







**MINISTRY OF ENERGY
OF THE KYRGYZ REPUBLIC**

**Investment Projects
in the Energy Sector**



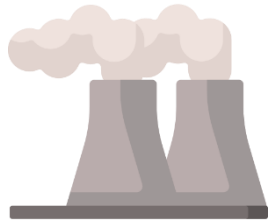
Kyrgyz Republic

-  Kyrgyzstan borders with China in the east and southeast, with Kazakhstan in the north, with Uzbekistan in the west and with Tajikistan in the south.
-  The terrain is dominated by the Tien Shan and the Pamir mountain systems, which occupy about 65% of the country's territory.
-  The entire territory of the republic lies above **394 m** above the sea level, the average altitude above the sea level is **2750 m**. More than a half of it is located at altitudes from **1000 to 3000 m** and about a third at altitudes from **3000 to 4000 m**.
-  Almost **90%** of the country is more than **1,500** meters above the sea level.

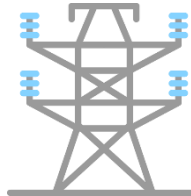
ENERGY SYSTEM OF THE KYRGYZ REPUBLIC



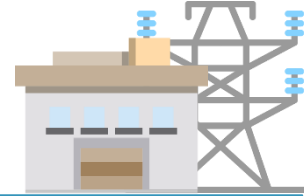
HPP
3093 MW



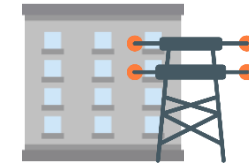
TPP
862 MW



HVL 110-500 kV
7 500 km



SS 110-500 kV
200 units
12498 MVA



HVL 0,4-35 kV – **59 700 km**
SS and TS – **23 915 units**



Due to geographical features, the energy system of the Kyrgyz Republic is clearly divided into northern and southern parts. Both parts are connected by **“Toktogul HPP - Frunzenskaya” 500 kV line**, passing through the territory of the Kyrgyz Republic, as well as through the Central Asia Unified Energy System, covering the RT, the RU and the RK, as well as **“Datka – Kemin” 500 kV line**.

