

Obstacles for Hydropower Station Projects in Kazakhstan

Authors: Perzadayeva S., Ospangali N.

unicase

The whole world already uses hydropower stations (hereinafter – **HPP, HPPs**) as a main source of energy while Kazakhstan, possessing one of the most powerful hydro potentials, is only reconstructing its energy production sector. Notably, the government is doing huge work to increase the number of HPPs in the country, yet there is a number of barriers impeding the development.

Sector overview

Kazakhstan is in an active phase of transition from traditional to alternative energy sources. Presidential Decree No. 577 of 30 May 2013 approved the Concept for Transition to a Green Economy. The document contains the goals, objectives, milestones, and steps necessary for the gradual transformation of the existing energy production model. Kazakhstan has set itself the ambitious goal of achieving carbon neutrality by 2060.¹

The Hydropower Development Plan for 2020-2030 establishes the priority activities and performance indicators to identify economically efficient hydro potential of Kazakhstan and to create certain conditions and stimulate the HPPs construction.

Hydropower is the second energy resource after coal in Kazakhstan's electricity generation structure. Altogether, all HPPs in the country produce an average of around 8 billion kWh per year, with the total hydropower potential amounting to 170 billion kWh annually. 62 billion kWh is recognised as technically feasible, where 30 billion kWh per year is economically feasible for use.²

The main hydro potential of Kazakhstan is concentrated in the following regions:

- Irtys River basin with large HPPs (Bukhtarma, Shulbinsk, Ust-Kamenogorsk);
- Ili river basin (Kapshagai, Moinak);
- Syr Darya, Talas and Chu (Shardara) river basins.

The most promising rivers for construction of significant HPPs are the following: Charyn, Chilik, Karatal, Koksus, Tentek, Khorgos, Tekes, Talgar, Usek, Aksu and Lepsy.

Hydropower produces about 9% of total energy in Kazakhstan. At the same time, the potential for hydropower development in Kazakhstan, although uneven, is large. HPPs, installed both in the

¹ President speaks at international conference on achieving carbon neutrality URL://akorda.kz/ru/prezident-vystupil-na-mezhdunarodnoy-konferencii-po-dostizheniyu-uglerodnoy-neytralnosti-1393134

² Borisova S. The great future of small HPPs. 15.07.2020. URL: <https://camonitor.kz/35401-bolshoe-buduschee-malyh-ges.html>

Soviet and post-Soviet periods, play an important part in Kazakhstan energy balance. As of 2016, the average age of Kazakhstani hydropower equipment was 36.5 years.³

The very first HPP in Kazakhstan - the Leninogorsk Cascade (installed capacity of 13.8 MW), was launched in 1928 and continues to operate today.

The latest plant is Moynak HPP, launched in 2011 and working at full capacity (300 MW) since 2012. A series of small HPPs in Almaty and Zhambyl regions were commissioned in 2013.

The Government is actively considering new opportunities and potential territorial resources to identify new possible land plots for HPPs construction. In general, according to the RoK Hydropower Development Plan for 2020-2030, approved by the Deputy Prime Minister of Kazakhstan on 4 September 2020, it is planned to:

- new capacity inputs from major HPPs: 1,300 MW;
- commissioning new capacities of small HPPs: 1,500 MW;
- increase in installed capacity of existing HPPs: 464 MW;
- completion of ongoing projects: 90 MW;
- construction of 70 prospective HPPs.

Among the planned HPP projects to be commissioned are the following:

1. Mini HPP on Tekes river (0.2 MW), Koktal HPP-1 (6 MW), HPP 1 on Baskan river (14.85 MW), commissioning year 2022;
2. HPP Shymbulak 1 on the Tentek River (500 MW), HPP Cascade 1-4 on the middle section of the Charyn River (continuation of Moynak HPP) (220 MW), HPP 1-10 (188.38 MW), commissioning year 2025;
3. HPP 2 on the Tentek river (50 MW), HPP Cascade 3 on the Yrgaity river (5.1 MW), HPP on the Tentek river (5 MW), commissioning year 2026.

Samruk-Energy JSC is carrying out pre-project works on construction of HPP-29, which is included in the company's long-term development strategy for 2022-2031, with a deadline in 2024.⁴ In the long term, reconstruction and modernisation of the HPPs cascade in Almaty region is required, since the existing HPPs have been in operation since 1943. This project will allow efficient use of hydrotechnical resources on the Bolshaya Almatinka River by increasing power generation at the reconstructed HPP-1 and HPP-2.

As part of the development of balancing generation and hydropower in the country's south, Samruk-Energy plans to build a 40 MW counter-regulating Kerbulak HPP on the Ili River in addition to reconstructing Almaty TPP-3, with the ability to provide shunting mode.⁵ The plant will increase the regulating capacity of the Kapshagay HPP up to 300 MW.

