

# Country Report

**Name of Training Course**

“202208409-J001 Energy Policy”

**Name of Applicant**

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**Name of Country**

Uzbekistan



Ministry of Energy of the  
Republic of Uzbekistan

# Energy sector of the Republic of Uzbekistan

# GENERAL INFORMATION



**Capital**  
Tashkent



**Political system**  
Presidential multi-party  
democratic republic



**Area**  
450 000 sq.km



**Official currency**  
"Soum" – UZS  
(UZS/USD) 1\$=11500)



**Population**  
36 mln



**Languages**  
Uzbek (official), Russian  
(commonly used)

**Uzbekistan** is a landlocked country in **Central Asia** with a more than **36 million** population. Uzbekistan has made significant progress in recent years in the development of its energy sector. The country is rich in natural resources, including oil, gas, and coal, and has a growing renewable energy sector. Uzbekistan has set ambitious goals for **renewable energy** production, aiming to generate **25 percent** of its electricity from renewable sources by **2030**. The government has also implemented policies to attract foreign investment in the energy sector, including the creation of special economic zones for renewable energy development. In addition to its domestic energy activities, Uzbekistan also plays an important role in regional energy cooperation. The country is part of the Central Asia South Asia Electricity Transmission and Trade Project (**CASA-1000**), which aims to **interconnect electricity** markets in **Central and South Asia**.

# REFORMS IN THE ENERGY SECTOR OF UZBEKISTAN



**Thermal Power Plants**  
~ Total installed capacity:  
**11 539 MW**  
~ 7 TPP~ 3 CHP



**Uzbekhydroenergo**  
~ Total installed capacity:  
**2 071 MW**  
~ 50 HPP



**Private stations**  
~ Total installed capacity:  
**3 674 MW**  
~ 7 TPP,  
**2 Photovoltaic PP**

## Regional Electric Grids of Uzbekistan



Distribution and supply of electrical energy to consumers through distribution networks.



O'ZBEKISTON  
MILLIY ELEKTR  
TARMOQLARI

## National Electric Network of Uzbekistan"

Transportation of electrical energy from generation sources through high voltage networks



UZBEKNEFTEGAZ

**Uzbekneftegaz**  
extraction and processing of hydrocarbon raw materials



UZTRANSGAZ

**Uztransgaz**  
Transportation, building up the export and transit potential of natural gas



HGT AKSIYADORLIK JAMIYATI

**Hududgaztaminot**  
distribution of natural gas to the end consumer



Electricity market models and transition stages identified



Together with experts from the WB, ADB and EBRD, a new version of the Electricity Law is being developed



The Electricity Grid Code is being developed with technical support from the World Bank and The ADB

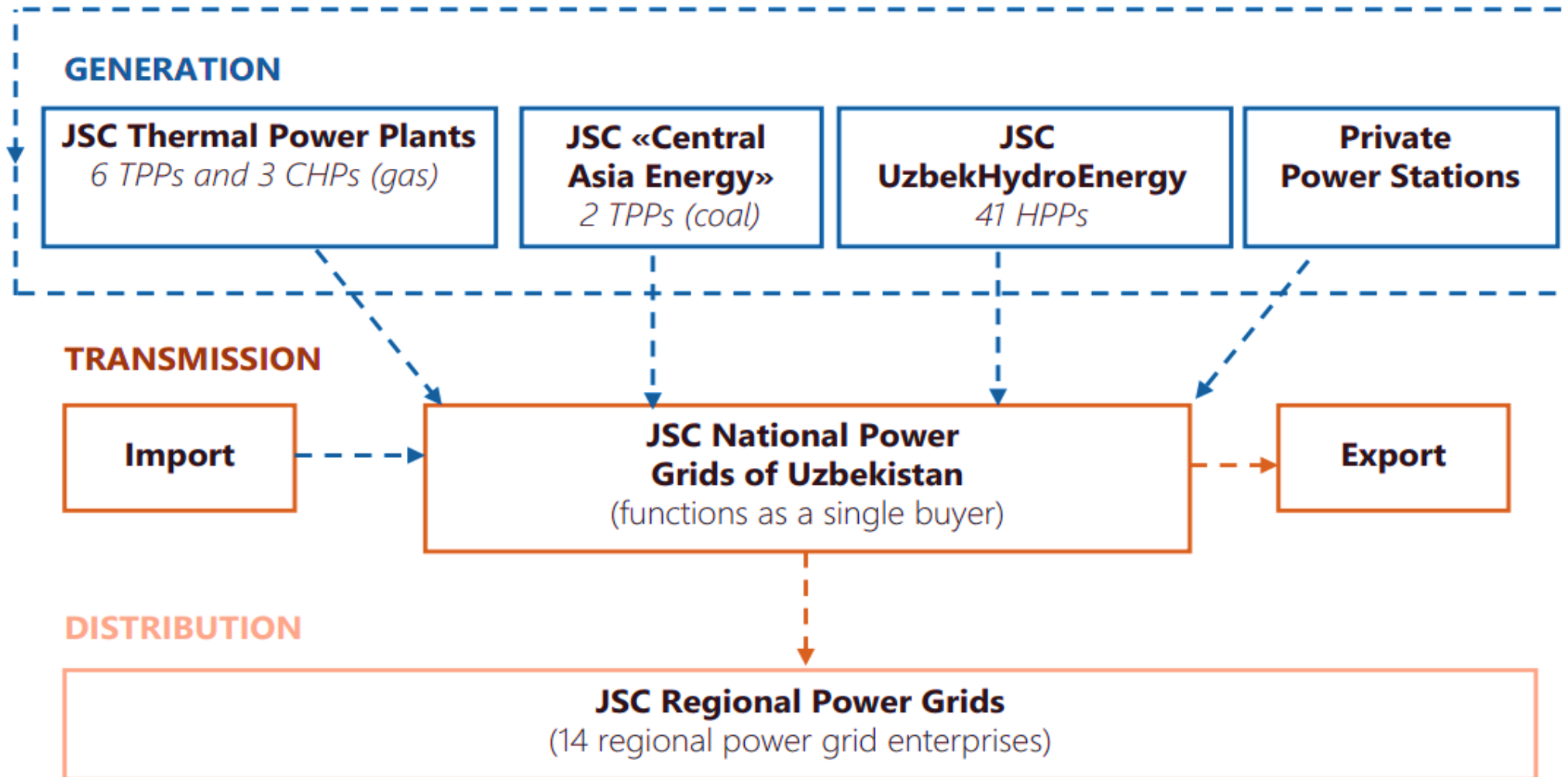


The Concept for the provision of the Republic of Uzbekistan with electric energy for 2020-2030 was developed



Transition to IEC standards in progress

# Power market structure (as of 19.04.2023)



# Current condition of Power sector

## Generation capacities of Uzbekistan:

### Power plants

72

17 900 MW

including:

	Thermal power plants	17	15 406 MW
	Hydro power plants	50	2 071 MW
	PV stations	2	200 MW
	Block stations	3	223 MW

## Existing substations:

### Substations

	500 kV substations	7	7 540 MVA
	220 kV substations	70	16 700 MVA
	35-110 kV substations	1752	21 300 MVA
	6-10/0,4 kV transformers	92 320	16 600 MVA

