



Project Information Document (PID)

Concept Stage | Date Prepared/Updated: 25-Mar-2020 | Report No: PIDC27793

**BASIC INFORMATION****A. Basic Project Data**

Country Uzbekistan	Project ID P171683	Parent Project ID (if any)	Project Name Electricity Transmission Modernization and Market Development (P171683)
Region EUROPE AND CENTRAL ASIA	Estimated Appraisal Date Aug 03, 2020	Estimated Board Date Nov 19, 2020	Practice Area (Lead) Energy & Extractives
Financing Instrument Investment Project Financing	Borrower(s) Republic of Uzbekistan	Implementing Agency JSC "Uzbekistan National Power Networks", Ministry of Energy	

Proposed Development Objective(s)

The Project development objective is to improve the reliability of the power transmission system and operation of the newly established transmission company to facilitate electricity market development in Uzbekistan.

PROJECT FINANCING DATA (US\$, Millions)**SUMMARY**

Total Project Cost	535.00
Total Financing	300.00
of which IBRD/IDA	300.00
Financing Gap	235.00

DETAILS**World Bank Group Financing**

International Bank for Reconstruction and Development (IBRD)	300.00
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Environmental and Social Risk Classification
Substantial

Concept Review Decision
Track II-The review did authorize the preparation to continue



B. Introduction and Context

Country Context

Uzbekistan is a resource-rich, double-landlocked, lower-middle-income country that has the unique position of bordering all the other countries in Central Asia. It ranks among the top countries with the largest energy and mineral reserves, including natural gas, gold, copper, uranium, and coal. The country also has a significant potential in renewable energy (RE) sources, such as solar, wind, and hydro, that can cater to the growing energy needs and transition to a clean energy economy. The Central Asia region is adjacent to some of the largest and rapidly growing economies in the world, including China, India, the Russian Federation, and Pakistan, which presents an opportunity for Uzbekistan to become a hub for energy production and trade.

Uzbekistan has a long-term development goal to become an industrialized upper-middle-income country by 2030. The approach of the Government of Uzbekistan (GoU) toward achieving this goal is to continue the transition to a more market-oriented economy, mitigate the potential negative consequences of external shocks, ensure equitable distribution of growth between regions, and maintain infrastructure and social services at an adequate level. In the medium term, the GoU's key development priorities are to (a) further strengthen the macroeconomic stability and maintain high rates of economic growth, including the balance of the state budget and stability of the national currency; (b) increase the efficiency of infrastructure, especially of energy, transport, and irrigation; (c) enhance the competitiveness of targeted strategic sectors; (d) diversify the economy, particularly to reduce reliance on the export of raw materials; and (e) improve access to and the quality and outcomes of education, health, and other social services so that the benefits of overall growth are shared equitably by the entire population. Removing infrastructure bottlenecks constitutes a key element for social and economic development. According to the Growth Diagnostics for Uzbekistan, ensuring uninterrupted supplies of electricity, natural gas, fuel, and water remains a key policy priority for small and medium firms to thrive and grow.

Uzbekistan has embarked on several ambitious reform measures since September 2017 and has undertaken a wide range of other macroeconomic and sector-specific reforms. The GoU has also embarked on reforms for SOEs and improvement of service delivery in the energy sector. Initial key measures to reform the energy sector and improve its financial sustainability were approved by a Presidential Decree in October 2018. Several key reform actions have been implemented through unbundling the SOEs (Uzbekenergo and Uzbekneftegaz) into separate generation, transmission, and distribution companies as a first step toward introducing market-based principles and competition; recovering the electricity utilities' financial standing; diversifying the power generation mix, currently highly dependent on depleting natural gas, toward a clean energy transition pathway; and strengthening regional energy connectivity and trade. The Government is also implementing large investment programs to improve the reliability of electricity supply and services to citizens and to maintain economic growth and enhance productivity.

