



ОТКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО

ЭЛЕКТРИЧЕСКИЕ
СТАНЦИИ

Project "Construction of the Kambarata-1 HPP"

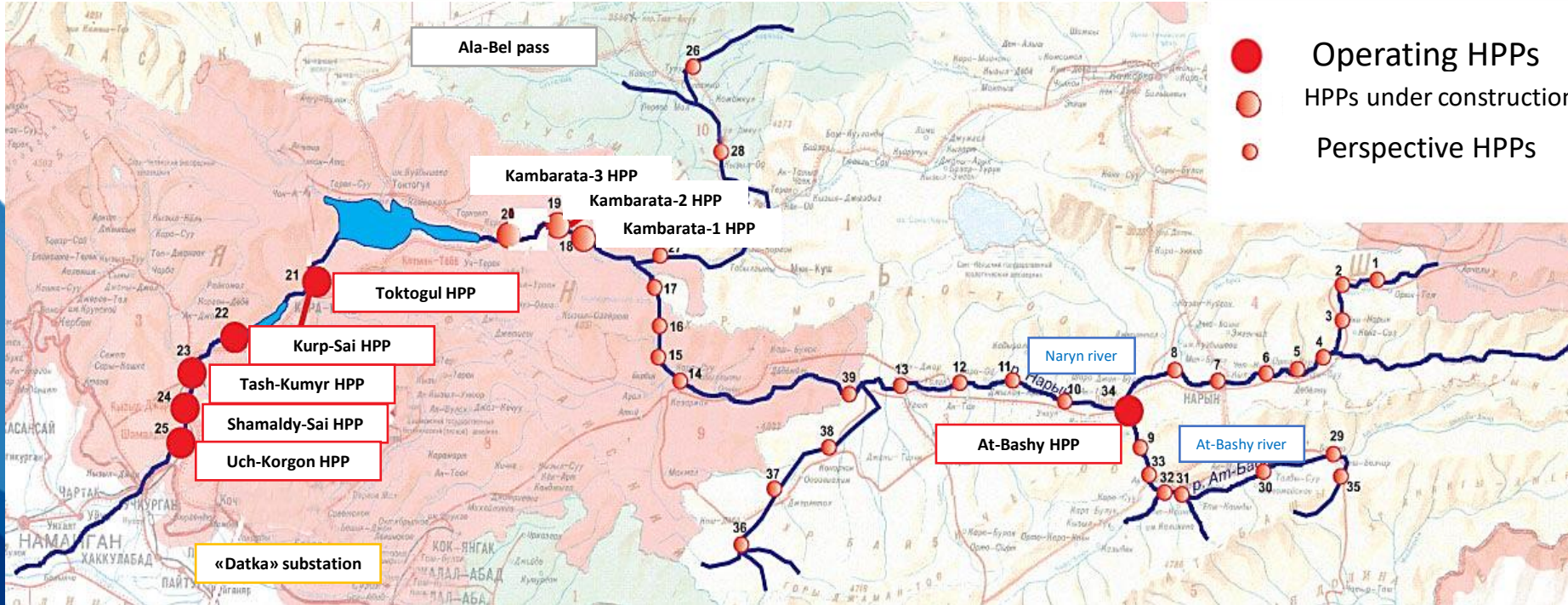
2021 year



Total hydropower potential of the Kyrgyz Republic



The location of the hydroelectric power station on the river. Naryn



General indicators

- Total natural hydropower potential of the Kyrgyz Republic - **142.5 billion kWh**
- The republic **ranks third** in the CIS after Russia and Tajikistan
- The percentage of natural potential development is only **10%**

Industry Outlook

- **9** cascades of **38** hydroelectric power plants can be built on the Naryn river.
- The total installed capacity of promising cascades is **9,271.2 MW**
- Average long-term annual production of more than **26 billion kWh** of electricity



Hydropotential of the rivers of the Kyrgyz Republic



Hydropotential type	Hydropower potential of rivers			
	Power, MW	Power utilization factor	Power usage hours per year	Energy, billion kWh per year
Theoretical natural hydropotential	28 040	1	8 760	245,6
Technical hydropotential, total	28 040	0,58	5 082	142,5
Economic hydro potential used for electricity generation according to the calculation FDI "Tashgidroproekt"	11 861	0,34	3 000	35,5
Hydropotential for use by small hydroelectric power plants	300	0,40	3 500	1,05
Hydropotential used for the current time	3 030	0,50	4 380	13,3
Hydropotential development percentage				37,5%



Prospective projects of JSC "Electric Stations"



One of the important components of the pivot of the economic development of the Kyrgyz Republic is the increase in energy capacity using the natural hydro potential of the rivers located on its territory. In the future, clean electricity generated at these HPPs will contribute to the development of the entire economy of the Kyrgyz Republic.

