# Report and Recommendation of the President to the Board of Directors

Project Number: 45306-001
June 2014

# Proposed Loan
# Republic of Uzbekistan: Takhiatash Power Plant Efficiency Improvement Project



Asian Development Bank

## CURRENCY EQUIVALENTS
(as of 1 June 2014)

| | | |
|---|---|---|
| Currency unit | – | sum (SUM) |
| SUM1.00 | = | $0.0004354 |
| $1.00 | = | SUM2,296.43 |

## ABBREVIATIONS

| | | |
|---|---|---|
| ADB | – | Asian Development Bank |
| CCGT | – | combined-cycle gas turbine |
| GHG | – | greenhouse gas |
| GWh | – | gigawatt-hour |
| LARP | – | land acquisition and resettlement plan |
| LIBOR | – | London interbank offered rate |
| MW | – | megawatt |
| PMU | – | project management unit |
| SPS | – | Safeguard Policy Statement |
| TA | – | technical assistance |
| TPP | – | thermal power plant |

## 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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| **Director General** | K. Gerhaeusser, Central and West Asia Department (CWRD) |
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# PROJECT AT A GLANCE

**1. Basic Data** — **Project Number:** 45306-001

| | | | |
|---|---|---|---|
| **Project Name** | Takhiatash Power Plant Efficiency Improvement Project | **Department /Division** | CWRD/CWEN |
| **Country** | Uzbekistan | **Executing Agency** | UzbekEnergo |
| **Borrower** | Republic of Uzbekistan | | |

| | **2. Sector** | **Subsector(s)** | **ADB Financing ($ million)** |
|---|---|---|---|
| ✓ | **Energy** | Conventional energy generation | 119.00 |
| | | Energy efficiency and conservation | 178.50 |
| | | Energy sector development and institutional reform | 2.50 |
| | | **Total** | **300.00** |

| **3. Strategic Agenda** | **Subcomponents** | **Climate Change Information** | |
|---|---|---|---|
| Inclusive economic growth (IEG) | Pillar 1: Economic opportunities, including jobs, created and expanded | Adaptation ($ million) | 157.80 |
| Environmentally sustainable growth (ESG) | Global and regional transboundary environmental concerns | Mitigation ($ million) | 64.90 |
| | | $CO_2$ reduction (tons per annum) | 418,000 |
| | Natural resources conservation | Climate Change impact on the Project | Low |

| **4. Drivers of Change** | **Components** | **Gender Equity and Mainstreaming** | |
|---|---|---|---|
| Governance and capacity development (GCD) | Institutional development | Effective gender mainstreaming (EGM) | ✓ |
| | Organizational development | | |
| Private sector development (PSD) | Public sector goods and services essential for private sector development | | |

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

**6. Risk Categorization:** Complex

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

**8. Financing**

| **Modality and Sources** | **Amount ($ million)** |
|---|---|
| **ADB** | **300.00** |
| Sovereign Project loan: Ordinary capital resources | 300.00 |
| **Cofinancing** | **0.00** |
| None | 0.00 |
| **Counterpart** | **400.00** |
| Others | 270.00 |
| Project Sponsor | 36.00 |
| Government | 94.00 |
| **Total** | **700.00** |

**9. Effective Development Cooperation**

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

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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 Takhiatash Power Plant Efficiency Improvement Project.[1]

2. The project, to be implemented in the Takhiatash thermal power plant (TPP), involves building two combined-cycle gas turbine (CCGT) units, decommissioning old and inefficient power generation units, improving energy efficiency, and increasing power supply to the Karakalpakstan and Khorezm regions. It includes a capacity development component to improve corporate performance and a social development component to foster gender equality.[2]

# II. THE PROJECT

## A. Rationale

3. Uzbekistan is one of the fastest-growing economies in Central Asia, aspiring to become an upper-middle-income country by 2020. The economy has sustained a high growth rate averaging over 8% (2007–2013). Generally, stable macroeconomic conditions and robust growth are set to continue as Uzbekistan aims to develop a highly developed and diversified industrial and export base. In particular, the Karakalpakstan and Khorezm regions, inhabited by 3 million people and located in the western part of Uzbekistan, will continue to attract important investment projects. Reliable power supply is critical to support industrial development in these regions. Indeed, these regions expect power demand to grow at 3%, double the expected medium-term national average rate of 1.5%.

