

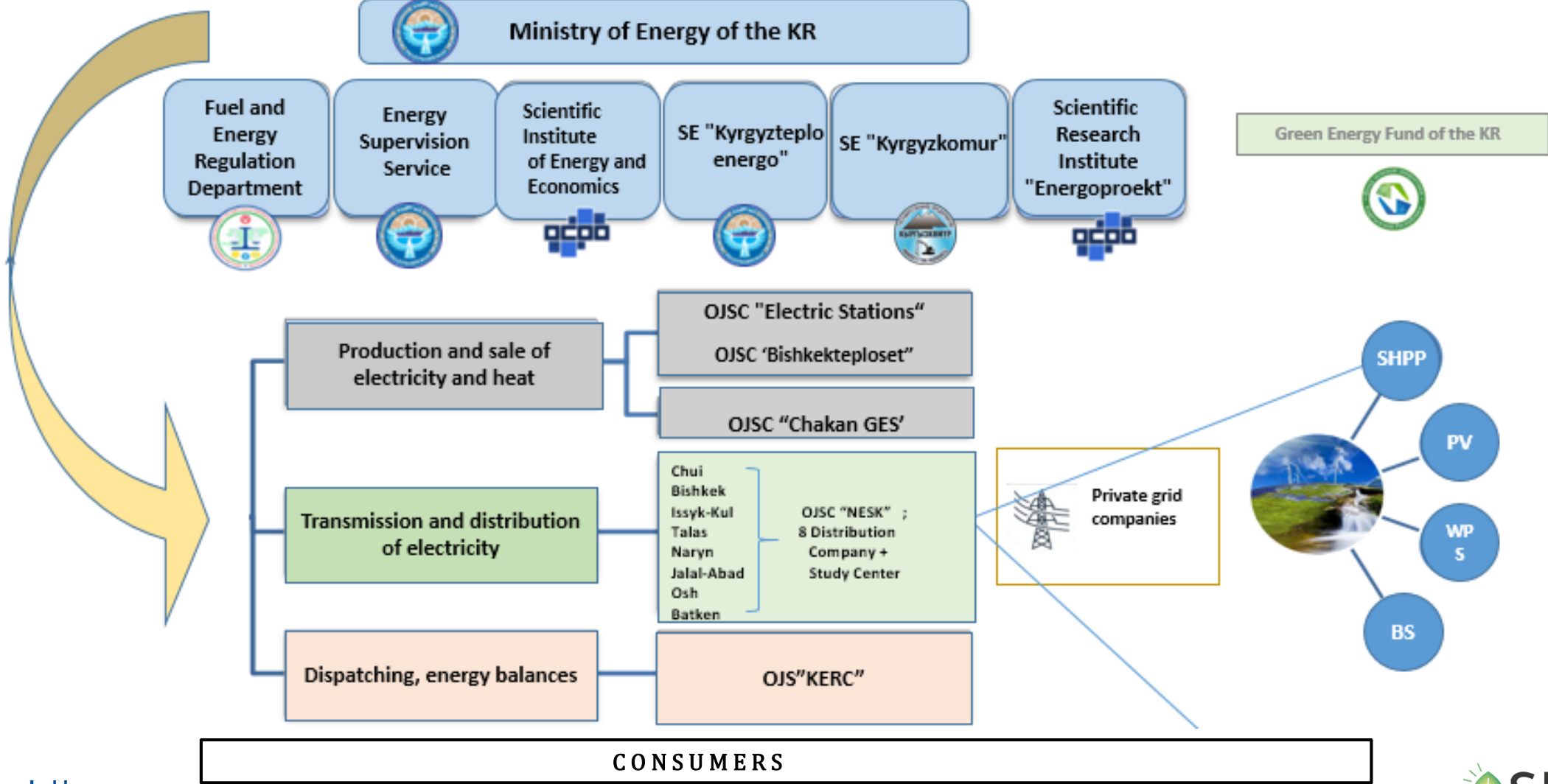
DEVELOPMENT OF SMALL HYDROPOWER ENERGY SECTOR IN KYRGYZSTAN - FROM ASSESSMENT TO IMPLEMENTATION

