Report and Recommendation of the President to the Board of Directors

Project Number: 41340-015
August 2015

Proposed Loan
Republic of Uzbekistan: Advanced Electricity Metering Phase 4 Project

This is the version of the document approved by ADB's Board of Directors that excludes information that is subject to exceptions to disclosure set forth in ADB's Public Communications Policy 2011.

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 27 July 2015)

Currency unit	–	sum (SUM)
SUM1.00	=	$0.000388935
$1.00	=	SUM2,571.12

ABBREVIATIONS

ADB	–	Asian Development Bank
AEM	–	advanced electricity metering
ATC&C	–	aggregate technical, commercial, and collection
LIBOR	–	London interbank offered rate
PES	–	predpriyatiye electrosetey of Uzbekenergo (regional distribution enterprises of Uzbekenergo)
PMU	–	project management unit
TA	–	technical assistance
UFRD	–	Uzbekistan Fund for Reconstruction and Development

NOTES

(i) The fiscal year (FY) of the Government of Uzbekistan ends on 31 December.
(ii) In this report, "$" refers to US dollars.

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CONTENTS

PROJECT AT A GLANCE

1. Basic Data — **Project Number:** 41340-015

Project Name	Advanced Electricity Metering Phase 4 Project	**Department /Division**	CWRD/CWEN
Country	Uzbekistan	**Executing Agency**	UzbekEnergo
Borrower	The Republic of Uzbekistan		

	2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓	**Energy**	Electricity transmission and distribution	300.00
		Total	**300.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Climate Change impact on the Project	Medium

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Institutional development Organizational development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas Pilot-testing innovation and learning		
Partnerships (PAR)	Civil society organizations Official cofinancing		

5. Poverty Targeting		**Location Impact**	
Project directly targets poverty	No	Rural	Medium
		Urban	Medium
		Nation-wide	High

