



# Development of nuclear energy in the Republic of Uzbekistan

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**ABSTRACT**

This article discusses the problems and prospects for the development of nuclear energy in Uzbekistan.

**Keywords:**

Nuclear Energy, Personnel Training, State Regulation.

The production of energy on the scale necessary for mankind is one of the pressing problems of mankind. The number of ways to generate energy is quite large, but most of them are non-renewable. Nuclear power is also a non-renewable energy resource, however, it is often seen as an alternative to traditional energy based on carbon resources. The growth of industry, the progressive shortage of energy resources, global climate change and many other problems contribute to the development of nuclear energy. To date, nuclear power is 17% of the world's electricity production and 393 GW of installed capacity, of which more than half is in three countries - the United States, France and Japan (100, 63 and 47 GW, respectively).

In the 1970s it seemed that nothing could stop the rapid growth of the world's nuclear energy. The basis for such conclusions was that in 1990 the installed capacity of nuclear power plants in the USSR will be 110 GW, and in the world - more than 1000 GW (of

which 530 GW will be in the USA). Despite the tragic events at the Fukushima-1 nuclear power plant and the Chernobyl nuclear power plant, the role of nuclear energy will only increase in the coming years. Over the past 10 years, electricity generation at Russian nuclear power plants has grown by more than 24% (according to the results of 2010, the growth was 4.16%) and reached 170.1 billion kWh

A significant role in the rise of the role of nuclear power plants was played by new environmental priorities: due to the problem of global climate change, simply increasing the capacity of thermal energy has become less acceptable, at least in European countries. The tense situation in the fossil fuel market that has developed in recent years also contributes. The scale of new construction is still relatively modest, but the announced development plans are very ambitious. Only China, which has nuclear power plants with an installed capacity of 45,368 GW, has set a goal of increasing

capacity to 120 GW by 2030 and is now considering an increase to 150 GW by that date. According to the Ministry of Energy of the Republic of Uzbekistan, today the total installed capacity of 48 power plants in the country is 14,100 MW with an annual electricity generation of about 70 billion kWh. Approximately 90% of electricity in Uzbekistan is generated by thermal power plants that run on coal or natural gas, the share of hydropower is 10%, and the weight of alternative energy sources, according to expert estimates, does not even reach 0.01%.

The energy system of Uzbekistan is in short supply: in 2020, with a generation of 66.4 billion kWh, consumption in the country amounted to 69.1 billion kWh, the deficit was closed by importing electricity from border countries. At the current rate of economic development and population growth, consumption can reach 117 billion kWh in 10 years (to cover this need, 189 tons of 5% enriched uranium or  $1.7 \cdot 10^7$  tons of pure coal will be needed).

Given the rapid growth of energy in other countries and the shortage of electricity, Uzbekistan has also adopted a strategy for the development of alternative energy sources. The problem of electricity shortage should be solved thanks to the construction of a nuclear power plant, the fuel for which is produced in Uzbekistan itself. The country is one of the ten largest world producers of uranium. The Navoi Mining and Metallurgical Combine produces up to 3.5 thousand tons of uranium per year, most of it is exported to Japan and China.

The start of the NPP construction project was given in October 2018. Presidents V. Putin and Sh. Mirzeev. The location of the nuclear power plant was chosen in the Jizzakh region of Uzbekistan, on Lake Tuzkan. The start of construction is planned for 2022, the launch of the reactors in 2030.

The nuclear power plant will be equipped with two power units with VVER-1200 reactor units with safety class 3+, which provides for the use of "passive safety systems" - their operation

continues even with a complete power outage. The reactors are protected by a double shell: the inner one prevents the leakage of hazardous substances, the outer one resists powerful mechanical influences.

Loans from the Russian government will be attracted to build the nuclear power plant. The project cost of construction is \$10 billion. The average payback period is 10 years, the next 50 years the station brings a net profit. Switching to a new type of fuel will save Uzbekistan 3.7 billion cubic meters of natural gas.

Uzatom must provide the construction with the necessary materials. Part of the equipment will be produced by local companies. All this will give impetus to the economic development of the territories around the station.

Training of personnel for work at the future nuclear power plant is carried out by the Tashkent branch of the National Research Nuclear University MEPhI. In 2019, the first flow of students began training, which involves an internship for students at Novovoronezh NPP-2.

Joining the "nuclear club" should have a positive impact on the image of the state. Uzbekistan will not only export, but also use nuclear fuel, independently train personnel for nuclear power plants, completely solve energy problems, reduce carbon dioxide emissions into the atmosphere and create thousands of jobs for its citizens.

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