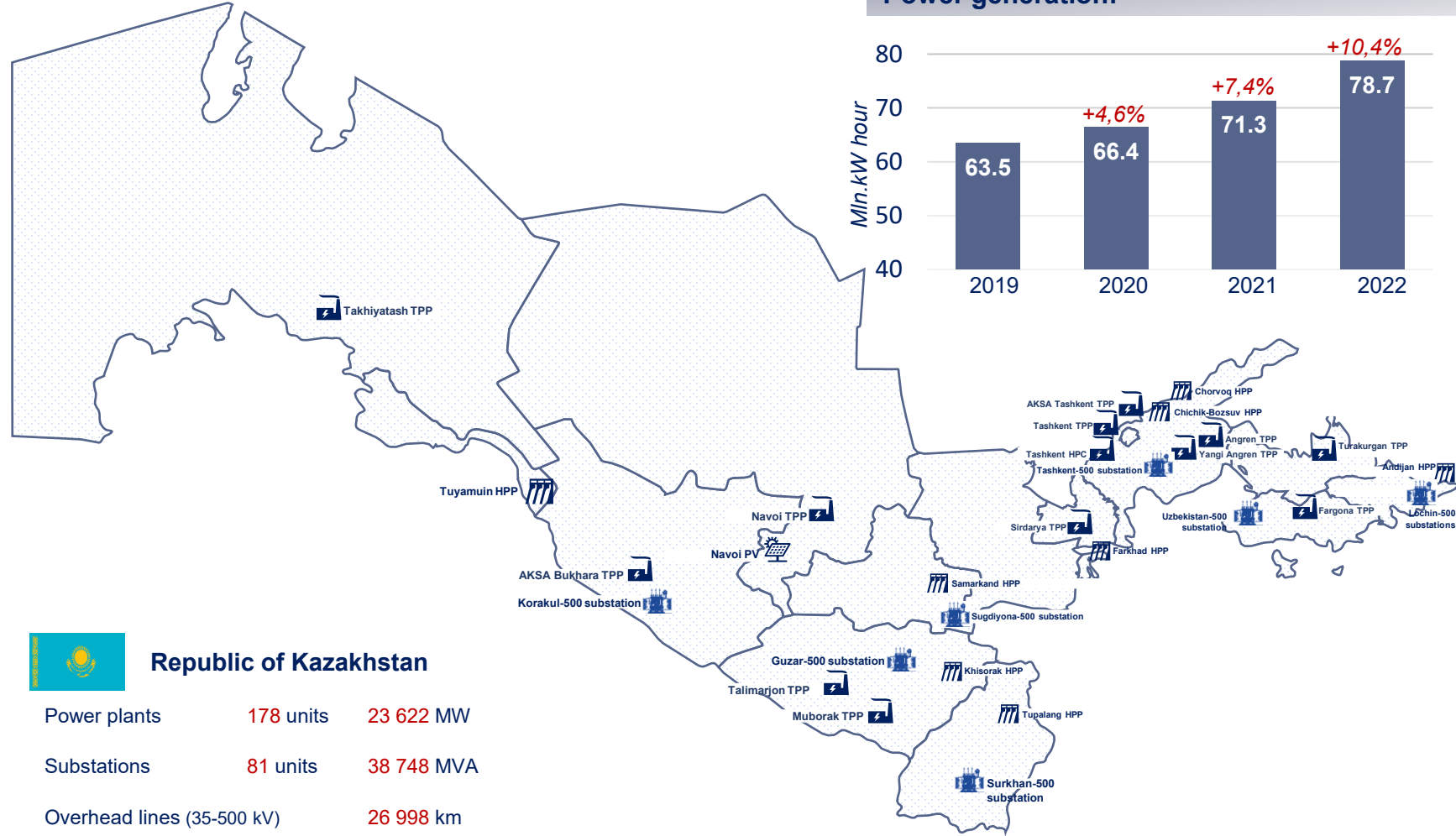
## Existing lines:

Total length of overhead lines are: **278 695 km**

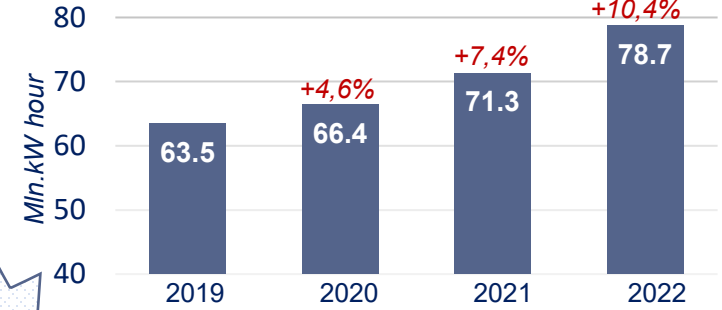
 220-500 kV lines – **10 541 km**

 35-110 kV lines – **29 523 km**

 Low voltage distribution lines – **238 631 km**



## Power generation:



## Republic of Kazakhstan

Power plants	178 units	23 622 MW
Substations	81 units	38 748 MVA
Overhead lines (35-500 kV)		26 998 km



## Kirgiz Republic

Power plans	12 units	3 932 MW
Substations	197 units	12 498 MVA
Overhead lines		7 541 km



## Republic of Tajikistan

Power plans	15 units	5 757 MW
Substations	205 units	13 828 MVA
Overhead lines		9 252 km

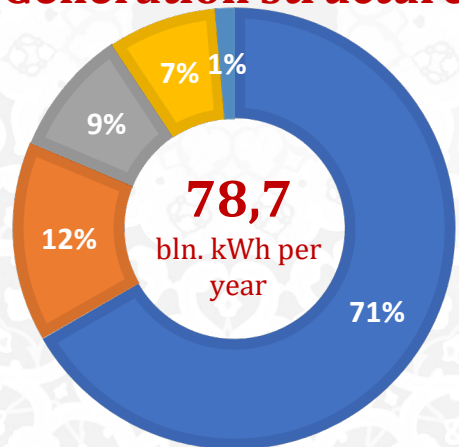


## Republic of Turkmenistan

Power plans	13 units	7 006 MW
Substations	461 units	11 196 MVA
Overhead lines		49 755 km

# POWER GENERATION

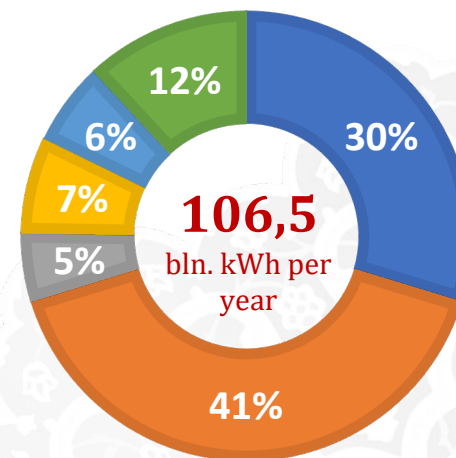
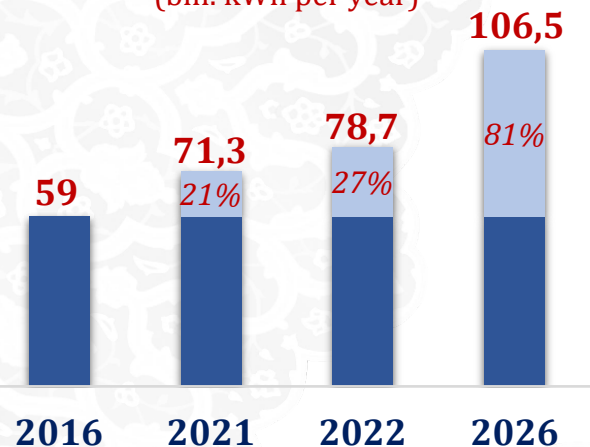
## Generation structure



■ Government TPP ■ Private TPP  
■ Coal TPP ■ Hydro power plants  
■ Photovoltaic power plants

## Generation growth

(bln. kWh per year)



■ Government TPP ■ Private TPP  
■ Coal TPP ■ Hydro power plants  
■ Photovoltaic power plants ■ Wind power plants

## Goal achievement

Operating PPP projects - 28.  
Total amount - 12 billion dollars,  
12.9 GW of power.  
They are:

**9 projects** of thermal power plants construction  
(4,0 billion dollars, 6,0 GW):

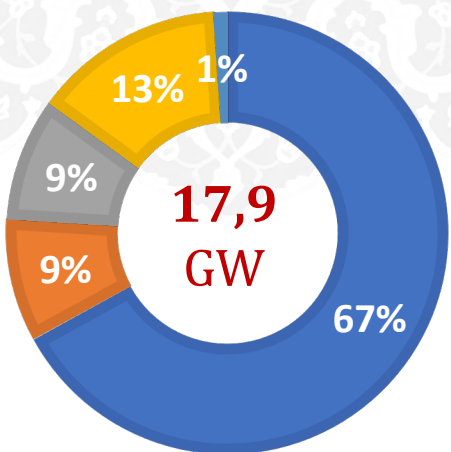
**19 photovoltaic and wind**  
(8 billion dollars, 6,9 GW).