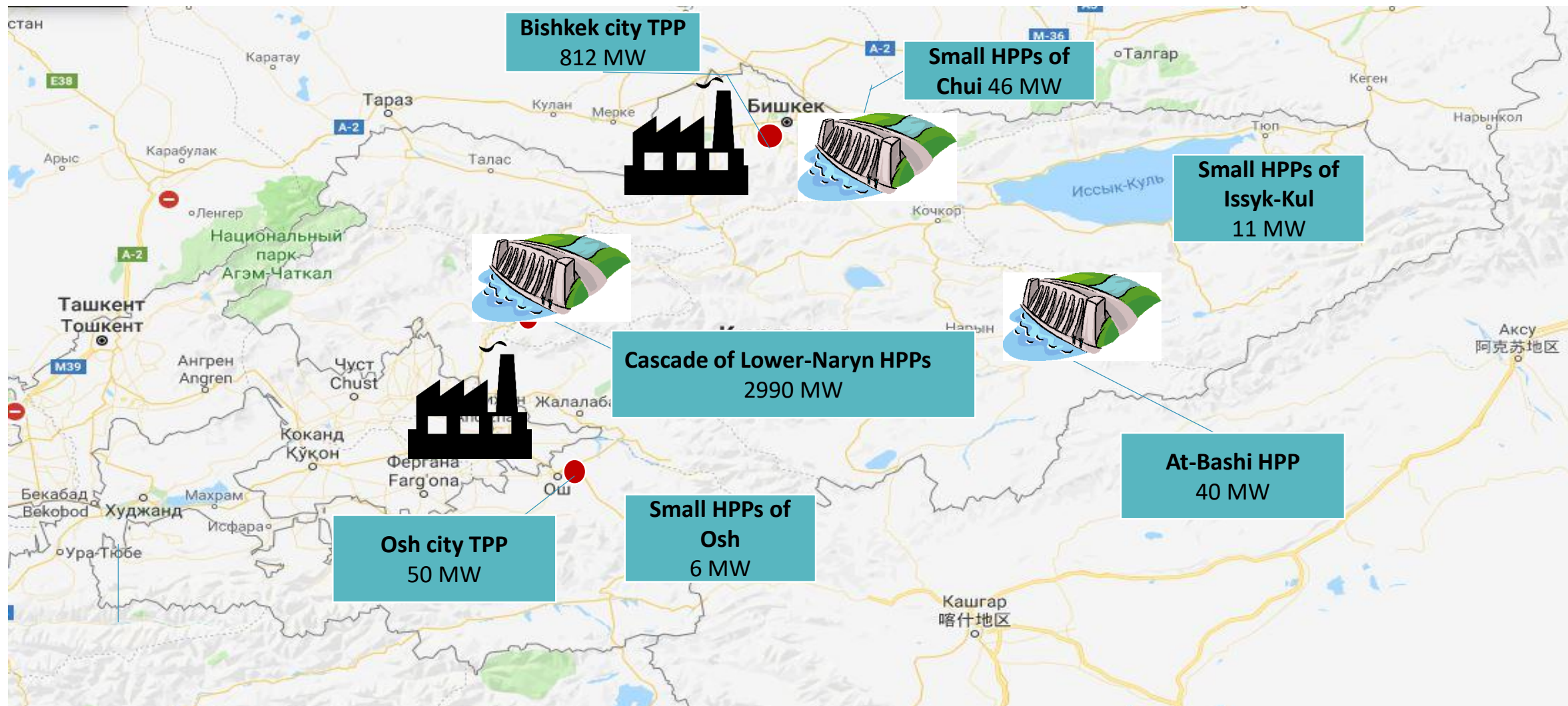


In the structure of electric power generation, the biggest share is occupied by hydropower plants (90%), the main of which are located in the south of the country.



Average annual output – electric power 14 billion kWh
- heat and power - 2,000 thousand Gcal

Main Generating Capacities



LARGE HPPs
3030 MW

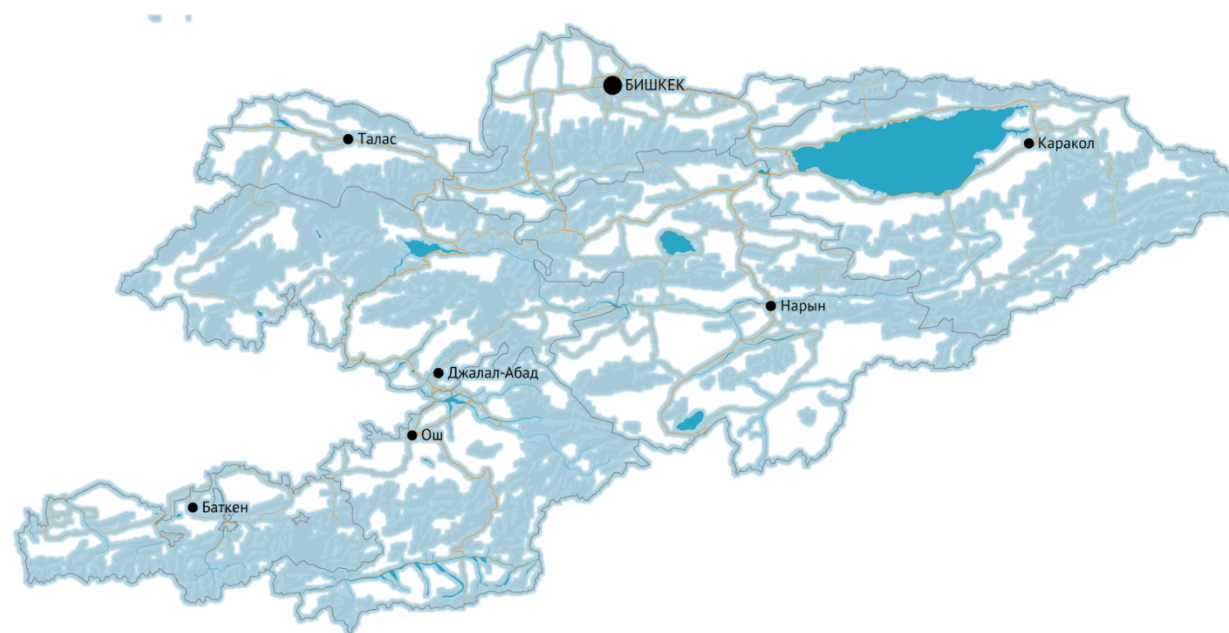
SMALL HPPs
63 MW

TPPs
862 MW

TOTAL
3955 MW

HYDROPOWER POTENTIAL

Potential



142,5
billion
kWh

**GENERAL HYDROPOWER
POTENTIAL**

III

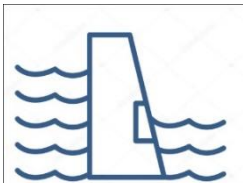
**PLACE IN THE CIS AFTER
RUSSIA AND TAJIKISTAN**

