan is also -2760 million. in second place, Uzbekistan -350 million tons. it makes up tons. In the first place in terms of gas reserves, Turkmenistan has raised -2860 billion. m^3, second place Uzbekistan -2000 billion. m^3, third place Kazakhstan -1841 billion. makes up m^3. In the first place in terms of uranium reserves, Kazakhstan -601 thousand tons, in the second-Uzbekistan -83,7 thousand tons, in the remaining republics there is no uranium reserves. The Republic of Tajikistan in the first place in terms of electricity from water, that is, in terms of hydroelectric power plants - 317 billion. the second place in the kwh is the Kyrgyz Republic in 2020 -99 billion. kW. made up the clock. In terms of renewable energy sources, the first place in the Republic of Kazakhstan is 66 billion kWh per year. the clock produces electricity. In second place in the Republic of Tajikistan 18.4 billion kW. the clock produces electricity.

The production of electricity in Uzbekistan mainly accounts for the contribution of thermal power plants and thermal power centers, which are part of the Joint-Stock Company "Thermal power station". According to the Republic in 2020, 66.5 billion.kW.when electricity is produced per hour, 81,8 percent of that is 54,42 billion.kW.the watch coincided with the contribution of thermal power units, which are part of the Joint Stock Company "Thermal power units". The Joint Stock Company "Thermal power station" includes 6 thermal power stations and 3 thermal power centers (Table 2).

2-table. The number of workers operating in the capacities and capacities of JSC "Thermal power station" installed in 2021

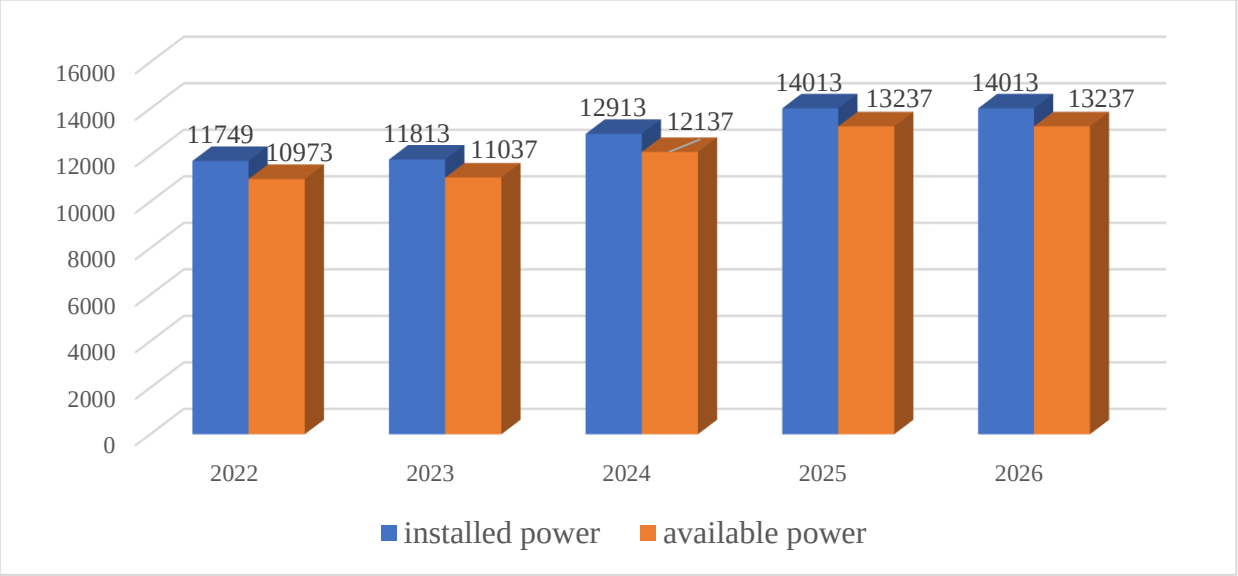
№	Name of stations	Installed power, MVt	Number of workers, Man
1	Sirdarya (TPS)	3165	1619
2	Tashkent (TPS)	1860	1860
3	Navoi (TPS)	2068	1565
4	Talimarjan (TPS)	1700	1700
5	Taxiatosh (TPS)	1190	860
6	Turaqurgan (TPS)	900	320

7	Fergana (TPC)	329	800
8	Mubarak (TPC)	60	476
9	Tashkent (TPC)	57,15	398
	Total	**11329,5**	**9598**

Source: compiled on the basis of data from JSC "Thermal power station".

