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THE ROLE OF GREEN INVESTMENTS AND RENEWABLE ENERGY PROJECTS IN THE ECONOMY OF UZBEKISTAN

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Abstract. This article analyzes the role of green investments and renewable energy projects in the economy of Uzbekistan from legal, economic, and statistical perspectives. The study is based on the Constitution, laws related to energy and investment activities, presidential resolutions, official data from the Ministry of Energy, official information from the President of the Republic of Uzbekistan, as well as data from the World Bank, IRENA, and the International Energy Agency. The results show that renewable energy projects strengthen Uzbekistan's long-term competitiveness by increasing electricity production, saving natural gas, reducing harmful emissions, attracting foreign investment, and expanding local industrial cooperation.

Keywords: green investments, renewable energy, solar energy, wind energy, green economy, energy security, natural gas, economy of Uzbekistan.

Introduction

The economy of Uzbekistan has entered a new stage in which energy security, industrial modernization, environmental sustainability, and investment activity are closely interconnected. Population growth, industrial production, urbanization, digital services, and the expansion of technological infrastructure are increasing demand for electricity. Under such conditions, increasing electricity production solely through traditional hydrocarbon sources is not sufficient for long-term economic sustainability. Excessive use of natural gas in electricity generation leads to the rapid depletion of gas resources, a reduction in opportunities for exports and high value-added industrial sectors, and an increase in environmental pressure.

For this reason, investments directed toward solar energy, wind energy, hydropower, energy storage systems, and energy efficiency projects are of strategic importance for the economy of Uzbekistan. Green investments not only increase electricity production but also contribute to saving natural gas, reducing harmful emissions, attracting foreign capital, creating new orders for local industry, and accelerating regional development. From this perspective, renewable energy projects should be viewed not merely as environmental initiatives, but as an important factor that changes the quality of economic growth.

Methodology

This article uses the methods of legal analysis, statistical analysis, comparison, and economic interpretation. The legal analysis is based on the Constitution of the Republic of Uzbekistan, the Law "On the Use of Renewable Energy Sources," the Law "On Electric Power Industry," the Law "On Investments and Investment Activity," the "Uzbekistan — 2030" Strategy, and presidential resolutions related to the green economy.

The statistical analysis uses official data for 2024–2025 on electricity production, the volume of green energy, natural gas savings, reductions in harmful emissions, foreign investments, and newly commissioned energy capacities. In calculating the share of renewable energy, the volume of renewable energy was divided by the total volume of electricity production and multiplied by 100.

Results

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The development of green investments in Uzbekistan has a solid legal foundation. The Constitution establishes the rational use of natural resources, environmental safety, and the protection of citizens' right to a favorable environment as important directions of state policy. Law No. ZRU-539 of May 21, 2019, is the main legal document regulating relations in the field of renewable energy. It defines issues such as support for producers, connection to electric grids, and tariff formation.

Presidential Resolution No. PP-4477 defines the strategy for transition to a green economy, while Resolution No. PP-436 establishes mechanisms for ensuring green and inclusive growth. The "Uzbekistan — 2030" Strategy sets the goal of increasing renewable energy capacity to 25,000 MW and raising its share in total consumption to 40 percent.

Table 1. Main legal foundations of green investments and renewable energy

Legal document	Main content	Economic significance
Constitution of the Republic of Uzbekistan	Establishes the principles of environmental safety and rational use of natural resources	Creates the constitutional foundation for the green economy
Law No. ZRU-539, May 21, 2019	Regulates relations concerning the use of renewable energy sources	Creates a legal basis for the solar, wind, and other renewable energy markets
Law No. ZRU-939, August 7, 2024	Regulates the electricity market	Supports the integration of green energy into the unified electricity system
Law No. ZRU-598, December 25, 2019	Defines guarantees for investment activity	Supports the attraction of private and foreign capital
PP-4477, PP-436, PF-158, PP-57	Define the green economy, the Uzbekistan — 2030 Strategy, and the Solar Household program	Transform green energy into a strategic economic direction

Statistical indicators confirm the growing role of renewable energy in the economy. In 2024, electricity production in Uzbekistan amounted to 81.5 billion kWh, while in 2025 this figure reached 86.7 billion kWh. The difference was 5.2 billion kWh, and the growth rate was calculated as follows: $5.2 \div 81.5 \times 100 = 6.4$ percent.

In 2025, 16.8 billion kWh of green energy was produced through solar, wind, and hydroelectric power plants. This accounted for 19.4 percent of total electricity production: $16.8 \div 86.7 \times 100 = 19.4$ percent. Electricity produced only by solar and wind power plants amounted to 10.5 billion kWh, which equaled 12.1 percent of total electricity production.

