ROLE OF RENEWABLES IN DRIVING CENTRAL ASIA REGIONAL ELECTRICITY MARKET (CAREM)

Bayan Abylkairova
USAID Power Central Asia Activity

ACEF, manila, June 3-7, 2024
CENTRAL ASIA AMBITIOUS CLEAN ENERGY TARGETS

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

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

Kyrgyz Republic
- 10% RE share by 2030

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

Turkmenistan announced no targets to date

### 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><strong>TOTAL</strong></td>
<td><strong>57 627</strong></td>
<td><strong>255.7</strong></td>
</tr>
</tbody>
</table>

* Data as of end of 2023*
CENTRAL ASIA REGIONAL ELECTRICITY MARKET

Trends for cross-border power trade

- RE and regional trade to reduce deficit
- Kazakhstan and Uzbekistan actively developing RE
- Solar and wind opportunities
- Need for flexible capacities
- Trade basis: electricity, transit, flexibility services

GOAL - expansion of mutually beneficial cooperation, increased trade in electricity, economic growth, and energy security in the region through the regional electricity market.

Why CAREM?

- Concentrated and diverse energy resources
- Aging of national power systems
- An open market could lower electricity prices
- Increasing profits by selling excess electricity
- Increased energy efficiency and electricity use

Expanding export opportunities will help RE

Central Asian Governments
  Management, knowledge and experience sharing

IFI’s and donors
  Financing and technical support

U.S. Government
  Sharing best practices and technical assistance

Private sector
  Investment into infrastructure and generation

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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 - CAREM

Implementation period:
October 1, 2020 – September 30, 2025
HOW USAID SUPPORTS RENEWABLES AND CAREM?

- RE Legislation and Investors Guide
- RE Auction Support
- Grid Connection and Forecasting
- PPA Bankability
- Off-taker creditworthiness
- Grid Impact and Stability
- Small scale RE
- RE Education and Study Tours
- University support
- Equipment procurement and training

Regional Electricity Trade

Harmonizing power sector Regulations
System Stability Studies
SCADA and WAMS
Power Modelling Trainings
Grid Code development
Electricity market platform
Ministerial coordination and policy dialogue
Data Collection and Sharing
Stakeholder Coordination (MoEs, IFIs, Utilities)
Metering infrastructure
CENTRAL ASIA BILATERAL ELECTRICITY TRADING

*2023 data in mln kWh or GWh

<table>
<thead>
<tr>
<th>Country</th>
<th>Export 2023</th>
<th>Import 2023</th>
<th>% Increase (2023 vs 2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tajikistan</td>
<td>+102%</td>
<td>+129%</td>
<td></td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>-54%</td>
<td>+846%</td>
<td></td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>+192%</td>
<td>+3%</td>
<td></td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>+22%</td>
<td>-78%</td>
<td></td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>+47%</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

**Sources:**
SUMMARY OF PROPOSED MODEL FOR CAREM

**CURRENT FOCUS – NATIONAL STRATEGIES**

to identify the barriers preventing each country from implementing an electricity market at the national and regional levels.

Developed and presented for KZ, KG, TJ and UZ in 2024.

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**Phased implementation**

**Phase 1** – bilateral trading + balancing energy trading – +support in emergencies

**Phase 2** – Phase 1 + DAM

**Phase 3** – Phase 2 + RTM + ASM

**Phase 4** – Phase 3 + Power Exchange
In addition to coordinated bilateral trade, CAREM offers multilateral regional electricity trade. Participation in CAREM can be a good incentive to return to synchronized and coordinated operation of Central Asian energy systems.
CURRENT ACHIEVEMENTS & NEXT STEPS

ACHIEVEMENTS

 ✓ Drafted CAREM rules, Market Procedures criteria, and software requirements.
 ✓ Designed the Real-Time Market and proposed alternatives.
 ✓ Conducted CAPS studies and an overview of Central Asian power sectors.
 ✓ Created working groups for local staff training on market principles and power system integration.
 ✓ Established collaboration with IFIs and Donors through Donors Coordination Meetings.
 ✓ Assessed national power systems for technical weaknesses and reviewed legal/regulatory frameworks to recommend convergence for CAREM efficiency.
 ✓ Developed national strategies for CAREM participation for Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan.

NEXT STEPS

 ➢ Creation of the Intergovernmental Council (IGC).
 ➢ Creation of the CAREM Council.
 ➢ Creation and financing of a regional system operator and a regional market operator.
 ➢ Financing the purchase of software and hardware.
 ➢ Agreement on the payment method and a single currency for settlement of transactions.
 ➢ Determination of customs rules and taxes for cross-border trade in electricity.
Through C5+1 programs such as USAID Power Central Asia, the United States and Central Asian states will unlock the economic benefits of regional, clean energy trade and a clean economy future. We are committed to deepening cooperation to develop the capacity to meet growing global clean energy demands, including by potentially providing the world with safe, secure, and sustainable nuclear fuel supplies”.

September 21, 2023

(official statement signed by the C5+1 Presidents and photo by The White House)