6. Risk Categorization: Complex

7. Safeguard Categorization **Environment:** C **Involuntary Resettlement:** C **Indigenous Peoples:** C

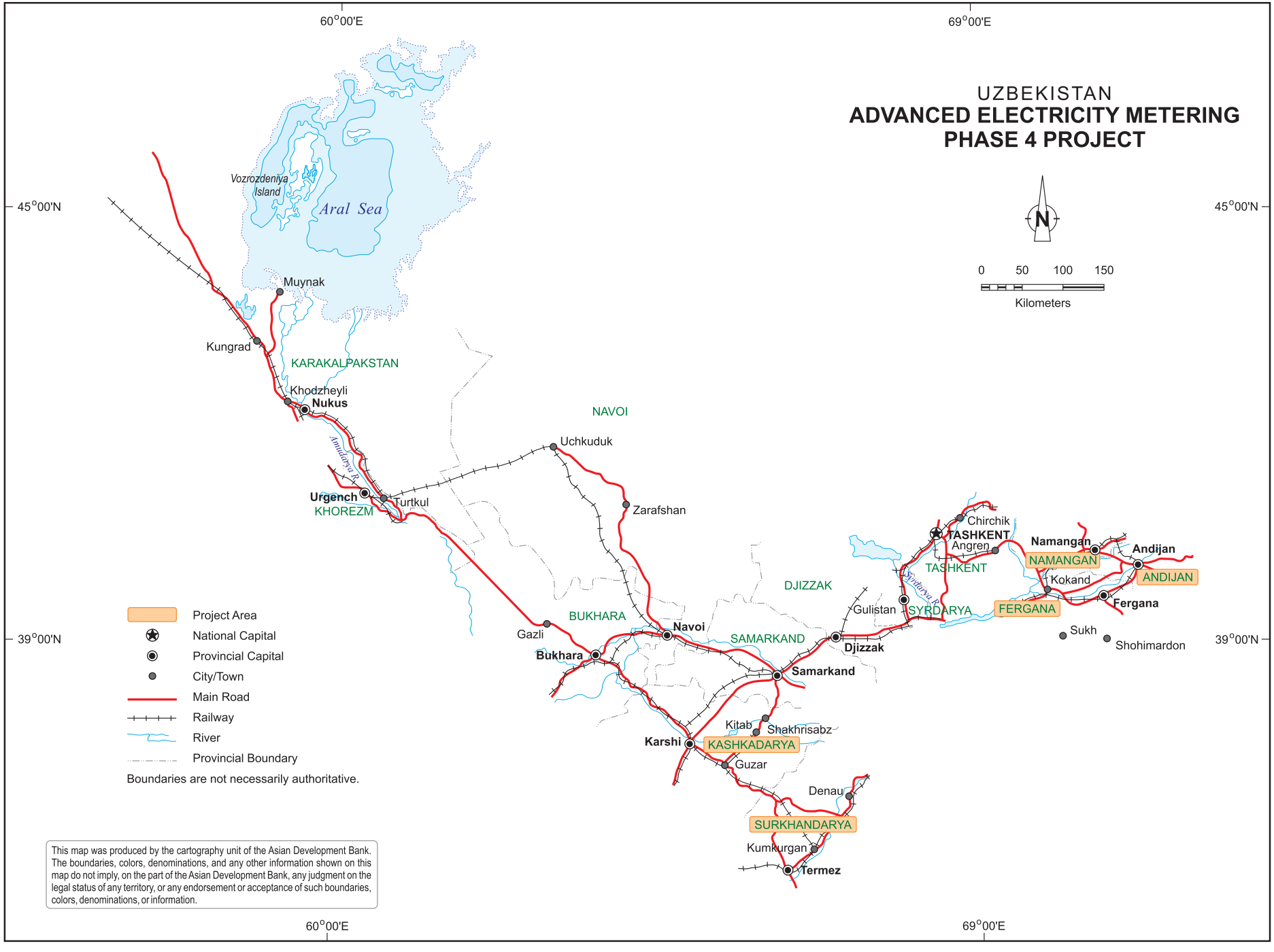
8. Financing

Modality and Sources	**Amount ($ million)**
ADB	**300.00**
Sovereign Project loan: Ordinary capital resources	300.00
Cofinancing	**70.00**
Uzbekistan Fund for Reconstruction and Development	70.00
Counterpart	**174.00**
Project Sponsor	101.00
Government	73.00
Total	**544.00**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	No

Source: Asian Development Bank


UZBEKISTAN
ADVANCED ELECTRICITY METERING
PHASE 4 PROJECT
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69°00'E
45°00'N
39°00'N
N
0 50 100 150
Kilometers
Vozrozdeniya Island
Aral Sea
Muynak
Kungrad
KARAKALPAKSTAN
Khodzheyli
Nukus
Amudarya R.
Urgench
KHOREZM
Turtkul
NAVOI
Uchkuduk
Zarafshan
BUKHARA
Gazli
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Navoi
DJIZZAK
SAMARKAND
Djizzak
Samarkand
Kitab
Shakhrisabz
Karshi
KASHKADARYA
Guzar
Denau
SURKHANDARYA
Kumkurgan
Termez
Chirchik
TASHKENT
Angren
TASHKENT
Gulistan
SYRDARYA
Namangan
NAMANGAN
Andijan
ANDIJAN
Kokand
FERGANA
Fergana
Sukh
Shohimardon
Project Area
National Capital
Provincial Capital
City/Town
Main Road
Railway
River
Provincial Boundary
Boundaries are not necessarily authoritative.
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I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Republic of Uzbekistan for the Advanced Electricity Metering Phase 4 Project.[1]

2. The project will install an advanced electricity metering (AEM) system that uses modern, accurate, and tamper-proof revenue meters for the power grid system and end-users in five regions (Andijan, Fergana, Kashkadarya, Namangan, and Surkhandarya) to complete the nationwide rollout of AEM.[2] The project will promote energy efficiency in power distribution by reducing commercial losses and improving the efficiency of electricity revenue collection. The installation of 3.1 million meters, integrated meter-to-cash solutions, and a capacity development component will help the power utility and its customers effectively adopt and utilize the new technology.[3]

II. THE PROJECT

A. Rationale

3. The economy has sustained high growth, averaging 8% in 2010–2014. Growth in 2015 and beyond is expected to remain above 7%. The Government of Uzbekistan prioritizes modernizing industry and developing infrastructure and the private sector. Reliable and affordable electricity supply is vital to achieving these goals. One of the key challenges is the high level of losses in the power sector. The Joint Stock Company Uzbekenergo, a vertically integrated state-owned utility, reported system losses of over 18% in 2014, with transmission losses at 4% and distribution losses at 14%.[4] Revenue collection rate was also low, at 80% or less. These reported losses may not be accurate because of Uzbekenergo's inability under its current system to accurately collect information about the amount of electricity supplied and to monitor the revenue collection.

4. The high level of electricity losses comes from the lack of investment in modern distribution assets and outdated manual operations, which results in inaccurate, unreliable, and inefficient revenue collection. Electricity meters are generally old and are in service beyond their designed economic life without proper recalibration. They are inaccurate and susceptible to tampering. Without proper grid metering, Uzbekenergo faces difficulty in accounting for electricity supplied and used. Manual billing systems leave room for potential collusion between customers and tariff collection officers. Incentive mechanisms to reduce losses are not sufficiently institutionalized.

5. To overcome these challenges, Uzbekenergo has requested international financial institutions to finance a nationwide AEM program.[5] AEM or "smart metering" allows two-way communication between the utility and customer meters. AEM enables the utility to remotely

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[1] The design and monitoring framework is in Appendix 1.