Kazakova Eleonora, energy expert

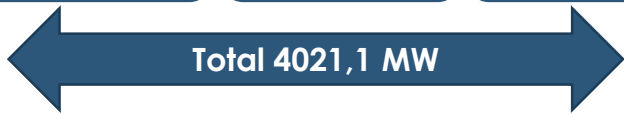
International Conference
“Sustainable energy in Kyrgyzstan: prospects and challenges”
15 May 2023, Bishkek



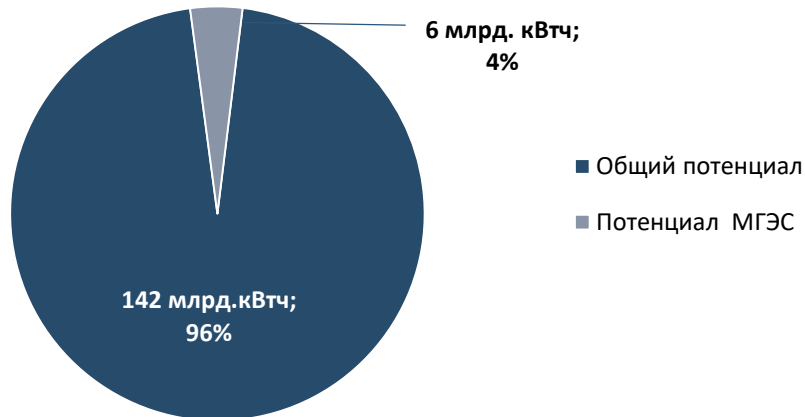
STRUCTURE AND MANAGEMENT OF THE ENERGY SECTOR OF KYRGYZSTAN