4. The Takhiatash TPP is the main source of power supply in the Karakalpakstan and Khorezm regions. In 2012, power consumption in these regions was 2,293 gigawatt-hours (GWh) with maximum load of 466 megawatts (MW). By 2020, the power consumption is expected to exceed 3,620 GWh, with maximum load of 620 MW. With 730 MW of installed capacity, the Takhiatash TPP now comprises five gas-fired steam turbine generation units. Three units totaling 310 MW have passed their designed economic life, and have been operating with derated capacity (130 MW), low thermal efficiency (23.7%), and limited plant availability (25%).[3] The other two units, totaling 420 MW, are 26 years old or less.[4] However, their capacity is derated by 15%, the efficiency is low at 31%, and they are overutilized to meet demand, which prevents regular maintenance.

5. To ensure reliable power supply, the government and Uzbekenergo, the state-owned power utility, identified the project as a priority, and decided to (i) construct two CCGT units (230–280 MW each); (ii) decommission three existing power units (Nos. 1–3); and (iii) maintain two power units (Nos. 7–8) for backup operation. This approach—construction of energy-efficient units while decommissioning old and inefficient ones—will be the first integrated modernization model and will pave the way to restructuring a power sector that faces acute issues with aging assets.

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

[2] The Asian Development Bank (ADB) provided project preparatory technical assistance (TA): ADB. 2012. *Technical Assistance to the Republic of Uzbekistan for the Takhiatash Power Plant Efficiency Improvement Project.* Manila. (TA 8142-UZB, for $1.2 million, approved on 16 August 2012).

[3] Of the three units, two of 100 MW each (No. 1 and No. 2) were built in 1969; No. 3, of 110 MW, was built in 1974.

[4] No. 7, commissioned in 1987, and No. 8, commissioned in 1990, have installed capacity of 210 MW each.

6. Indeed, Uzbekistan's power generation plants are generally old and inefficient, requiring urgent modernization. The aging power plants are a result of underinvestment in power infrastructure after the collapse of the Soviet Union. More than 75% of the power plant units are over 30 years old, reaching or exceeding their economic life.[5] The thermal efficiency averages 31%, while that of energy-efficient CCGTs exceeds 50%. Although the country is endowed with abundant proven natural gas reserves and potential gas reserves are being explored, natural gas is not infinite. The reserve to production ratio for the country's natural gas is estimated at about 25–30 years. Replacing existing power generation assets with energy-efficient equipment is a key strategy for saving energy, securing reliable power supply, and reducing greenhouse gas (GHG) emission.

7. To date, Uzbekistan's power sector has shown steady progress in meeting new challenges. In an attempt to improve energy efficiency, one CCGT was commissioned in Navoi TPP and four more CCGT units are under preparation with confirmed funding.[6] On the sector reform, the electricity tariffs have been steadily raised since 2004 to ensure financial sustainability. Financial transparency has improved since Uzbekenergo, with the assistance of the Asian Development Bank (ADB), adopted external audits based on the International Standards of Auditing (ISA) starting from fiscal year (FY) 2011.[7] Further, to reduce high electricity losses and to spur demand-side energy efficiency improvement, Uzbekenergo has secured funding to introduce an advanced electricity metering program in nine of the 14 regions.[8]

8. Nonetheless, further efforts to improve Uzbekenergo's corporate performance are necessary. The utility needs to develop a strategy and build the capacity to become more commercially bankable in the medium term. It needs to introduce a modern management system with performance accountability. Uzbekistan and Uzbekenergo will benefit from learning and adopting best international practices for tariff determination to improve efficiency and to ensure full cost recovery. Uzbekenergo's information technology infrastructure needs improvements in management information system.

9. The project is consistent with ADB's country partnership strategy, 2012–2016 for Uzbekistan, which includes a focus on energy efficiency and reliable power supply.[9] The project is included in the country operations business plan, 2012–2014 for Uzbekistan.[10] ADB has three ongoing projects in the energy sector, addressing the need for energy efficiency, reliable power supply, and development of renewable energy (footnotes 7 and 8).[11]

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[5] ADB. 2010. *Technical Assistance for Central Asia Regional Economic Cooperation: Power Sector Regional Master Plan.* Manila.

[6] The four additional CCGT units comprise a second unit of 450 MW at Navoi TPP, two units of 450 MW each at Talimarjan TPP (with ADB assistance), and one unit of 370 MW at Tashkent TPP.

[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] Out of nine, ADB finances the program in three regions (Bukhara, Jizzakh, and Samarkand regions). 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. The advanced electricity metering program in other regions is financed by the World Bank (Tashkent City, and Tashkent and Syrdarya regions) and the Islamic Development Bank (Karakalpakstan, Khorezm, and Navoi regions).