Result:

- the possibility of **67.2 billion kWh** electricity generating.
- Saving **7.6 billion cubic meters** of gas for electricity generation.

**Implemented PPP projects - 7;**  
(915 mln dollars. 1354 MW)

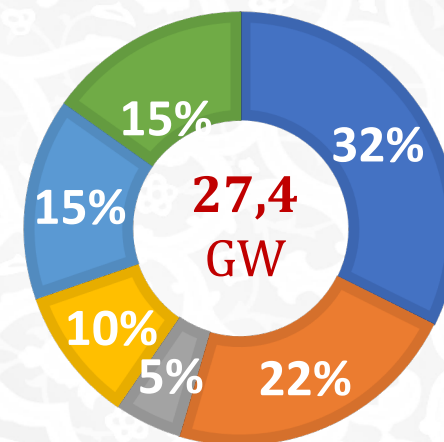
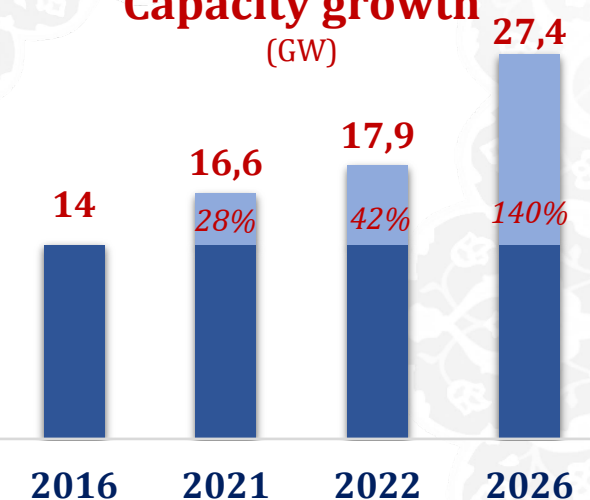
One more project until the end of the year (140 mln dollars; 220 MW, Syrdarya region)



■ Government TPP ■ Private TPP  
■ Coal TPP ■ Hydro power plants  
■ Photovoltaic PP

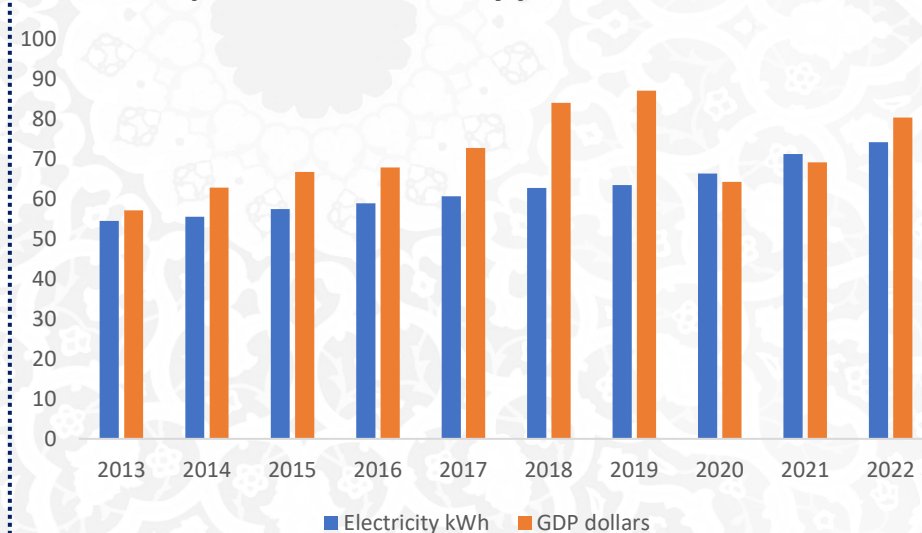
## Capacity growth

(GW)

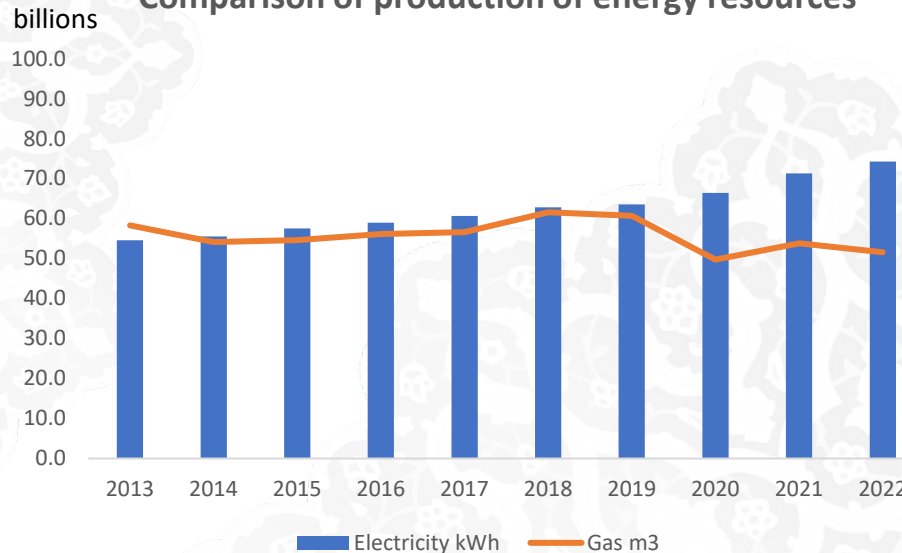


■ Government TPP ■ Private TPP  
■ Coal TPP ■ Hydro power plants  
■ Photovoltaic PP ■ Wind PP

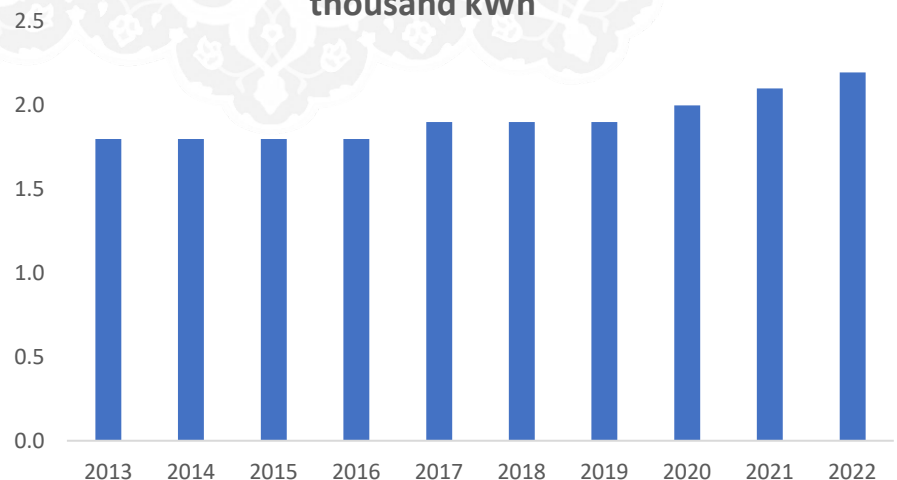
## Comparison of electricity production and GDP



