



**NATIONAL  
ENERGY HOLDING**

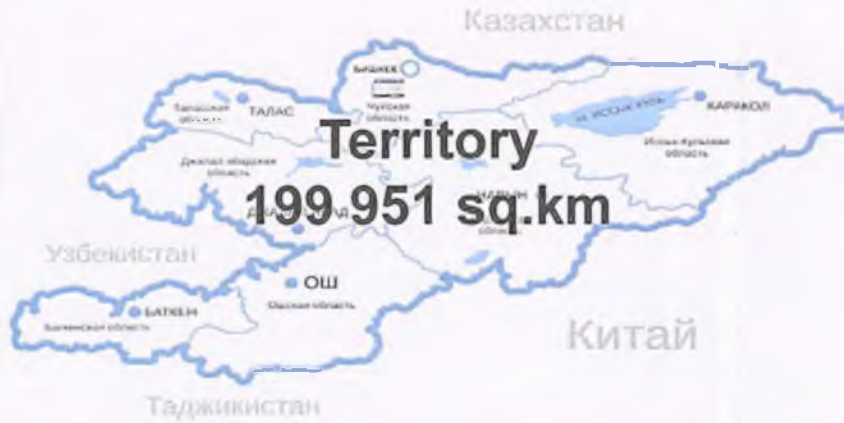


# **Perspective Investment Projects in the Field of Energy**

Bishkek, 2020



# Kyrgyz Republic



**POPULATION 6,2 mln**

**63,5 % working age population;**

**99,2 % of adult population has education.**



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**CURRENCY** Som-KGS

1 USD=69,5 KGS



**GDP**

8 billion US Dollars

**STATE LANGUAGE**

Kyrgyz

**OFFICAL LANGUAGE**

Russian

**HYDRO POWER POTENTIAL**

142 billion kWh

# Structure of the National Energy Holding



NATIONAL ENERGY HOLDING

## Transmission



НАЦИОНАЛЬНАЯ ЭЛЕКТРИЧЕСКАЯ СЕТЬ КЫРГЫЗСТАНА

Settlement center

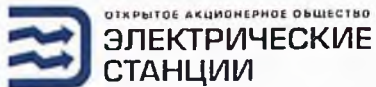


КЫРГЫЗСКИЙ ЭНЕРГЕТИЧЕСКИЙ РАСЧЕТНЫЙ ЦЕНТР



# NATIONAL ENERGY HOLDING

## Generation

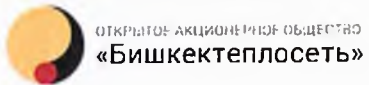


ОТКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО ЭЛЕКТРИЧЕСКИЕ СТАНЦИИ



ОТКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО ЧАКАН ГЭС

Теплоснабжение г. Бишкек



ОТКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО «БИШКЕКТЕПЛОСЕТЬ»