[2] The rollout started with the phase 1 project. ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of Uzbekistan for the Advanced Electricity Metering Project*. Manila. Phase 2 is financed by the World Bank and covers Tashkent City, Tashkent region, and Syrdarya region. Phase 3 is financed by the Islamic Development Bank and covers Karakalpakstan, Khorezm, and Navoi regions. The project will be the fourth, and the last, phase of the national rollout of advanced metering.

[3] The Asian Development Bank (ADB) provided project preparatory technical assistance (TA) for the project.

[4] Uzbekenergo is a 100% state-owned monopoly in charge of electricity generation, transmission, and distribution, and operates under the supervision and regulation of the cabinet of ministers.

[5] ADB is the lead development partner in this initiative. ADB prepared the feasibility study and introduced AEM to Uzbekistan, paving the way for the World Bank and the Islamic Development Bank to follow.

disconnect and reconnect supply without having to send utility officers to the site. This function removes the human factor in meter reading and reporting, thus enhancing disincentives for meter tampering and customers who do not make full payment on time. AEM provides more accurate power usage information, which helps customers manage their electricity consumption and improve energy efficiency, and empowers the utility in identifying losses in the distribution system. The remote monitoring capability also enables the utility to prevent overloading of the distribution system and, as a result, technical losses may be reduced.

6. The introduction of AEM is one of many efforts being undertaken by Uzbekenergo to improve the sector's efficiency and performance, and it is a priority project under the government's long-term investment and structural reform program (2015–2019).[6] Uzbekistan has 13,500 megawatts of installed capacity, of which 85% is thermal power. Concurrently, old inefficient power plants are being replaced by energy-efficient combined-cycle gas turbines. The electricity tariff has been steadily rising to support financial sustainability and cost recovery. Financial transparency has improved, with ADB assistance, since Uzbekenergo adopted external audits based on the International Standards on Auditing from FY2011.[7]

7. Uzbekenergo aims to cover 6.3 million customers with AEM. It initiated its first large-scale AEM project financed by ADB for 1 million customers. Implementation of the phase 1 project has been satisfactory, although procurement has taken longer than expected because AEM systems are complex and new to the country. To complete the nationwide rollout of AEM, Uzbekistan has requested ADB to finance the project to cover five regions.

8. ADB is actively involved in the dialogue with the government to promote energy sector reform and development, capacity development, and good governance. In 2012, the power sector regional master plan was prepared under Central Asia Regional Economic Cooperation, which identifies investment priorities and development plan.[8] ADB is also assisting Uzbekenergo's capacity development efforts to improve gender equality and corporate management and performance in Uzbekenergo.[9]

9. The project is in line with ADB's country partnership strategy for Uzbekistan, which includes a focus on energy efficiency and reliable power supply.[10]

B. Impact and Outcome

10. The impact will be improved financial viability in the power sector. The project will help ensure (i) accurate accounting and billing of energy, (ii) commercial loss reduction, and (iii) improved energy efficiency. The outcome will be the improved electricity revenue collection in the targeted regions. The project will cover Andijan, Fergana, Kashkadarya, Namangan, and Surkhandarya regions. The project will improve metering accuracy, billing efficiency, and tariff collection rates; and provide anti-tampering and fault-detection capability to Uzbekenergo.

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[6] Government of Uzbekistan. 2015. *Decree of the President of the Republic of Uzbekistan No UP-4707 dated 4 March 2015 on the program of measures to promote structural reforms, modernization and diversification of production in 2015–2019*. Tashkent.

[7] ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Administration of Loan to the Republic of Uzbekistan for the Talimarjan Power Project*. Manila.

[8] ADB. 2010. *Technical Assistance for Power Sector Regional Master Plan*. Manila.

[9] ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of Uzbekistan for the Takhiatash Power Plant Efficiency Improvement Project*. Manila.

[10] ADB. 2012. *Country Partnership Strategy: Uzbekistan, 2012–2016*. Manila.

Table 1: Summary of Expected Project Outcome

Item		Number of Meters (million)	Distribution Losses (%)	Collection Rate (%)	ATC&C Losses (%)
Before the project	(A)	2.68	17.68	76.87	36.72
After the project	(B)	3.13	10.04	98.00	11.84
Impact change	(C) = (B) – (A)	0.45	(7.64)	21.13	(24.88)
Impact percentage	(D) = (C) / (A)	16.79	(43.21)	27.49	(67.76)

( ) = negative, ATC&C = aggregate technical, commercial, and collection.
Sources: Asian Development Bank and Uzbekenergo estimates.

C. Outputs

11. The project will have three outputs: (i) AEM infrastructure installed and functional, (ii) operations manual developed and loss reduction operations strengthened, and (iii) customer services for end-users improved. Output 1 will include the installation of 3.1 million advanced electricity meters and associated equipment for all customer categories and the electricity grid substations, and an integrated AEM and billing system. Under output 2, to strengthen Uzbekenergo's metering and testing functions, a project implementation consultant will train staff and introduce standard operating procedures for distribution operations. Synergy is expected between the AEM infrastructure and the capacity development program for operational improvement to reduce aggregate technical, commercial, and collection (ATC&C) losses.[11] Output 3 will include public information campaigns to raise awareness on energy efficiency and gender equality. Customers will enjoy easier and faster access to accurate electricity billing through improved customer service centers as well as through mobile services and internet.