10%

UTILIZED

**IT IS POSSIBLE TO CONSTRUCT ON THE NARYN
RIVER:**

7 cascades



27 hydro power plants



5 600 MW

Total installed capacity

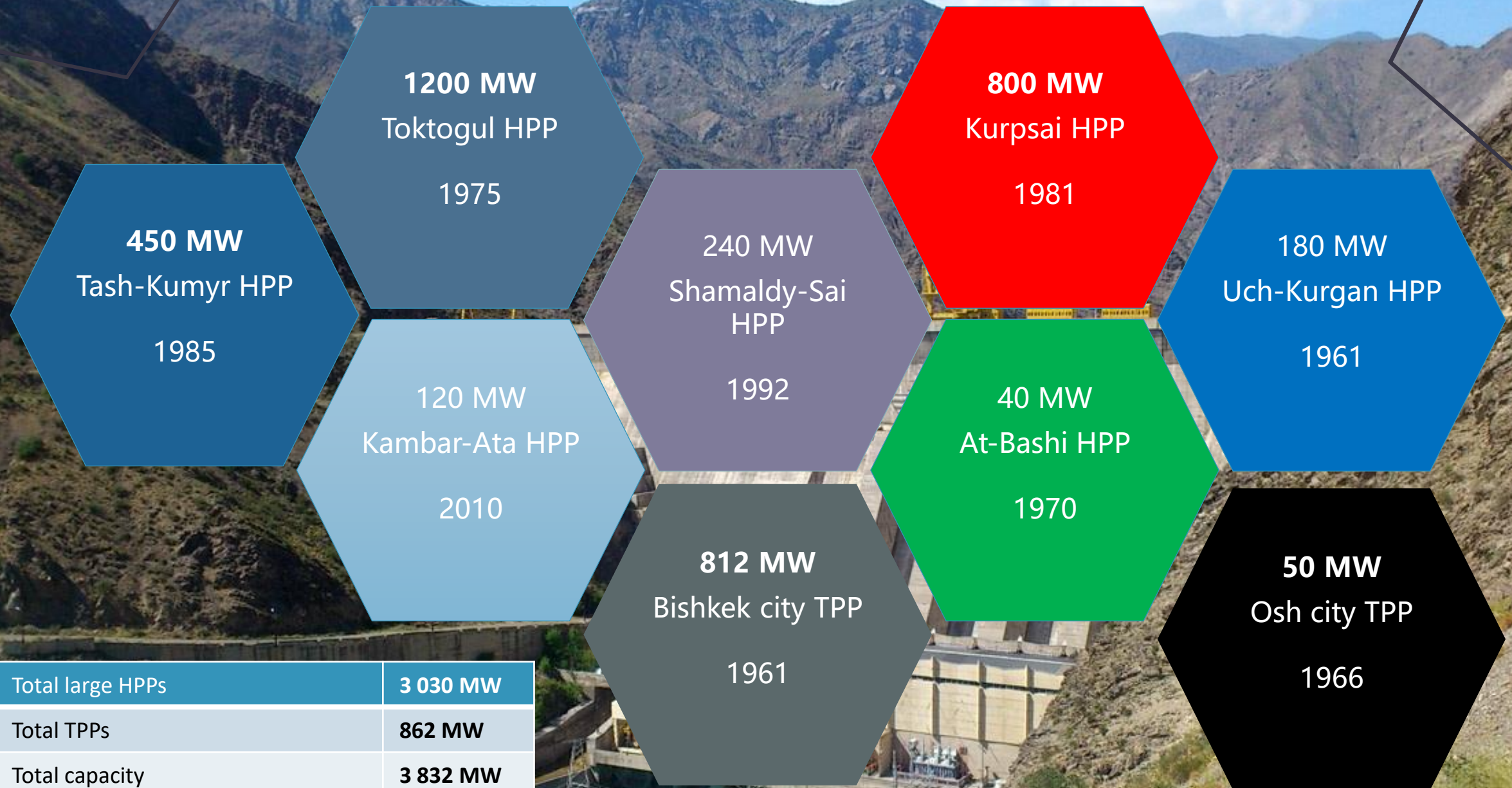


20 billion kWh

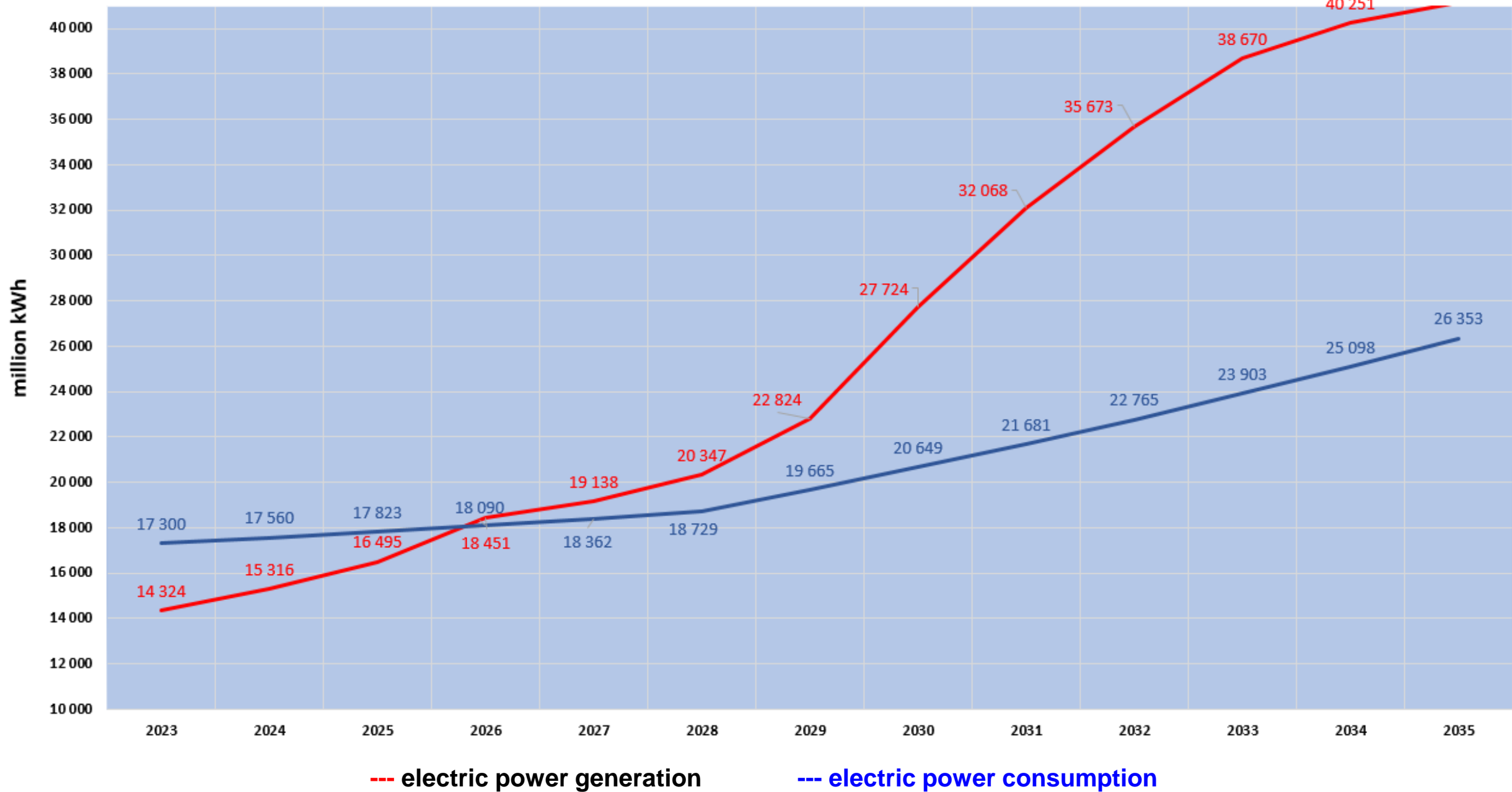
Average multi-annual generation










Main generating capacities



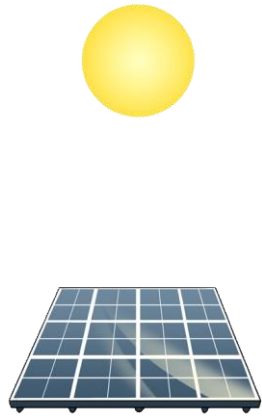
Commissioning of new capacities by year



Promising Projects

		HPP POWER	CONSTRUCTION PERIOD	Electric energy generation mln kWh	<div>\$</div> PROJECT AMOUNT	<div></div> STATUS
<div></div>	Construction of Upper-Naryn Cascade of HPPs (4 HPPs)	237,7 MW	5 years	942,4	727,7 mln.\$	FS and Project are developed