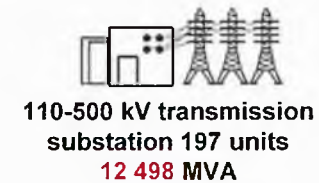


Subscriber base 1.5 million

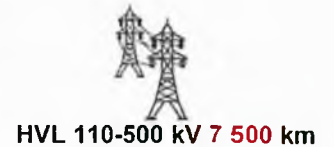


Overall number of staff 16 350 people

## Distribution and marketing



110-500 kV transmission substation 197 units 12 498 MVA



HVL 110-500 kV 7 500 km



LVL 0,4-35 kV 59 700 km



Distribution substations 23 915 units



HPP 3070 MW TPP 862 MW

Average annual generation

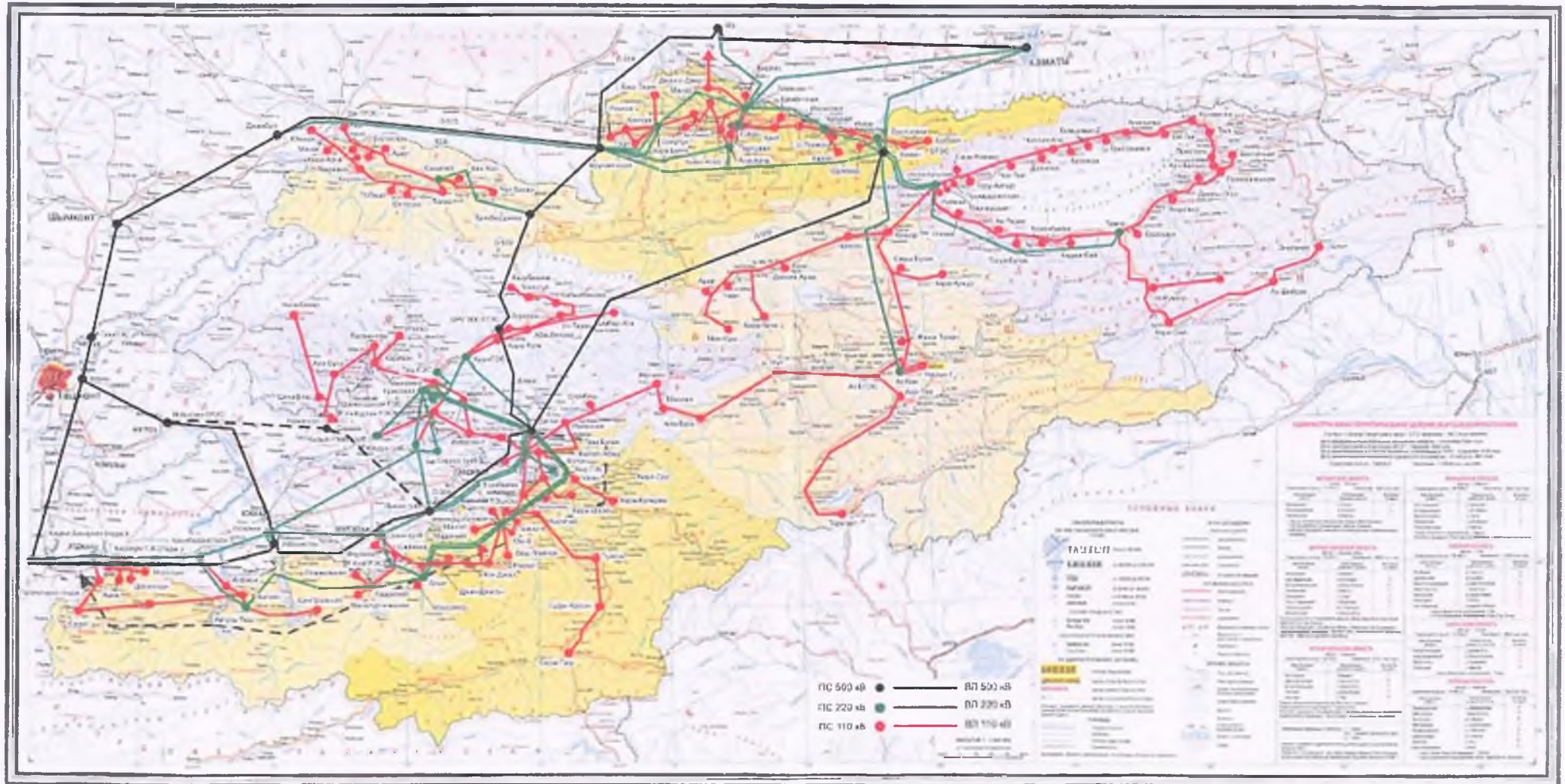


- electricity energy 14 billion kWh  
- heat energy - 2 000 thousand Gcal

# The Diagram of the Main Electrical Network of the Kyrgyz Republic's Energy System.



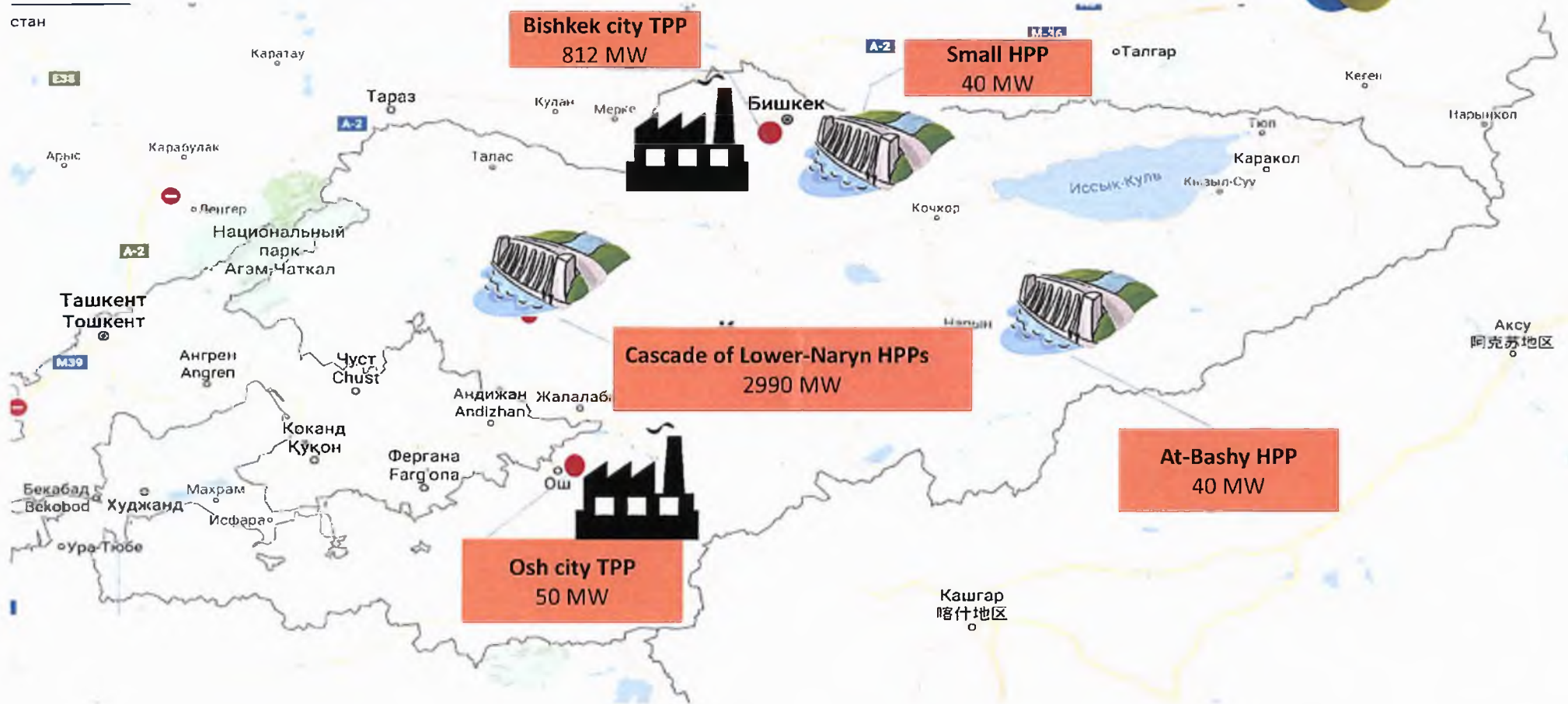
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# Main Generating Capacities



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**LARGE HPPs**  
**3030 MW**