D. Investment and Financing Plans

12. The project is estimated to cost $544 million (Table 2).

Table 2: Project Investment Plan
($ million)

Item			Amount[a]
A.	**Base Cost**[b]		
	1.	Turnkey contracts	400.0
	2.	Installation works and services	71.0
	3.	Consulting services	5.0
	4.	Public information program[c]	1.0
		Subtotal (A)	**477.0**
B.	**Contingencies**[d]		**46.3**
C.	**Financial Charges During Implementation**[e]		**20.7**
		Total (A+B+C)	**544.0**

[a] Includes taxes and duties of $73 million to be financed from government resources.
[b] In mid-2015 prices.
[c] Includes costs of gender action plan and advanced electricity metering capacity development program, which are not included in consulting services.
[d] Physical contingencies computed at 5% for equipment. Price contingencies computed at 1.5% on foreign exchange costs and 10.0% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

[11] ATC&C losses include the total loss of electricity revenue against the electricity supplied, and account for technical and nontechnical losses and revenue collection losses.

[e] Includes interest and commitment charges. Interest during construction for the Asian Development Bank's ordinary capital resources loan has been computed at the 5-year forward London interbank offered rate (LIBOR) plus a spread of 0.5% and 0.1% of maturity premium. Commitment charges for the Asian Development Bank's ordinary capital resources loan are 0.15% per year to be charged on the undisbursed loan amount.

Source: Asian Development Bank estimates.

13. The government has requested a loan of $300 million from ADB's ordinary capital resources to help finance the project. The loan will have a 25-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility,[12] a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan and project agreements. The loan proceeds will be relent from the borrower to Uzbekenergo pursuant to a subsidiary loan agreement at the same interest rate as that applicable to the loan. Uzbekenergo will assume the foreign exchange risk.

14. The Uzbekistan Fund for Reconstruction and Development (UFRD) will cofinance the project.[13] UFRD will provide a loan of $70 million to Uzbekenergo. The loan will have a 15-year term, including a grace period of 3 years, an annual interest rate matching ADB's ordinary capital resources loan, and a commitment charge of 0.3% per year. The UFRD loan proceeds will be relent from an eligible commercial bank to Uzbekenergo under a subsidiary loan agreement with terms acceptable to UFRD.

15. Uzbekistan will arrange counterpart financing as follows: (i) coverage of taxes and duties amounting to $73 million; and (ii) Uzbekenergo's internal resources to cover $101 million for the cost of meter installation, public information program, financial charges during construction, and related contingencies. The financing plan is in Table 3.

Table 3: Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank	300.0	55.1
Uzbekistan Fund for Reconstruction and Development	70.0	12.9
Government of Uzbekistan	73.0	13.4
Uzbekenergo	101.0	18.6
Total	**544.0**	**100.0**

Source: Asian Development Bank estimates.

[12] The interest includes a maturity premium of 10 basis points per annum based on the above loan terms and the government's choice of repayment option and dates, which results in the average loan maturity being 15.25 years.

[13] UFRD, established in 2006, is a 100% state-owned fund with $15 billion of charter capital to finance important investment projects in Uzbekistan's priority industrial sectors (e.g., oil and gas, chemicals, energy, and metals and mining), which contribute to the country's socioeconomic development. UFRD partners with foreign investors, international financial institutions, and export credit agencies. It is a financing partner of ADB-funded projects in Uzbekistan, including ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Administration of Loan to the Republic of Uzbekistan for the Talimarjan Power Project*. Manila; ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Loans to the Republic of Uzbekistan for the Samarkand Solar Power Project*. Manila; and ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of Uzbekistan for the Takhiatash Power Plant Efficiency Improvement Project*. Manila. Cofinancing will be on a joint basis without ADB's disbursement supervision.

E. Implementation Arrangements

16. The implementation arrangements are summarized in Table 4 and described in detail in the project administration manual.[14]

Table 4: Implementation Arrangements

Aspects	Arrangements		
Implementation period	January 2016–December 2020		
Estimated completion date Loan closing date	31 December 2020 30 June 2021		
Management			
(i) Executing agency	Uzbekenergo		
(ii) Project management unit	Uzbekenergo will establish a project management unit (8 staff).		
Procurement[a] Turnkey contract for the advanced electricity metering system	International competitive bidding	1 package, 2 lots (lot 1: Andijan, Fergana, and Namangan regions; lot 2: Kashkadarya and Surkhandarya regions)	$327 million
Consulting services[b] Project management and supervision consultant	Quality- and cost-based selection (90:10)	73 person-months (international) 237 person-months (national)	$4.5 million
External audit	Least-cost selection	30 person-months 3 contracts covering 2 years each	$0.5 million
Retroactive financing and advance contracting[c]	Advance contracting is requested for all goods, works, and consulting services. Retroactive financing is requested for consulting services and will not exceed 20% of the loan amount, incurred before loan effectiveness but not earlier than 12 months before the signing of the loan agreement.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2015, as amended from time to time) and detailed arrangements agreed upon between the Ministry of Finance, Uzbekenergo, and ADB. Direct payment, reimbursement, and commitment procedures will be used for all expenditure categories.		