<div></div>	Construction of Kambar-Ata-1 HPP	1860 MW	8 years	5 640	2,9 billion \$	FS is developed
<div></div>	Construction of Suusamyr-Kokomeren Cascade of HPPs (3 HPPs)	1305 MW	8 years	3 317	3,3 billion \$	Preliminary FS is developed
<div></div>	Construction of Kazarman Cascade of HPPs (4 HPPs)	1160 MW	8 years	4 661,6	2 billion \$	FS development is required
<div></div>	Construction of Sary-Jaz Cascade of HPPs (6 HPPs)	1100 MW	8 years	4 764	2,5-3 billion \$	FS development is required
<div></div>	Construction of Chatkal Cascade of HPPs (2 HPPs)	950 MW	5 years	1 870	1,37 billion \$	FS development is required
TOTAL		6 612,7 MW		21 195		

RENEWABLE ENERGY POTENTIAL

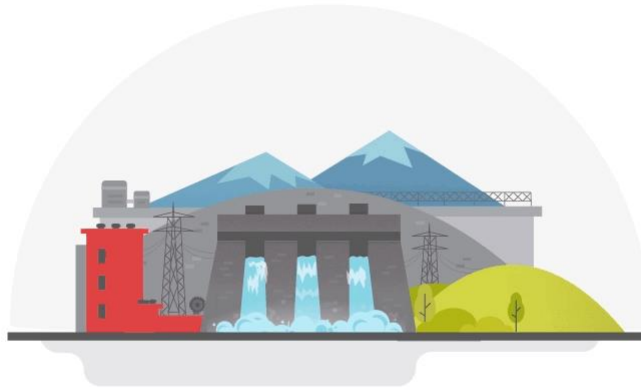


2100-2900 h.