Sectoral and Institutional Context

Uzbekistan is one of the most energy intensive countries in the world. Despite efforts to improve efficiency, the electricity demand is expected to continue growing steadily in conjunction with the economic growth (projected at about 6 percent over the next 5–10 years). The demand for electricity is expected to grow annually at approximately 4 percent from 2018 to 2030 increasing from 61.2 TWh to 101.6 TWh, respectively. In terms of electricity consumption, the industrial sector



represents the largest customer segment (41 percent) followed by residential (24 percent), agriculture (21 percent), commercial (11 percent), and others (3 percent). The energy sector is less diversified and highly dependent on natural gas. Natural gas accounts for 86 percent of the total primary energy consumption and more than 80 percent of the electricity mix and is a major source of commodity exports but is getting depleted. Natural gas has significant implicit subsidies due to significant differences between its export and domestic prices. The system is therefore vulnerable, and the country is taking actions toward sustainable energy transition pathways.

Removing infrastructure bottlenecks constitutes a key element for improving operational efficiency and increasing productivity across the economy. Uzbekistan has more than 250,000 km of electricity transmission and distribution lines. The networks are interconnected with neighboring countries through 500 kV and 220 kV lines. However, most of the grid networks were built during the Soviet era and have become obsolete and past their economic life. On average, transmission and distribution assets are approximately 35 years old.

With the obsolete sector infrastructure, electricity losses are high, estimated at 20 percent of net generation. This level is more than twice higher than commercial and technical losses in high-income and some middle-income countries. Unbundled utilities are also incurring additional operations and maintenance (O&M) expenses to source spare parts that are no longer easily available and to cope with frequent outages of equipment. Furthermore, the condition of the electricity networks puts the sustainability and quality of the energy supply at risk. Both frequency and duration of electricity outages are high by the region's standards. According to the World Bank's 'Growth Diagnostics for Uzbekistan Study', large and small manufacturing firms experienced around 24–29 days of electricity blackouts in 2017/2018. As a result, a large amount of production output, estimated at 24 percent among large firms and 38 percent among small firms, is lost due to interruptions in physical infrastructure services, including electricity, gas, and water. As a result, the financial standing of the power sector has deteriorated over the past few years. The sector cash deficit was mainly caused by high technical and commercial losses; relatively low collection rates; increasing indebtedness in foreign currencies and the foreign exchange risk materializing after the currency devaluation in September 2017; and below-cost recovery tariffs.

In order to address these issues, the GoU has prepared an Electricity Sector Reform Implementation Plan (ESRIP), which outlines the priority power sector reform actions, their sequence and timeline, required resources for the effective corporatization and commercialization of the newly unbundled electricity companies, and key areas of electricity sector reform for donor support. The ESRIP has the following key pillars: (i) utility management and governance, (ii) utility commercialization, (iii) sector financial viability and tariff reforms, (iv) investment program and private sector participation, and (v) reform implementation support. The GoU presented the ESRIP at the first meeting of the Economic Council and at the Energy Sector Reform Roundtable organized with the World Bank's help in July 2019. Following the Energy Sector Reform Roundtable, the GoU officially approved the ESRIP in August 2019, which is currently being implemented by the central and line ministries and sector utilities.

Going forward, as outlined in the ESRIP, the GoU needs to properly sequence the reforms and take action on the foundational aspects, along with the institutional reforms, which include (a) establishing an enabling corporate governance structure for the unbundled entities to be effectively functional; (b) improving the sector policy and regulatory framework; (c) enabling financial recovery of the sector utilities through the energy tariff and subsidy reforms and transparent cash flow and management; (d) upgrading and expanding the sector assets aimed at improving the service delivery for the benefit of Uzbekistan's citizens; (e) scaling up clean energy transition with successful private investments on a competitive basis; and (f) strengthening the human and institutional capacity of the MoE and recently unbundled sector utilities. Following the recent unbundling, as outlined in the ESRIP, a set of actions will need to be undertaken: (a) establishment of corporate governance arrangements to ensure effective management of the new companies; (b) commercialization of the sector utilities; (c) creation of sector regulatory bodies (the recently established tariff



commission may further evolve as the sector regulator); and (d) improvement of the operational efficiency and financial viability of sector utilities.

Under the new sector structure, Uzbekistan National Power Networks (NES) JSC will be maintained as the government-owned central utility responsible for planning, designing, developing, operating, and maintaining the power transmission system as well as single buyer of electricity in Uzbekistan. The company will also be the operational backbone of a new electricity market to be put in place in Uzbekistan. Further, with the rapid expansion of the power system in Uzbekistan, including large-scale RE and gas-fired projects promoted and financed by the private sector, investments in modernization and expansion of the aged transmission infrastructure will also need to be accelerated to keep pace with power generation expansion and growing electricity demand to ensure secured, reliable, and affordable electricity supply to households, businesses, and industries. The new digital technologies shall in parallel be embedded in modernization and expansion of the transmission infrastructure.

