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SCALING UP RENEWABLE ENERGY IN CENTRAL ASIA

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DECEMBER 14, 2023

USAID Power Central Asia Program

MAIN GOAL:

- To assist the five Central Asian countries to meet their national and regional priorities in energy security and unlock the economic benefits of regional energy trade.

TASKS:

- Task 1: National market reforms
- Task 2: Clean energy
- Task 3: Regional electricity market
- Cross-cutting areas of activity (4)

IMPLEMENTATION PERIOD:

- October 2020 - September 2025



OVERVIEW OF THE ELECTRIC POWER SECTOR IN CENTRAL ASIA

- 5 countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.
- Governments see the potential of solar, wind and hydropower.
- There is potential for cross-border energy trade to drive the energy transition.

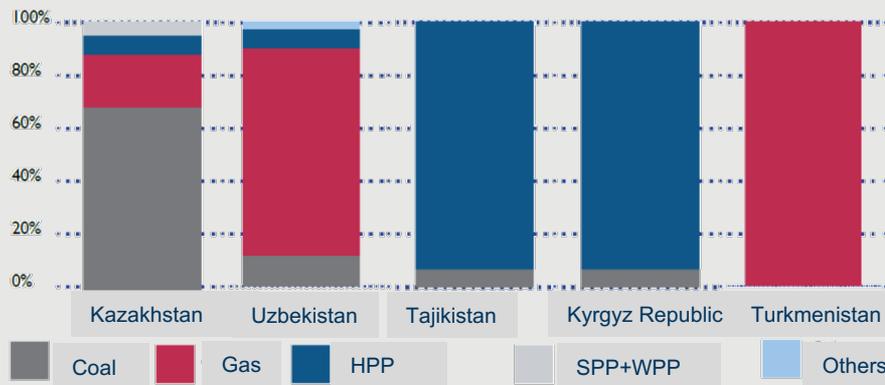
COUNTRY	INSTALLED CAPACITY (MW)*	ELECTRIC POWER GENERATION (billion kWh)*
KAZAKHSTAN	24 523	112,8
KYRGYZSTAN	3 986	13,9
TAJIKISTAN	6 124	21,4
TURKMENISTAN	6 511	28,5
UZBEKISTAN	16 514	74,3
TOTAL	57 658	250,9

* As of the end of 2022

KEY ISSUES IN THE ENERGY SECTOR

- High level of wear and tear of energy assets
- High power losses (up to 17%)
- Low energy efficiency and high carbon intensity
- Low electricity tariffs
- Lack of **maneuvering and balancing capacities**

GENERATION MIX



AMBITIOUS CLEAN ENERGY GOALS IN CENTRAL ASIA



Kazakhstan

6% - of the energy balance by 2025,
15% by 2030
50% by 2050
Carbon neutrality by 2060