The Kyrgyz Republic can become one of the main suppliers of electricity in the Central Asian region and China.

The following projects are proposed for the implementation of new generating capacities of Electric Power Plants OJSC: Upper Naryn HPP cascade, Kambarata-1 HPP, Suusamyr-Kokomeran HPP cascade, Kazarman HPP cascade.

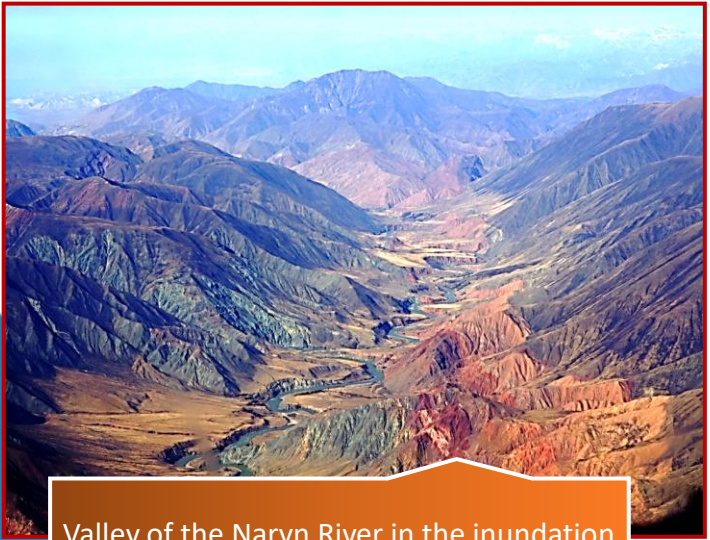
The list of promising hydroelectric power plants with a total installed capacity of 4562.7 MW and a total annual output of 14.561 billion kWh was selected from the whole variety of objects identified when clarifying the scheme for using the river basin. Naryn and its tributaries, special attention was paid to the projects of hydroelectric power plants in the areas provided by:

- ready-made infrastructure for the early start of construction work;**
- developed transport links;**
- funds that do not require significant investments for power supply;**
- other engineering support for construction;**
- problem-free placement of subsidiary enterprises and construction workers;**
- closely laid national power lines for the least costly solution of the subsequent power distribution of the hydroelectric power station.**