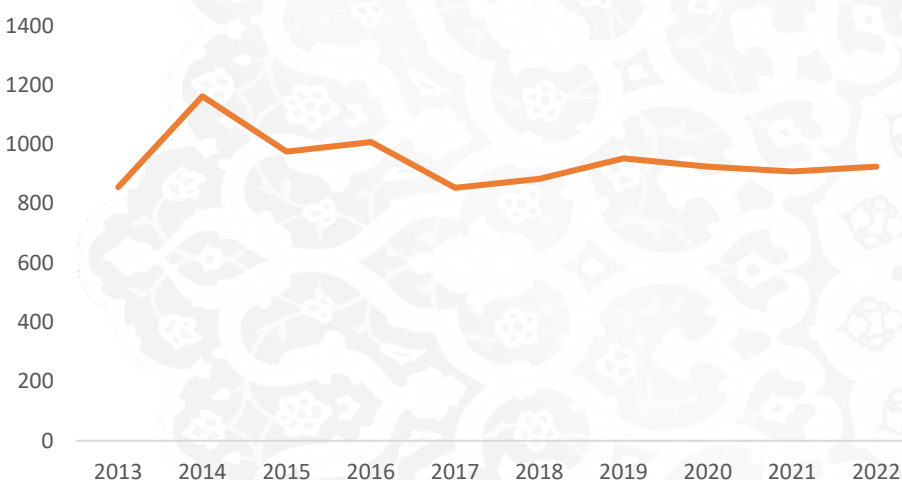
## Comparison of production of energy resources



## Energy supply per capita thousand kWh



## Emissions tons



### Brief information

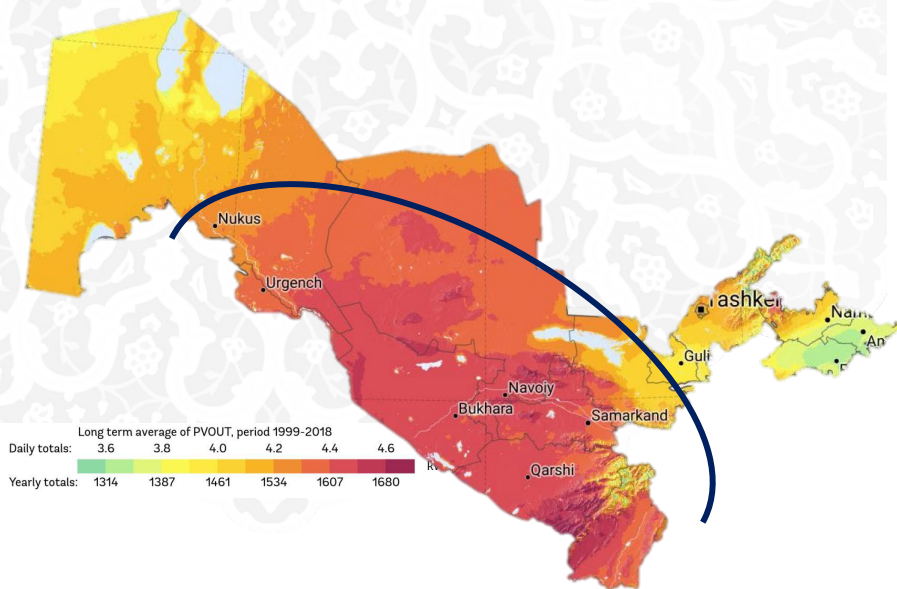
By analyzing the graphs, we observe the production of gas and electricity is growing from year to year, taking into account the depletion of fossil natural resources, our state pays great attention to the development of renewable energy sources, which in turn implies the development of green energy.

Pointing out that during the implementation of new projects, the government pays great attention to the environmental impact, and the energy development strategy is also considered with climate change in the region and in the world

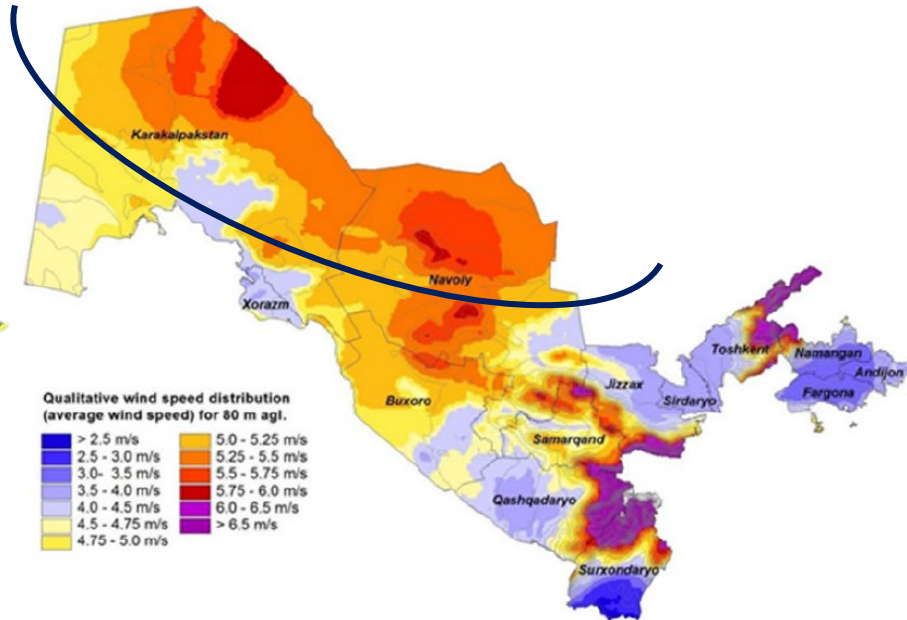


# UZBEKISTAN RENEWABLE ENERGY POTENTIAL

## Solar potential



## Wind potential



## Diversification of energy supply by sources



**HPP**

\$6,2 billion investment in 2023-2030 to develop 60 new projects and upgrade 18 existing stations



**PPP**

**51 billion tons of oil equivalent**



**WPP**

**360 million tons of oil equivalent**

# IMPLEMENTED AND PLANNED WORKS IN THE FIELD OF RENEWABLE ENERGY SOURCES

## Works performed in 2017-2023

Number of announced tenders	7
Number of projects	19
Number of agreements signed	19
Capacity of signed projects	6 947 MW
Adopted legal documents on projects	10
The cost of signed projects	8 billion dollar