**SMALL HPPs**  
**40 MW**

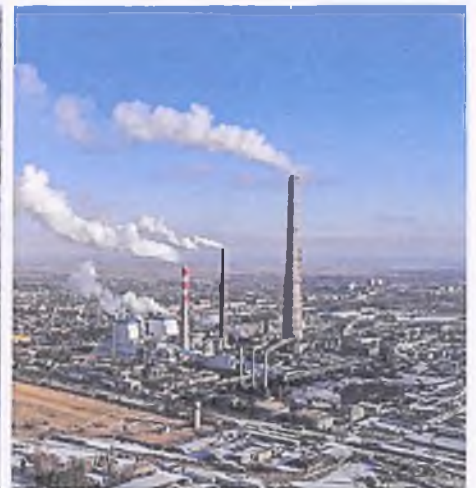
**TPPs**  
**862 MW**

**TOTAL**  
**3932 MW**



## Main Generating Capacities

Name	Capacity	Commission date
Toktogul HPP	1200 MW	1975
Kurpsai HPP	800 MW	1982
Tash-Kumyr HPP	450 MW	1987
Shamaldy-Sai HPP	240 MW	1992
Uch-Kurgan HPP	180 MW	1961
At-Bashy HPP	40 MW	1970
Kambar-Ata HPP-2	120 MW	2010
<b>Total large HPPs</b>	<b>3030 MW</b>	
Bystrovka HPP	8,7 MW	1954
Lebedinovka HPP	7,6 MW	1943
Cascade of Alamedin HPPs	23,7 MW	1957
<b>Total small HPPs</b>	<b>40 MW</b>	
Bishkek TPP	812 MW	1961
Osht TPP	50 MW	1988







## Hydropower potential



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142,5  
billion  
kWh

**GENERAL HYDROPOWER  
POTENTIAL**

III

**PLACE IN THE CIS AFTER  
RUSSIA AND TAJIKISTAN**

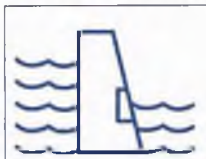
10%

**UTILIZED**



IT IS POSSIBLE TO CONSTRUCT ON THE NARYN  
RIVER:

7 cascades



27 hydro power plants



**5 600 MW**

Total installed capacity









**20 billion kWh**

Average multi-annual generation

# Perspective Projects



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	HPP POWER	CONSTRUCTION PERIOD	Electric energy generation mln. kWh	\$ PROJECT AMOUNT	 STATUS
Construction of Upper-Naryn Cascade of HPPs	237,7 MW	5 years	942,4	727,7 mln.\$	FS and Project Developed
 Construction of Kamar-Ata-1 HPP	1860 MW	8 years	5 640	2 868,5 billion \$	FS Developed
 Construction of Suusamyr-Kokomeren Cascade of HPPs	1305 MW	8 years	3 317	3,3 billion \$	Preliminary FS Developed
 Construction of Kazarman Cascade of HPPs	1160 MW	8 years	4 661,6	2 billion \$	FS Development is required
 Construction of Small HPPs	95 MW	3 years	450	100 mln \$	FS Development is required

# Upper-Naryn cascade of HPPs



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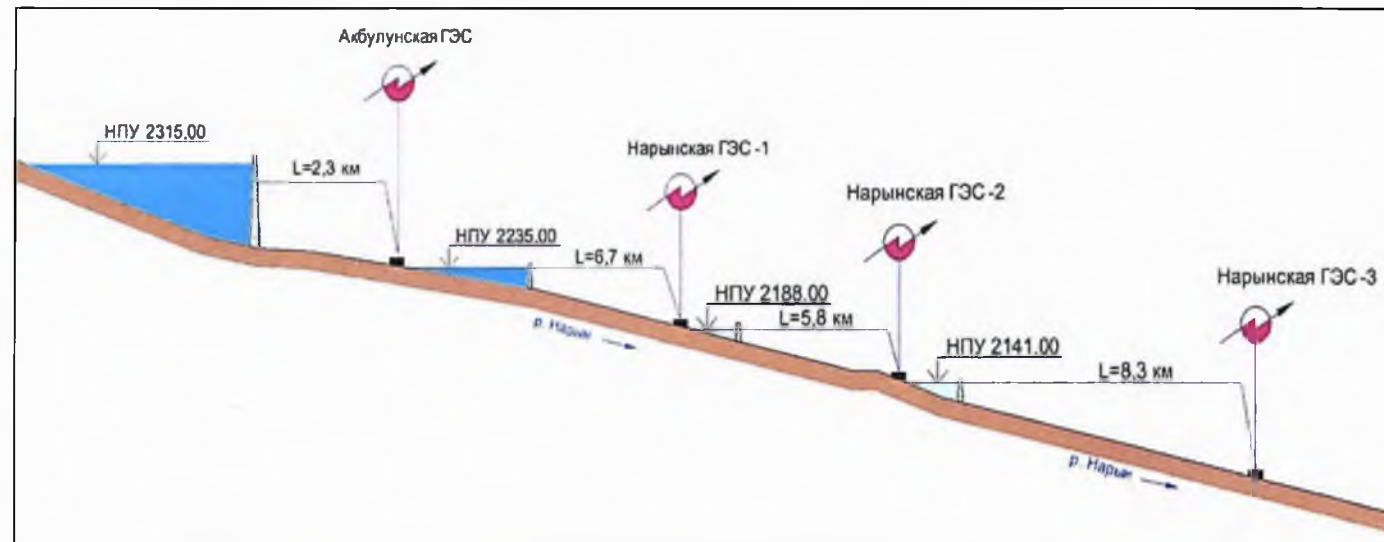
HPP name	Installed capacity, MW	Average multi-annual generation, mln. kWh	Dam height, m	Construction period, months
Akbulun HPP	87,4	345,5	75	72
Naryn HPP-1	47,7	187,5	20,5	36
Naryn HPP-2	47,6	188,8	19	36
Naryn HPP-3	55,0	220,5	9	48
<b>Total</b>	<b>237,7</b>	<b>942,4</b>		<b>86</b>

