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REGIONAL CONFERENCE

INCLUSIVE ENERGY TRANSITION IN SOUTH ASIA AND BEYOND

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ADB's Programmatic Approach Powering Energy Transition in Uzbekistan

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1 Country Context

■ Uzbekistan is...

- A double landlocked country in the Central Asia with 36.8 million population (2024)
- GDP \$125.4 billion (per capita GDP \$3,407)
- Rich in natural resources with natural gas production ranked 11th in the world with annual outputs of 60 – 70 billion cubic meters.

■ Uzbekistan energy sector

- With fast-growing electricity demand, the energy sector confronts the challenges of (i) meeting the growing demand; (ii) modernizing old/inefficient infrastructure; and (iii) maintaining energy security; and (iv) improving sector's sustainability.
- Took a bold step for energy transition in 2019 with fundamental sector reforms for climate commitment under the Paris Agreement and energy strategy to diversify sources using renewables on a large scale
- Energy transition is not just scaling up renewables; it is a process of addressing underlying complex sector challenges in a holistic approach.

2 Energy Snapshot

Uzbekistan is...

- Heavily dependent on the natural gas with the abundant renewable energy potential untapped.
- Characterized with high carbon intensity, overall energy inefficiency across the electricity supply chain.

Renewable potential



~600 GW

Total potential of renewable energy is estimated at ~600 GW, with 98% from solar energy.

Exports



>12 million toe

Uzbekistan's natural gas exports exceeded 12 million toe in 2018.

Carbon intensity



114th out of 172

Uzbekistan is ranked 114th out of 172 countries in the global ranking of carbon intensity of energy, largely due to the low share of coal in the electricity mix.

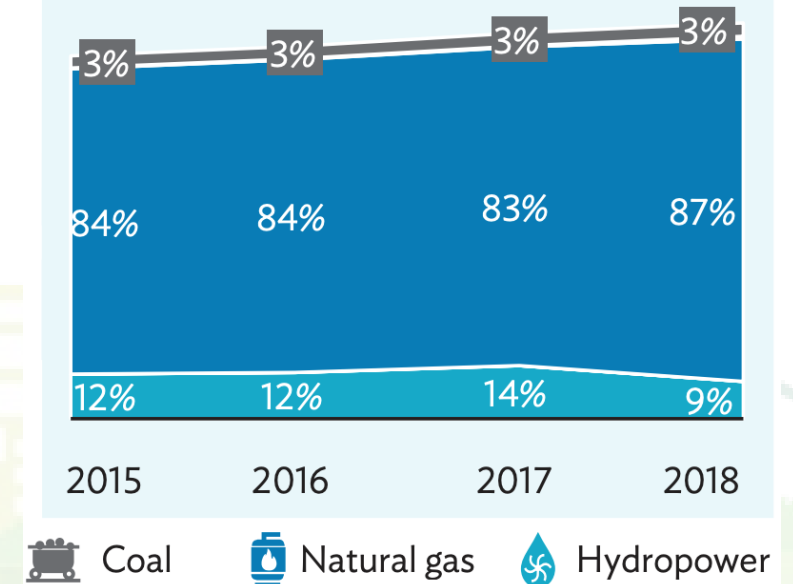
Gas Interconnections



~150 bcma

Cross-border natural gas export and transit capacity of Uzbekistan is ~150 bcma.

Electricity generation mix (%)



3 Development Constraints in Energy Sector – Pre-Reform

- **Vertically integrated utility with weak sector governance, and opaque regulatory framework**
 - Combined regulatory/policy function with operational functions
 - Lack of competition, independence, and transparency
- **Absence of integrated energy planning and climate management**
 - Heavy reliance on fossil fuel, policy deficit for energy transition
 - Reorientation of the government's roles on policy formation and execution is needed
- **Weak financial performance worsened by growing subsidies**
 - Lack of commercial principles: non-cost reflective tariff, inadequate collection rates and revenue leakage
 - Significant currency depreciation in 2017
- **Constrained private investment and inadequate investment on critical infrastructure**
 - heavy reliance on the sovereign financing and subsidies
 - Under-developed regulatory framework, lack of independent regulations and market principles disabling private sector participation

