

STATUS AND DIRECTIONS OF IMPROVING ENERGY BALANCE AND ELECTRIFICATION IN UZBEKISTAN.

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Abstract. The article analyzes the situation and main directions aimed at improving the energy balance and electrification system of Uzbekistan. The strategic importance of the energy sector in the country's economy, the need for efficient management of energy resources and the use of renewable energy sources are considered. Also, the current state of the system of production, transmission and consumption of electricity in Uzbekistan, existing problems and proposals for their elimination are highlighted.

The article pays special attention to the issues of modernization of the energy system, improvement of energy efficiency and provision of environmental safety through the introduction of advanced technologies. It is emphasized that the prospects of using renewable energy sources - sun, wind and biogas, as well as the introduction of energy-saving methods on a large scale, are important in forming the energy balance.

This study aims to create a scientific and practical basis for strategic planning aimed at solving the current problems in the energy sector of Uzbekistan and ensuring sustainable development. The article serves to provide a balance between the supply and consumption of energy resources for the industrial, transport and residential sectors.

Keywords: Energy balance, Electrification, Energy efficiency, Renewable energy sources, Solar energy, Wind energy, Biogas technologies, Energy saving, Environmental security, Modernization, Energy infrastructure, Energy strategy, Sustainable development, Energy use, Electricity generation, Electricity

transmission system , Problems in the field of energy, Energy in Uzbekistan,
Development of human capital

The energy sector of Uzbekistan is one of the important sectors that directly affects the country's economy, social life and environment. Changes and updates are being made to improve the energy balance and electrification system of Uzbekistan. Below is complete information about the energy balance, electrification status and directions for improvement in Uzbekistan.

Energy Balance in Uzbekistan:

Energy balance means the general distribution of energy sources produced and consumed in the country. Uzbekistan's energy balance is based on traditional fuel sources (oil, gas, coal), but the share of renewable energy sources is gradually increasing.

Main Energy Sources:

Natural gas: one of the main energy sources of Uzbekistan. The country has rich reserves of natural gas, most of which is used in thermal power plants (CHP) and industrial enterprises. In the early 2020s, the average use of natural gas in the country was 50-60%. Coal: Coal also occupies an important place in the energy balance of Uzbekistan. But the share of coal is much smaller than that of natural gas. Coal is mainly used in electricity generation and industrial production.

Solar and wind energy: Uzbekistan pays great attention to the development of renewable energy sources. Solar and wind energy is becoming one of the main future sources of energy production in Uzbekistan. In 2023, Uzbekistan began implementing a number of large-scale projects to expand the use of solar energy.

Hydropower: Hydroelectric power plants (HPP) also exist in Uzbekistan, but their production capacity is relatively limited and new hydropower projects are being developed.

Energy Consumption:

Energy consumption in Uzbekistan is relatively lower than that of developed countries. However, population growth and industrial modernization processes lead to an increase in energy consumption. At the same time, strategies for strengthening energy efficiency and energy saving are being developed in the country.

Electrification Improvement:

Electrification is one of the important directions in the development of Uzbekistan, aimed at providing electricity to all regions of the country, especially rural areas. The main goals in improving the electrification system are to increase energy efficiency, make the population's energy supply reliable, and increase the use of renewable energy sources.

Production of electricity:

Uzbekistan's electricity generation sector relies mainly on thermal power plants (TES). However, in recent years, the use of renewable energy sources (solar, wind) has also grown significantly. In the early 2020s, the importance of solar energy increased, but the share of these energy sources is still very small.

New Projects in Electrification:

The government of Uzbekistan is paying great attention to the modernization of the energy sector. Several projects are underway to build new power plants, upgrade and improve efficiency of existing plants, and invest in renewable energy sources:

Solar energy: Uzbekistan is implementing large-scale projects to expand the use of solar energy. For example, a large solar power plant (300 MW) was built in Samarkand region, and similar projects are being implemented in other regions.

Wind energy: New projects have also been launched for the use of wind energy. Agreements have been concluded on the installation of wind turbines in Bukhara and Kashkadarya regions.

Supply and distribution of electricity:

Extensive work is also underway to modernize the electricity supply and distribution systems. It is planned to improve the reliability and quality of electricity by improving the energy infrastructure and introducing modern technologies.

Smart grids: It is planned to introduce smart grids to make electricity management and distribution efficient. Through these technologies, it is possible to improve energy supply, monitor consumers and use energy resources more efficiently.

Energy Storage Systems: A system of electrical energy storage systems (such as batteries) is expected to be introduced, which will help address the challenges associated with the variable nature of renewable energy sources.

Improving Energy Balance:

There are several main directions in improving the energy balance in Uzbekistan:

Increase Energy Efficiency:

Great attention is being paid to energy efficiency improvement in the country. New initiatives are being implemented to introduce energy-efficient technologies and reduce energy consumption. For example, there are projects aimed at reducing energy consumption in industrial production and improving energy efficiency in housing.

Reducing Dependence on Coal and Gas:

Development of renewable energy sources (solar, wind) is a priority in Uzbekistan to reduce dependence on coal and gas. It is also planned to increase the efficiency of gas use and expand its export.

Environmental Protection:

In order to combat climate change and protect the environment, Uzbekistan continues to expand renewable energy sources. It aims to reduce the carbon footprint and ensure environmental safety.

Summary:

The measures implemented in Uzbekistan to improve the energy balance and electrification are aimed at ensuring the country's energy security, increasing the use of renewable energy sources, and improving energy efficiency. The energy sector of the country will further develop through the modernization of electrification and energy production systems, as well as the introduction of new technologies. Also, issues of combating global climate change and environmental protection are one of the main factors shaping the future of Uzbek energy.

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