In this context, the GoU has requested the World Bank's continued support to the energy sector, including institutional and market reforms. Key prospective strategic areas of support are as follows: (a) implementation of energy reforms and establishment of the new electricity entities, especially the grid company NES; (b) digitalization of electricity sector operations; (c) subsequent electricity market reforms with transitioning to the wholesale electricity market in the long term; (d) financial recovery of sector utilities with access to commercial financing; and (e) financing sector priority investments, especially in transmission segment. This proposed Uzbekistan Electricity Transmission System Modernization and Market Development (ETMMD) Project (the proposed Project) will hence provide financing support and technical assistance for the effective establishment and operationalization of NES, digitalization of the sector, and modernization and expansion of its transmission networks.

Relationship to CPF

The proposed Project is consistent with the Performance and Learning Review (PLR) of the Country Partnership Framework (CPF) for Uzbekistan (FY2016–20) dated May 29, 2018. Specifically, it is consistent with and contributes to the PLR's following objectives: (a) Objective 1.1. Enhanced economic growth and transition toward a market economy; (b) Objective 2.1. Strengthening fiscal institutions and financial sustainability of SOEs; (c) Objective 2.2. Increased access, efficiency and reliability of power supply and heating services; and (d) Objective 1.5. Improved efficiency of infrastructure service delivery, including through PPPs.

The PLR identifies key priorities for World Bank Group engagement in the energy sector, among others, (a) SOE reforms, (b) energy sector strategy development, (c) scaling-up of clean energy development and energy efficiency, and (d) strengthening of regional energy trade and market development. The proposed Project would contribute to these four priorities in the energy sector.

C. Proposed Development Objective(s)

The Project development objective is to improve the reliability of the power transmission system and operation of the newly established transmission company to facilitate electricity market development in Uzbekistan.

Key Results (From PCN)



Success of the project will be monitored against achievement of the following results indicators:

- (i) A new SCADA/EMS system integrated and functional (yes/no).
- (ii) Outages of major equipment in the substations and transmission lines covered under the proposed Project reduced (number/year).
- (iii) Renewable energy generation capacity integrated into the transmission network (MW).
- (iv) Financial performance and decision-making of NES improved as a result of commercialization and institutional strengthening (text).
- (v) An Electricity Sector Regulatory Entity established as part of transition to a wholesale electricity market (yes/no).

D. Concept Description

The proposed Project would have the following four components: (i) Digitalization of the electricity transmission sector; (ii) Power grid strengthening and modernization; (iii) NES Institutional Development and Project Implementation Support; and (iv) Electricity Market Development.

Component 1: Digitalization of the electricity transmission sector. This component will take advantage of modern digital technologies to support the enhanced monitoring, automation, and control of the power system in Uzbekistan. Digital technologies to be deployed under this component would comprise SCADA, EMS, and substation Remote Terminal Units (RTUs). The component will also support an upgrade of NES' digital telecommunication network to enable those systems to be fully functional.

Component 2: Power grid strengthening and modernization. This component will finance a portion of the NES priority investment program for 2021–2026, including upgrade and modernization of existing high-voltage substations and lines and construction of new transmission substations and lines. 29. The Government of Uzbekistan (GoU) is targeting to increase the share of non-hydro RE in the capacity mix to 25 percent by 2030, including 5,000 MW of solar and around 3,000 MW wind. In the meantime, obsolete and inflexible power grid infrastructure would prevent realization of that ambition clean energy transition program, if not immediately strengthened and modernized. The main part of grid assets was commissioned starting from 1940s with no upgrade and modernization so far, thus putting the supply security at a high risk. A preliminary assessment concludes that, Uzbekistan's power system at current shape can accommodate only around 600-800 MW of variable RE. In the meantime, while the GoU jointly with WBG, ADB and EBRD has launched the preparation of 3,000 MW of solar and wind to be commissioned by 2025 (and 8,000 by 2030). The reliability and safety of electricity supply may potentially be negatively affected if the transmission grid is not enforced accordingly for gigawatt (GW)-scale variable RE penetration. Therefore, this component will expand the capacity and improve the flexibility of the power grid to absorb and enable the use of increasing RE.