Kyrgyzstan

RES share -
10% by 2030



Tajikistan

10/10/10/10 - by 2030
700 MW of RES capacities (excluding HPPs) - by 2030



Turkmenistan

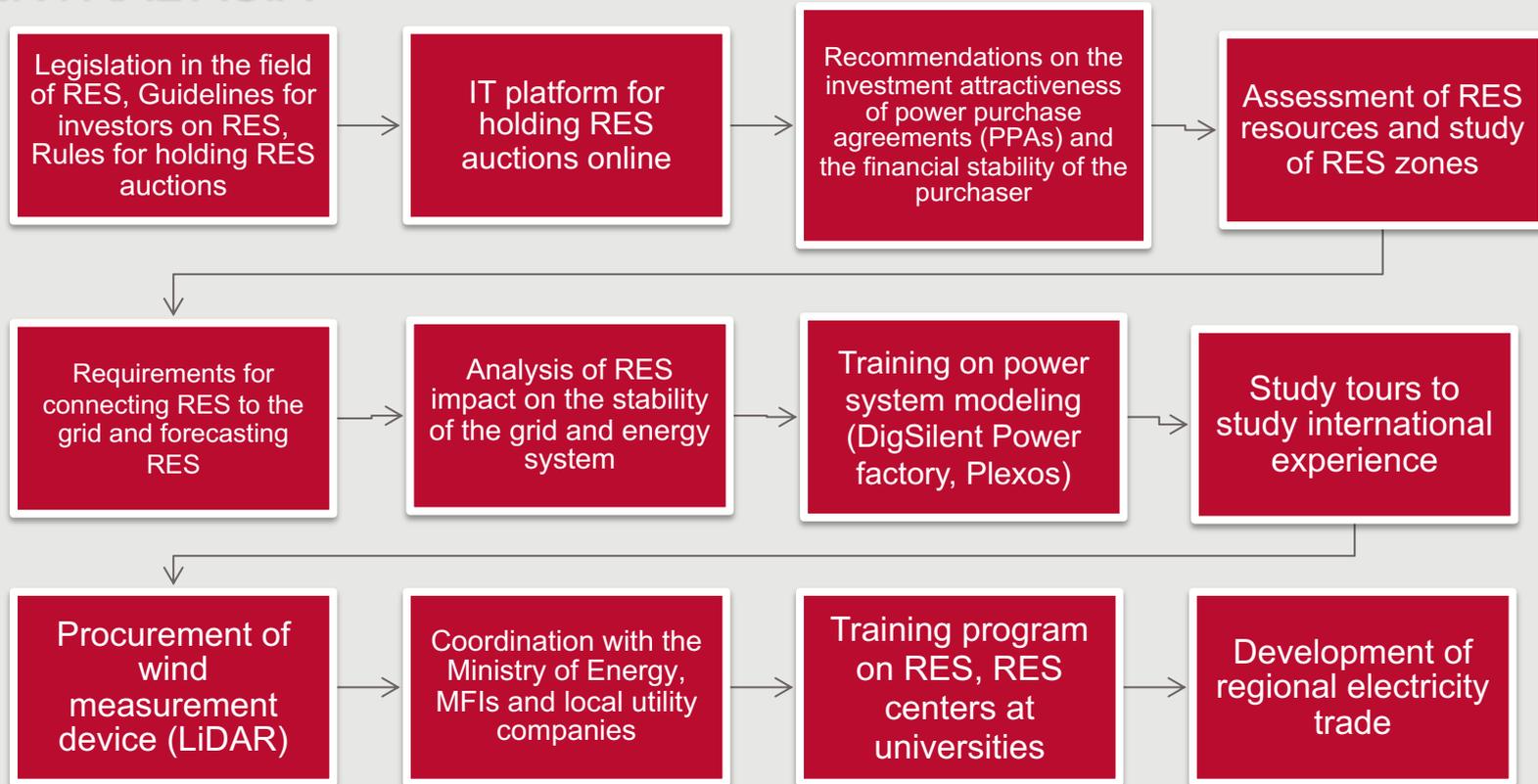
Scaling up the use of RES in electricity production



Uzbekistan

8 GW - by 2026,
12 GW (7 GW SPP + 5 GW - WPP) - by 2030,
25% of RES in total generation
Carbon neutrality by 2050

USAID'S ROLE IN RENEWABLE ENERGY DEVELOPMENT IN CENTRAL ASIA



KAZAKHSTAN: SUCCESS OF AUCTIONS ON RES PROJECTS

WPP



SPP



KEY POINTS

- ✓ From feed-in tariff to competitive bidding (RES auctions)
- ✓ Rules and schedule for RES auctions
- ✓ IT platform for online auctions
- ✓ Project auctions were introduced in 2019.
- ✓ Guaranteed purchase of electricity
- ✓ Tariff indexation to the exchange rate
- ✓ Power Purchase Agreement (PPA - 20 years)
- ✓ Guaranteed connection to the grid
- ✓ Investment preferences
- ✓ Seminars on RES
- ✓ Guide for RES investors

Starting price 2018	12,6 US dollar cents	19,2 US dollar cents
Min.price 2023	2,28 US dollar cents	3,05 US dollar cents
Tariff reduction (KZT)	81,9%	84,11%

- ✓ **3255 MW offered at renewable energy auctions**
- ✓ **Projects selected for 2,496 MW**
- ✓ **254 companies from 13 countries**
- ✓ **Renewable energy prices have decreased compared to the feed-in tariff**

KAZAKHSTAN: 141 RES POWER PLANTS — 2,716 MW (October 2023)