Average annual duration of sunshine

Annual surface radiation

1700 kWh/m²



258 MW

Small hydropower plants potential

172 rivers and watercourses

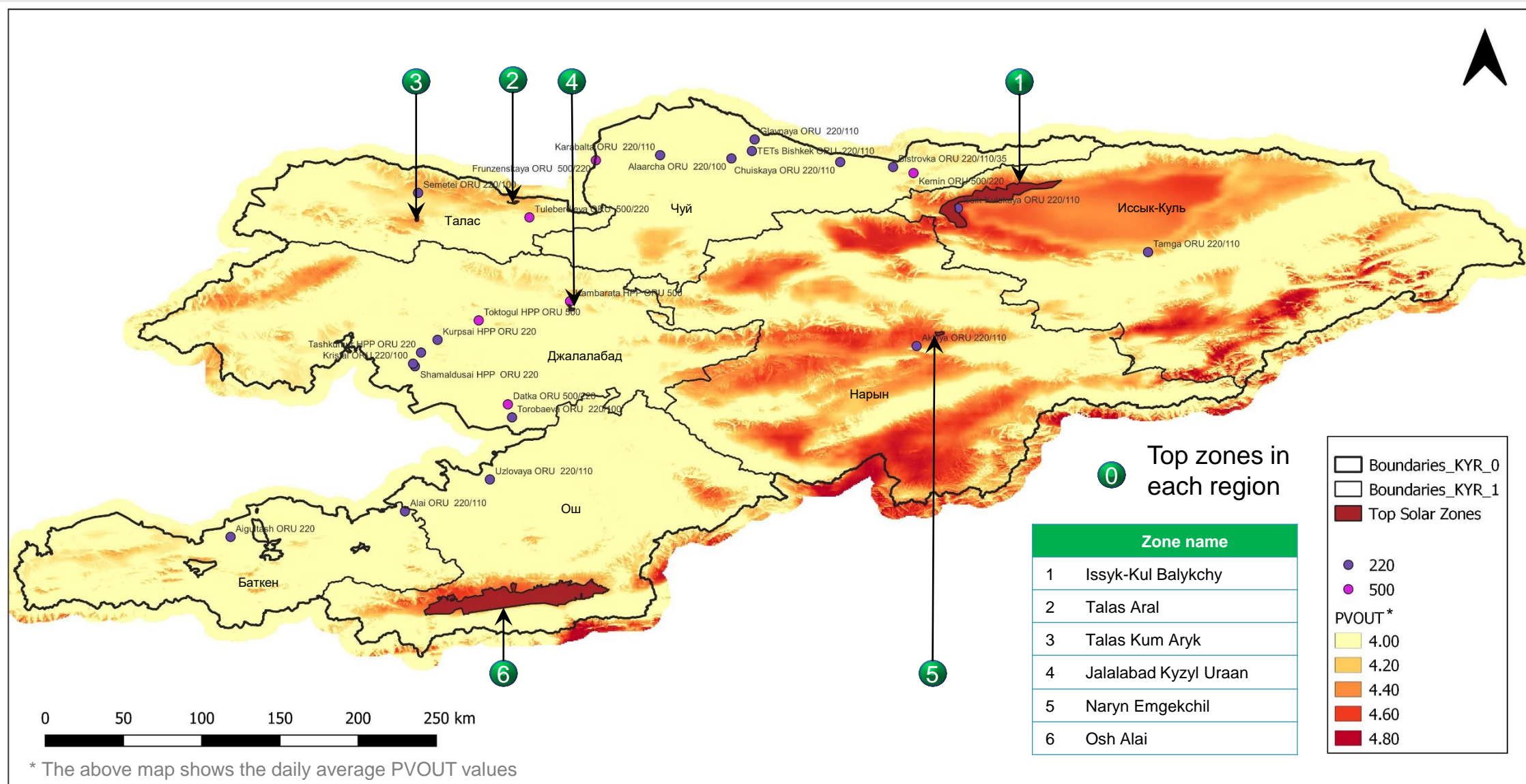
5-8 kWh



2 billion kWh

Wind energy potential

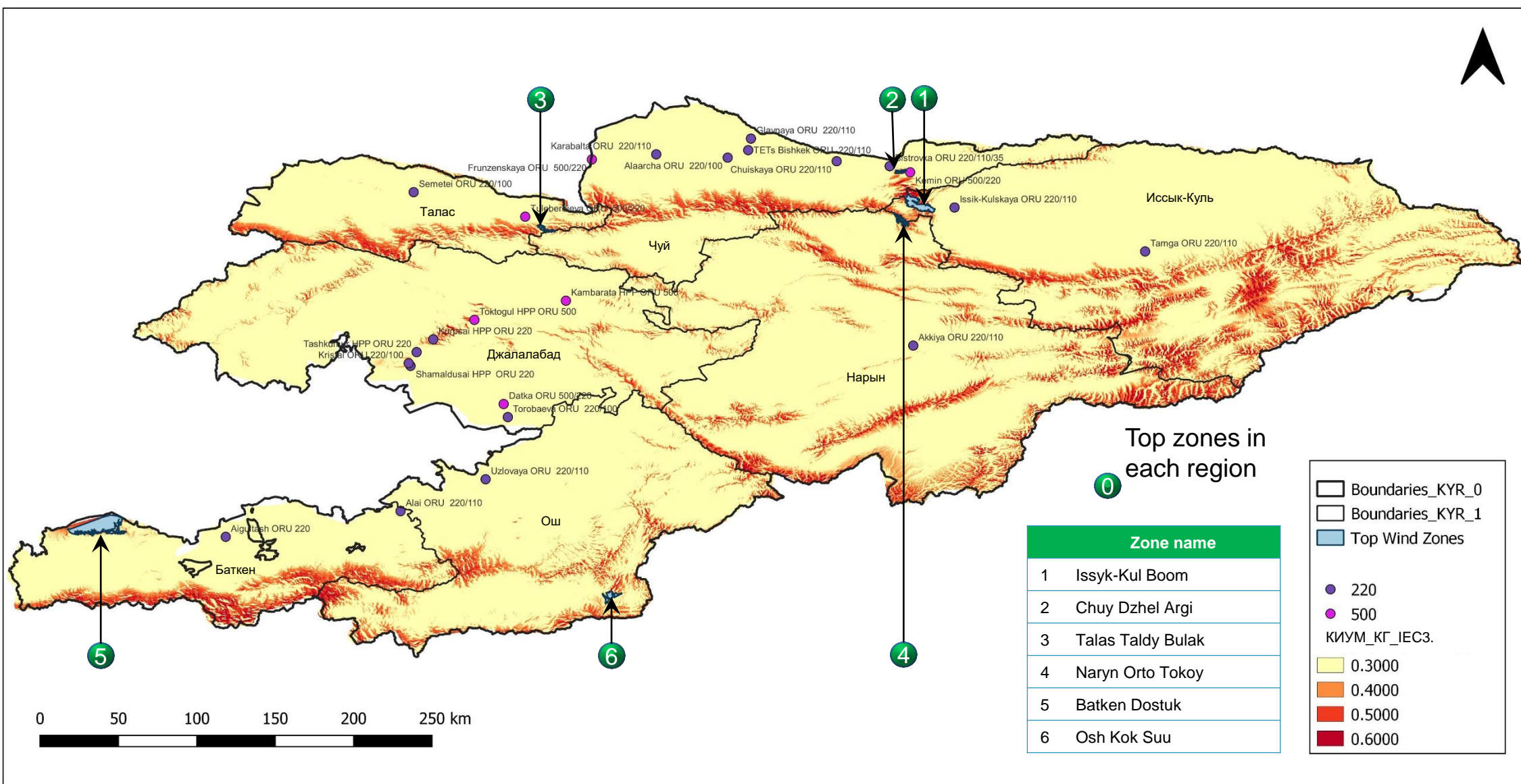
TOP SOLAR ZONES



TOP SOLAR ZONES

SOLAR ZONE	DESCRIPTION
Issyk-Kul Balykchy	Good solar resource (average daily PVOUT is 4.597 kWh/kW/peak kWh/kW/peak), the distance to the nearest power transmission center (Issyk-Kulskaya 220 kV SS) is about 15 km, the main road passes through the zone. Coordinates: 42.31512, 76.15148. The zone can accommodate 5,000+ MW of solar power, especially in the eastern part of the zone.
Talas Aral	Sufficient solar resource (average daily PVOUT is 4.251 kWh/kW/peak), the distance to the nearest power transmission center (Tuleberdiev 500/220 kV SS) is about 15 km, passes through the major road. Coordinates: 42.2837508, 73.1746799. The zone can accommodate 300 MW of solar power.
Talas Kum Aryk	Good solar resource (average daily PVOUT is 4.4 kWh/kW/peak), the distance to the nearest power transmission center (Semetey 220 kV SS) is about 25 km. The access to the site is via a dirt mountain road, which begins approximately 10 km from the site. Coordinates are 42.367647, 72.213567. The zone can accommodate 225 MW of solar power.
Jalalabad Kyzyl Uraan	Lower solar resource (average daily PVOUT is 4.13 kWh/kW/peak), the distance to the nearest 110 kV power transmission center (Kambarata-2 HPP) is about 10 km. This center will be upgraded to 500 kV in the near future. The access to the site is via a dirt mountain road that begins approximately 4 km from the site. Coordinates: 41.7081867, 73.3473317. The zone can accommodate 400 MW of solar power.
Naryn Emgekchil	Good solar resource (average daily PVOUT is 4.624 kWh/kW/peak), quite a long distance to the nearest 220 kV power transmission center (Ak-kiya 220 kV SS) - about 15 km, a short distance from the main road - 4 km. Coordinates: 41.52584, 76.00246. The zone can accommodate 600 MW of solar power.
Osh Alai	Good solar resource (average daily PVOUT is 4.542 kW*h/kW/peak), a significant distance to the nearest 220 kV power transmission center (Uzlovaya 220 kV SS) - about 190 km, a highway passes through the zone. Coordinates: 39.690990, 73.230980. The zone can accommodate 72,327 MW of solar power.