Component 3: NES Institutional Development and Project Implementation Support. This component will support developing and improving the institutional capacity and technical capabilities of NES to ensure it can effectively carry out its functions of reliable operation of the transmission system and electricity market in Uzbekistan. The component will include the following subcomponents: (a) Modernization of NES business process; (b) NES Financial Sustainability and Preparatory Work to Access Commercial Financing; (c) NES Institutional Capacity Building and Project Implementation Support; and (d) Technical Supervision Consultants.

Component 4: Electricity Market Development. This component will provide technical assistance for the design and implementation of the electricity sector's transition plan toward the introduction of a wholesale electricity market



including required policy, regulatory, and market rules and technical codes.

The proposed Project will be implemented by NES JSC. For Component 4, the MoE and its project office would support NES as the key policy focal point and coordinating body, while the procurement of activities would be conducted by NES and its PMU. Day-to-day supervision and management responsibility for the project will be assigned to the PMU established within NES. The PMU will be responsible for the preparation and implementation of this proposed Project, including preparation of project plans, procurement documents, and progress reports and management of all consulting and investment contracts. The NES Management Board will be responsible for monitoring the proposed Project outcomes.

The proposed Project would also lead to some climate mitigation co-benefits. New SCADA/EMS system will enable NES' dispatch center to optimize generation dispatch, transmission network and reserve allocation, potentially leading to reduced greenhouse gas emissions. Transmission network reinforcements and expansions will expand the grid capacity to facilitate large-scale RE penetration as well as will contribute to reducing the system losses.

The proposed Project will use existing channels for engaging with citizens and receiving grievances. Several Grievance Redress Mechanisms (GRMs) are available to beneficiaries, including Presidential virtual reception (online platform for collecting and processing citizen's suggestions and opinions), NES hotline/call-center and special channels in social media (platform for receiving and addressing grievances related to electricity transmission), which are maintained both at central/NES and regional/subsidiary level. The mentioned channels would also cover all transmission substations, including those covered under the proposed Project.

Legal Operational Policies	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

Summary of Screening of Environmental and Social Risks and Impacts

At PCN stage, the project recognizes the following standards (ESS) as relevant: Assessment and Management of Environmental and Social Risks and Impacts (ESS1); Labor and Working Conditions (ESS2); Resource Efficiency and Pollution Prevention and Management (ESS3); Community Health and Safety (ESS4); Land Acquisition, Restrictions on Land Use and Involuntary Resettlement (ESS5); and Stakeholder Engagement and Information Disclosure (ESS10). Considering the scale of activities and associated potential risks, Environmental and Social risks are both rated as substantial. Environmental risks and occupational health and safety hazards will mostly originate from activities under Component 2: Power Grid Strengthening and Modernization. This component is expected to support the rehabilitation of 23 transmission substations, 24 transmission lines and construction of three new substations with associated transmission lines. Most of the expected impacts are likely to occur during the construction phase (occupational health and safety hazards, generation of solid waste, air pollution and noise, disruption of traffic, etc.). These risks are of limited duration, influence relatively small areas, and are easily mitigable. Additionally, while replacing old transformers, there might be some serious health and environmental impacts related to the presence of polychlorinated biphenyls (PCBs), which represent Persistent Organic Pollutants (POPs) - substances regulated under the Stockholm Convention (to which Uzbekistan is signatory). Some additional construction activities may occur under Component 1: Digitization of Electricity Transmission Sector, which will be associated with laying



optical ground wire (OPGW) fiber optic cables or putting them overhead. Environmental risk is also expected from works under Component 1, associated with the design and establishment of national dispatch center, backup dispatch center, and five regional centers.

During Project preparation, an ESMF, acceptable to the World Bank, will be developed, consulted on with stakeholders, and disclosed prior to Project Appraisal. The ESMF will analyze the overall environmental and social situation related to the Project, including details on which Environment and Social Standards (ESSes) are relevant; identify risks and appropriate mitigation; provide screening criteria that spell out scope of site specific Environmental and Social Impact Assessments (ESIAs)/ ESMPs for the proposed Project activities; suggest template for a simplified checklist ESMP for small-scale rehabilitation construction works; environment and social monitoring and reporting requirements; a section on proposed capacity building activities to help the PMU comply with the ESF; and expected costing implications.

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