

**THE ROLE OF INVESTMENTS IN ENHANCEMENT OF ENERGY EFFICIENCY**

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**Abstract**

Investing in energy efficiency will have a positive impact on reducing future energy demand and improving the quality of services. Therefore, conducting scientific research in the direction of ensuring energy saving in the economy and improving energy efficiency is of great practical importance.

**Keywords:** Investment, energy efficiency, renewable energy, energy supply.

**Introduction**

Today, the issue of ensuring energy efficiency has become one of the important tasks that must be solved on a global scale. Improving energy efficiency helps governments achieve their main energy policy goals, while simultaneously ensuring the country's energy security, reducing environmental impacts by adopting new energy production methods, and increasing industrial competitiveness.

**Analysis and Results**

When conducting research on energy efficiency in Uzbekistan, it is necessary to focus on the sources that create energy resources. Unlike other countries, natural gas dominates the energy supply of our country. In recent years, about 85 percent of the country's total energy and electricity supply is provided by natural gas. Gas is the main source of energy supply in all sectors of our country's economy.

According to the evaluations of experts of the International Energy Agency (IEA), "the government of Uzbekistan plans to stop the export of natural gas until 2025 and use it for petrochemical production and domestic energy supply in the future. However, if natural gas is used at current rates, the country could run out of gas reserves in less than 20 years. The country's government predicts that the demand for natural gas will increase by 30% by 2030 and reach 65 billion m<sup>3</sup>" [1].

Based on the evaluation conclusions of IEA experts, it will be necessary to implement targeted, continuous and systematic measures to reduce dependence on natural gas in energy supply and electricity production, increase the possibilities of using renewable energy sources, efficient use of energy and energy saving.



**Table 1 of the Republic of Uzbekistan in 2022**  
(based on 1000 tons of oil equivalent) [2]

Indicators	Coal	Natural gas	Oil, oil, gas condensate	Gasoline, diesel, gasoline, nitrogen, coke	Compressed carbon is hydrogen gas	Neft products other types	Electric energy	Thermal energy	Total
Production	1517.3	42498.8	2921.8	-	-	-	595.0	-	47533.0
Import (+)	991.3	1756.0	451.1	794.5	1365.3	375.3	427.9	-	6161.4
Export (-)	-24.5	-3430.6	-0.1	-208.1	-97.7	-61.0	-232.4	-	-4054.3
Balance change (+,-)	67.7	-855.0	5.1	166.6	4.5	-	-	-	-611.1
<b>Total supply of primary energy (=)</b>	<b>2551.8</b>	<b>39969.3</b>	<b>3377.9</b>	<b>753.0</b>	<b>1272.1</b>	<b>314.2</b>	<b>790.6</b>	<b>-</b>	<b>49028.9</b>
Losses	-1.0	-3748.2	-19.9	-3.0	-0.5	-	-290.6	-126.1	-4189.3
<b>General consumption</b>	<b>755.1</b>	<b>21404.3</b>	<b>-</b>	<b>3059.8</b>	<b>2217.6</b>	<b>426.8</b>	<b>4868.6</b>	<b>2067.3</b>	<b>34799.4</b>
- Industrial network	162.7	5259.9	-	255.9	157.6	12.3	1833.5	32.6	7714.6
- Transport network	3.4	4180.3	-	2266.9	506.3	-	120.5	-	7077.4
- Other networks	589.0	11397.9	-	536.86	1552.6	62.6	2914.6	2034.7	19088.2
including population	273.2	9422.0	-	1.0	428.8	-	1502.2	1163.2	12790.4
- Non-energy use in other fields	-	566.2	-	-	1.1	351.9	-	-	919.2

If we analyze the data from the above table, the total supply of primary energy in the fuel and energy balance of our country in 2022 is close to 49.03 million tons of oil equivalent, of which 39.97 million tons of oil equivalent or 81.5% of the total supply of primary energy is natural gas coming into account. In the fuel and energy balance of our country in 2022, the total amount of fuel and energy consumed was approximately 34.8 million tons of oil equivalent. In particular, 36.7% of consumed fuel and energy was contributed by the population, 22.2% by industry, 20.3% by transport, 2.6% by non-energy sectors and 12.8% by other sectors.

