THE CURRENT STATE OF RURAL ELECTRICITY SUPPLY AT GLOBAL AND LOCAL LEVELS

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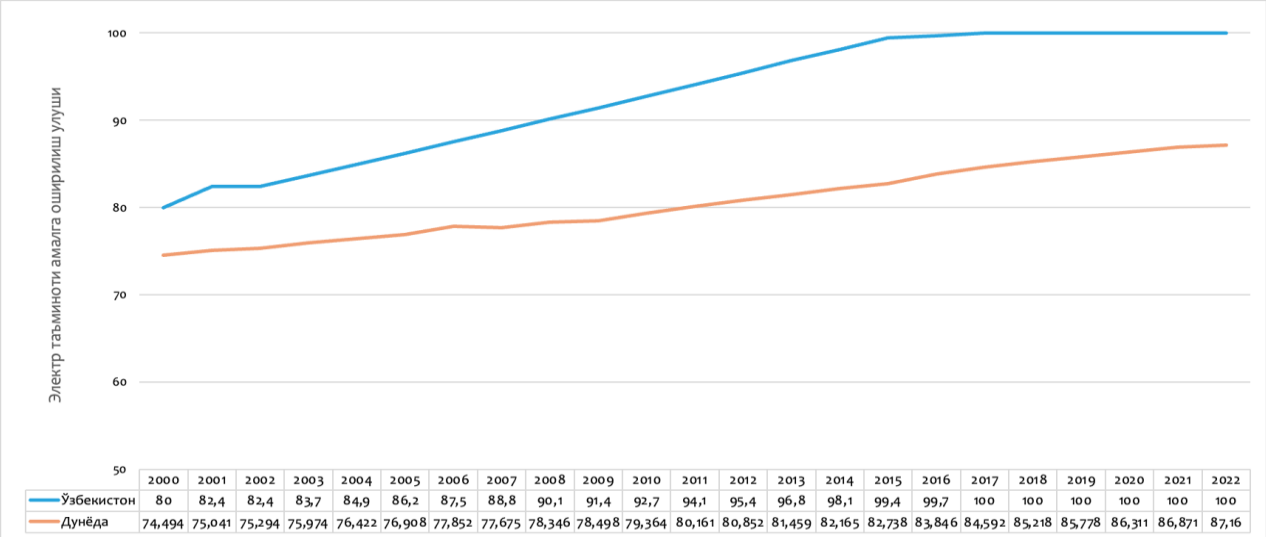
The demand for energy consumption is increasing year by year not only in developed and developing cities but also in rural areas. By 2022, the rural electrification rate worldwide reached 87.6%, whereas this figure in Uzbekistan had already reached 100% by 2016 (Figure 1).



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Ўзбекистон	80	82,4	82,4	83,7	84,9	86,2	87,5	88,8	90,1	91,4	92,7	94,1	95,4	96,8	98,1	99,4	99,7	100	100	100	100	100	100
Дунёда	74,494	75,041	75,294	75,974	76,422	76,908	77,852	77,675	78,346	78,498	79,364	80,161	80,852	81,459	82,165	82,738	83,846	84,592	85,218	85,778	86,311	86,871	87,16

Figure 1: The Share of Electrification in Rural Areas Globally and in Uzbekistan from 2000 to 2022

In terms of electricity production, the figure reached 28,000 TWh in 2020, while the demand for electricity in the same year equaled 29,000 TWh. By 2040, these figures are expected to reach 40,000 TWh and 42,000 TWh, respectively.

In rural areas, the demand for electricity varies due to several factors, such as the level of economic development, population density, availability of electricity, and tariff types. In 2019, the total electricity demand in rural areas worldwide averaged 4,260 TWh, which accounted for approximately 10% of the global electricity demand (Figure 1.2).

