SCALING-UP RENEWABLES IN CENTRAL ASIA

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USAID POWER CENTRAL ASIA ACTIVITY

ACEF, MANILA, JUNE 13-16, 2023
CENTRAL ASIA POWER SECTOR OVERVIEW

- 5 countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.
- Governments see the potential of solar, wind & hydropower resources.
- Potential for cross-border electricity trade to drive energy transition.

### Key Sector Challenges

- Old energy assets
- High power losses (up to 17 percent)
- Low energy efficiency and high carbon intensity
- Low level of electricity tariffs
- Lack of power system flexibility and balancing capabilities

### Power Generation Structure

<table>
<thead>
<tr>
<th>Country</th>
<th>Installed Capacity (MW)</th>
<th>Electricity Generation (TWh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kazakhstan</td>
<td>24,523</td>
<td>116.1</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>3,955</td>
<td>15.4</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>6,124</td>
<td>21.4</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>6,511</td>
<td>28.5</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>16,514</td>
<td>74.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>57,627</strong></td>
<td><strong>255.7</strong></td>
</tr>
</tbody>
</table>

Governments see the potential of solar, wind & hydropower resources. Potential for cross-border electricity trade to drive energy transition.
Kazakhstan
USAID POWER CENTRAL ASIA

MAIN GOAL:
• Assist Central Asia meet national and regional energy priorities to ensure energy security and regional electricity trade.

OBJECTIVES:
• Objective 1: National market reforms
• Objective 2: Clean energy
• Objective 3: Regional power market
• Cross-cutting activities (4)

IMPLEMENTATION PERIOD:
• October 2020 – September 2025
USAID’S ROLE IN INCREASING RENEWABLES IN CENTRAL ASIA

- RE legislation, RE Investors Guide RE Auction Rules
- IT platform for online RE auctions
- Recommendations on PPA bankability and financial stability of the off-taker
- RE resource assessment and RE zones studies
- RE grid connection requirements and RE forecasting
- Analysis of RE impact on grid and power system stability
- Trainings on power systems modelling (DigSilent Power factory, Plexos)
- Study tours for learning international experience
- Procurement of wind measurement equipment (LiDAR)
- Coordination with MoE, IFIs and local utilities
- RE curriculum, RE center for university
- Promoting regional electricity trade
KAZAKHSTAN: SUCCESS OF RENEWABLE ENERGY AUCTIONS

KEY FEATURES

✓ From FiT to competitive auctions
✓ RE auction Rules and Schedule
✓ On-line auction toolkit
✓ Site-specific auctions in 2019
✓ Off-taker guaranteed electricity purchase
✓ Tariff indexation
✓ PPA – 20 years
✓ RE sites with grid connection
✓ Investment preferences
✓ RE workshops and Investor’s Guide

<table>
<thead>
<tr>
<th></th>
<th>WIND</th>
<th>SOLAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starting price</td>
<td>6.58 U.S. cents</td>
<td>10.04 U.S. cents</td>
</tr>
<tr>
<td>2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum price</td>
<td>2.7 U.S. cents</td>
<td>3.7 U.S. cents</td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariff decrease</td>
<td>45%</td>
<td>64%</td>
</tr>
<tr>
<td>(KZT)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

✓ 2395 MW proposed for RE auctions
✓ 1746 MW selected
✓ 232 companies from 13 countries
✓ RE prices decreased comparing to FiT
KAZAKHSTAN: 130 RE POWER PLANTS - 2388 MW (2022)

RENEWABLES CAPACITY & GENERATION (2015-2022)

- **Wind**: 958 MW
- **Solar**: 1148 MW
- **Hydro**: 280 MW
- **Bio**: 1,77 MW

RE auctions introduced

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UZBEKISTAN: FAST GROWING RENEWABLE ENERGY MARKET

**KEY FEATURES**

- Power sector reforms to enable competition and increased private investment
- The government plans - 12 GW of renewables by 2030
- In 2019 government adopted RE law and PPP law
- Bankable PPA 25-year, “take or pay”, international arbitration, tariff denomination
- State support agreements for RE investment

**ACHIEVEMENTS**

- RE projects pipeline is growing with key financiers – WB/IFC, EBRD, ADB, and key investors - Masdar, ACWA Power, Total Eren
- About 2157 MW of solar and wind project through tender and 3500 MW through direct contracting.
- First two solar PV plants – each of 100 MW capacity commissioned in 2022 (Navoi and Samarkand)

**RE POTENTIAL**

- **WIND ENERGY**
  - 1000 TWh/year
- **SOLAR ENERGY**
  - 525-760 TWh/year
- **HYDROPOWER**
  - 15 TWh/year
CHALLENGES TO SCALING UP RENEWABLES

RE FINANCE AND BANKABILITY CHALLENGES
CHALLENGES TO SCALING UP RENEWABLES

VRE INTEGRATION AND GRID STABILITY CHALLENGES
## KEY RECOMMENDATIONS

<table>
<thead>
<tr>
<th>RE targets and RE development road map</th>
<th>RE resources measurement and RE sites map, with land and grid availability</th>
<th>Competitive procurement mechanism for RE projects introduction</th>
<th>Status of a single buyer of electricity and its solvency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bankable power purchase agreement (PPA)</td>
<td>Agreement on state support and other related documents</td>
<td>Methodology for determining and indexing RE tariffs</td>
<td>Introducing PPP framework for RE projects</td>
</tr>
<tr>
<td>Land regulatory framework for RE projects</td>
<td>Grid integration, priority dispatching etc.</td>
<td>Grid modernization, flexible generation, energy storage to back up RE, etc.</td>
<td>Regional electricity trade</td>
</tr>
</tbody>
</table>
THANK YOU!

USAID Power Central Asia

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