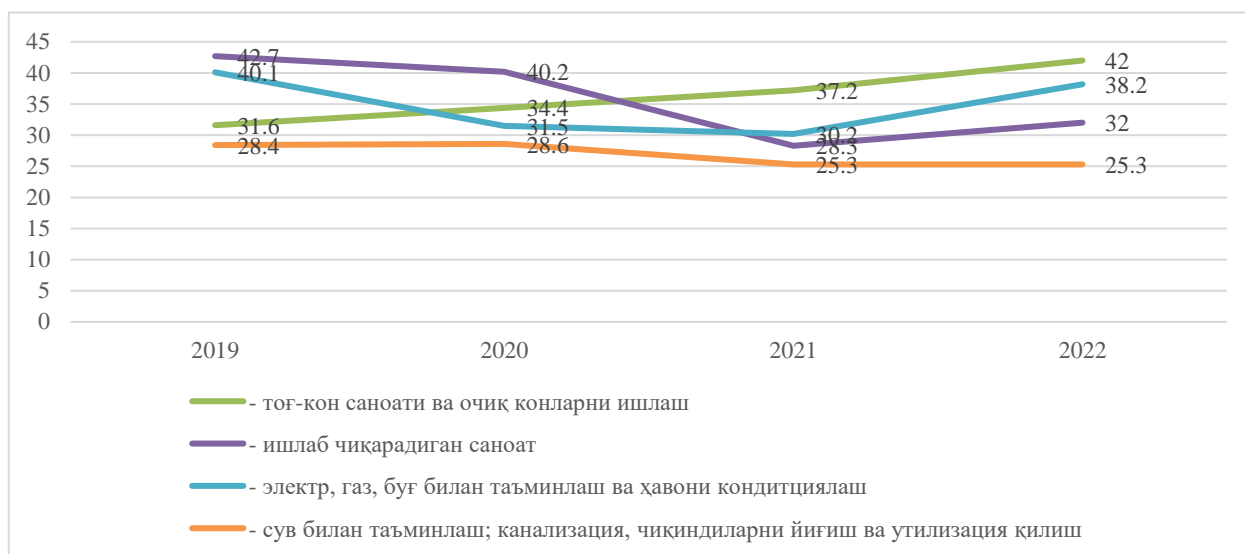
It should be noted here that the total amount of fuel and energy generated at the expense of natural gas is equal to 21.4 million tons of oil equivalent, the share of the population in the consumption of natural gas is 44.0 percent, the share of industry is 24.7 percent, the share of the transport sector is 19.3 percent, the share of non-energy sectors was 2.7 percent and the share of other sectors was 9.3 percent. In this regard, it is worth paying special attention to the fact that there are losses in the supply of fuel and energy resources to consumers, and the amount of losses in our country in 2022 is equal to 4.19 million tons of oil equivalent, which is 8.5% of the primary fuel and energy supply. Also, losses in the supply of electricity to consumers amounted to 36.7 percent or 290.6 thousand tons of oil equivalent. If we compare this indicator with other countries, we are sure that this is a huge loss.

For example, "Today, the total losses of electricity in Russia are about 10%, in Canada - 6.3%, in Japan - 5%, in Germany - 7.6%, in the USA - 6.5%, in Finland - 6.7%, but in Norway - It is 16.3%" [3].

Based on the above-mentioned principles, we will focus our attention on the analysis of the level of wear and tear of the main means of production in our country (Fig. 1). From the data presented in the picture, it can be seen that the level of wear and tear of fixed assets in the industrial sectors of the republic is high. In particular, the rate of depreciation of fixed assets in the electricity, gas,



steam supply and air conditioning industry is 40.1% in 2019, 31.5% and 30.2% in 2020 and 2021, respectively, and 38.2% in 2022. organized.



**Figure 1. Obsolescence level of industry production fixed assets** (in percentage of the total value of assets at the end of the year) [2]

The high level of depreciation of fixed assets in the energy industry shows that it is closely related to the size of technical losses in this industry. In addition, 30.8% of the consumed electricity in the fuel and energy balance of the country in 2022 corresponds to the share of the population, and the price of 295 sums for 1 kWh of electricity used by about 98% of the population during the last five years is investments for the modernization of the main means of enterprises in the energy sector. did not fully allow input.