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

[10] ADB. 2012. *Country Operations Business Plan: Uzbekistan, 2012–2014.* Manila.

[11] 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.

## B. Impact and Outcome

10. The project's impact will be more reliable power supply. The outcome will be increased energy-efficient power supply for the Karakalpakstan and Khorezm regions. The project will generate more electricity with less gas, lower GHG emission, and less water, thereby contributing to climate change mitigation and adaptation. Table 1 summarizes the expected project outcome.

**Table 1: Summary of Expected Project Outcome**

| | Item | Installed Capacity (MW) | Power Generation (GWh/year) | Gas Usage (million $m^3$) | $CO_2$ Emission (1,000 $tCO_2e$) | Water Usage (million $m^3$) |
|---|---|---|---|---|---|---|
| (a) | Existing units | 730 | 3,276 | 1,117 | 2,117 | 453 |
| (b) | Decommissioning | (310) | (956) | (390) | (741) | (155) |
| (c) | Backup | 420 | 342 | 108 | 203 | 44 |
| (d) | New units | 510 | 3,554 | 691 | 1,496 | 7 |
| (c)+(d) | After project | 930 | 3,896 | 799 | 1,699 | 51 |
| (c)+(d)-(a) | Net change | 200 | 620 | (318) | (418) | (402) |

( ) = negative, $CO_2$ = carbon dioxide, GWh = gigawatt-hour, $m^3$ = cubic meter, MW = megawatt, $tCO_2e$ = ton of carbon dioxide equivalent.
Sources: Uzbekenergo and Asian Development Bank estimates.

## C. Outputs

11. **Efficient and clean energy.** The project will construct two CCGT units (230–280 MW each) with at least 52% thermal efficiency at the existing Takhiatash TPP. Three existing units (Nos. 1–3) will be decommissioned and two (Nos. 7–8) will be kept for backup power generation, while underutilized structures (blocks 1 and 2) will be demolished and the land will be remediated. A single turnkey contractor will undertake these physical components. An implementation consultant will prepare the bidding documents.

12. **Capacity development.** The project will develop Uzbekenergo's capacity for becoming a commercially bankable utility. Tariff methodology study and training will develop the skills required to improve the tariff determination model and ensure cost-recovering tariff setting. Corporate performance management capacity will be measured and managed by developing key performance indicators. A risk-profile assessment study will help Uzbekenergo gain better access to financing. The project preparatory technical assistance (TA) consultant prepared the terms of reference and the capacity development road map.

13. **Social development.** The project will build a community social service center adjacent to the Takhiatash TPP. The center, open to TPP employees and residents of Takhiatash City, will create jobs and include facilities such as laundry services, health checkups, and a gym. It will thus help improve the community's welfare and foster gender equality. The need for these facilities was established in a social survey undertaken by the project preparatory TA consultant. The Takhiatash TPP will be responsible for the sustainable operation of the facilities.

## D. Investment and Financing Plans

14. The project is estimated to cost $700 million (Table 2).

**Table 2: Project Investment Plan**
($ million)

| Item | | Amount[a] |
|---|---|---|
| **A.** | **Base Cost**[b] | |
| | 1. Energy efficient and clean energy | 584.5 |
| | 2. Capacity development | 3.0 |
| | 3. Social development | 3.5 |
| | **Subtotal (A)** | **591.0** |
| **B.** | **Contingencies**[c] | **78.9** |
| **C.** | **Financing Charges During Implementation**[d] | **30.1** |
| | **Total (A+B+C)** | **700.0** |

[a] Includes taxes and duties to be financed by the government.
[b] In mid-2013 prices.
[c] Physical contingencies computed at 10% for base cost. Price contingencies computed at 2.0% on foreign exchange costs and 10.3% on local currency costs; includes provision for potential exchange rate fluctuation assuming purchasing power parity exchange rate.
[d] Includes interest and commitment charges. Interest during construction for Asian Development Bank (ADB) loan has been computed at the 5-year forward London interbank offered rate plus a spread of 0.50% and a maturity premium of 0.10%. Commitment charges for the ADB loan are 0.15% per year to be charged on the undisbursed loan amount. Interest during construction for Uzbekistan Fund for Reconstruction loan has been computed at the same rate as ADB loan.

Source: Asian Development Bank estimates.