³ Domnin S. Hydropower Issues in Central Asia: A View from Kazakhstan. Almaty. 2016. URL:

<https://cabar.asia/ru/segrej-domnin-gidroenergeticheskie-problemy-v-tsentralnoj-azii-vzglyad-iz-kazahstana-2>

⁴ Accounts Committee for Controlling the Execution of the Republican Budget. URL:

<https://www.gov.kz/memleket/entities/esep/press/news/details/290598?lan%3C%2Fi%3Eg=kk&lang=ru>

⁵ Samruk-Energy summed up the year 2020 and spoke about promising projects in the energy sector. URL:

<https://www.samruk-energy.kz/ru/navigation-and-support/projects/11-novosti/818-v-samruk-energo-podveli-itogi-2020-goda-i-rasskazali-o-perspektivnykh-proektakh-v-energetike>

Kazakhstan needs to take more active steps to attract foreign investment, improve legislative regulation, and provide economical support to HPP projects.

Barriers to hydropower development

The government has planned many changes and is gradually introducing innovations, but the fundamental barriers to hydropower projects implementation have not been removed yet. One of the most difficult barriers to overcome is getting land plots for construction. Next, there is insufficient time for commissioning, which is a challenge for developers. And the final barrier is the low profitability of existing plants due to low electricity tariffs.

There are solutions to all these - based on the direct experience of advising investors and HPPs developers in Kazakhstan and international construction experience, a set of measures has been designed to overcome these barriers. Now, let us walk you through the measures.

Land Plots

Investors in hydropower projects face the problem of finding land plots to allocate HPPs; many lands located in favorable zones for HPPs are the lands of the forestry fund and specially protected natural areas, where business activity is limited or banned. To requalify land from the forestry fund and specially protected natural areas to a different category, a Decree of the Kazakhstan government is required. The adoption of such a document may become a very difficult task for investors. It would suffice to mention that during the effective period of the Forest Code since 2003, only three Government resolutions were adopted and categorised the forest land into the land for HPP construction (between 2017-2019), and they all relate to three hydropower plants on the Kora River in the Almaty region:

1. Decree of Kazakhstan government dated 15 September 2017 No. 570 'On Transfer of Certain Forestry Fund Land Plots to Land of Other Category' (with a total area of 7.88 hectares for Korinskaya HPP LLP);
2. Decree of Kazakhstan Government dated 29 May 2019 No. 336 'On Transfer of Certain Forestry Fund Land Plots to Land of Other Category' (with a total area of 7.7 hectares for Korinskaya HPP-2 LLP);
3. The Decree of Kazakhstan Government dated 29 May 2019 No. 329 'On Transfer of Certain Forestry Fund Land Plots to Land of Other Category' (with a total area of 7.4 hectares for Korinskaya HPP-2 LLP).

Forest Code

Clause 1-1 of the article 51 in the Forest Code, states that the transfer of forestry fund lands to lands of other categories for purposes not related to forestry is allowed only in exceptional cases.⁶ The article's exhaustive list of possible cases does not provide for the HPPs construction and mentions only the construction of "power lines". Thus, the Forest Code completely excludes the possibility of withdrawing forest fund land for HPP construction.

In order to solve this problem and develop the hydropower sector, Kazakhstan's legislation needs to be amended. It is recommended to make an addition to clause 1-1 of Article 51 of the Forest Code by including the construction of HPPs in the list of cases allowing the state forestry fund land transfer to the land of other categories for purposes not related to forestry. It is also

⁶ Paragraph 1-1 of the Article 51 of the Forestry Code

recommended to make relevant amendments to the Rules for Transfer from Category of Forestry Fund Lands to Lands of Other Categories for Purposes Not Related to Forest Management, approved by Order of the Minister of Agriculture of Kazakhstan, dated 28 January 2015 No. 18-02/45.⁷

Lands of Specially Protected Natural Areas

Pursuant to Articles 40, 43, 48 and 52 of the Law on Specially Protected Natural Areas, throughout the entire territory of the state nature reserve, a reserve protection regime is effective, which prohibits actions that change the hydrological regime of the territory, the construction of buildings/structures/facilities, roads, pipelines, power lines, and other communications and items, not related to the state nature reserve function.

The only way to organise construction on specially protected lands is to transfer such land plots to reserve lands. At present, this procedure is carried out by decision of the Government in case there is a positive conclusion of the state ecological expertise in accordance with a certain procedure:⁸

1. for the construction, development and operation of facilities of the State Border of the Republic of Kazakhstan and facilities for defence needs in the absence of other options for their possible location;
2. for the construction and operation of water facilities of particular strategic importance⁹, in the absence of other options for their possible location and those land plots only on which the regime of limited business activity is established;
3. for the extraction of solid minerals (except for widespread minerals) those land plots only on which the regime of limited business activity is established;
4. for the construction of engineering infrastructure for tourism facilities (roads, power lines, pipelines).