Historical Energy Sector Reforms in Uzbekistan

- Prior to 2001, power sector directly managed by the Government of Uzbekistan under Ministry of Energy and Electrification (MOEE)
- 2001, Uzbekenergo created as the vertically integrated utility and took of MOEE functions (MOEF abolished)
- Minor organizational changes of Uzbekenergo and divestment of minor shares of generators (~2009)
- In 2009, the electricity law formulated the single-buyer model still within the framework of Uzbekenergo
- In 2017, Uzbekhydroenergo unbundled from Uzbekenergo
- In 2019, Uzbekistan initiated a fundamental sector with assistance of ADB and other development partners

4 Samarkand Solar Power Project – Pre-Reform

- **ADB pioneered solar energy development in Uzbekistan in 2011**
 - ADB's technical assistance supported the development of solar energy policy and development road map
 - Uzbekistan solar institute was also established to build up national capacity in the solar energy development.
- **A very first 100 MW utility-scale Samarkand Solar Power Project initiated in 2013**
 - ADB committed \$110 million for the project
 - Vertically integrated monopoly utility, Uzbekenergo, led the project initiation and implementation
- **Project faced significant implementation challenges, resulting in cancellation**
 - Preparation of tender documents took 2.5 years to address various internal concerns
 - Various reasons brought up to terminate EPC contract (grid stability, lack of capacity, price competitiveness, transparency)

Key Lessons Drawn from Project

- General capacity gap existed within Uzbekenergo
- Uzbekenergo, a vertically integrated monopoly and de-facto, energy ministry, faced various resistance to renewable energy development:
 - ✓ Concerns on the grid stability
 - ✓ No economic incentives to develop alternative fuels due to heavily subsidized natural gas
 - ✓ Internal dynamics among different departments
- Fundamental lack of independence and transparency under combined regulatory/policy/operations functions

5 Formulation of Enabling Environment for Energy Transition

Upstream Policy Reforms

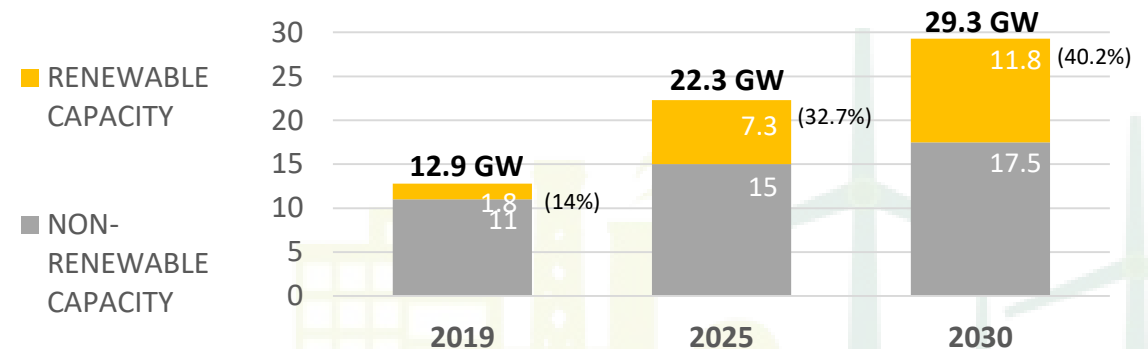
- Analytical support and capacity building for the sector reforms –
 - ✓ High-level policy dialogues
 - ✓ development of power sector masterplan, laying out energy transition roadmap
- Support for institutionalization of the Ministry of Energy (MOE), and subsequent unbundling of Uzbekenergo to remove structural restrictions
- PPP Law, Renewable Energy Law formulated; Amendment to Electricity Law initiated
- MOE announced its first long-term sector development plan for energy transition, and RE development by private investors
- Provision of crucial budgetary support to absorb the financial impacts of the reforms

Midstream

- Transaction advisory support for identification of RE projects on PPP basis [ADB was mandated to develop 1GW solar program]
- Support the deal structuring, development of contractual agreements, and tendering process
- Support for the contract negotiations until the financial closure