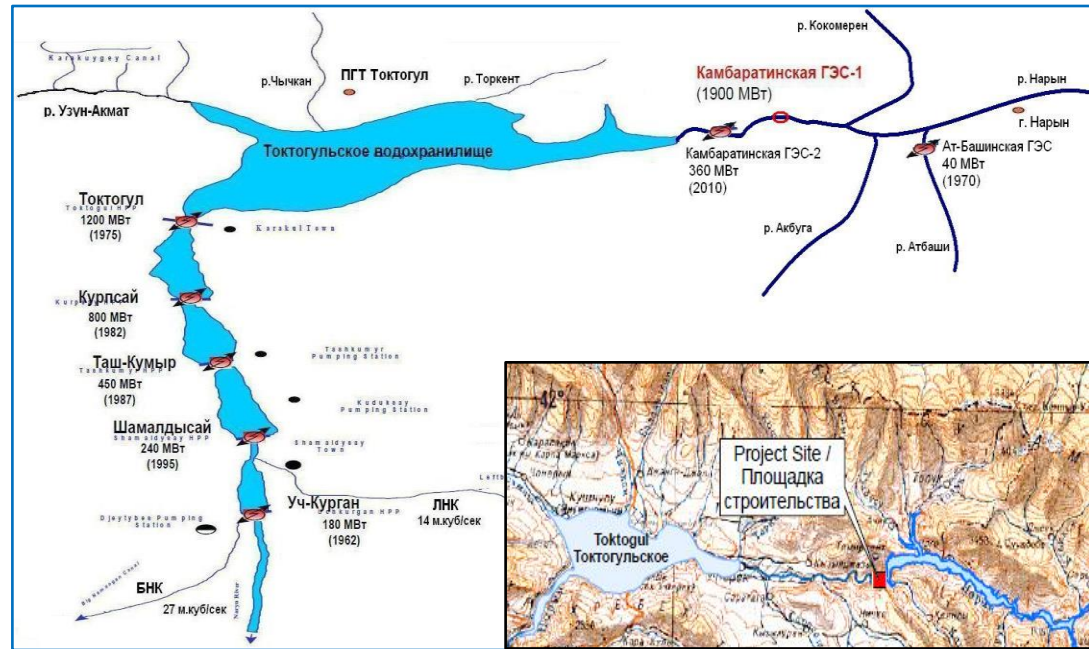
- The initial pre-design studies (FS) for the Kambarata-1 HPP were started in 1975. Tashgidroproekt (Central Asian Branch Hidroproekt Institute) (Tashkent), Hidroproekt (Moscow) and other design organizations took part in them.
- In 1978, the Tashgidroproekt Institute (Central Asian Branch of Hydroproject Institute) developed a feasibility study for the Kambarata HPPs on the Naryn River with a capacity of 1900 MW.
- In 1985-86. the preparatory period for the construction of the Kambarata-1 HPP and HPP-2 was carried out on the basis of the technical design of the Kambarata-1 HPP, prepared by the Institute of «Hidroproekt» SAB (1978). With the collapse of the USSR, preparatory work was suspended due to the lack of funding for the construction project of the Kambarata-1 HPP.
- In 2014, SNC Lavalin (Canada) and OJSC ENEX (Russia) developed a feasibility study for the Kambarata-1 HPP.

Kambarata-1. General information.



Valley of the Naryn River in the inundation zone of the reservoir in the downstream direction

The right to use **6318 hectares** of land plots for the construction of the Kambarata-1 HPP was transferred to OJSC Electric Power Plants in accordance with the Decree of the Government of the Kyrgyz Republic No. 56 dated February 08, 2013..



Location

The facility is located in the Toktogul district of the Jalal-Abad region, above the Toktogul reservoir and has a strong impact on improving its operating mode.

The estimated construction period for the hydroelectric power station is 9 years.

- ❖ The construction project of the Kambarata-1 HPP is the most feasible for the following reasons:
 - the section and watercourse of the Kambarata-1 HPP are the most studied;
 - there is pre-design documentation (feasibility study);
 - part of the infrastructure has been prepared: bases, roads, quarries;
 - close location to the 500 kV overhead line "Datka-Kemin", accordingly, will not require additional costs to resolve the issue of power delivery.
- ❖ The construction project of the Kambarata-1 HPP makes it possible to start the construction and installation work of the preparatory period immediately after determining the source of funding.

According to the 2014 feasibility study, the project "Construction of the Kambarata-1 HPP" is the largest power facility of the entire cascade of the Kambarata HPPs, providing for the construction of a rock-fill dam **256 m** high and a total reservoir volume of **5.4 billion m³** of water.

Elektricheskie Stantsii OJSC is **100% owner** of the feasibility study for the construction of the Kambarata-1 HPP, developed by SNC Lavalin Co Ltd (Canada) and ENEX JSC (Russia).
The cost of the feasibility study is **5,791,806.72 US dollars**.

Specifications

Name	Power, MW		
Kambarata-1 HPP	1860 (4GA * 465MW) *		
Average annual electricity generation, billion kWh	Capital investments (according to feasibility study), USD million	Unit cost per 1MW, USD	Maximum consumption of HPP (when operating 4 turbines), m ³ / s
5640	2916,4	1,56	975

*at Normal (top)water level = 1198m



Investment indicators of the project



No s\n	Indicators	Unit measurements	The values		
1	Installed capacity	MW	1860		
2	Annual production	million kWh	5 640		
3	Electricity consumption for own needs	million kW	140		
4	Supplied electricity	million kW	5 460		
5	Consolidated estimate of the cost of construction	USD million	2 916,4		
6	Selling tariff	\$ / kWh	0,03	0,045	0,0515
		som / kWh	2,53	3,80	4,35
7	Income from the sale of electricity	USD million	164	246	281
8	Production costs excluding loan servicing	USD million	42	63	72
9	Net profit after tax	USD million	110	164	188
10	Discounted payback period	years	26,60	17,73	15,50
11	Simple payback period, excluding costs (subparagraph 8)	years	19,78	13,1	11,5
12	Specific capital investments	\$ / kW	1 568	1 568	1 568