## Location:

The cascade is designed in the upper reaches of the Naryn river, with absolute elevations of 2100-2300 m. All stations are designed according to the dam-diversion scheme with small reservoirs, which reduces the area of flooded lands.

## Construction infrastructure:

- ✓ There exists a production infrastructure
- ✓ Close proximity of the highway of the national importance
- ✓ There is an existing 35 kV overhead power line on the right bank of the river
- ✓ The main type of transport in the area of construction is automobile. The nearest railway station "Balykchy" is located at a distance of 183 km
- ✓ The necessary land plots for the construction of hydropower plants are provided
- ✓ The feasibility study of the project and a part of project documentation is developed



The chosen cascade scheme allows the full use of the fall of more than 30-km stretch of the river - the lower pool of the overlying plants is the reservoirs of the underlying ones

## Completed works



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- Allocated 2459.04 hectares of land
- The first stage of the shift camp for 450 people, readiness - 100%
- Facility “Pioneer base”, readiness - 80%
- Facility “Shift camp”, readiness - 95%
- The facility of the main construction “Surface Spillway Naryn HPP-1”  
1st stage, readiness 100%
- The facility of the main structure “Diversion canal Naryn HPP-1”  
readiness - 10%
- Concrete mixing plant – 35 m<sup>3</sup>/h, performed commissioning, at the moment  
plant produces concrete (produced 1,000.0 m<sup>3</sup> of concrete)



## Completed works



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- Facility “Temporary bridge Naryn river”- readiness 30%.
- Facility “Onsite road”, readiness 100%
- Temporary power supply - have been put into operation: substation 35/10 kV, more than 10 km of 35 kV and 10 kV overhead lines, 8 transformers of various capacities
- Production of inert materials - deployed two crushing and screening facilities, produced 20 thousand cubic meters of inert materials

**Project survey work** – development of project documentation for the construction of the main hydro unit cascade, working documents (Akbulun HPP and Naryn HPP-1). Topographical survey completed, main constriction plan refined.