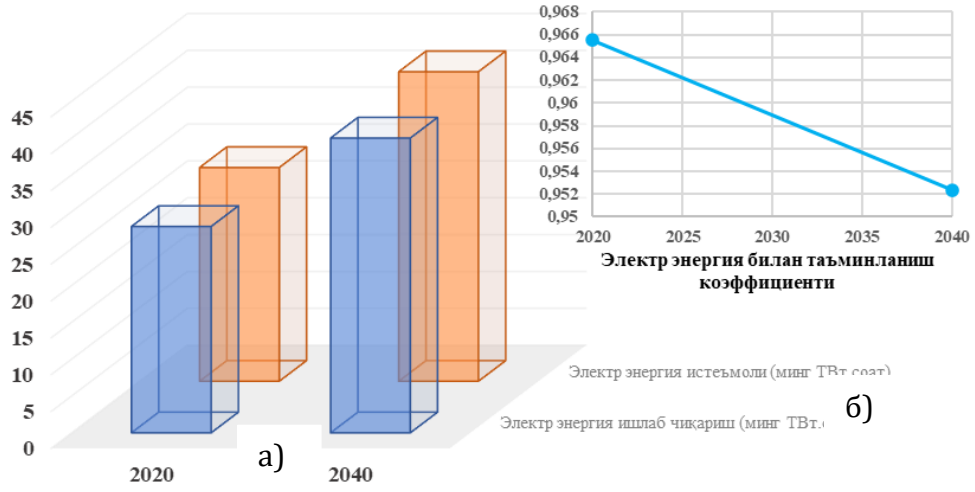


Figure 2. a) Global Electricity Production and Consumption Between 2020 and 2040. b) Electricity Supply Coefficient.

In Uzbekistan, the annual energy production in 2022 amounted to 74 TWh, of which 49% was consumed by industrial enterprises, 27.7% by the population, 12% by agriculture, 7.3% by service sectors, 3% by the energy sector, and 1% by transport. In 2023, the country's total electricity consumption amounted to 57.61 billion kWh. Per capita, this figure averaged 1,616 kWh. Out of this total electricity consumption, 37%, or 21.08 billion kWh, corresponds to rural areas (Figure 3).

It is known that the parameters characterizing the quality of electricity supply in power networks can be divided into two types:

1. Electricity losses;
2. Reliability parameters of the operational condition of the power supply.

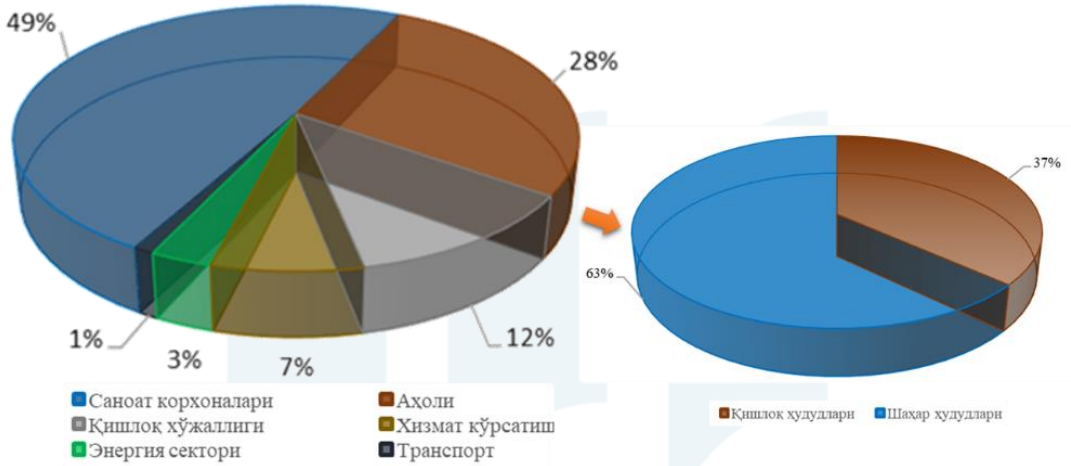


Figure 3. Sectoral Distribution of Electricity Consumption.

The dynamics of electricity production and consumption in Uzbekistan are steadily developing. In 2022, the country produced 74 TWh of electricity, 37% of which was consumed in rural areas. The increasing demand for electricity supply in these regions necessitates improving infrastructure and enhancing energy efficiency.

The main challenges in the power supply system include:

1. Reducing electricity losses in networks;
2. Improving the reliability of electricity supply;
3. Ensuring energy efficiency through the implementation of technological innovations.

In conclusion, improving electricity supply in rural areas not only enhances energy efficiency but also creates a foundation for economic development and improvement of living standards. At the same time, ensuring the stability of electricity networks must be implemented alongside infrastructural and technological solutions.