TOP WIND ZONES



TOP WIND ZONES

WIND ZONE	Description
Issyk-Kul Boom	High wind resource (8.11 m/s at an altitude of 100 m), flat terrain, a highway and a railway line pass through the site. The distance to the nearest power transmission center (500/220 kV Kemin) is about 20 km. Coordinates: 42.52993, 75.82003. The zone can accommodate 490 MW of wind power.
Chuy Dzhel Argi	High wind resource (9.17 m/s at 100 m altitude), the zone can be accessed via a dirt mountain road, the main road passes in close proximity (<5 km) to the zone. The distance to the nearest power transmission center (500/220 kV Kemin) is approximately 5 km. Coordinates: 42.712294, 75.760380. The zone can accommodate 55 MW of wind power.
Talas Taldy Bulak	High wind resource (8.51 m/s at an altitude of 100 m), short distance from the main road < 1 km, you need to get to the zone on foot, the distance to the nearest power transmission center (Tuleberdiev 220 kV SS) is about 15 km. Coordinates: 42.281526, 73.176148. The zone can accommodate 90 MW of wind power.
Naryn Orto Tokoy	High wind resource (8.87 m/s at an altitude of 100 m), short distance from the main road (~5 km), there is no access road to the zone. The distance to the nearest 220 kV power transmission center (Issyk-Kulskaya) is approximately 31 km. Coordinates : 42.33854, 75.794577. The zone can accommodate 135 MW of wind power.
Batken Dostuk	High wind resource (7.76 m/s at an altitude of 100 m), a highway passes through the zone. The distance to the nearest 220 kV power transmission center (Aigul-Tash) is approximately 62 km. Coordinates: 40.133579, 69.925703. The zone can accommodate 1,505 MW of wind power.
Osh Kok Suu	High wind resource (7.67 m/s at an altitude of 100 m), a highway passes through the site. The distance to the nearest 220 kV power transmission center (Uzlovaya) is about 230 km. Coordinates: 39.647474, 73.646336. The zone can accommodate 155 MW of wind power.

TARIFFS FOR IMPLEMENTATION OF RES PROJECTS IN THE KYRGYZ REPUBLIC



INVESTOR



1 kWh of electric power = negotiated price \pm transit

Once a year - indexation taking into account the changes in the exchange rate of the national currency to foreign currencies in the manner determined by the Cabinet of Ministers of the Kyrgyz Republic

Tariff rates

* T_{max} - the maximum selling tariff on the territory of the Kyrgyz Republic

*EE - electrical energy generated by RES installations

The grace period for projects in the field of solar and wind energy is 25 years, for small hydropower - 15 years.



Promising electric power markets

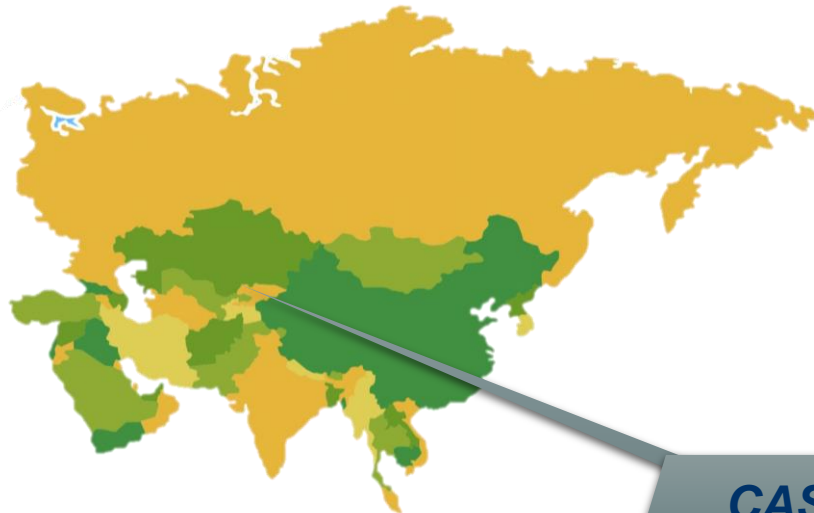


CASA → 1000

CASA-1000 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 electric power to the Central Asian countries

