INCREASING RENEWABLES FOR ENERGY TRANSITION IN CENTRAL ASIA

BAYAN ABYLKAIROVA
USAID POWER CENTRAL ASIA ACTIVITY

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Central Asia Power Sector Overview

Key Sector Challenges

• Old energy assets
• High power losses
• Low energy efficiency and high carbon intensity
• Lack of power system flexibility and balancing capabilities
• Low level of tariffs

Power Generation Structure & Numbers

<table>
<thead>
<tr>
<th>Country</th>
<th>Installed Capacity (MW)</th>
<th>Electricity Generation (bln kWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kazakhstan</td>
<td>24,641</td>
<td>112.8</td>
</tr>
<tr>
<td>Kyrgyz Republic</td>
<td>3,955</td>
<td>13.8</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>6,125</td>
<td>21.9</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>6,948</td>
<td>32.1</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>16,609</td>
<td>78.0</td>
</tr>
<tr>
<td>Total</td>
<td>57,627</td>
<td>255.7</td>
</tr>
</tbody>
</table>

* Data as of end of 2023*
CENTRAL ASIA AMBITIOUS CLEAN ENERGY TARGETS

**Kazakhstan**
- 6% in energy mix by 2025,
- 15% by 2030,
- 50% by 2050,
- Carbon neutrality by 2060

**Kyrgyz Republic**
- 10% RE share by 2030

**Uzbekistan**
- 8 GW by 2026
- 25 GW or 40% RE in generation mix by 2030
- Carbon neutrality by 2050

**Tajikistan**
- 10/10/10/10 - by 2030
- 700 MW of RE capacity (non-hydro) by 2030

**Turkmenistan**
- announced no targets to date
PCA’s main goal is to help Central Asia countries to:
• meet their energy priorities to improve energy security
• realize economic benefits from regional electricity trade

PCA has three objectives, complemented by cross-cutting activities:
1. National Market Liberalization Reforms
2. Clean Energy
3. Regional Power Market

Implementation period:
October 1, 2020 – September 30, 2025
USAID’S ROLE IN INCREASING RENEWABLES IN CA

- RE legal and regulatory framework
- RE Auction Rules
- RE Auctions toolkit
- Investors Guide
- PPA Bankability
- Off-taker creditworthiness
- RE Zones Studies
- RE Resource Assessment
- Small scale RE
- RE Curriculum
- University RE Center
- Grid Connection Requirements
- Power Systems Modelling
- Grid Impact Analysis
- Power System Stability
- RE Forecasting
- Trainings (DigSilent, Plexos)
- Resource Measurement Equipment (LIDAR)
- Regional Electricity Trade
- International Study Tours
- Stakeholder Coordination (MoEs, IFIs, Utilities)
KAZAKHSTAN: RENEWABLE ENERGY AUCTIONS

GOVERNMENT SUPPORT MEASURES

- From FiT to competitive auctions
- RE auction Rules and Schedule
- On-line auction toolkit
- Site-specific auctions in 2019
- Single buyer guaranteed purchase
- Reserve fund of single buyer
- Guaranteed financial support to single buyer
- Tariff indexation
- PPA – from 15 to 20 years
- Reservation of RE sites with grid connection
- Investment preferences (exemption from tax duties and VAT on import
- RE workshops and Investor’s Guide

**RE auctions price dynamics**

- Starting Price WPP
- Min. Price WPP

**3255 MW proposed, 2503 MW procured (2018-2023)**
- 260 companies from 13 countries participated
- RE prices decreased
- RE generation reached 5.92% in 2023
KAZAKHSTAN: 148 RE POWER PLANTS - 2903 MW (2023)

INCREASE OF RE POWER PLANTS & CAPACITY (2015-2023)

Wind 59
1409,5 MW

Solar 46
1222,6 MW

Hydro 40
269,8 MW

Bio 3
1,77 MW

Ministry of Energy plans - RE auctions for 2024-2027 for total 6 GW
<table>
<thead>
<tr>
<th>Company</th>
<th>Capacity</th>
<th>Location</th>
<th>Inter-governmental agreement signed</th>
<th>Tariff for purchasing electricity has been approved</th>
<th>Investment agreement signed with the Government of KZ</th>
<th>Work on PPA and Investment agreement with the Government of KZ is process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Eren</td>
<td>1 GW</td>
<td>Location: Zhambyl region</td>
<td></td>
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</tr>
<tr>
<td>ACWA Power</td>
<td>1 GW</td>
<td>Location: Zhetysu region</td>
<td></td>
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<td></td>
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<tr>
<td>Masdar</td>
<td>1 GW</td>
<td>Location: Zhambyl region</td>
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<tr>
<td></td>
<td>500 MW in Phase I</td>
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</table>
UZBEKISTAN: FAST GROWING RENEWABLES MARKET

KEY FEATURES

- Power sector reforms to enable competition and increased private investment
- Plans - 25 GW of renewables by 2030
- RE law and PPP law (2019)
- Bankable PPA 25 - year, “take or pay”, international arbitration, tariff denomination
- Government support agreements for RE investment

STATUS AND PLANS

- **Solar PV**: 6447 MW contracted; 8640 MW planned for 2030
- **Wind**: 4200 MW Contracted, 17 000 MW planned by 2030
- **BESS**: contracted 1440 MW,
- **Hydro**: contracted 78 projects (construction and modernization) for 2 92 MW, 4999 MW planned by 2030.
CHALLENGES TO SCALING UP RENEWABLES

RE POLICY AND REGULATORY CHALLENGES
1. Lack of long-term power planning.
2. Lack of capacity for favorable RE framework.
3. Need clear strategy and roadmap for energy transition.
4. Need clear and timely permitting/regulatory procedures.
5. Need effective dispute resolution mechanisms.

RE FINANCE AND BANKABILITY CHALLENGES
1. Currency risk needs mitigation.
2. Cost-reflective tariffs are important.
3. PPA needs to be acceptable to lenders/investors.
4. Creditworthiness of power off-taker needs to be strong.
5. Ensuring project bankability is crucial.

VRE INTEGRATION AND GRID STABILITY CHALLENGES
1. Need grid modernization and energy storage.
2. Lack of CA regional connections and trading.
3. Inflexible grid, incomplete digitalization, lack of flexible generation.
4. Need improved grid codes for RE interconnection.
5. Integrating intermittent renewables while maintaining reliability.
THANK YOU!

USAID Power Central Asia

Bayan.Abylkairova@tetratech.com

https://www.linkedin.com/in/bayan-abylkairova-89817329/