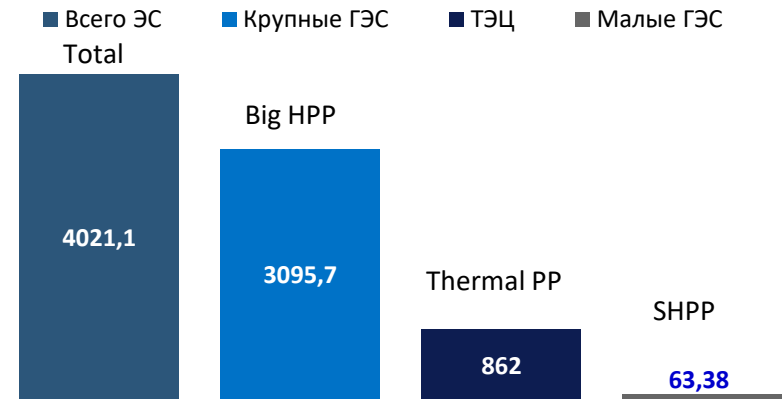
ENERGY SECTOR OF KYRGYZSTAN



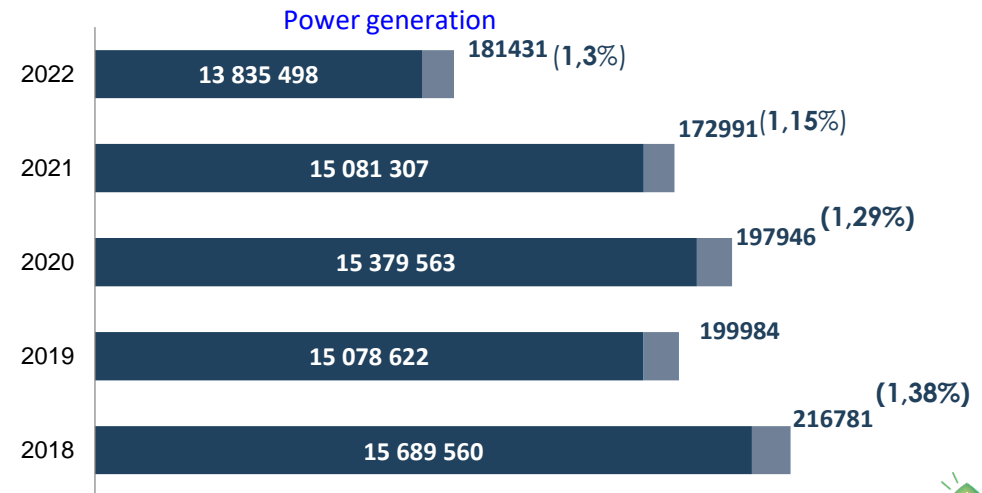
Total power generation potential



HPP Power, MW



Выработка э/э по энергосистеме КР (кВтч), 2018-2022

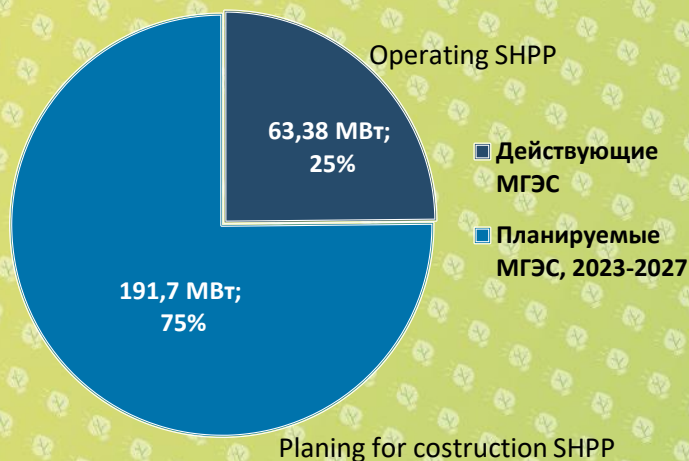
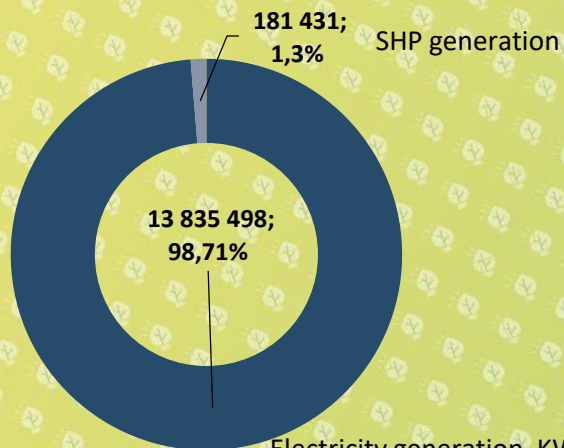


PERSPECTIVE SITES FOR SHPPs

SOURCE	LINKS
<p>1. Ministry of Energy of the Kyrgyz Republic. Information interactive map. Data on potential RES projects (HPP, FV, WPP). Planned capacity is not indicated anywhere</p>	<p>https://minenergo.gov.kg/ru/projects</p>
<p>2. State portal of open data of the Kyrgyz Republic. Data on the availability of sites for the construction of SHPPs in the regions of the Kyrgyz Republic (130 sites). Planned capacity is not indicated</p>	<p>Chu region https://data.gov.kg/dataset/perechen-potencialnyh-stvorov-dlya-stroitelstva-novyh-malyh-ges-po-chujskoj-oblasti Issyk Kul region https://data.gov.kg/dataset/perechen-potencialnyh-stvorov-dlya-stroitelstva-novyh-malyh-ges-po-issyk-kulskoj-oblasti/resource/a8253de7-052e-4361-b1ab-b665d5cceb7e Talas region https://data.gov.kg/dataset/perechen-potencialnyh-stvorov-dlya-stroitelstva-novyh-malyh-ges-po-talasskoj-oblasti Naryn region https://data.gov.kg/dataset/perechen-potencialnyh-stvorov-dlya-stroitelstva-novyh-malyh-ges-po-narynskoj-oblasti Jalalabad region https://data.gov.kg/dataset/perechen-potencialnyh-stvorov-dlya-stroitelstva-novyh-malyh-ges-po-dzhalal-abadskoj-oblasti Osh region https://data.gov.kg/dataset/perechen-potencialnyh-stvorov-dlya-stroitelstva-novyh-malyh-ges-po-oshskoj-oblasti Batken region https://data.gov.kg/dataset/perechen-potencialnyh-stvorov-dlya-stroitelstva-novyh-malyh-ges-po-batkenskoj-oblasti</p>
<p>3. CJSC "Inkraff". An interactive map was developed, which includes a list of 63 potential SHPP sites with indication of the technical parameters of the HPP. The map was handed over to the Ministry of Energy and Industry in 2015. Due to the liquidation of the ministry it was not published.</p>	<ul style="list-style-type: none"> <i>(can be requested from the Ministry of Energy or the Kyrgyz Republic or from the developer)</i>
<p>4. Investment Agency under the President of the Kyrgyz Republic. Interactive map. Investment projects for the construction of 16 SHPPs with an indication of the planned capacity for each project. The total installed capacity of the stations is 148,6 Mw</p>	<p>https://invest.gov.kg/investmap/map.xhtml?lang=ru#</p>
<p>5. "Tazabek" online edition. Interactive map of operating and planned for construction SHPPs (139 sites), indicating the planned capacities and owners of projects that have received the Certificate of RES-subject. Some projects consist of a cascade of several SHPPs, for which data are not provided separately. Many projects are not confirmed by the presence of a preliminary feasibility study.</p>	<p>https://www.tazabek.kg/news:1791907</p>
<p>6. The Ministry of Energy in 2023 identified 88 potential SHPP sites for the Green Energy Fund of the Kyrgyz Republic. The table contains geographic coordinates. The capacity of the HPPs is not indicated.</p>	<p>https://www.gov.kg/files/news/froala/be55d81e69c9e08e1b5881d84d29320b5dc4c4b7.xls x</p>

