



Hydropower Industry of New Uzbekistan

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ABSTRACT

The article highlights such moments as the organization of the activities of JSC "Uzbekhydroenergo", activities over the past 5 years, tasks and long-term plans, achievements.

Keywords:

JSC "Uzbekhydroenergo", HPP.

Independence is a great asset. Today, in all spheres of activity, a new time, new reforms are in action. Comparing with the past, we are witnessing how the potential of all updates, changes, and creative works is manifested.

In the new Uzbekistan, which has chosen the path of modern progress, hydropower is actively developing in the circle of large-scale reforms, which is an important power of the country's national economy. As a result of radical reforms in the hydropower sector, new HPPs have been commissioned, and the volume of new energy sources is increasing every year. It is noteworthy that as a result of successive reforms, practical work in this area has accelerated the modernization of existing HPPs, which are obsolete and did not operate at full capacity, and work has accelerated to resume design and survey work.

JSC "Uzbekgidroenergo" was established in accordance with the Decree of the President of the Republic of Uzbekistan No. UP-5044 dated May 18, 2017, and over this short period of activity of the Joint Stock Company, the country has achieved a number of important achievements in the further development of the hydropower sector and increasing the volume of renewable energy sources.

It should be noted that over the past period, thanks to the efforts of the management of the Joint Stock Company, a number of investment projects were reconstructed. Also today, the construction of large-scale hydraulic structures throughout the country and the modernization of existing ones are being carried out at a high pace.

As a result of this creative work and as a result of reforms in the industry, the energy sector, including hydropower, is developing from year to year.

In comparison with the years of Company's activity dynamics of growth in electricity generation indicators was as follows - production capacities increased from 1731 MW in 2017 to 2053 MW in 2021.

In 2017-2021 244 MW were put into operation in total. During this short period, 13 modern hydroelectric power plants were built and 9 modernized, which are equipped with modern machinery and equipment.

As the head of our state noted while familiarizing himself with projects in the field of hydropower, the country's potential in this area is used by less than 50%.

Therefore, 20 projects have been developed with a total capacity of 740 MW. In

particular, in 2022, it is planned to implement 8 projects with a capacity of 258 MW, 4 of which are related to the modernization of existing and 4 to the construction of new HPPs, in 2023-2024 8 projects with a capacity of 76 MW and in 2025-2026 4 projects with a capacity of 506 MW. All this will bring a worthy contribution to the development of our country and the prosperous future of our people.

It should be emphasized separately that in the Joint Stock Company in 2022 8 projects are planned to be commissioned, which will provide an additional **178 MW** of electricity generation capacity, resulting in a total hydropower generation capacity of **2,230 MW**.

This Decree was a historic dream for all hydropower professionals working in this field, especially specialist engineers. The proclamation of the decree was not only a practical embodiment of many years of dreams, but on the other hand, it was a great responsibility for the industry. We are faced with important tasks - efficient and rational use of water resources, construction of new HPPs for the production of cheap electricity.

In terms of achieving the goals and objectives set, our Company has implemented a number of potential and promising projects. It should be noted separately that in order to build new HPPs and attract investments in the modernization of existing HPPs, as well as to carry out active foreign cooperation, a promising investment program has been developed.

The tomorrow of Uzbekistan will be created by the sweat of our faces. Who will do it? Loyal people who love their Motherland! We have one way: to honestly serve the people, to seek the consent of our people," these words of our respected President gave us strength and high support.

Today, hydropower includes 49 HPPs, 25 of which were commissioned 40-80 years ago, and therefore partially or fully used their technical resource, modernization and reconstruction of equipment, technical installations, buildings and structures is required. In accordance with the program, which was approved by the President of the country Shavkat Mirziyoyev, consistent work is

underway to efficiently use the hydropower potential of the republic, increase the share of renewable hydropower resources in the structure of electricity production, create new environmentally friendly generating capacities, carry out technical and technological re-equipment of existing HPPs, attracting foreign investments into the development of hydropower and ensuring, on this basis, the fullest satisfaction of the needs of enterprises and the population in electric energy.