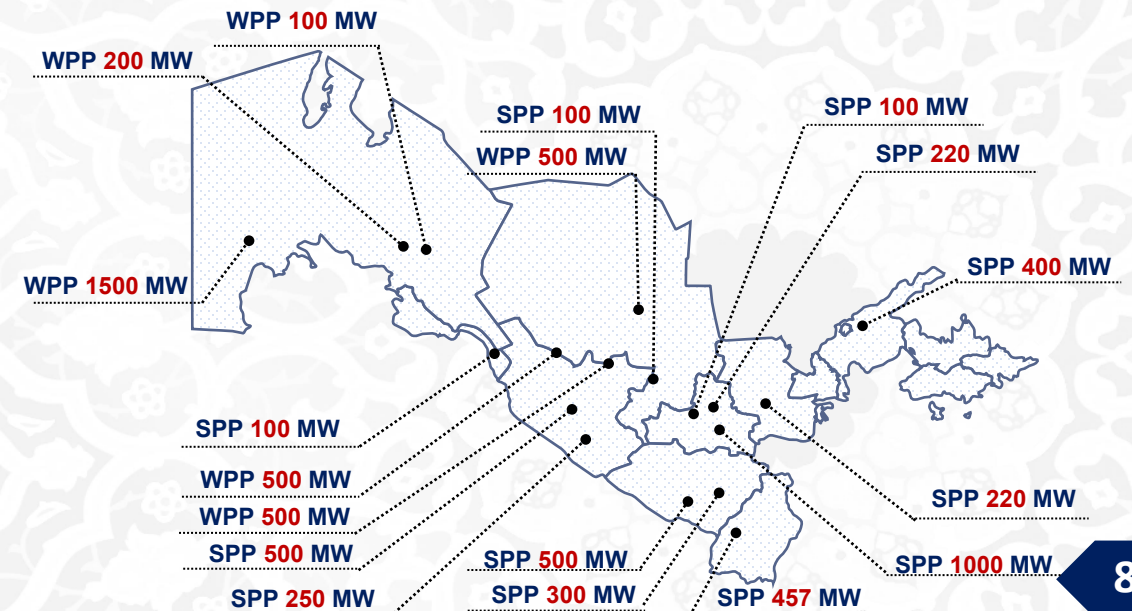
### Commissioned solar power plants

Investors	Masdar (UAE) Total Eren (France)
Total capacity of projects	200 MW
Electricity generation per year	500 million kWh
Saving natural gas per year	150 million cubic m
Reducing greenhouse gas emissions per year	200 thousand tons
Funds raised by investors within the project	200 million dollar



## Plans till 2030

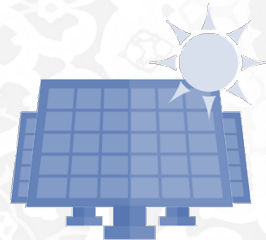
Total RES capacity	15 000 MW
Solar photovoltaic stations	10 000 MW
Wind farms	5 000 MW
Total annual output	40 billion kWh
Total annual gas savings	11,4 billion cubic meters
Total cost of investment	14 billion dollar
Permanent jobs created	3 000
Prevention of CO2 emissions	16 million tons








# SIGNED AGREEMENTS ON PPP TERMS

## Photovoltaic plants

**12 projects** with a total capacity of **3 847 MW (3,7 bln.dollar)**





	Power, MW	Investments, millions of USD.	
	1400	1800	(with 1000 MW BESS)
	1247	970	(with 63 MW BESS)
	1000	750	
	100	90	
	100	90	

## Wind farms

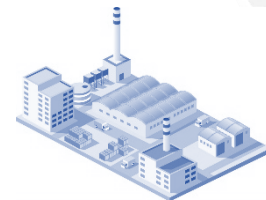
**7 projects** with a total capacity of **3 100 MW (4,3 bln.dollar)**











	Power, MW	Investments, millions of USD.	
	500	600	
	2 600	3 708	(with 300 MW BESS)

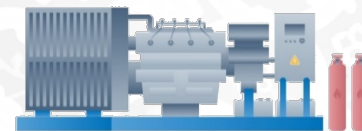
**28 projects**  
with a total capacity  
of **12.955 GW**  
and the cost of  
**\$11.87 billion**




Combined cycle power plants  
**5 projects** with a total capacity of  
**5 114 MW (3,3 bln.dollar)**



	Power, MW	Investments, millions of USD.
	1 500	1 050
	240	150
	240	150
		
	1 560	1 100
	1 574	875
		
		







Gas-piston power plants  
**4 projects** with a total capacity of  
**894 MW (0,5 bln.dollar)**



	Power, MW	Investments, millions of USD.
	500	300
	174	105
	220	140

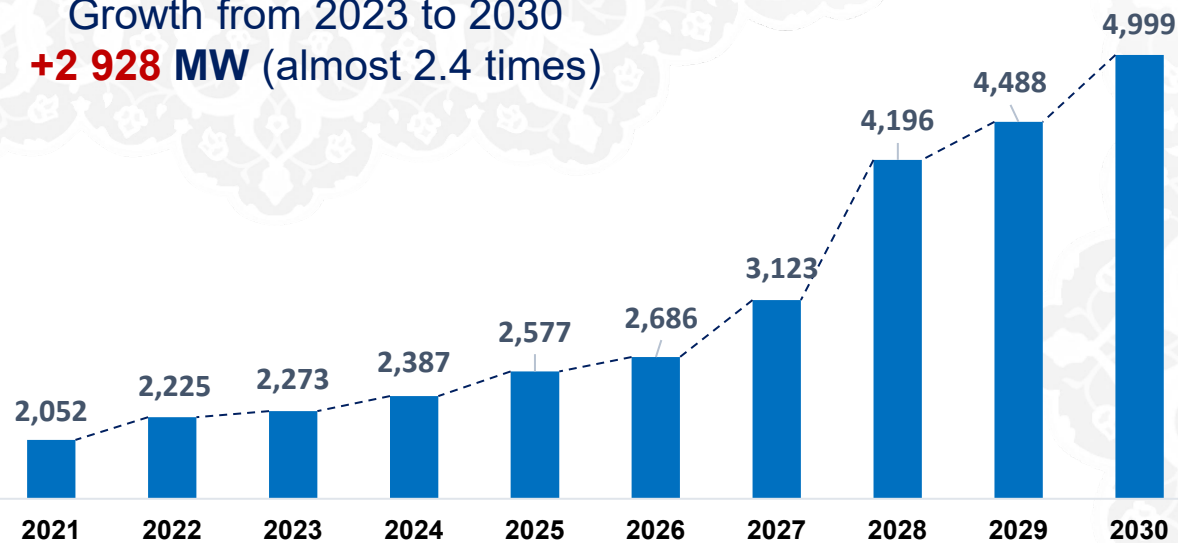
# HYDROPOWER DEVELOPMENT

## Target indicators for hydropower development

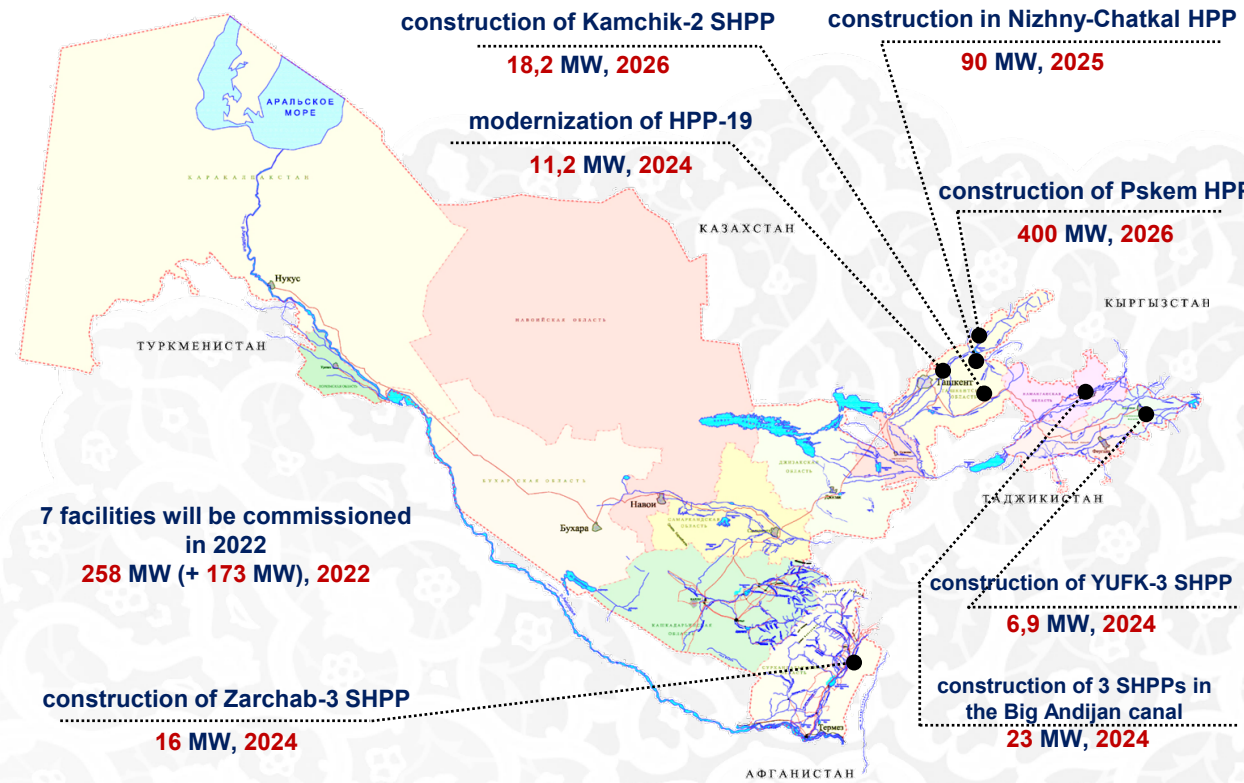
	Number of projects (construction and modernization)	<b>78 (2 928 MW)</b>
	Projects in cooperation with the private sector (SHPP)	<b>200 (56,6 MW)</b>
	Planned total power	<b>1 364 MW</b>
	Additional annual output	<b>11,5 billion kWh</b>
	Total cost of projects	<b>6,2 billion dollar</b>
	Created jobs	<b>over 2 500</b>