■ Выработка э/э по энергосистеме КР (кВтч), 2022 г.

■ Малые ГЭС



	Название	Мощность, МВт
1	Малая ГЭС	0,4
2	Лебединовская ГЭС	7,6
3	Аламединская ГЭС-1	2,2
4	Аламединская ГЭС-2	2,5
5	Аламединская ГЭС-3	2,1
6	Аламединская ГЭС-4	2,1
7	Аламединская ГЭС-5	6,4
8	Аламединская ГЭС-6	6,4
9	Быстровская ГЭС	8,7
	Итого "ОАО "Чакан ГЭС"	38,4
10	Иссык-Атинская ГЭС	1,6
11	Калининская ГЭС	1,4
12	Марьям ГЭС	0,5
13	Сокулукская ГЭС-2	2,4
14	Тегирментинская ГЭС	3
15	Кок-Сайская ГЭС	3,4
16	Конур-Олонская ГЭС	3,6
17	Тонская ГЭС	3,6
18	Найманская ГЭС	0,6
19	Кыргыз-Ата ГЭС	0,4
20	Джидалик ГЭС	1
21	Жиптик ГЭС	2
22	Ак-Бура (Озгур) ГЭС	0,23
23	Буйга ГЭС	0,4
25	Окталио ГЭС	0,85
	Итого частные МГЭС	24,98
	Всего МГЭС	63,38

THE POTENTIAL OF SMALL HYDROPOWER OF KYRGYZSTAN

SHPP Construction Plan (MW), 2023-2027

	Название	Мощность, МВт		Название	Мощность, МВт
1	Бала-Саруу ГЭС	25	1	Ак-Терек ГЭС	4
2	Лейлек ГЭС	6	2	Саркент ГЭС	2
3	Кыштут ГЭС	1	3	Турген ГЭС	15
4	Көгарт ГЭС	7	4	Шамси ГЭС	10
5	Ыссык-Ата ГЭС	4	5	Боз-Учук ГЭС	0,7
6	Кайнама-1 ГЭС	9,6	6	Жергез ГЭС	6,2
7	Исфайрам-1 ГЭС	4	7	Кара-Жыгач	1
8	Ала-Башская ГЭС 1	4,5	8	Сары-Таш	1
9	Аксы ГЭС	2,6	9	Аманат	0,5
10	Тосту ГЭС	1	10	Адын-Ункур	0,85
11	Белес ГЭС	0,54	11	«СиЭнЭй Энерджи»	12
12	Айгыр Жал ГЭС	2,4	12	Кожо-Кайыр ГЭС	0,3
13	Курак-Тектир	1,2	Всего в 2024 г.		53,55
14	Ленинполь	2,3	1	Орто-Токой	21
15	Буйга	6	2	Каракуль	18
16	"СиЭнЭй Энерджи" ЖЧК	2	3	Папан	20
Всего в 2023 г.		79,14	Всего до 2027 г.		59
					191,7

LEGAL REGULATION IN THE SPHERE OF RES IN KYRGYZSTAN

By 2030, Kyrgyzstan has set a goal to reduce greenhouse gas emissions by 44% and achieve carbon neutrality by 2050.