When JSC «Uzbekgidroenergo» was formed, it included 36 HPPs, which in turn were combined into 15 unitary enterprises. In particular, these were 8 enterprises (comprising 28 HPPs) of JSC «Uzbekenergo» and 8 HPPs of the «Uzsuvenergo» association. The total power generation capacity of these enterprises was 1,856 MW.

In particular:

In 2017, a test wind farm with a capacity of 750 kW was put into operation for the first time in Uzbekistan in the village of Yubileiny, Bostanlyk region. The basis for the introduction of new capacities has been created.

In 2018, a micro-HPP with a capacity of 200 kW was commissioned in Zamin district of Jizzakh region at the Zamin reservoir; in March 2019, a new HPP with a capacity of 11.4 MW was commissioned at the Tuyabuguz reservoir of Tashkent region. In June of the same year, a small cascade was put into operation on the Big Fergana Canal of Namangan Region with a total capacity of 12.0 MW.

In 2020, JSC «Uzbekgidroenergo», within the framework of the implementation of 6 investment projects for a total capacity of 118.3 MW, constructed 2 new HPPs and modernized 4 HPPs.

It should be emphasized that as part of the implementation of investment projects this year, all conditions were created for the additional production of 543 million kWh of electricity. As a result of the commissioning of these projects, an additional 220 jobs were created for qualified specialists.

Also it should be underlined that in 2020 the Company has organized work on the

modernization and commissioning of a capacity of 7.1 MW at the Cascade of Shakhrikhan HPPs (SFC-2) and a capacity of 15.34 MW at the Cascade of Kadirya HPPs (HPPs- 3).

Last year, Kamchik small HPP with a capacity of 26.5 MW and the Zarchob-1 small HPP with a capacity of 37.4 MW were commissioned.

Within the framework of modernization projects for existing HPPs, the capacities of HPP-19 were modernized, which is part of the organizational structure of the UE "Cascade of Tashkent HPPs" and HPP-14, which is part of the organizational structure of the UE "Cascade of Lower-Bozsu HPPs".

HPP-9 was built in 1943 and is located in Tashkent on the Chirchik-Bozsu tract. Over the 75-year period of its activity, electrical installations, technological equipment have become materially and spiritually obsolete, and in recent years this HPP has no longer operated at its installed capacity.

As part of the modernization of this HPP, the 8.3 MW hydroelectric unit was replaced by 2 hydroelectric units, the total installed capacity of which is 16.6 MW, which made it possible to produce 95.0 million kW of electricity per year by this HPP. This, in turn, doubled the production of electricity. The implementation of this project allowed HPP-9 to provide electricity to 60-70 thousand houses in Tashkent.

And also, the implementation of the project for the modernization of HPP-14 of the UE "Cascade of Lower-Bozsu HPPs" made it possible to increase the production of electricity for the needs of the population and industrial enterprises.

Responsible employees of JSC «Uzbekgidroenergo», cascade leaders and partners from the People's Republic of China took part in the grand opening of a new stage of the HPP operation.

HPP-14 was commissioned in 1944 and is located 15 km from the city of Tashkent, it is the first station in the organizational structure of the "Lower-Bozsu HPPs Cascade". In 2007, a hydroelectric unit with a capacity of 10.7 MW was out of order at HPP, the modernization of

the HPP made it possible to commission 2 new hydroelectric units with a capacity of 7.5 MW each, with a total capacity of 15 MW. The annual electricity production is 90.7 million kWh.

As part of the implementation of this project, the capacity of the HPP was additionally increased by 4.3 MW.

The implementation of this investment project allowed HPP-14 to provide electricity to 50-60 thousand houses in the Tashkent region.

These two projects: the modernization of HPP-9 at the UE "Cascade of Tashkent HPPs" and HPP-14 at the UE "Cascade of Lower-Bozsu HPPs" are investment projects and were implemented with a loan from the Eximbank of the People's Republic of China.