Downstream financing support

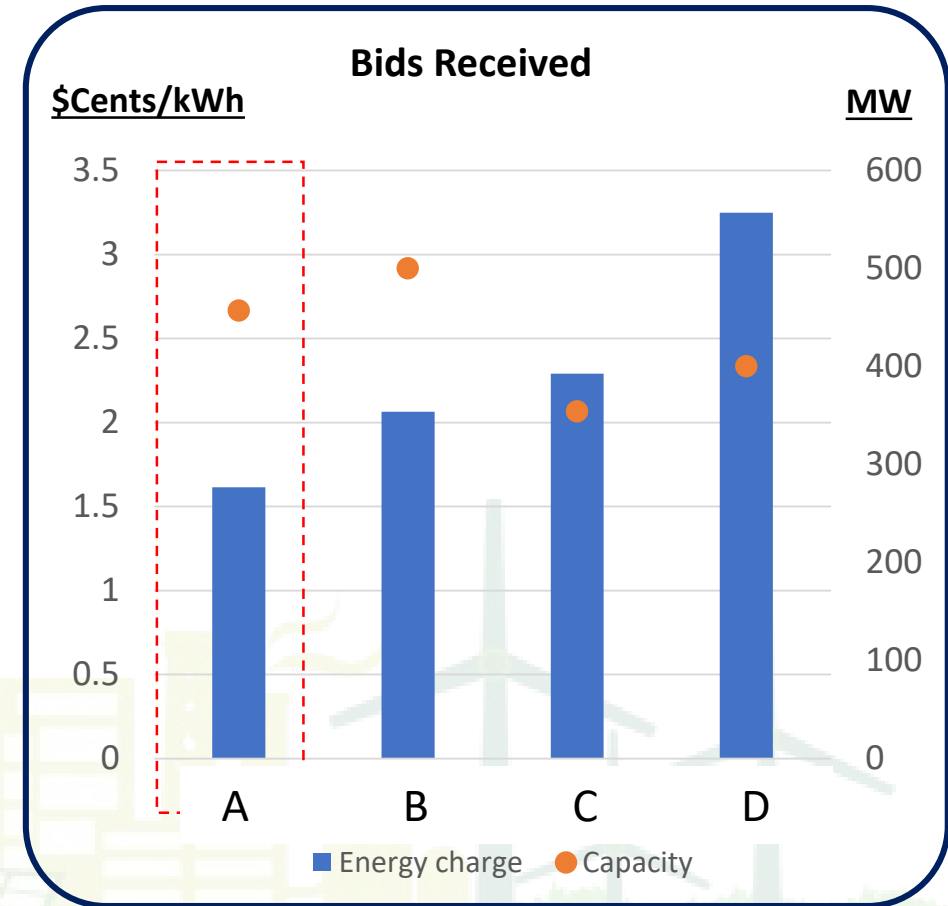
- Provision of long-term financing for private sector investors
- Provision of credit enhancement instrument to mitigate the nascent market and off-taking risks of state-owned offtaker
- Continued investments in strengthening and modernizing state-owned T&D assets