To this end, steps are being taken in the country to improve the legislative framework, tariff policy and the regulatory system of the energy sector, including the renewable energy sector.



Funded by
the European Union

LEGAL REGULATION IN THE SPHERE OF RES in KYRGYZSTAN

National policy:

- National Energy Program for 2008-2010 and Development Strategy for the Fuel and Energy Complex until 2025
- National Development Strategy of the Kyrgyz Republic for 2018-2040
- The concept of green economy in the Kyrgyz Republic "Kyrgyzstan - a country of green economy" (2018)
- Green Economy Development Program (2019)
- Master plan for the development of the energy sector of the Kyrgyz Republic until 2040 (2022)
- National Water Strategy - 2040

Codes, laws, legal acts:

- Codes: Land, Water, Forest
- Laws: "On Energy", "On Electricity", "On Investments in the Kyrgyz Republic", "On PPP"
- **Law on Renewable Energy Sources (subject to change)**
- Regulation "On the conditions and procedure for the implementation of activities for the generation and supply of electricity using RES" (Decree of the Government of the Kyrgyz Republic No. 583 of 10/24/2022)
- Regulations on the procedure for issuing documents for the design, construction and other changes in real estate and assessing the conformity of commissioned completed facilities in the Kyrgyz Republic (Resolution of the Cabinet of Ministers of the Kyrgyz Republic No. 114 dated 08/06/2021)
- Rules for the technological connection of generating sources, electrical networks of electrical distribution organizations and electrical installations of consumers to electrical networks (Resolution of the Government of the Kyrgyz Republic dated March 29, 2018 No. 169)
- Order of the Department for Regulation of the Fuel and Energy Complex under the Ministry of Energy of the Kyrgyz Republic "On the establishment of a single tariff for electricity generated by installations using renewable energy sources" dated January 23, 2023 No. 8.
- Decree of the President of the Kyrgyz Republic N 62 dated March 23, 2023 "On the issues of transfer of land intended for the use of renewable energy sources"



LAW OF THE KYRGYZ REPUBLIC “ON RENEWABLE ENERGY SOURCES” (FROM 30/06/2022 No. 49)

Current provisions

- Small HPPs include stations up to 30 MW, other RES without limitation
- Free sale of energy obtained from RES to its consumers
- Preferential period of 15 years for the purchase of electricity from renewable energy entities using a multiplying factor of 1.3 (1kWh = 3.4 * 1.3 = 4.42 som (0.05 \$))
- Acquisition of RES electricity by an energy company under the **relevant agreement**, regardless of which electricity company's networks the RES installation is connected to
- Supply and payment of electricity from renewable energy entities on the basis of a Power Purchase Agreement concluded for the duration of the preferential period
- Unhindered transit of electricity from renewable energy entities

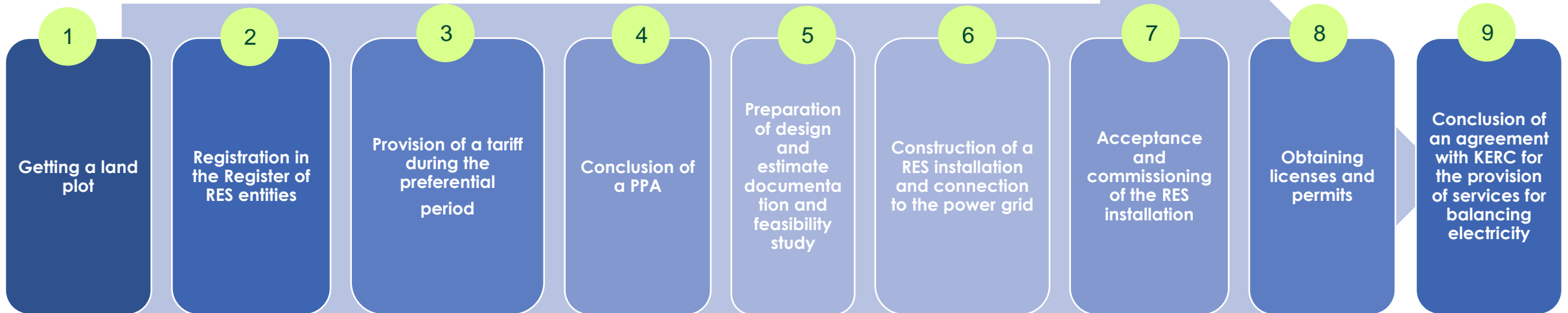
LAW OF THE KYRGYZ REPUBLIC “ON RENEWABLE ENERGY SOURCES” (FROM 30/06/2022 No. 49)