The work on the modernization of these HPPs was carried out by the Company in cooperation with the general contractor of the project, a leading foreign partner, "Power Construction of China Ltd" of the People's Republic of China.

The new technological equipment installed at the HPPs is connected to a modern automated control system. This, in turn, provides the ability to monitor and control electrical devices from a distance in real time using modern surveillance cameras.

JSC «Uzbekgidroenergo» in 2021 is scheduled to implement 16 investment projects with a total capacity of 993.0 MW, in 2022 15 projects with a total capacity of 931.2 MW, in 2023 18 projects with a total capacity of 1,002.2 MW

In particular, in 2021, it is planned to implement 3 main projects with a total capacity of 173.4 MW. These projects are related to the commissioning of the new Kamolot HPP with a capacity of 8.2 MW, Zarchob small HPP with a capacity of 38.2 MW, and the modernization of Farhad HPP with a capacity of 127 MW. The implementation of these projects will additionally produce 620 million kWh of electricity and create 60 new jobs.

At the same time, the specialists of the Company, together with the sub-structural organization "Gidroproekt", carry out design and survey work in the hydro-potential and

promising territories of Andijan, Jizzakh, Namangan, Kashkadarya, Samarkand and Fergana regions. Survey work carried out by specialists is organized taking into account the results of test projects for the construction of micro HPPs.

In the course of the study, specialists identified promising areas where micro-HPPs can be installed, for example, in Andijan region 6, in Kashkadarya 2, in Samarkand 5, in Fergana region 1, in total, 14 promising areas have been identified. In these areas, the water head is 6-90 meters, the discharge per second is 1-8 m³ and the frequency of water flow is high throughout the year. On these sites, it is planned to build 19 micro-HPPs with a total capacity of 10.05 MW.

Today, work is underway to modernize Farhad HPP, the cost of all work on the modernization project is 81.1 million USD. The project is financed by VEB.RF Russian Bank, direct negotiations were organized with PJSC "Power Machines", and on December 12, 2020, an agreement was signed for 69.7 million USD.

The feasibility study of the project has passed the examination of the RDI "Uzengineering"; today, active work is underway to modernize this HPP. The Farhad HPP is one of the most potential and significant HPPs in the country. This HPP was built during the most difficult period - during the Second World War. Despite all the hardships of these years, the State Defense Committee of the country on November 18, 1942, adopted a resolution on the construction of a HPP, the construction of which began on February 10, 1943 on the Syrdarya River. This hydraulic structure was built by the joint efforts of the workers, the dekhkans - by the method of the people's hashar, which was actively practiced at that time. More than 60 thousand people were involved in its construction from various regions of the country, in particular, from Fergana, Namangan, Samarkand, Bukhara, Andijan and Tashkent regions. On the basis of technologies brought from Germany in 1948, the first parts of the HPP were commissioned, the electric current for the first went through overhead electric lines to the city of Bekabad

and Syrdarya region. On July 3, 1951, the HPP was fully commissioned.

Another of the major projects of strategic importance is related to the construction of Pskem HPP on the Pskem river in Kurdukhtar village in Bostanlyk district of the Tashkent region, 120 km from the city of Tashkent and 45 km from the Charvak reservoir. The cost of this project is 798 million USD. Geological and first construction works have been organized for this project. In particular, the construction of the HPP began in September 2017.

The electric power potential of Pskem HPP is 404 MW. This figure proves once again about its importance in the hydropower industry of the country. This HPP will produce 900 million kWh of electricity per year. This will create a large reserve source of electricity in the region.

The volume of the Pskem reservoir will be 520.8 million m³, of which 486.5 million m³ of water has a useful component in the production of electricity. In terms of capacity and volume, this HPP will occupy the second place after Charvak HPP.

Today, the construction work of the HPP has been significantly intensified, in particular, a small specialized mobile plant for the production of crushed stone from local rock was created to perform various concrete works at the construction sites of the HPP.