[a] In accordance with ADB's Procurement Guidelines (2015, as amended from time to time).
[b] In accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).
[c] The government has been advised that approval of advance contracting will not commit ADB to subsequently approve financing for the project; and that ADB will not finance expenditures paid by the borrower prior to loan effectiveness, even if advance contracting is approved, unless ADB has also approved retroactive financing.
Source: Asian Development Bank.

17. Uzbekenergo will establish a project management unit (PMU) and bring in qualified and experienced personnel to incorporate lessons from current AEM projects. The PMU will be funded by Uzbekenergo's internal resources. It will administer all consulting and procurement contracts and prepare project plans, bid evaluation reports, progress reports, applications for withdrawal of funds, and other reports and documents required by ADB.

18. Uzbekenergo will employ turnkey contractors (two lots) to deliver the meters and related equipment, install the AEM and billing system, and provide related services including training, customization, and oversight of meter installation.[15] These contracts will be procured through ADB's single-stage, two-envelope bidding procedure.

[14] Project Administration Manual (accessible from the list of linked documents in Appendix 2).
[15] The installation of meters will be undertaken by personnel of the regional distribution enterprises of Uzbekenergo, under the supervision of the contractors and the project implementation consultant.

III. DUE DILIGENCE

A. Technical

19. With the intention to rollout AEM in the entire country, Uzbekenergo has successfully piloted several AEM projects in many of its regions using its own resources. While the collective impact will only be seen once the ongoing AEM projects are completed, the results shown by these pilot projects are already encouraging. The distribution losses in pilot districts (0.4 kilovolt system) were reduced from 40% to 10%. Tariff collection in the piloted districts improved from 50% to 98%. Consumer behavior is also changing—customers regularly paying bills have risen from 40% to 99.5%.[16] Uzbekenergo has tested a locally developed automated billing system for its entire network and the improvements achieved through this system have encouraged the government to proceed with countrywide deployment of the AEM system.

20. Under the project, AEM will be rolled out in five regions. The ATC&C losses in these regions range from 20% to 56% and are about 11,000 gigawatt-hours annually—almost a quarter of Uzbekenergo's total sales. A significant part of these losses are attributed to residential customers, who consume about one-third of the power distributed.[17]

21. The installation of meters and concentrators will be carried out by staff provided by the regional distribution enterprises of Uzbekenergo (PES) under the supervision of the turnkey contractor and the project implementation consultant. The installation of AEM and the billing system will be done by the contractors. PES will appoint managers and technicians to work with the contractor and the project implementation consultant, who will also provide training on AEM operation and maintenance. All parties will be jointly responsible for the successful commissioning of AEM. This approach will allow the local staff to acquire the necessary skills and knowledge to operate the system even after project completion.

22. **Advanced electricity meters and communication systems.** The technology selected for the meters will follow international standards, including specific local requirements and functionalities required to achieve the project's targets, such as remote data collection for billing, remote connection and disconnection of the meters, prepayment function, energy balancing, and alarms for theft detection. With regard to the communication infrastructure, after all options were analyzed by the project preparatory TA consultants it was confirmed that power line carrier be the primary technology and radio frequency for the remaining meters.

23. **Head-end system and meter data management systems.** AEM comprises (i) the head-end system and (ii) meter data management systems to remotely exchange information with the meters, process information, and provide the required alarms or inputs to manage the meters. The modular design solution recommended in the feasibility study follows international standards and allows future adoption of demand-side management. Interoperability with other PES and interface with the head office were carefully considered. The project also includes supporting software to manage the information technology networks and the AEM rollout. The AEM control centers will be located in each PES for independence and self-sustainability. A backup of these centers will be installed considering the risks of flood and landslide to ensure operational response in case of an unexpected major incident.

[16] The impact of pilot projects were reviewed and analyzed by project preparatory TA consultants.
[17] Industrial consumers account for about 40% and other customers, including agricultural and public entities, consume 30%.

24. **Billing systems.** A separate billing system shall be implemented in each PES. The system shall be integrated with the AEM systems so that the "meter-to-cash" process is fully automated. The billing system will also be accessible in each customer service center, as well as through mobile services and the internet.

B. Economic and Financial

25. The project is financially and economically viable. The financial internal rate of return is 16.9%, which compares favorably with the weighted average cost of capital at 0.7%. The benefits include additional revenue from improved collection rates and incremental electricity sales accrued from a reduction in commercial losses and unserved energy.