Suggested changes

- Preferential period for renewable energy projects using water energy for a period of 15 years, using solar, wind, biomass, geothermal energy for 25 years
- Approval by the Cabinet of Ministers of the Kyrgyz Republic of a standard form of a Power Purchase Agreement for the supply of electricity from RES
- Indexation of the tariff for electricity from RES to the US dollar exchange rate during the preferential period
- Implementation of the auction bidding mechanism for the selection of the most cost-effective projects
- Development of regulations on microgeneration and rules for connecting microgeneration facilities to the national power grid

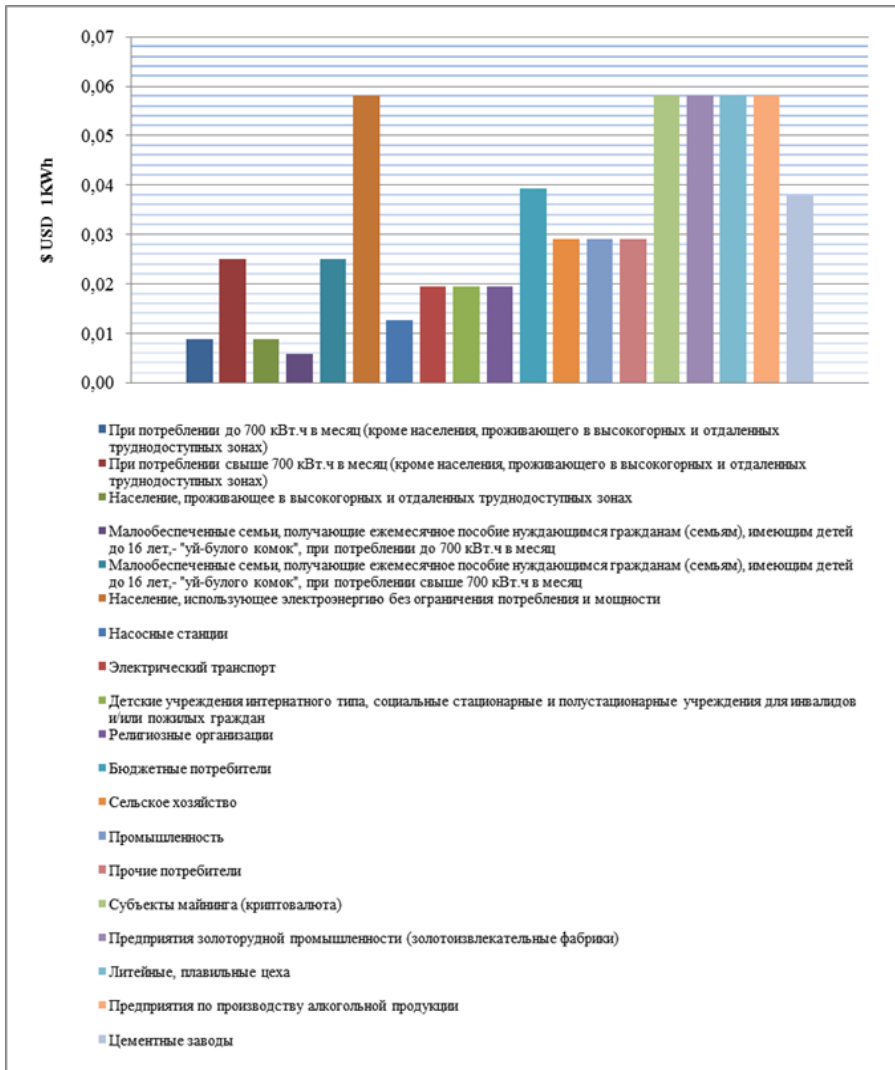
Regulation "On the generation and supply of electricity using RES" (Decree of the Government of the Kyrgyz Republic No. 583 of 10/24/2022)

Stages of implementation of activities for the generation and supply of electricity using renewable energy sources



TARIFF POLICY

National electricity tariffs, 2023 r.