The commissioning of this HPP on the Pskem River will ensure the conservation and preservation of the country's fuel and energy resources. The electricity generated by this HPP will save 330.0 million m³ of natural gas, as well as prevent the release of a large amount of harmful substances into the atmosphere. And most importantly, the operation of this HPP will improve the socio-economic conditions of the local population, create a modern engineering and social infrastructure.

The construction of Pskem HPP is being carried out in accordance with the approved plan and will be put into operation in 2024.

In turn, during the construction of this HPP, work is underway to plant greenery on a huge nearby area, roads have been laid, and infrastructure is being formed. Priority

attention is paid to the creation of social conditions for the population. In particular, work is underway on the construction of about 60 modern cottages for workers, a school for 80 places and a preschool educational institution for the children of workers and employees of the HPP, as well as 3 dormitories for 150 places, commercial and social facilities are being built. By the end of this year, 2 dormitories for 100 beds, 20 cottages will be commissioned.

Pskem HPP is designed by the "Gidroproekt" design organization.

Another of the largest and most significant projects is the construction of Lower-Chatkal HPP. The total capacity of the HPP is 76 MW, the average annual electricity production will be 282 million kWh. To increase the produced capacity, a 50-meter-high dam will be constructed, and the reservoir volume will be 5 million m³. The commissioning of this HPP will create 39 new jobs.

In accordance with the investment program for the construction of large HPPs of JSC «Uzbekgidroenergo», it is planned to build a large Mullalak HPP in Tashkent region. The design capacity of this HPP is 140 MW, the average annual electricity production is 282 million kWh m³. Design and construction work is carried out with a foreign partner continuously.

It should be noted that today a huge amount of work is being done to repair the administrative buildings of the cascades and HPPs, which were last repaired 15 years ago.

The country has intensified work on the digitalization of the economy, and a number of practical measures have been taken. In particular, priority attention is paid to creating conditions for enhancing the development of modern information technology, ensuring information security.

In order to ensure the targeted use of the water and energy potential in our country, on the basis of approved investment projects for the construction of new HPPs, intensive construction work is underway in the regions. Construction projects are carried out by hardworking builders, despite the scorching

summer heat and the severe cold of winter, thanks to their hard and well-coordinated work, projects for the production of cheap and clean electricity are being implemented.

This year, the expected consumption of electricity is 71 billion kWh, which is 10% more than the previous year, that is, electricity consumption in the sectors of the economy will increase by 10%, and for the population by 8.5%. Also this year, it is planned to commission capacities of 1177 MW at thermal power plants and 174 MW at HPPs. According to calculations, by 2030, electricity consumption in our country will double compared to current indicators.

It should be emphasized separately that the Company is carrying out a number of measures to transform financial capabilities. If in 2018 the centralized 1C settlement program was fully implemented, then in 2019 the International Financial Reporting Standards (IFRS) were introduced. In 2021, a "positive" opinion was received from the international auditing organization PricewaterhouseCoopers, as well as a "BB-" credit rating from Fitch Ratings. The Company received this assessment as the first among the production enterprises of in Uzbekistan. This year it is planned to receive a second international credit rating from S&P Ratings.

In particular, in order to ensure financial stability and investment attractiveness, JSC «Uzbekgidroenergo» in June 2021 signed an agreement with the international rating agency Fitch Ratings, which is one of the top three world rating agencies, to obtain an international credit rating. The international rating agency "Fitch Ratings" not only studied the financial and economic activities of the Company, but also made an in-depth analysis of the corporate governance system, business strategy, maintenance of internal regulatory documents and other areas.

As a result of rational measures taken by our government, the growth rates of the country's economy have been preserved. Thus, international rating agencies "Fitch Ratings" and "Standard and Poor's" provided the Republic of Uzbekistan with sovereign credit

ratings of "BB-" (stable) and "B+" (stable) levels, respectively.