Growth from 2023 to 2030

**+2 928 MW** (almost 2.4 times)



By 2030, all existing HPPs will be fully modernized



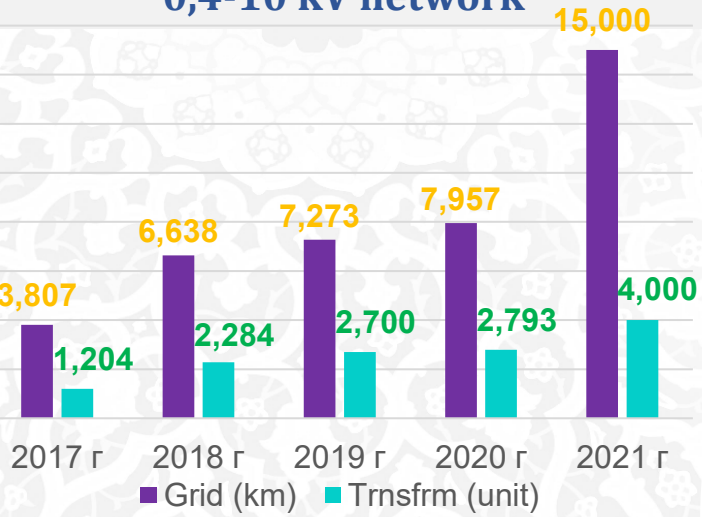
## Investment program

<b>Number of projects – 14</b> <b>Power – 817,5 MW</b>	<b>Cost – 1 338 million dollar</b>
<b>Construction – 8</b> <b>Power – 580,9 MW</b>	<b>1 191,3 million dollar</b>
<b>Modernization – 5</b> <b>Power – 236,6 (+152) MW</b>	<b>146,7 million dollar</b>
<b>Created jobs – 400</b>	<b>2,6 billion kWh additional generation</b>