By order of the Department for Regulation of the Fuel and Energy Complex under the Ministry of Energy of the Kyrgyz Republic "On the determination of a unified tariff for electricity generated by RES installations" dated January 23, 2023 No. 08, the following tariff was approved:

Name of energy source	Max.tarif	Coeff.	Som	US\$
All RES	3,40	1,3	4,42	0,05



LEGAL REGULATION IN THE SPHERE OF RES IN KYRGYZSTAN

Tax Code of the Kyrgyz Republic

- Exemption from income tax for 5 years from the date of commissioning
- Exemption from VAT on imports into the territory of the Kyrgyz Republic of specialized goods and equipment intended for the construction of power plants using renewable energy sources (the list of equipment is approved by the Cabinet of Ministers)

Land legislation

- Exemption from compensation for agricultural and forestry losses during the construction of RES installations by domestic investors, for PPP projects
- A draft NLA is being developed on the provision and use of lands of the water fund

Licensing legislation

- Subjects of the fuel and energy complex are required to obtain a license for the sale of electrical energy issued by the authorized state body for the regulation of the fuel and energy complex. RES entities are exempted from obtaining a license for the production of electrical energy. "Production, transmission, distribution, sale, export and import of electrical energy (with the exception of the production of electrical energy resulting from the use of renewable energy sources, as well as the production of electrical energy from any energy sources for own use with a power of up to 1000 kW)"

BARRIERS TO THE IMPLEMENTATION OF SHPP PROJECTS

- Frequent changes in the management structure of the energy sector
- The inefficiency of ongoing reforms in the energy sector
- Absence of a strategic document for the development of the renewable energy sector
- Absence of a balanced policy for the management of land, water and electricity resources
- Duplication of functions of authorized bodies and the lack of an interdepartmental unified approach to the implementation of the renewable energy development policy
- Lack of information on the economically viable volume of SHPP construction at the country level
- Subjective decisions and incompetence of some local officials

Institutional



- Absence of legal acts (until 2020) regulating the stages, procedures and conditions for the implementation of projects for the construction and commissioning of SHPP
- Difficulties in allocating land plots for the construction of SHPP
- Absence of the concept of “right to water” in water legislation
- Lack of land cadastral information and lack of hydrological data for regional planning of SHPP commissioning
- Absence of an approved form of the Contract for the supply of electricity
- Different interpretation of the norms of land, water legislation

Legal



- High external debt of the energy sector
- Huge deficit of the energy sector's own funds
- Low electricity tariff
- Determination of prices for energy and services in the fuel and energy complex not based on the real costs of energy companies
- High bank rates on loans
- Limited use of investment schemes such as leasing, bond issuance and project financing tariff for electricity for the purchase of renewable energy installations (including SHPP), fixed in the national currency
- Increase in the cost of capital investments in the construction of hydraulic structures

Financial



BARRIERS TO THE IMPLEMENTATION OF SHPP PROJECTS

- Seasonality of electricity generation, low water and drying up of rivers
- Problems of silting and rising water levels, flooding and flooding of the banks
- Landslide phenomena
- Insufficient knowledge of the effect of seismicity on hydraulic structures and buildings of small hydropower plants
- Snow cover and ice phenomena (ice and slush)

Natural



- Weak production and repair base of enterprises
- Lack of qualified engineering and operational personnel
- Lack of comprehensive studies and a full evaluation of projects at low national tariffs lead to the wrong choice of technologies and equipment
- Irrational approach to the choice of technical solution in order to reduce costs (for example: SHPP with 1 hydro unit)
- Remoteness of SHPP sites from power lines, which increases the cost of construction projects

Technical



- Almost 100% access of consumers to electric networks at low tariffs does not stimulate the transition to the use of renewable energy installations
- The low level of well-being of a significant part of the population
- Difficulty in getting a job for graduates of specialized educational institutions in the renewable energy sector

Social



- Poor knowledge of the regimes of small rivers and watercourses due to lack of funding for these purposes
- Lack of national modern methods, instructions and SNiPs for the construction and operation of SHPPs
- Classifiers in the system of the National Statistical Committee are not adapted to collect information on the production of RES and energy management
- The backlog of the content of training programs in secondary specialized and higher educational institutions from modern needs and technologies

Informational



THANK YOU FOR YOUR ATTENTION