## Kambar-Ata-1 HPP



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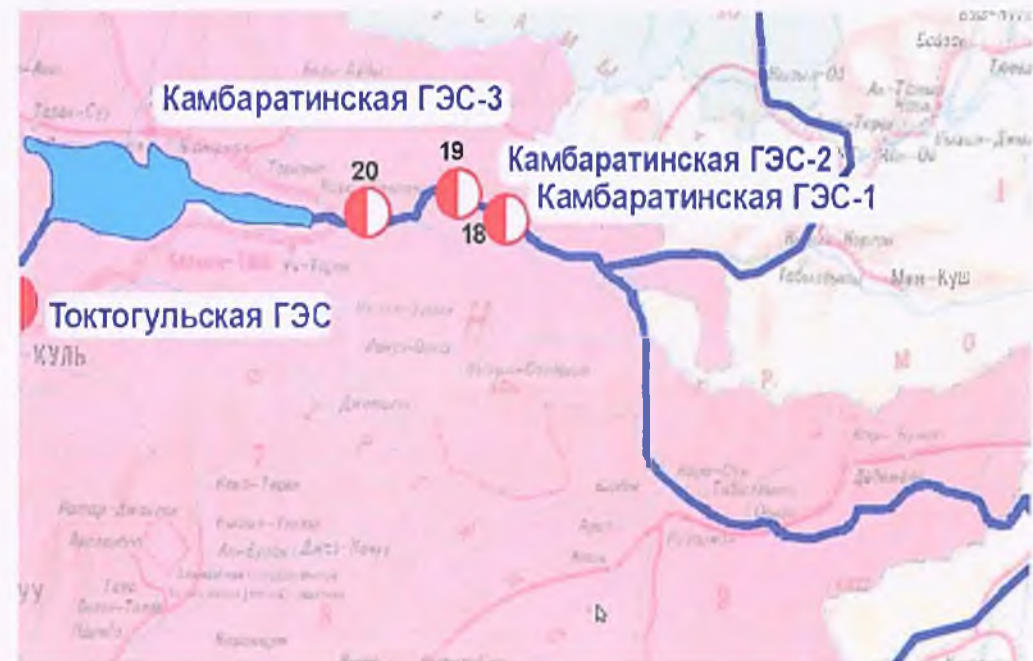
Name	Normal headwater level, NHL, m	Installed capacity, MW	Electric energy generation, mln. kWh	Reservoir volume mln.cbm	HPP type
Kambar-Ata-1 HPP	1 198	1860	5 640	2 730	Near dam type

### Location:

The dam of Kambar-Ata HPP-1 is located on the Naryn river in the V-shaped canyon, 14 km above the Kambarata HPP-2

### Construction infrastructure:

- ✓ There is a production infrastructure that was used during the construction of Kambar-Ata HPP-2
- ✓ There are the sufficient reserves of quarries of building materials for construction of the dam of Kambar-Ata HPP-1
- ✓ The close proximity of the republican road and a 500 kV power line connecting the North and South of the country
- ✓ Feasibility study developed (by SNC Lavalin International Inc.)



# Suusamyр-Kokomeren Cascade of HPPs



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HPP name	Reservoir volume mln.cbm	Installed capacity, MW	Electric energy generation, mln. kWh
Karakol	400	33	95,0
Kokomeren 1	680	360	848
Kokomeren 2	19,5	912	2374
Total		1305	3317

## Location:

Suusamyр-Kokomeren cascade of HPPs (hereinafter SKC) is located on the river Kokomeren, which is a tributary of the Naryn. The catchment area of 10400 sq. km, length – 199 km. The average altitude of the basin - 2737 m. the highest monthly average temperature is plus 39 degrees Celsius in the area of Chaek, the lowest temperature is minus 37 degrees Celsius. Geographically it is located in Jaiyl district of Chui oblast and Toktogul district of Jalal-Abad oblast.



## Kazarman Cascade of HPPs



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HPP name	Normal headwater level, NHL, m	Installed capacity, MW	Electric energy generation, mln. kWh	Reservoir volume mln.cbm	HPP type
Alabuga HPP	1 570	600	2 358,3	2 835,5	near dam
Karabulung HPP-1	1 370	149	536	110	near dam
Karabulung HPP-2	1 370	163	852	110	diverting dam
Toguztoroo HPP	1 327	248	915,3	168,5	near dam
<b>Total for the Cascade</b>		<b>1 160</b>	<b>4 661,6</b>		

### Location:

The Kazarman cascade is located on the Naryn river section between its inflows – the Alabuga and the Kokomeren rivers.

### Construction Infrastructure:

The existing road of the republican significance with a length of 155 km provides an exit from the Naryn zone to the cities of Osh and Jalal-Abad.

In addition, construction of an alternative North-South road has begun in this area.

Precipitation - 303 mm per year; The relief is mountainous; Seismic activity - 9 points.