15. 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, straight-line repayment method, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, and a commitment charge of 0.15% per year. Based on this, the average loan maturity is 15.25 years, and the maturity premium payable to ADB is 0.10% per annum. The government has provided ADB with (i) the reasons for its decision to borrow under ADB's LIBOR-based lending facility based on these terms and conditions and (ii) an undertaking that these choices were its own decision and not made in reliance on a communication from ADB. 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.

16. Uzbekistan will arrange counterpart financing as follows: (i) coverage of taxes and duties amounting to $94 million; (ii) Uzbekenergo's internal resources to cover the remaining balance of the project cost ($36 million) including ancillary infrastructure, community social service center, recurrent cost, land acquisition, and interest during construction; and (iii) a loan from the Uzbekistan Fund for Reconstruction and Development to Uzbekenergo in the amount of $270 million to cover a part of the power plant turnkey contract and related contingencies.[12]

**Table 3: Financing Plan**
($ million)

| Source | Amount | Share of Total (%) |
|---|---|---|
| Asian Development Bank | 300.0 | 42.9% |
| Uzbekistan Fund for Reconstruction and Development | 270.0 | 38.6% |
| Uzbekenergo | 36.0 | 5.1% |
| Government | 94.0 | 13.4% |
| **Total** | **700.0** | **100.0%** |

Source: Asian Development Bank estimates.

[12] Uzbekistan Fund for Reconstruction and Development, 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 socio-economic development. It has partnered with foreign investors, international financial institutions, and export credit agencies.

## E. Implementation Arrangements

17. The implementation arrangements are summarized in Table 4 and described in detail in the project administration manual.[13]

**Table 4: Implementation Arrangements**

| Aspects | Arrangements | | |
|---|---|---|---|
| Implementation period | December 2014–October 2020 | | |
| Estimated completion date | 31 October 2020 | | |
| Management | | | |
| (i) Executing agency | Uzbekenergo | | |
| (ii) Project management unit | Takhiatash project management unit will be established within Uzbekenergo with a minimum of 10 full-time staff. | | |
| **Procurement**[a] | | | |
| Construction of two CCGT units (230–280 MW each), demolition of blocks 1–2, and decommissioning of units Nos. 1–3 | ICB | 1 contract | $480 million |
| **Consulting services**[b] | | | |
| Project management and supervision consultant | QCBS (90:10) | 127 person-months (international)<br>141 person-months (national) | $6,000,000 |
| Corporate management capacity development consultant | QCBS (90:10) | 25 person-months | $900,000 |
| Capacity development program manager | ICS | 20 person-months | $570,000 |
| External audit | CQS | 24 person-months | $600,000 |
| Risk profile assessment consultant | CQS | 12 person-months | $400,000 |
| Social and gender consultant | ICS | 16 person-months | $30,000 |
| Retroactive financing and/or advance contracting[c] | Both retroactive financing and advance contracting are requested for all goods, works, and consulting services. Retroactive financing 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* (2012, as amended from time to time) and detailed arrangements agreed on between the government represented by the Ministry of Finance, Uzbekenergo, and ADB.<br>Direct payment, reimbursement, and commitment procedures will be used for all expenditure categories. | | |

ADB = Asian Development Bank, CCGT = combined-cycle gas turbine, CQS = consultants qualification selection, ICB = international competitive bidding, ICS = individual consultant selection, MW = megawatt, QCBS = quality- and cost-based selection.

[a] Procurement will be in accordance with ADB Procurement Guidelines (2013, as amended from time to time).

[b] Consultant recruitment will be in accordance with the Guidelines on the Use of Consultants by Asian Development Bank and Its Borrowers (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.

18. Uzbekenergo will employ a single engineering, procurement, and construction turnkey contractor to construct the CCGT power generation unit, decommission existing units Nos. 1–3, and demolish the remaining structures on blocks 1–2 in the Takhiatash TPP and remediate the land. The procurement will be in accordance with ADB's Procurement Guidelines (2013, as

[13] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

amended from time to time) and follow international competitive bidding procedures using ADB's two-stage bidding method without prequalification. ADB's standard bidding documents for Plant: Design, Supply, Install will be used.

## III. DUE DILIGENCE

### A. Technical

19. The proposed CCGT units use well-established and natural-gas-based technology, and will have thermal efficiency of at least 52% with a designed capacity of 230–280 MW each. The CCGT units will be a multi-shafted configuration with one gas turbine, one heat-recovery steam generator, and one steam turbine. With the two CCGT units constructed on the same site, the plant design can be optimized to save cost by sharing systems such as water intake, gas supply facility, water treatment plant, wastewater treatment facility, switchyard, and substation. The cooling system will need to withstand extreme weather conditions both in summer and winter, and the two-stage bidding procedure will allow the bidders to propose the optimal solutions including air, wet, or hybrid cooling system. The CCGT units will provide base and peak power generation to ensure safe, more flexible, and efficient operation. The whole system will be designed, supplied, and installed by a single system integrator. Construction of the units will take about 30 months, and the units will be operated and maintained by the Takhiatash TPP.