In this direction, JSC «Uzbekhidroenergo» also organized a number of events, in particular, the objectives of the Company were defined to implement the resolutions of the President of the Republic of Uzbekistan dated July 21, 2018 "On additional measures to diversify sources of external financing" No. PP-3877 and dated February 24, 2020 "On additional measures for the transition to international financial reporting standards" No. PP-4611.

In 2020, the Department of International Financial Reporting Standards (IFRS) was organized in the executive office of the Company, in cooperation with the international auditing organization PricewaterhouseCoopers, which is one of the four leading global audit organizations, an audit of the Company's financial activities for compliance with the requirements of international standard was organized.

As a result of active work in this direction, in October 2020 the international auditing organization PricewaterhouseCoopers presented a positive opinion on the consolidated financial report for 2017-2019 of the Company and substructure enterprises, formed in accordance with the requirements of IFRS.

This level of ratings was presented by JSC «Uzbekhidroenergo» to the world investor markets as the first production enterprise in Uzbekistan with a specific business strategy, transparent financial reporting and a strong corporate governance system.

This success is aimed at ensuring the economic stability of the Company and actively attracting foreign loans to finance investment projects, and attracting direct investments without state guarantees.

JSC "Uzbekhidroenergo" is not limited to this success, we are working to increase the rating, which will serve to strengthen the authority of the Company in the world markets.

The "BB-" level (stable), provided by the international rating agency "Fitch Ratings", will allow us in the future to list the Company's Eurobonds on the London Stock Exchange.

At the same time, in order to further improve the activities of the Joint Stock Company, the world's leading consulting companies are involved in this process. In particular, partnerships have been established with PricewaterhouseCoopers on financial activities, with X-Holdings on digital transformation, **McKinsey & Company** on revising corporate governance and investment program. Also, in order to improve the efficiency of procurement, cooperation was established with **Deloitte & Touche enterprises**, which are included in the Big Four and from which the necessary recommendations and advice were received on the further development of the Joint Stock Company.

Also, in order to ensure the efficient use of the republic's water resources, the German company Tractabel Engineering was attracted under a grant from the Asian Development Bank, which studied the hydropower potential of the republic and, in accordance with its recommendations, a hydropower development program until 2030 was developed.

Over the past 5 years, a number of promising large investment projects have been implemented. Huge work is underway to implement more than 30 investment projects for the construction of new and modernization of existing HPPs, a lot of work is being done in this direction, industry specialists of local and foreign significance are involved.

The joint-stock company has established consistent cooperation with the People's Republic of China, the Russian Federation, France, Italy, Germany, South Korea, Austria, Turkey, Tajikistan and Kyrgyzstan to launch new production facilities as part of the program for the construction of new hydroelectric power plants and the modernization of existing hydroelectric power plants.

We can proudly announce that in 2017-2021 the Joint Stock Company increased the number of operating 36 HPPs to 50 due to the commissioning of new large, medium and micro HPPs, and the total hydropower capacity of the country today is about 2,053 MW.

In order to strengthen scientific cooperation with the country's universities, the Company established a construction laboratory at the Tashkent Institute of Irrigation and Agricultural Mechanization Engineers. Today we are working to create a Hydraulic Laboratory on the basis of the Tashkent State Technical University, we are actively cooperating with the Tashkent Institute of Architecture and Civil Engineering to create a model of Pskem HPP.

Construction in the hydropower industry is complex and a big responsibility. Hydropower builders must have extensive experience and practice in this matter. And therefore, specialists of a narrow profession are mainly involved in this work. A specialist without engineering education and skills will not be able to practically participate in the construction of hydraulic structures. Design and survey work in hydropower, in particular, requires knowledge, knowledge and once more knowledge.

In conclusion, I would like to note that the active and systematic activity of the Company, the successful implementation of promising investment projects, the construction of new and modernization of existing HPPs, the increase in the generated power capacity are aimed primarily at improving the socio-economic conditions of the regions and the country as a whole, uninterrupted supply of population with electricity and economic sectors, the most important thing is to improve the well-being of our people.

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«Uzbekhydroenergo» JSC