# The Map of Priority Small HPPs



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The List of Small HPPs

No	Names of HPPs	Capacity, MW	Location, river
1	Orto-Tokoi	25	Orto-Tokoy Reservoir
2	Kirov	21	Kirov Reservoir
3	Papan	20	Papan Reservoir
4	Karakul (Kara-Suu-1,2)	18	Kara-Suu river, (left)
5	Tayan	3,5	Sokh river
6	Tortkul	3	Tortkul Reservoir

## Perspective small HPPs



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### Kirov SHPP:

Installed capacity – **21** MW

Average generation - **91,4** million kWh

### Karakul SHPP:

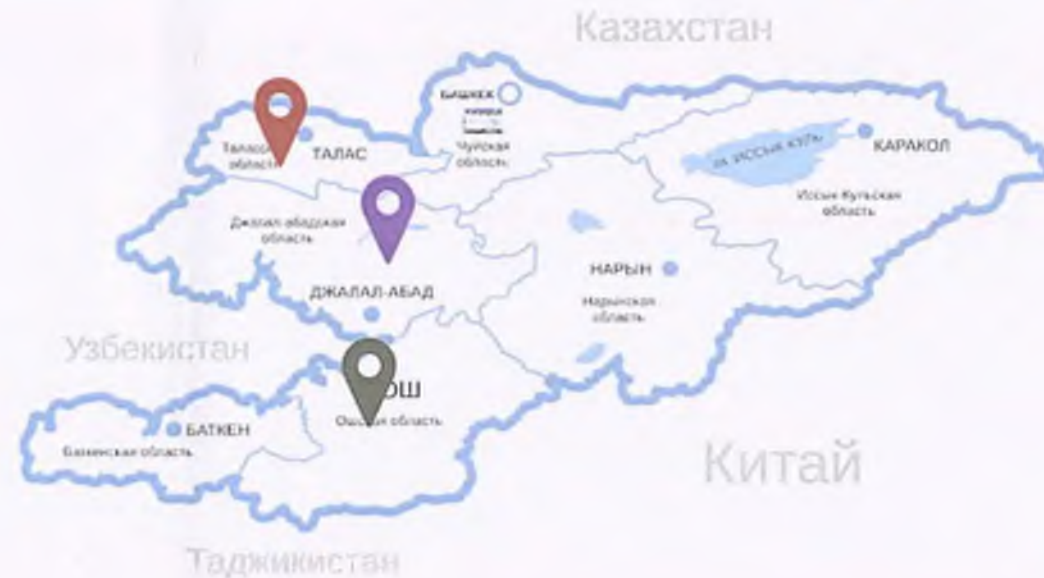
Installed capacity – **18** MW

Average generation - **110** million kWh

### Papan SHPP:

Installed capacity – **20** MW

Average generation - **106** million kWh







## Technical and economic parameters



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### Kirov SHPP



Project cost – **23** million  
USD



Generation – **91,4** million  
kWh



Hydraulic generators per  
**10,5** MV



Payback period – **10** year

### Papan SHPP



Project cost – **28** million  
USD



Generation – **106** million  
kWh



Hydraulic generators per  
**10** MV



Payback period – **10** year

### Karakul SHPP



Project cost – **20** million  
USD



Generation – **110** million  
kWh



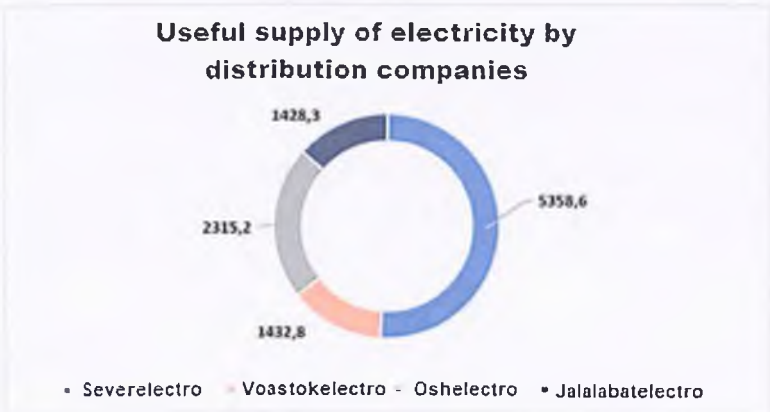
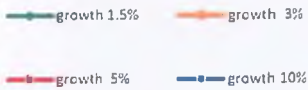
Hydraulic generators per  
**9** MV