Table 2 shows the number of workers operating in the thermal power plants and centers of JSC "Thermal power station" installed in 2021. In 2021 year, 11329,5 MW of electricity was produced by the stations, while a total of 9598 people were operating in the stations. The highest power in terms of stations and centers, which are part of the JSC "Thermal power station", is installed Syrdarya TPS and is 3165 MW. Most workers-employees of Tashkent TPS, that is, 1860 people.

Production forecast figures for the years 2022-2026 by thermal power plants and centers under JSC "Thermal power station" are shown in Figure 1.



1- Figure. Production forecast indicators by stations and centers under JSC "Thermal power station", MVt

Source: compiled on the basis of data from JSC "Thermal power station".

In Figure 1, the forecast indicators of production by stations and centers under the Joint-Stock Company "Thermal power station" are mentioned. In terms of electricity production, it is projected to establish 11749 MW of installed power, 10973 MW of available power, 12913 MW of installed power in 2024, 12137 MW of available power, 14013 MW of installed power, 13237 MW of available power, while in 2026. If we take into account that in 2021 year the installed capacity at the stations and centers under the Joint-Stock Company "Thermal power station" amounted to 11329,5 MW, we can expect an increase of 2683,5 MW by 2026 year.

There is no normative-legal framework on the formation of the conditions for the provision of uniform energy security in the countries of the world. The nomenclature of indicators that make up the conditions of energy security, summarizes: energy production capacities, energy resource reserves; constant depreciation of the main production assets in the field; the amount of investment involved in the creation of new capacities in the field; the ratio of gross domestic product growth and energy consumption of the economy; the marginal share of tax burden on.

V. Summary and suggestions.

The main purpose of the state economic policy for the energy sector is determined by the ability of the producers of electricity, the supply of energy resources to consumers in accordance with their own needs. As a guarantee of the country's energy security, it is the creation of economic, organizational and legal conditions that ensure the reliable operation of the energy supply system. To do this, it is necessary to ensure the implementation of the following priority areas of energy policy in the country:

-implementation of energy efficiency and energy saving policies in all sectors of the country's economy;

-increase the financial stability of the energy sector;

- increase the volume of investments in the field of electricity;

- through the modernization of the electric power industry and the use of new technologies, to reduce the impact of energy on the environment;

- to create an energy security monitoring system;

- implementation of support for the prevention and elimination of crisis situations in the energy sector of the country.

List of used literature

[1] Resolution of the President of the Republic of Uzbekistan dated March 27, 2019 No PP-4249 "On the strategy for further development and reform of the electricity sector in the Republic of Uzbekistan" https://lex.uz/docs/4257083

[2] Kruyt, B., van Vuuren, D.P., de Vries, H.J.M., Groenenberg, H. (2009), Indicators for energy security. Energy Policy, 73(6), 2166-2181.

[3] Franki, V., Višković, A. (2015), Energy security, policy and technology in South East Europe: Presenting and applying an energy security index to Croatia. Energy, 90(1), 494-507.

[4] Yergin, D. (2006), Ensuring energy security. Foreign Affair, 85(2), 69-82.

[5] Kondrakov O.V. Classification of threats to the energy security of the region // Socio-economic phenomena and processes. 2012. No. 10.

[6]. Gafurov A.R. The essence of the category "energy security" and its place in the overall structure of security. Access mode:
http://vestnik.mstu.edu.ru/v13_1_n38/ articles/31_gafur.pdf.

[7]. Voropay N. I., Senderov S. M. Energy security: essence, main problems, methods and results of research. M.: INP RAN, 2011.

[8] Zavalnev V.N. Security in the political worldview of thinkers of the past: an analytical retrospective // Vestn. Moscow state region university Ser. "History and Political Science". 2016. No. 1. S. 176–189.

[9] Karimov I.O. Attracting investment projects to the construction industry and improving their efficiency. SAARJ Journal on Banking & Insurance Research 10 (1), 47-53, 2021, South Asian Academic Research Journals.