WPP

55 facilities
1246.6 MW



SPP

44 facilities
1197.83 MW



HPP

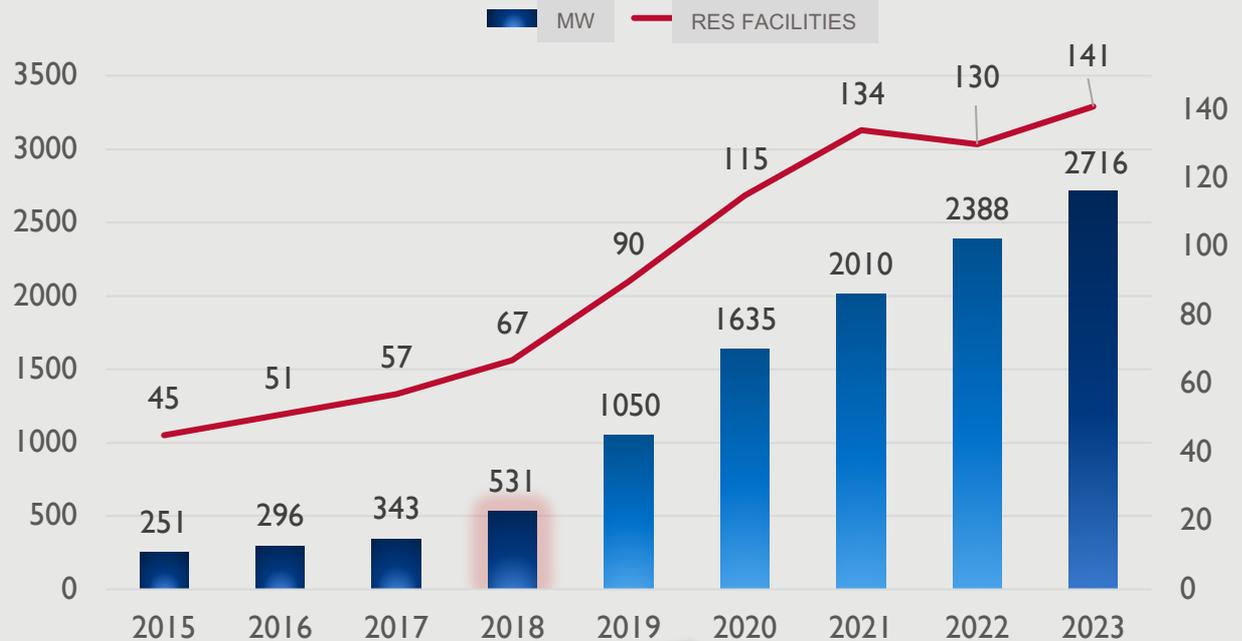
39 facilities
269.605 MW



BIO

3 facilities
1.77 MW

RES capacity and generation (2015-2023)



Introduction of renewable energy auctions

UZBEKISTAN: FAST GROWING RES MARKET

KEY POINTS

- Reforms in the electricity sector to ensure competition and increased private investment
- In 2019, the government adopted a law on renewable energy sources and a law on PPP
- The government's plans - 12 GW (+ 6 GW) of RES by 2030
- Investment-attractive PPA for 25 years, "take-or-pay", international arbitration, tariff denomination
- Agreements on state support for investments in RES

ACHIEVEMENTS

- Large portfolio of renewable energy projects financed by the WB/IFC, EBRD, ADB.
- Key investors are Masdar, ACWA Power, Total and other world leaders.
- About 2,157 MW of SPP and WPP projects on a tender basis and 3,500 MW on the basis of direct contracts (2022).
- The first two SPPs with a capacity of 100 MW each were commissioned in 2022 (Navoi and Samarkand)

RES POTENTIAL



WIND ENERGY
1000 TWh/year



SOLAR ENERGY
525-760 TWh/year



HYDROPOWER
15 TWh/year

UZBEKISTAN: PLANS FOR IMPLEMENTATION OF RES PROJECTS (October 2022)