Payback period – **10** year

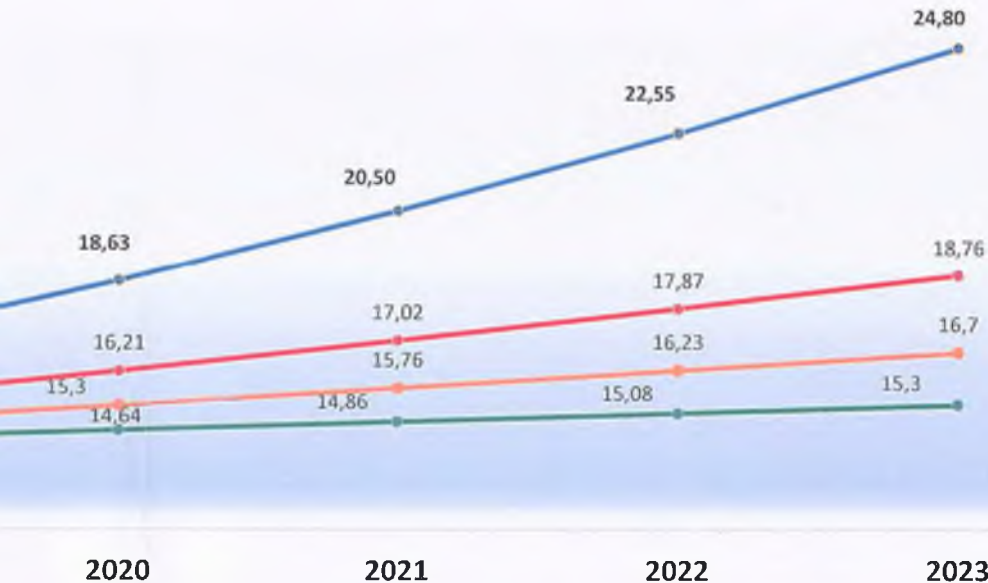
# Marketing

## Consumption growth (billion kWh)





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In the medium and long term, a shortage of power is formed in the market

The key buyer of generated electricity will be distribution energy companies **with the condition of guaranteed purchase of the entire volume**



## Obligations of the Government of the Kyrgyz Republic and the National Energy Holding Company OJSC

- I. Obtaining a decision of the authorized state body on the issuance of quotas for the construction of HPP
- II. Decision-making on land allotment for the construction of HPP
- III. Assistance in issuing permits for the construction of HPP
- IV. Issuance of technical specifications by energy companies
- V. Creation of conditions for receiving generated electricity at a substation

## Investor obligation

- I. Attracting investment resources for the construction of HPP
- II. Infrastructure construction
- III. Construction of power lines to the point of electricity reception from distribution energy companies
- IV. Attracting local labor for the construction and operation of HPP



# Promising Markets for Electricity



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The project involves the construction of a high-voltage power line connecting the energy systems of the Kyrgyz Republic and the Republic of Tajikistan with the Islamic Republic of Afghanistan and the Islamic Republic of Pakistan to export electricity to the Central Asian countries

Domestic Electricity Price is 3 US Cents

## Options for cooperation

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**in the form of the investment project** (direct investments) that assumes project financing



**in the form of public-private partnership (PPP)**, including the following models:



- BOT (Build, Operate, Transfer)
- BOOT (Build, Own, Operate, Transfer)
- BOMT (Build, Operate, Maintain, Transfer)



## State support (preferences)

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Protection of the foreign investments



Assistance in implementation of electricity exports in the framework of the project "CASA-1000" (according to the rules of open access to the third parties)



Assistance in obtaining the licenses, permits and approvals



Equal operating conditions for the foreign and local companies



Possibilities of broad cooperation in the framework of PPP



Available qualified personnel

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**THANK YOU FOR ATTENTION!**

"National Energy Holding Company" OJSC  
119, Akhunbaev street, Bishkek, Kyrgyz Republic, 720055,  
tel. +996 312 561822  
fax. +996 312 561928  
web: [www.energo.gov.kg](http://www.energo.gov.kg)  
e-mail: [energyholding.kg@gmail.com](mailto:energyholding.kg@gmail.com)