26. The economic benefit is the net redistribution effect of electricity consumption due to changes in customer behavior. The project will reduce the electricity consumption that was not paid for and that was valued less than the tariff rate, resulting in energy saving. The saved energy will be redistributed to those customers that were using alternative means for electricity and valued electricity higher than the tariff rate. The economic internal rate of return is 18.2%, which is greater than the economic opportunity cost of capital of 12.0%. The sensitivity analysis suggests sufficient robustness of the project under all tested assumptions.

27. Uzbekenergo has operated profitably since 2008.[18] The gross profit margin remained above 10.0%, but decreased from 35.1% in 2008 to 16.9% in 2013 largely because of higher maintenance costs resulting from aging facilities. However, low fuel costs and semiannual tariff adjustments to reflect inflation contributed to the profitability of Uzbekenergo.

28. Financial projections for 2014–2025 indicate that the financial base will remain stable if tariff adjustments remain synchronized with inflation and gas prices. The ongoing capacity development program initiated under previous projects will continue under this project to help Uzbekenergo sustain its profitability.

C. Governance

29. **Sector governance.** The power sector is under the direct supervision of the cabinet of ministers and is managed by Uzbekenergo. The energy policy and the long-term investment plan are prepared by the cabinet in coordination with ministries and government agencies. The long-term investment plan (2011–2015) was updated annually and a new plan for the period 2015–2019 was announced in March 2015. The Ministry of Finance sets the tariff for utility costs. Uzbekistan has been successful in adjusting tariffs semiannually to reflect the cost of services. Licenses are issued by the State Inspection of Control in Power Industry under the cabinet. Institutional capacity development activities for Uzbekenergo, such as strengthening safeguard assessment, bringing in modern and transparent performance assessment, and upgrading the management information system, are under way with ADB support.[19]

30. **Financial management.** Uzbekenergo's financial management risk is considered high and requires capacity strengthening. Uzbekenergo's accounting policies, procedures, and

[18] This is based on Uzbekenergo's unconsolidated financial statements; consolidation of the financial account is expected to be completed for FY2015.

[19] ADB. 2010. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Administration of Loan to the Republic of Uzbekistan for the Talimarjan Power Project*. Manila; and ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of Uzbekistan for the Takhiatash Power Plant Efficiency Improvement Project*. Manila.

financial reporting follow the national accounting standards of Uzbekistan and national standards on auditing. However, Uzbekenergo has not fully consolidated its account with its subsidiaries, and current assessments are based on partially consolidated financial statements that cover the revenue and cost of the core electricity operations. To enhance its financial management, Uzbekenergo has adopted external audit of its financial statements since FY2011 based on the International Standards on Auditing issued by the International Assurance Auditing Standards Board. The audit found areas for improvement, such as the classification methods and impairment provisions on account receivables, the scope of account consolidation, and integration of the accounting system.

31. Uzbekenergo started to adopt the International Financial Reporting Standards in FY2012 and plans to achieve full compliance to cover all subsidiaries in FY2015. Capacity development activities planned under ADB- and World Bank-financed projects will train specialists to comply with the International Financial Reporting Standards and will strengthen Uzbekenergo's information systems to improve its financial management capability.

32. **Procurement capacity.** Uzbekenergo's procurement capacity was assessed as high risk. Uzbekenergo has experience with projects funded by multilateral and bilateral financiers, including ADB. Despite improvements, PMU's capacity is still weak. An international firm will be recruited as project management and supervision consultant to assist in the bidding process and contract management. ADB will provide Uzbekenergo with specific procurement advice and recommendations during project implementation.

33. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and Uzbekenergo. The specific policy requirements and supplementary measures are described in the project administration manual (footnote 14).

D. Poverty and Social

34. **Poverty.** The increased efficiency and reliability of power supply resulting from the project will have a positive impact on economic growth and poverty reduction. The project will improve the financial sustainability of the power sector through reduced ATC&C losses. The utility's load management capability will also improve through better decision-making resulting from data accessibility through the advanced metering technology. Power system stability and power outage reduction are essential for increased economic activity and job opportunities. To strengthen customer service, the project will (i) make payment transactions more user-friendly and improve the response time to payment and disconnection, (ii) establish a functional complaint redress mechanism, and (iii) develop a participatory public information program.

35. **Gender equality.** The project supports effective gender mainstreaming. Reliable power supply to households and effective energy use positively affects women who are often the managers of household activities. The project will empower consumers, especially women, as agents of change through public information program about energy efficiency, consumer rights, the newly introduced billing system, and job opportunities. The project will improve career and training opportunities for women by providing better customer service and data collection and a gender-sensitive user education program. The gender action plan includes a targeted strategy and approaches to enhance project benefits for women and thus improves gender equality in the energy sector.