The current version of the Article 23 of the Law on Specially Protected Natural Areas does not allow the transfer of lands of specially protected natural areas to reserve lands for the construction of HPPs. An exception is only for the construction and operation of water management structures of particular strategic importance (the list of such structures is approved by a separate Government resolution), in the absence of other options for their possible location and only those land plots on which a regime of limited economic activity is established. The overwhelming majority of planned HPP projects do not meet these criteria, and the conversion of protected area land to reserve land for HPP construction is exceptionally difficult for investors ¹⁰.

To remove this legal barrier it is recommended to introduce amendments to Article 23 of the Law on Specially Protected Natural Areas, which would allow transferring specially protected natural areas to HPPs construction with minimum environmental impact (subject to their type and capacity) and the Rules for Transferring Land of Specially Protected Natural Areas to Reserve

⁷ Amendments to the relevant by-laws may be made as a result of the amendments

⁸ Article 23 of the Specially protected natural areas

⁹ Decree of the Government of RK No. 933 of 29 December 2017 'On the list of water management facilities of special strategic importance, including those that may be leased and managed in trust'

¹⁰ Resolution No. 172 of the Government of the Republic of Kazakhstan dated 17 February 2009 "On Approval of the Rules for Transfer of Land of Specially Protected Natural Areas into Reserve Land and Transfer of Reserve Land back into Specially Protected Natural Areas"

Land and Transferring Reserve Land Back to Land of Specially Protected Natural Areas, approved by the Resolution of Kazakhstan Government dated 17 February 2009 No. 172.

Low electricity tariff

The electricity tariff is the actual price for selling electricity generated by HPPs, thus the entire financial return of the plants is bound by the tariff.

Fixed tariffs are approved by the Government for 15 years for each type of renewable energy source (hereinafter – the **RES**), the support for which is found in documents of the State Planning System of Kazakhstan. Approved fixed tariffs are indexed annually in accordance with the procedure determined by the Government (Decree dated March 27, 2014 No. 271 "On Approval of the Rules for Determination of Fixed Tariffs and Marginal Auction Prices"). Approved tariffs, depending on the structure of project financing and economic feasibility, are subject to annual indexation, taking into account changes in the currency exchange rate.

This foreign currency indexation procedure is financially detrimental to HPP investors. The currency situation in Kazakhstan is unstable and investors incur huge losses as a result of the established tariff at the time of construction not changing in proportion to the national currency fluctuations, and revenues from power generation significantly decrease in relation to the foreign currency.

To solve this, it is proposed to introduce a new mechanism for electricity tariff setting for HPPs by means of a direct proportional calculation.

Insufficient Time for HPP Construction

In accordance with the policy of the Republic to develop the RES sector and to support the use of RES, the Government purchases electricity for a period of 15 years from the date of commencement of complex tests, in which the supply of electricity to the power grid is implemented, or from the expiry date of submission of the facility acceptance certificate in accordance with the sale-purchase agreement, whichever comes first.¹¹ The Settlement and Financial Centre for Renewable Energy Support LLP (hereinafter – the **FSC**) procures electricity from producers (Government Decision No. 1281 of 29 November 2013).

The terms and conditions of electricity purchase by the FSC are determined by Order No. 480 of the Minister of Energy dated 28 December 2017 "On Approval of the Standard Forms of Contracts of the Settlement and Financial Centre with Energy Producers Using Renewable Energy Sources, Energy Waste Management, Energy Producers Producing and Releasing Flood Electricity into the Network, Conditional Consumers and Qualified Conditional Consumers" (hereinafter – the **Rules**).

In accordance with the Rules, the seller (HPP investor) provides the FSC with a copy of the RES facility acceptance certificate in accordance with the legislation in the field of architectural, urban planning, and construction activities within sixty (60) months from the date of signing the contract. The HPP construction is complex to implement technically, and obtaining permits, construction, and installation work requires a large amount of time. The HPP investors simply do not have time to complete a start-up within five years of contracting.

¹¹ Paragraph 14 of the Article 7-1 of the Law on RES

In order to solve this barrier and encourage investors to build HPPs, it is proposed to increase the deadline for commissioning HPPs as set out in sub-paragraph 18 of Paragraph 11 of the Rules. It is also possible to eliminate the requirement for a single deadline for commissioning by shifting to determining the deadline for each HPP project individually.

HPPs will provide a bright future for Kazakhstan's energy production sector and increase the country's investment attractiveness. Thus we believe that the state is able to overcome all existing barriers by improving the legislation and economics of energy production.