Ensure ADB's supports are provided for inclusive growth and development

6 Sherabad Solar Power Project – Post Reform

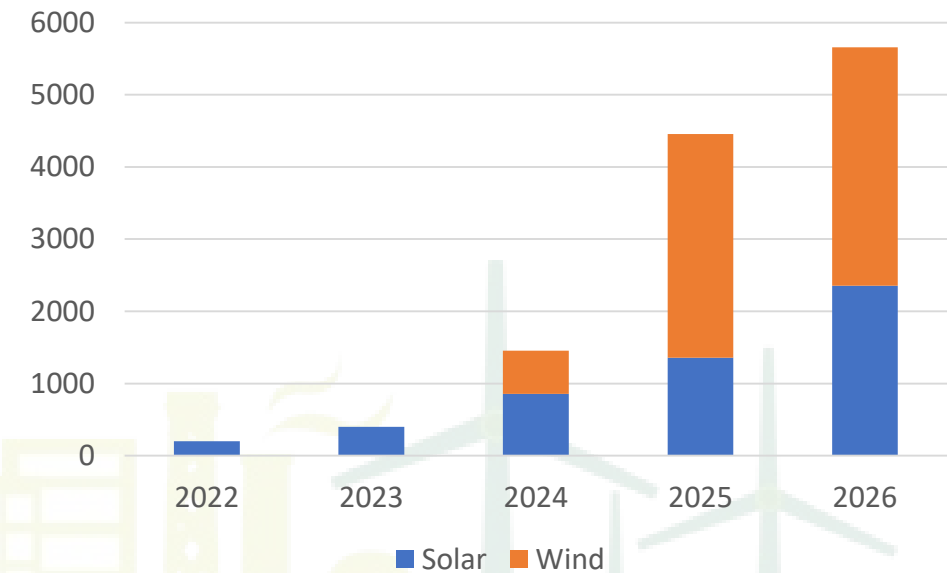
- **ADB has been mandated to develop 1GW solar program on PPP basis***
 - 1st project, Sherabad solar project, is selected from the candidates in the pre-developed solar road map.
- **ADB developed a project structure, contract packages, and assisted the government in running tender process**
 - Standard contract packages, incorporating international best practices, provided to improve project's bankability
 - Credit enhancement mechanism and public support for supporting infrastructure improves the project attractiveness
- **Project resulted in 456 MW, the largest in the Central Asia, with lowest-ever winning tariff**
 - Well-structured tender with bankable PPAs results in true price discovery and better terms for the off-taker although this mainly depends on the PPA bankability, resource abundance, land availability, regulatory certainty and off-taker credit rating



7 Review of Energy Transition

- **Uzbekistan signed more than 5,600 MW solar and wind generation capacity,**
 - Mostly MDB assisted projects which are already commissioned, under construction, and reaching financial closure
- **Encouraged by early success, Uzbekistan also solicitates bilateral RE projects using the contract templates and established benchmark PPA prices**
 - While competitive process would result in better results, this approach can accelerate renewable energy uptakes, shortening the lead time while controlling price somehow
- **Concerns are emerging on the grid stability and curtailment of RE sources, payment capacity of off-taker**
 - New RE projects are equipped with onsite BESS to manage curtailment from the generation side
 - T&D strengthening is making progress, but needs acceleration.

Cumulative New RE Capacity in Service, 2022-2026 (MW)



8 Supporting Infrastructure Development for Energy Transition

- **Continued support for revenue protection measures to ensure sector's overall sustainability**
 - ADB initiated an advance metering infrastructure in 2012 with pilot 1.5 million consumers
 - Pre-paid meters and mobile billing significantly improved the collections, changing consumer behaviors on the efficient use of electricity
 - Encouraged by promising results, the government fully rolled out AMI to cover all consumers
 - Tariff reforms ongoing to realize cost-recovery, with social protection measures
- **Strengthening transmission and distribution network**
 - ADB continues investments in expansion and modernization of critical T&D assets
 - Transmission (WB) and distribution (ADB) masterplans guide overall investment programs
 - Where possible, PPP modality is explored, especially, in the distribution sector (ADB, WB)
- **Digitalization of the grid system and enhancement of system resilience**
 - 2nd generation renewable IPPs are equipped with BESS to manage grid stability and curtailment
 - SCADA / EMS are being rolled out in transmission grid, which will be followed by distribution
 - Substations, grid system operations are being digitalized

- **Uzbekistan achieved an early success in energy transition with significant upscale of renewable energy capacity, especially, through private sector investments.**
 - Substantial upstream work has been crucial to formulate the legal/regulatory framework and shift the government's policy toward the energy transition.
 - Private sector investments are inevitable for upscaling and expediting energy transition – bankable project structuring, supporting market mechanism, and regulatory certainty are the precedent conditions.
 - IFIs support proved to be useful in mitigating early market risks, especially, in the developing markets.
- **Programmatic approach is important to gain market confidence and predictability.**
 - This is due to massive pre-investment activities that investors commit to.
 - The government needs to take an informed decision to invest in the supporting infrastructure.
- **Overall sector sustainability is still the key to the energy transition, calling for a holistic and inclusive approach to the sector development.**
 - Tariff reforms, market mechanism, and continued intervention on the revenue measures will ensure the underlying sector sustainability and private sector's confidence in the market.
 - Ensure inclusive development and reform for gender and vulnerable

Thank you.