E. Safeguards

36. No major social or environmental safeguard issues are envisaged. The project is category C for all safeguards as defined in ADB's Safeguard Policy Statement (2009). The impacts on the environment are negligible and will not extend beyond the immediate meter replacement area. All the waste equipment and old meters will either be recycled within Uzbekenergo, will be dismantled and reused for parts, or will be disposed to designated areas within Uzbekenergo's facilities. ADB will monitor safeguard issues during implementation. If ADB becomes aware of any unanticipated environmental or social impacts during project implementation, ADB will advise and require Uzbekenergo to (i) assess the significance of such unanticipated impacts, (ii) evaluate the options available to address them, (iii) prepare the relevant safeguard documents; and (iv) take necessary action. The project will be implemented and operated in compliance with the government's rules and regulations governing the project's environmental and social aspects.

F. Risks and Mitigating Measures

37. Major risks and mitigating measures are summarized in Table 5 and described in detail in the risk assessment and risk management plan.[20] The overall risk is medium and the integrated benefits and impacts are expected to outweigh the costs.

Table 5: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Delayed procurement and implementation of turnkey contract	Advance contracting is adopted to recruit the project implementation consultant to assist procurement. An international consulting firm will be recruited to assist Uzbekenergo in project implementation and strengthen procurement transparency. Uzbekenergo will recruit experienced procurement specialists for the PMU before the bidding process. Uzbekenergo will assign staff with experience in other AEM projects. Lessons from phase 1 project will be analyzed and will be shared with the PMU and project implementation consultant. ADB's staff consultant and procurement specialist will provide procurement and contract management training and advice throughout project implementation. The institutions responsible for contract registration assessment will be involved in procurement and consultant recruitment to avoid delays in the contract registration required for contract effectiveness. ADB will monitor implementation progress and identify the cause of delay and actions required through regular portfolio review meetings.
Limited financial management capacity and capacity to prevent corrupt practices	No imprest account will be established. An international consulting firm will support the PMU. Experiences and lessons from ongoing projects will be shared with the PMU. Training on ADB procedures will be provided. Uzbekenergo will recruit staff and undertake training on International Financial Reporting Standards with the help of the international consulting firm. Uzbekenergo will hire capacity development consultants financed under other

[20] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigating Measures
	projects by ADB and other development partners to assist Uzbekenergo in achieving full consolidation of its accounts, International Financial Reporting Standards implementation, and upgrade of accounting and reporting systems. Uzbekenergo has established and staffed its internal audit and the project will be subject to review by the internal audit. Uzbekenergo will engage a reputable independent audit firm to undertake external audit based on the International Standards on Auditing.
Lack of system compatibility and interoperability	The bidding documents for the turnkey contracts will specify the details of the system requirements. The turnkey contracts will have a pilot phase under which the contractor will test system compatibility and interoperability before the contract is fully implemented. Meters and the meter data management system are procured under the same turnkey contract and the contractor will assume responsibility for system compatibility and interoperability.
Limited social acceptance	Uzbekenergo will implement a public information program, which includes a customer complaint redress mechanism.

ADB = Asian Development Bank, PMU = project management unit.
Source: Asian Development Bank.

IV. ASSURANCES AND CONDITIONS

38. The government and Uzbekenergo have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the project administration manual and loan documents. The government and Uzbekenergo have agreed with ADB on certain covenants for the project, which are set forth in the loan agreement and project agreement.

39. As a condition for loan effectiveness, a subsidiary loan agreement for the relending of the ADB loan to Uzbekenergo, in form and substance satisfactory to ADB, shall have been signed and become effective in accordance with its terms. In addition, no disbursement will be made for the turnkey contracts until a loan agreement between the UFRD and an eligible commercial bank, and a related subsidiary loan agreement between such bank and Uzbekenergo, both for the purposes of the project and in form and substance satisfactory to ADB, have been signed and become effective in accordance with their terms.

V. RECOMMENDATION

40. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of $300,000,000 to the Republic of Uzbekistan for the Advanced Electricity Metering Phase 4 Project, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 25 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao
President