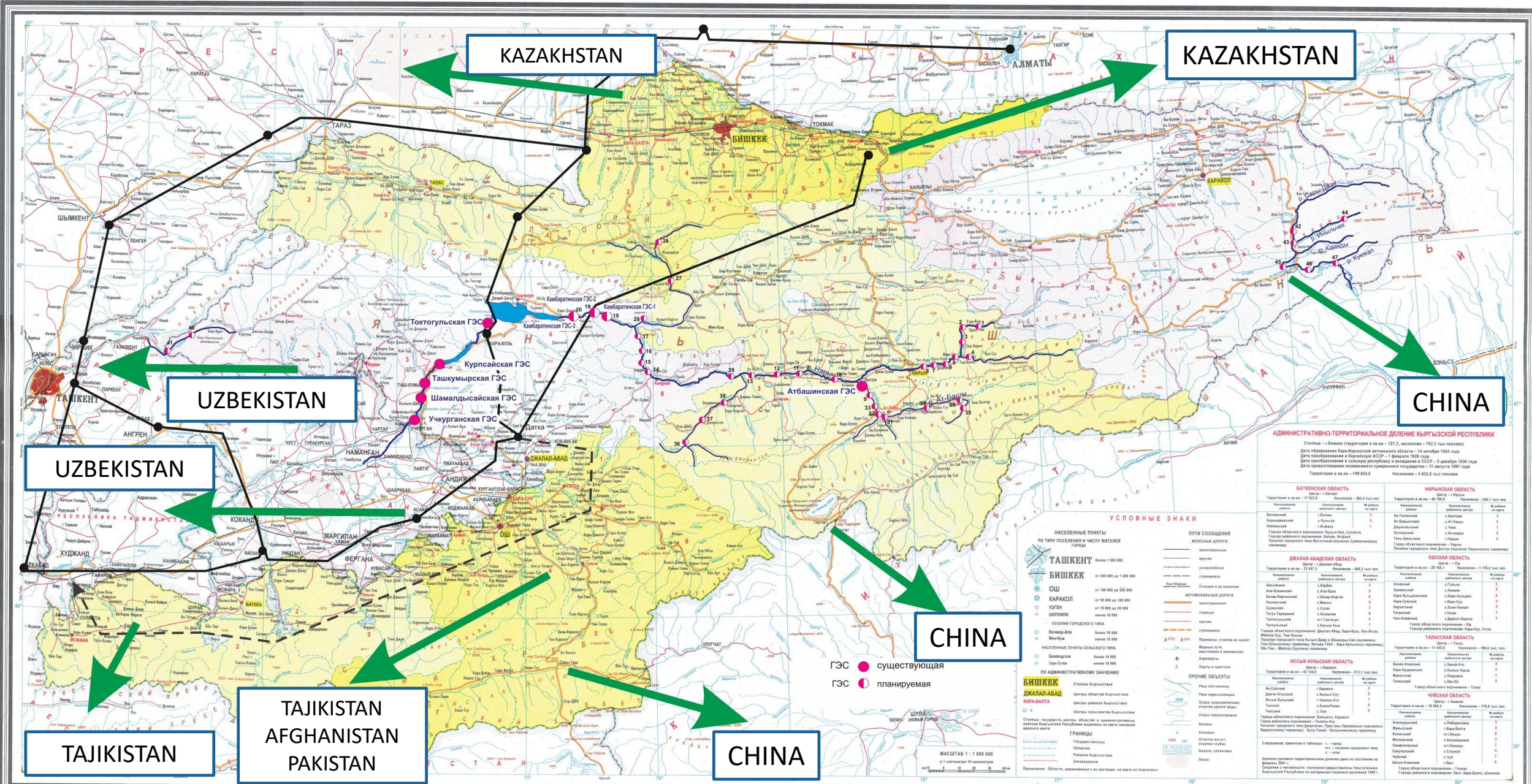
Domestic electric power price is 3 US Cents

Tariff within CASA-1000 for:
Afghanistan - 8.11 US cents
Pakistan - 9.41 US cents



CASA-1000

ELECTRIC POWER DISTRIBUTION SCHEME (EXPORT) TO OTHER STATES



State support (preferences)

01

Investment protection and assistance
in obtaining of permits.

Equal conditions for investors

02

Provision of a **letter of credit**
to investors
(state guarantee)

03

Grace period:

Small HPP – **15** years;
Solar PP – **25** years;
Wind PP – **25** years.

04

100% power purchase in national
and foreign currency,
possibility of **export** within the
framework of CASA-1000 project

Cooperation options



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

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



THANK YOU FOR ATTENTION!!!

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