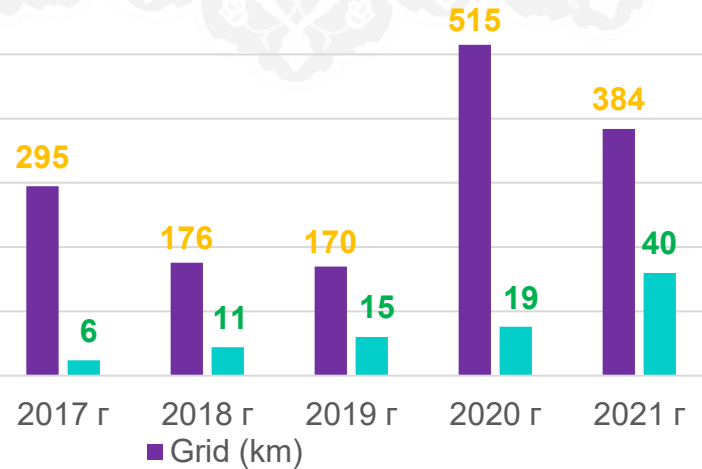
# POWER GRID

## Works done in 2017-2021 years

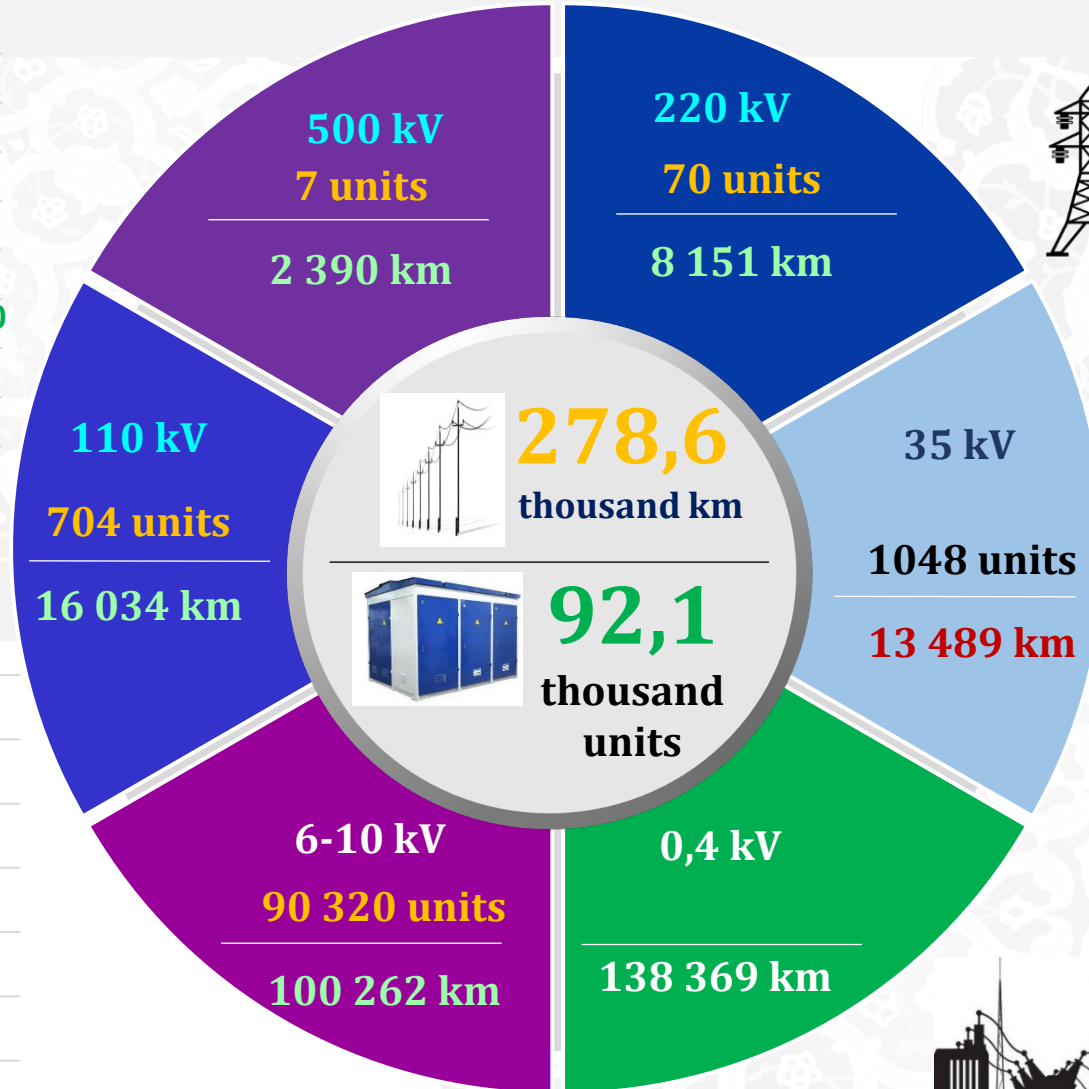
### 0,4-10 kV network



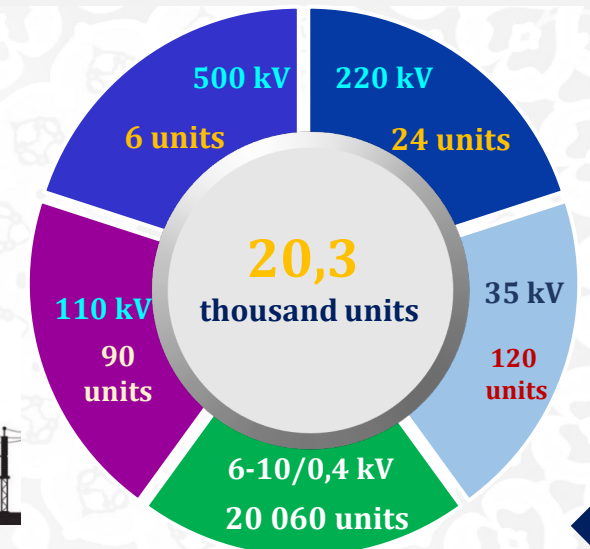
### 35-500 kV network



## ACTIVE VOLUME



## Perspective work to be done until 2026 year



# AUTOMATED ELECTRICITY METERING AND CONTROL SYSTEM IMPLEMENTATION

## ADVANTAGES OF METERS

The human factor, external interference is reduced.

Detection of illegal use of electricity.

Even if the voltage changes by 30% from the standard, the error rate does not change.

Resistant to climatic conditions of all regions of the republic (-30 ; +70 C).

It does not turn off even when connecting consumers with a large load (13 kW or 60 A).

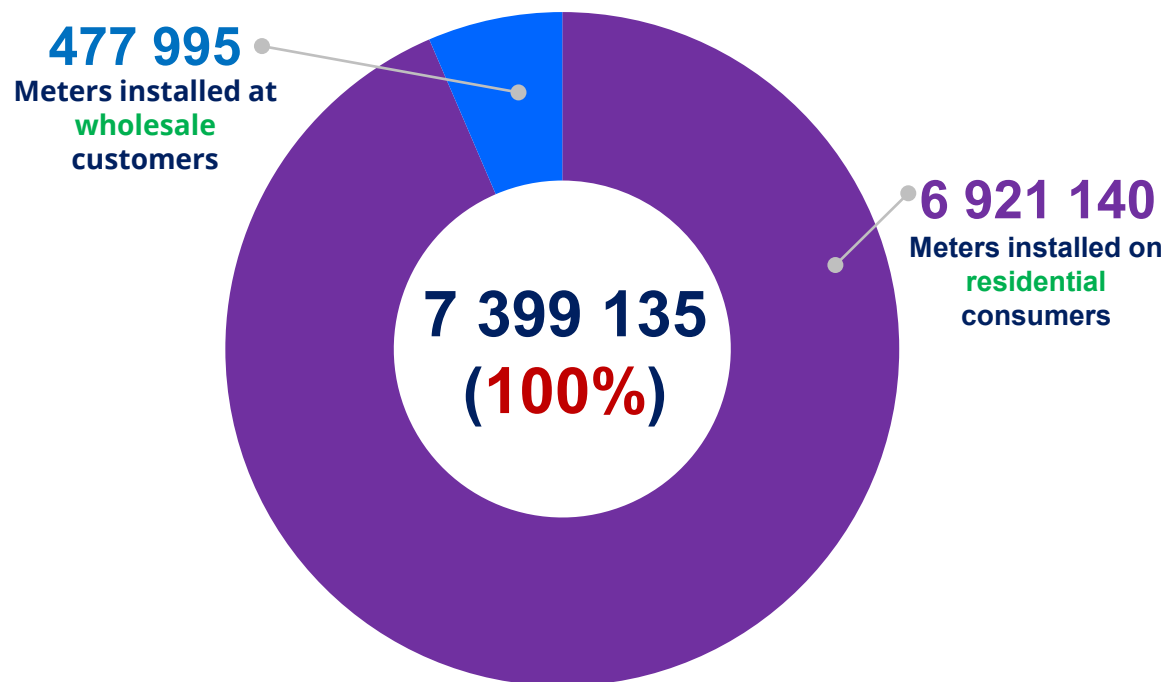
The term of service is 25 years, it is reviewed once every 10 years

Two-directional measurement is available (input and output).

Ability to apply differentiated (differential) tariffs.

It stores data in its memory even if communication with the center is lost.

## METERS INSTALLED WITHIN THE PROJECT



85 203

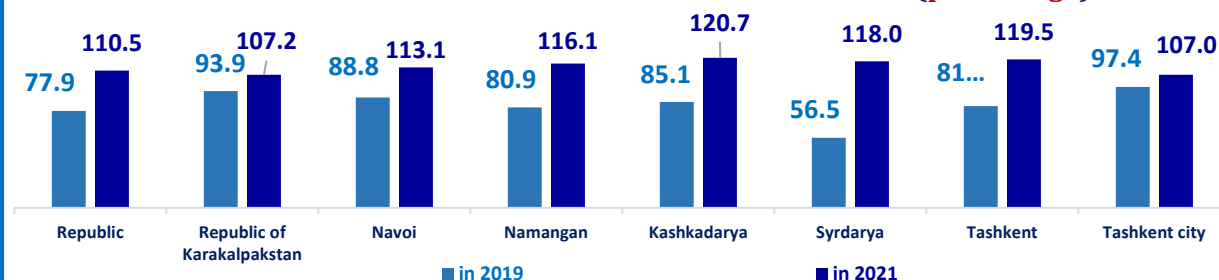
Balance meters installed at transformer points

7 259 016

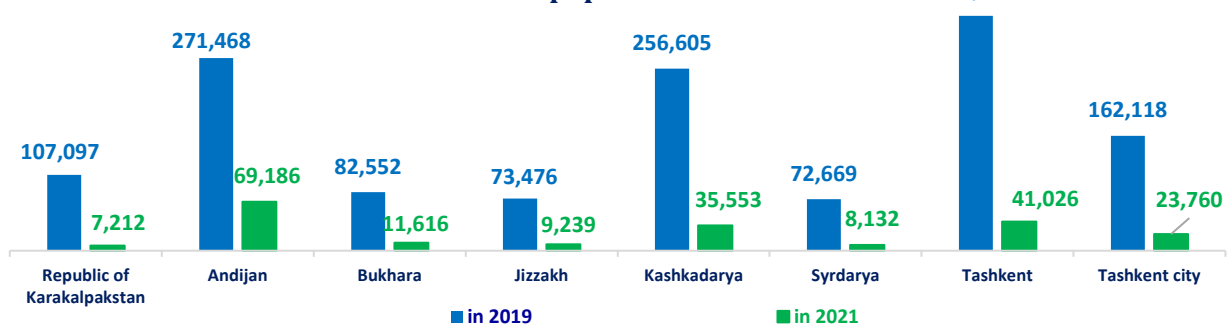
Consumers connected to the billing system

## RESIDENTIAL CONSUMERS CONNECTED TO THIS SYSTEM.

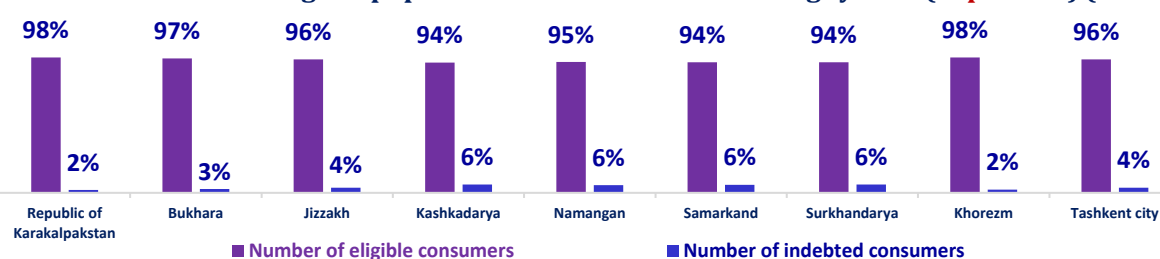
### Level of collection of funds from residential consumers (percentage).