25 August 2015

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with Power sector financial viability improved (National Investment Program: 2015–2019)[a]			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting Mechanisms**	**Risks**
Outcome Electricity revenue collection in the targeted regions improved.	(2014 baseline) a. Distribution losses reduced from (i) 21.3% to 11.6% in Andijan, (ii) 14.6% to 8.7% in Fergana, (iii) 28.7% to 12.2% in Kashkadarya, (iv) 15.9% to 9.2% in Namangan, and (v) 11.1% to 8.9% in Surkhandarya by 2021. b. Revenue collection rate increased in the targeted regions to 98% from: (i) 61.5% in Fergana, (ii) 60.6% in Kashkadarya, (iii) 80.5% in Namangan, and (iv) 61.5% in Surkhandarya. Revenue collection rate in Andijan is maintained at 100% by 2021. c. Aggregate technical, commercial, and collection losses are reduced in the targeted regions from (i) 20.2% to 11.6% in Andijan, (ii) 47.5 to 8.7% in Fergana, (iii) 56.8% to 12.2% in Kashkadarya, (iv) 32.3% to 9.2% in Namangan, and (v) 45.4% to 8.9% in Surkhandarya by 2021.	a-c. Uzbekenergo's annual report	Uzbekenergo management and staff's priority and incentives to reduce distribution losses and improve revenue collection are decreased. The enforcement of legal and regulatory frameworks for loss reduction and Uzbekenergo's internal control is ineffective.
Outputs 1. AEM infrastructure installed and functional.	(2014 baselines: 0) 1a. Advanced electricity meters are installed for about 3.1 million customers and relevant substations in the targeted regions by 2020. 1b. Communication infrastructure is functional in the targeted regions and commissioned by 2020.	1a-c. Commissioning certificate by Uzbekenergo	The government's internal procedure may delay procurement and contract effectiveness. Availability of competent installation personnel and Uzbekenergo's budget to mobilize them is limited.

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	1c. Head-end system, meter data management system, billing system are functional and integrated in the targeted regions by 2020.		The system integration with existing systems in other regions may have limited compatibility and interoperability. The system may be subject to system attacks or misuse of private information. Uzbekenergo's customers have limited knowledge on the AEM technology.
2. Operations manual adopted and loss reduction operations strengthened.	(2014 baselines: 0) 2a. Standard operating procedures for meter-to-cash operations are developed and implemented by 2018. 2b. Staff training materials developed on AEM system with 50% of modules are engendered by 2018. 2c. Training is completed on AEM system (at least 4,000 personnel, and at least 20% are women) by 2020. 2d. Metering and testing unit is established at Uzbekenergo with support provided at each PES level by 2020.	2a. Standard operations manual 2b-d. Project's training report prepared by PIC	
3. Customer service for end-users improved.	(2014 baselines: 0) 3a. Gender-sensitive brochures and media advertisement on AEM are developed and disseminated by 2018. 3b. Customer complaint feedback mechanism is functional (at least 20% of customer service staff are women) by 2018. 3c. Gender-sensitive customer service module is developed, implemented, and staff trained (at least 1,000 personnel, and at least 20% are women) by 2019.	3a. Uzbekenergo's publication material 3b-c. PES personnel report	

Key Activities with Milestones

Output 1. AEM infrastructure installed and functional.

1.1 Recruit and mobilize project implementation consultant (advance action). (Q2 2015–Q2 2016) (GCD).
1.2 Procure and award turnkey contracts for the AEM system (advance action). (Q2 2015–Q2 2017).
1.3 Train Uzbekenergo staff on meter installation and AEM system operation. (Q3 2017–Q4 2020) (GCD) (gender equality).
1.4 Complete AEM system installation and make the system functional. (Q1 2018–Q4 2020) (knowledge solutions)
1.5 Complete meter installation. (Q1 2018-Q4 2020).

Output 2. Operations manual adopted and loss reduction operations strengthened.

2.1 Recruit and mobilize project implementation consultant (advance action). (Q2 2015–Q2 2016) (GCD).
2.2 Establish loss reduction (metering and testing) units and train staff (Q1 2016–Q1 2017) (GCD) (gender equality).
2.3 Develop and implement standard operations procedure for metering and testing (Q1 2016–Q1 2018) (GCD).

Output 3. Customer service for end-users improved.

3.1 Commence public information program with creation of women core groups at the regional centers. (Q1 2016–Q4 2019) (gender equality).
3.2 Customer feedback and complaint redress mechanism introduction. (Q1 2016–Q4 2019) (GCD) (gender equality).
3.3 Train regional customer service center staff. (Q1 2017–Q4 2019) [GCD] (gender equality).

Inputs

Asian Development Bank:	$300,000,000 (ordinary capital resources)
Joint Stock Company Uzbekenergo:	$101,000,000
Government of Uzbekistan:	$73,000,000
Uzbekistan Fund for Reconstruction and Development:	$70,000,000 (loan)

Assumptions for Partner Financing

Not applicable

AEM = advanced electricity metering, GCD = governance and capacity development, PES = regional distribution enterprises of Uzbekenergo, PIC = project implementation consultant, Q = quarter.

[a] Government of Uzbekistan. 2015. *Decree of the President of the Republic of Uzbekistan No UP-4707 dated 4 March 2015 on the program of measures to promote structural reforms, modernization and diversification of production in 2015–2019.* Tashkent.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=41340-015-3

1. Loan Agreement
2. Project Agreement
3. Sector Assessment (Summary): Energy
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Gender Action Plan
12. Risk Assessment and Risk Management Plan

Supplementary Documents

13. Technical Due Diligence Report
14. Financial Management Assessment Report
15. Procurement Capacity Assessment Report
16. Poverty and Socio-Economic Assessment Report