РЕСПУБЛИКИ УЗБЕКИСТАН

Location

Resource type Installed capacity Comiss.date

№	Расположение солнечных и ветряных электростанций	Тип	Установленная мощность, МВт	Дата ввода
1	В Навоийской области	ФЭС	100 (введена)	2021 г.
2	В Самаркандской области	ФЭС	100 (введена)	2022 г.
3	В Сурхандарьинской области	ФЭС	460	2024 г.
4	В Самаркандской области	ФЭС	220	2024 г.
5	В Джизакской области	ФЭС	220	2024 г.
6	В Навоийской области	ФЭС	200	2025 г.
7	В Бухарской области	ФЭС	250	2025 г.
8	В Наманганской области	ФЭС	150	2025 г.
9	В Хорезмской области	ФЭС	100	2025 г.
10	В Ферганской области	ФЭС	100	2026 г.
11	В Кашкадарьинской области	ФЭС	300	2026 г.
12	В Джизакской области	ФЭС	150	2026 г.
13	перспективные проекты	ФЭС	1650	2025-2026 гг.
	Итого ФЭС:		4000	до 2026 г.
1	В Навоийской области	ВЭС	500	2024 г.
2	В Бухарской области	ВЭС	1000	2024 г.
3	В Республике Каракалпакстан	ВЭС	100	2024 г.
4	В Республике Каракалпакстан	ВЭС	200	2025 г.
5	В Республике Каракалпакстан	ВЭС	1500	2026 г.
6	перспективные проекты (ВЭС)	ВЭС	700	2025-2026 гг.
	Итого ВЭС:		4000	до 2026 г.
	Итого ВИЭ:	ВИЭ	8000	до 2026 г.

KEY CONDITIONS FOR SUCCESSFUL DEVELOPMENT OF RES

FINANCING AND INVESTMENT ATTRACTIVENESS OF RES

- The key factor for any investment is project profitability.
- A Power Purchase Agreement (PPA) that is acceptable to lenders and investors is critical.
- Financial stability of the electricity purchaser must be guaranteed.
- Electricity tariffs should reflect costs.
- Currency risks must be resolved.

POLITICAL, REGULATORY AND ADMINISTRATIVE ISSUES

- The need to develop a clear strategy and road map for RES development
- Lack of long-term planning for the energy system.
- Clear and timely permitting and regulatory procedures are critical to creating a favorable investment climate (grid connection, land issues).
- Clearly defined and effective dispute resolution mechanisms to ensure transparency.
- Introduction of competitive procedures (tenders, auctions) to select renewable energy investors

KEY CONDITIONS FOR SUCCESSFUL DEVELOPMENT OF RES

INTEGRATION OF VARIABLE RES AND STABILITY OF ENERGY GRIDS

- Integrating volatile renewable energy sources (wind and solar) while maintaining reliability is the most challenging task.
- The need to improve power grid rules, electricity transmission and distribution rules, rules for connecting and integrating renewable energy sources, including the priority of dispatching electricity from RES, forecasting generation from RES, etc.
- Solving issues related to the “take-or-pay” mechanism and reducing transmitted power or energy.
- Inflexible grid infrastructure, insufficient digitalization, lack of balancing capacity.
- The need to modernize energy grids and introduce energy storage devices.
- The need to develop a regional electricity trading market in Central Asia.

MAIN RECOMMENDATIONS

RES target indicators and the road map for the development of RES

Measurement of RES resources and map of RES facilities indicating the availability of land plots and grids

Introduction of a competitive procurement mechanism for renewable energy projects

Status of the single electricity purchaser and their solvency

Investment-attractive Power Purchase Agreement (PPA)

State support agreement and other related documents

Methodology for determining and indexing RES tariffs

Introduction of the PPP mechanism for renewable energy projects

Procedures for selecting land for renewable energy projects

Grid integration, priority dispatch, etc.

Grid modernization, balancing generation, energy storage devices for backup power supply at renewable energy facilities, etc.

Regional electricity trade



SUPPORTING WOMEN IN ENERGY INDUSTRY

SUPPORTING WOMEN AND YOUNG PEOPLE IN ENERGY INDUSTRY

- The USAID's Power Central Asia project sponsors 20 students from all Central Asian countries to help them do a Master's degree program in Strategic Management in Renewable Energy and Energy Efficiency at the German-Kazakh University in Almaty. In 2023, the first graduates received their diplomas.
- PCA supported 40 young professionals by organizing a six-month mentoring program for women and young people.
- More than 40 women from the energy sector took part in the "Summer Camp: The Role of Women in the Energy Transition in Central Asia" organized by PCA.



SUPPORTING WOMEN AND YOUNG PEOPLE IN ENERGY INDUSTRY



- As part of the memorandum with AUES, an educational program on renewable energy for undergraduate and graduate students was developed and implemented
- Internship program in ministries of energy and utilities companies for female students (40 people).
- Visiting renewable energy power plant sites with technical training.
- A Committee on Gender Issues has been created under the Ministry of Energy of the Kyrgyz Republic
- Regional conferences are held annually for women from the energy sector of Central Asia with representatives from all 5 countries in the region.



THANKS!

**USAID Power Central Asia
Program**

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