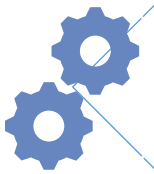


### The number of indebted population consumers.



### Consumers of the eligible population connected to the billing system (in percent) (in 2021).





Loses in production (up to 15%)

Renovation and modernization of existing power plants: introduction of new technologies and equipment upgrades to improve efficiency and reliability.



Low efficiency of old technologies

Implementing new technologies and energy efficiency methods: applying innovative solutions to reduce energy consumption and optimize processes.



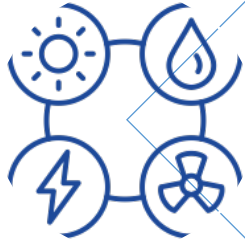
Risks with development of renewable energy plants

Utilization of solar and wind energy: development and increase of the share of solar and wind power plants for the production of clean energy sources.



Risks of development of hydro power plants

Development of hydropower potential: Research and development of hydropower resources to increase the share of hydropower plants.



Diversity of energy sources to reduce import dependence

Diversity of energy sources to reduce import dependence: developing different energy sources to reduce the risks associated with import dependence.



Development of energy cooperation with other countries

Developing energy cooperation with other countries: Partnering and cooperating with other countries in the energy field to share expertise and resources.



Loses in electricity grids (up to 14%)

Renovation and modernization of grids: introduction of new technologies and equipment upgrades to improve efficiency and reliability.

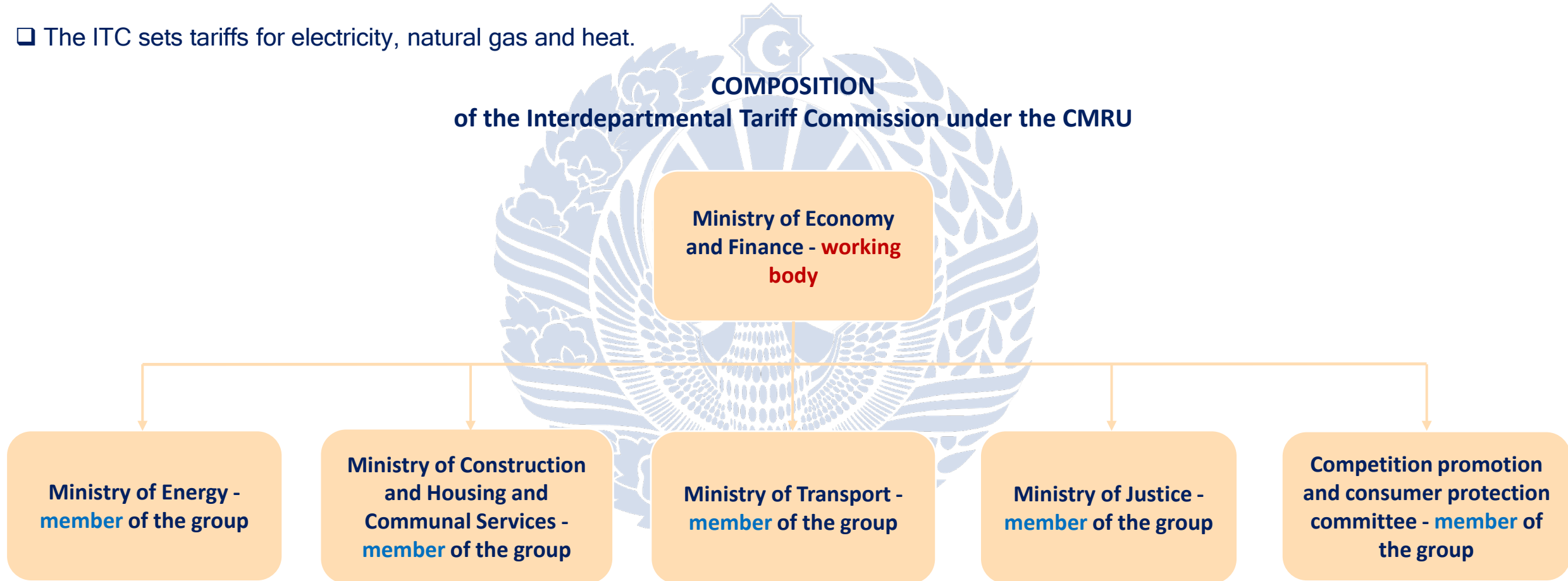
One of the biggest problem on energy system is that 40% of generation consist of old Soviet technologies, even the Government trying step by step modernizing and build up new generation capacities, the system has much loses in fuel and electricity. I hope due to exchange program I learn up about ways of minimizing the loses.

**Thank you for your attention**



# The energy tariff regulator - Interdepartmental Tariff Commission (ITC)

- ❑ The functions of the energy tariff regulator are performed by the Interdepartmental Tariff Commission (ITC) under the Cabinet of Ministers of the Republic of Uzbekistan (CMRU);
- ❑ The ITC sets tariffs for electricity, natural gas and heat.



# Electricity tariff (as of 19.04.2023)

Group	Category	Tariff options	Tariffs (with VAT)
I	Commercial consumers (with a connected capacity of 750 kVA and above)	Time-of-use tariff for the SOE's (mining, oil and gas, chemical and automobile industry companies)	<b>Half peak 9:00–17:00</b> <b>800 UZS/kWh (0.07 USD/kWh)</b> <b>Peak 6:00–9:00 and 17:00–22:00</b> <b>1200 UZS/kWh (0.11 USD/kWh)</b> <b>Night 22:00–6:00</b> <b>533 UZS/kWh (0.05 USD/kWh)</b>
		Time-of-use tariff for all other consumers	<b>Half peak 9:00–17:00</b> <b>450 UZS/kWh (0.04 USD/kWh)</b> <b>Peak 6:00–9:00 and 17:00–22:00</b> <b>675 UZS/kWh (0.06 USD/kWh)</b> <b>Night 22:00–6:00</b> <b>300 UZS/kWh (0.03 USD/kWh)</b>
II	Other commercial consumers	Flat-rate tariff budgetary and particular categories financed by the state budget	<b>800 UZS/kWh (0.07 USD/kWh)</b>
		Flat-rate tariff for other commercial consumers	<b>450 UZS/kWh (0.04 USD/kWh)</b>
III	Residential consumers	50% of the flat-rate tariff for consumers with electric stoves	<b>147.5 UZS/kWh (0.015 USD/kWh)</b>
		Flat-rate tariff for remaining consumers	<b>295 UZS/kWh (0.03 USD/kWh)</b>
IV	Tariff for group I and II consumers, for heating, hot water supply and cooking	Flat-rate tariff	<b>450 UZS/kWh (0.04 USD/kWh)</b>