Table 2 Electricity consumption in Uzbekistan by types of economic activity (million kWh) [2]

Indicators	2001	2005	2010	2015	2020	2021	2022
Total <sup>1)</sup>	48454.8	47384.2	50807.7	56368.6	69021.1	74951.7	76543.3
Industry	18791.2	17897.2	18117.7	20811.4	18284.3	18683.3	21324.1
Construction	129.8	164.8	199.0	341.3	1448.0	1566.0	1072.3
Agricultural gi	14753.9	13693.4	8607.4	9031.2	9202.4	9644.5	6870.3
Transport t	1226.3	1372.6	1207.9	1166.3	1058.0	1122.3	1401.1
Commercial enterprises and government agencies	1783.7	1551.8	2243.3	3451.6	5238.9	7483.9	7175.3
Population	4411.3	4652.7	11449.3	12548.7	15549.5	15461.8	17470.8
Other areas	-	-	-	-	1170.0	1670.0	1265.0

<sup>1)</sup> including consumption in production, distribution and re-transformation of electricity



If we analyze the data presented in Table 2, in 2001 in our country, a total of 48454.8 billion kWh of electricity consumed. If we pay attention to the consumption of electricity by types of economic activity, the share of industry is 38.8 percent, the share of agriculture is 30.4 percent, the share of the population is 9.1 percent, the share of commercial enterprises and government agencies is 3.7 percent, and the share of the transport sector is 2.5 percent and finally the share of the construction sector is 0.3 percent. If we compare the same situation of electricity consumption in our country with 2015, we can witness the emergence of new trends. In particular, in 2015, a total of 56368.6 billion kWh, compared to 2001, 7931.8 million kWh of electricity was consumed more. In 2015, 36.9% of electricity consumed by industry, 22.3% by population, 16.0% by agriculture, 6.1% by commercial enterprises and government agencies, 2.0% by transport and 0.6% by construction came. The electricity consumed in our country in 2022 is 76543.3 billion kWh. If we compare this indicator with the year 2001, the consumption of electricity increased by almost 58% or 28088.5 million kWh. The share of the industry is 27.9 percent, the share of the population is 22.8 percent, the share of commercial enterprises and government agencies is 9.4 percent, the share of the agricultural sector is 9.0 percent, the share of the transport sector is 1.8 percent, and finally, the share of the construction sector is 1.4 which is a percentage. The change in the volume of electricity consumption is explained by the increase in the number of the population and the increase in the standard of living, the development of private business and the increase in the volume of work in the construction sector.

It should be noted that efforts to ensure energy efficiency in our country are not producing the expected results. Due to the low level of profitability of enterprises in the energy sector, it is difficult for the enterprises of the sector to attract debt funds for investment projects related to the improvement of energy efficiency.

In conclusion, it is necessary for the government to adopt a unified approach to energy efficiency as an independent source of energy for economic entities and households. In our country, every citizen should act on the principle that the value of saved energy resources is equal to an independently created energy source.

### **Suggestions**

1. In order to ensure energy efficiency in economic sectors, to control strict compliance with the standard consumption of fuel and energy resources, as well as to provide financial incentives to responsible managers of enterprises that have achieved clear results in terms of ensuring energy efficiency in product production or increasing energy efficiency, or, on the contrary, to take economic measures for those who do not ensure energy efficiency. should be developed.
2. It is necessary to establish state subsidization of investment and innovation projects aimed at ensuring energy efficiency by energy sector companies.
3. According to the results of some studies, a 1% increase in the share of the service sector in the economy can lead to a 0.48% decrease in energy consumption. Based on this, in order to optimize the demand for energy resources, it is appropriate to adopt service sector development programs in our country for 2025-2030.
4. The country needs to invest more in renewable energy sources in order to diversify its energy balance, reduce the economy's dependence on natural gas and other fossil fuels, and preserve natural resources for future generations.



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