Table 2. Main statistical indicators of green energy in Uzbekistan

Indicator	Figure	Analytical explanation
Electricity production, 2024	81.5 billion kWh	Shows the existing production base
Electricity production, 2025	86.7 billion kWh	Indicates an increase in electricity demand
Growth in 2024–2025	5.2 billion kWh; 6.4%	Shows the need for new capacities
Green energy production, 2025	16.8 billion kWh	Renewable sources have gained a significant share
Share of green energy	19.4%	Calculated on the basis of $16.8 \div 86.7 \times 100$
Solar and wind generation	10.5 billion kWh	The fastest-growing segment

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Indicator	Figure	Analytical explanation
Share of solar and wind energy	12.1%	Calculated on the basis of 10.5 ÷ 86.7 × 100
Natural gas saved	3.2 billion cubic meters	Creates an opportunity to allocate gas to higher-value uses
Harmful emissions prevented	4.7 million tons	Reduces environmental costs
Foreign investments and new capacities	USD 35 billion; 9,000 MW	Energy has become a strategic investment sector
Contribution of local producers	USD 700 million	Expands industrial cooperation

Major investment projects are also strengthening the economic significance of green energy. In recent years, USD 35 billion of foreign investment has been attracted to the energy sector, and 9,000 MW of new capacity has been commissioned. In addition, 42 new generation, energy storage, and infrastructure facilities worth USD 11 billion are being commissioned or their construction is being launched.

These include 16 large projects with a total value of USD 3.3 billion and a total capacity of 3,500 MW, implemented in the Republic of Karakalpakstan, Bukhara, Kashkadarya, and Tashkent regions. Once these facilities reach full capacity, they are expected to generate 15 billion kWh of electricity annually, save nearly 7 billion cubic meters of natural gas, and reduce harmful emissions by 11 million tons.

Discussion

The most important economic impact of green investments is reflected in natural gas savings. Since Uzbekistan's energy system has long relied on natural gas, producing part of the country's electricity through solar, wind, and hydroelectric power plants reduces gas consumption. In 2025, 3.2 billion cubic meters of natural gas were saved due to green energy. Instead of being burned in power plants, this gas can be directed to the chemical industry, industrial production, exports, or the direct needs of the population. Therefore, renewable energy is not only a means of electricity production, but also an instrument for the rational use of natural resources.

Green investments also play an important role in attracting foreign capital. Energy projects require large capital, modern technology, long-term contracts, and grid infrastructure. Therefore, the participation of international investors, the private sector, and international financial institutions is of decisive importance in this field. Investments directed toward large solar and wind power plants, energy storage systems, and power transmission networks reduce the burden on the state budget and accelerate technological modernization.

From the perspective of local industry, renewable energy projects also create important opportunities. During the construction of power plants and networks, demand increases for metal structures, cable products, transformers, construction materials, installation works, design, and engineering services. In 2025, local producers supplied USD 700 million worth of products and services for energy facilities, which shows that this direction has a real economic effect.

In terms of regional development, renewable energy projects contribute to the development of new infrastructure, jobs, service activities, and the construction market. The implementation of large projects in regions with high solar and wind potential, such as Navoi, Bukhara, Kashkadarya, Karakalpakstan, and other areas, strengthens regional economic activity. The construction of transmission networks and substations also increases the industrial potential of the regions.

Energy storage systems and the Solar Household program are important directions for increasing the efficiency of renewable energy. Since solar and wind energy depend on natural conditions, battery systems store excess electricity and return it to the grid during peak load periods. The commissioning of 10 energy storage systems with a capacity of 1,245 MW strengthens grid stability. The installation of small-capacity solar panels in households turns citizens from ordinary consumers into producer-consumers and supports the development of distributed energy systems.

Conclusion

The analysis shows that green investments and renewable energy projects play a multifaceted role in the economy of Uzbekistan. They contribute to increasing electricity production, saving natural gas, reducing harmful emissions, attracting foreign investments, expanding local industrial cooperation, and accelerating regional development. The existence of a legal framework creates clarity and guarantees for investors, while statistical indicators confirm that renewable energy sources are beginning to occupy a real share in the national electricity balance.

For Uzbekistan, green energy is not only an environmental choice, but also a strategy for energy security and long-term economic competitiveness. Through the modernization of electricity networks, the broad introduction of energy storage systems, transparent tariff policy, deeper local industrial cooperation, and support for private sector participation, green investments can become one of the key drivers of Uzbekistan's economic growth in the coming years.

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