Possible options for cooperation



1. On the basis of the existing CJSC Kambarata-1, whose shares are 100% owned by JSC Electric Stations, an additional issue of shares is proposed, taking into account the contribution of the Kyrgyz side in the form of the cost of long-term lease of land plots for the construction of Kambarata-1 HPP facilities, developed by the feasibility study, existing structures (transport tunnel, access road) serving the site of the Kambarata-1 HPP

- Kyrgyz side - at least 51%;
- Investor - up to 49%, while the investor purchases shares of Kambarata-1 HPP CJSC according to the assessment made by the Kyrgyz side and the additional issue.

2. With the participation of a third party, the share of shares is distributed as follows:

- Kyrgyz side - at least 51%;
- side number 1 - up to 24%;
- side number 2 - up to 25%.

3. The income received by CJSC “Kambarata HPP-1” after the redemption of shares by new participants after the additional issue will be considered a contribution to the share capital and will be used to finance the construction of a part of the facilities of the Kambarata-1 HPP;

4. The rest of the investment for the completion of the project is attracted by the shareholders of CJSC “Kambarata-1 HPP” through loans and credits.

In both forms of cooperation, it is assumed that after the completion of the project, the facility will come under the joint management of the Kyrgyz side and the Investor (s).



Possible options for cooperation



3. Implementation of the project in cooperation with the state within the framework of the law "On public-private partnership in the Kyrgyz Republic", including in the form of the following cooperation models:

- **Construction and transfer (BT, Build-and-Transfer)** - a private partner finances and builds an infrastructure facility and, after completion of construction work, transfers this infrastructure facility to a public partner, which, within the time period stipulated in the PPP agreement, pays the costs of the private partner for the construction of the infrastructure object.
- **Construction, lease and transfer (Build-Lease-and-Transfer - BLT)** - a private partner finances and builds an infrastructure facility of a public-private partnership and upon completion of construction transfers it to a public partner, retaining the rights to lease an infrastructure facility for a certain period of time, after which the ownership rights to the infrastructure facility are automatically transferred to the state partner.
- **Construction, operation and transfer (BOT, Build, Operate, Transfer)** - under this model of the Agreement, the Investor undertakes to build, finance the construction, operate and maintain the infrastructure facility for a certain period of time before the transfer of this facility to the state.
- **Build-Own-Operate-and-Transfer (BOOT)** is a form of participation of a private partner in PPP projects, defined as "build, operate and transfer", except that after the expiration of the agreement, the private partner transfers the object to the public partner.
- **Build-Transfer-and-Operate (BTO)** - A public partner transfers an infrastructure facility to a private partner who builds it, taking on cost overruns, potential construction delays and associated risks. After the official acceptance of the infrastructure facility by the public partner, the ownership rights to it are transferred to the public partner, while the private partner operates it on behalf of the public partner.
- **DBFO (Design-Build-Finance-Operate)** - design-build-finance-management. The state partner under this scheme retains the rights to the created infrastructure object and leases it to the project company for the period of the concession.



Basic laws of the Kyrgyz Republic applied in the electric power industry



The main documents regulating the activities and the procedure for attracting investments in the electric power industry of the Kyrgyz Republic are:

- ❖ Law of the Kyrgyz Republic "On Energy" dated October 30, 1996 No. 56;
- ❖ Law of the Kyrgyz Republic "On the Electric Power Industry" dated January 28, 1997 No. 8;
- ❖ Law of the Kyrgyz Republic "On Natural Monopolies in the Kyrgyz Republic" dated August 8, 2011 No. 149;
- ❖ Law "On Investments" dated March 27, 2003 No. 66;
- ❖ Law "On Public-Private Partnership" dated July 22, 2019 No. 95.

Tariffs for the sale of electricity are approved by the state represented by the State Department for Regulation of the Fuel and Energy Complex under the Ministry of Energy and Industry of the Kyrgyz Republic with the consent of the Jogorku Kenesh (Parliament).