20. The power plant infrastructure—e.g., power evacuation, gas supply, and water supply systems—has been constructed for the existing capacity of 730 MW. Natural gas is supplied from the Gazli Group gas field in Bukhara region, and the dedicated gas distribution station is located about 2 kilometers away from the Takhiatash TPP. Gas reserves and supply capacity of 1,014.5 million cubic meters per year is assured for the lifetime of the CCGT units through renewal of the annual gas supply contract with Uzbekneftegaz, another wholly state-owned enterprise. Water is supplied from the Amu Darya River through the canal. Two other canals with pump stations act as backup canals. The two backup canals will be running only when the water level is low in the intake canal. Power is evacuated through the 110-kilovolt and 220-kilovolt substations and can be evacuated through the existing switchgears and transmission lines with minor upgrades on the switchyard. The transmission capacity is 540 MW and sufficient for the project. However, Uzbekenergo has a plan to expand the transmission capacity to improve stability and reliability of the grid in the future.

21. After commissioning the first CCGT unit, the power generation units Nos. 1–2 will be decommissioned. Power unit No. 3 will be decommissioned after the second CCGT unit is commissioned. The outdated units Nos. 1–3 have exceeded their designed economic life and are currently running at an efficiency of about 24%. The project will also demolish the remaining structures for the already dismantled units 1 and 2. The other two units (Nos. 7 and 8) have been overutilized to meet increasing power demand in the Karakalpakstan and Khorezm regions, which left no time for sufficient maintenance. After the two CCGT units are commissioned, units Nos. 7–8 will be maintained as backup during maintenance and overhaul of the CCGT units.

22. Although the Takhiatash TPP is well endowed with engineers experienced in steam turbine operation and maintenance, operating a CCGT requires different technical know-how. Training the plant engineers in CCGT operation and maintenance will be part of the engineering, procurement, and construction contract.

## B. Economic and Financial

23. The project is financially and economically viable. The financial internal rate of return is 6.6%, which compares favorably with the weighted average cost of capital at 0.8%. The incremental benefits include the sale of additional power generated by the two CCGT units, and gas savings as a result of higher energy efficiency of the CCGT technology.

24. The economic benefits comprise incremental benefits as a result of more electricity consumption and nonincremental benefits from fuel savings. The sensitivity analysis suggests sufficient robustness of the project under all tested assumptions. The economic internal rate of return is 32.6%, which is greater than the economic opportunity cost of capital.

25. Uzbekenergo has operated profitably since 2008. The gross profit margin has been above 10% throughout the period, but has decreased from 35.1% in 2008 to 11.3% in 2012, largely due to higher-cost maintenance of aging facilities. Despite slow growth in the volume of electricity sales (at an annual average of 1.5% since 2008), low fuel costs and semiannual tariff adjustments to reflect inflation have contributed to the profitability of Uzbekenergo.

26. Financial projections for 2013–2020 indicate that the financial base remains stable if tariff adjustment remains synchronized with inflation and gas prices. Improvement of tariff policy and determination practice under the capacity development component of this project will ensure the sustainability of Uzbekenergo's profitability, and boost its ability to attract financing.

## C. Governance

27. The pre-mitigation risk level of Uzbekenergo is considered substantial given that its current financial management capacity requires further strengthening, especially in the recruitment and retention of qualified financial and accounting professionals, automation of the accounts consolidation and management reporting process, and ability to become fully compliant with the International Financial Reporting Standards (IFRS). Uzbekenergo needs to strengthen its financial management capacity.

28. Uzbekenergo's accounting policies, procedures, and financial reporting have followed Uzbekistan's national accounting and auditing standards. However, to step up its financial management, Uzbekenergo undertook an external audit of its financial statements in FY2011 based on the ISA issued by the International Assurance Auditing Standards Board. The results indicated the need for further improvements, such as in the classification methods and impairment provisions on account receivables, the scope of account consolidation, and the accounting system. Uzbekenergo started to adopt the IFRS in FY2012. The capacity development plan under other ADB-financed projects will strengthen Uzbekenergo's information systems with the objective of improving its financial management capability (footnote 7). Uzbekenergo's financial management risk after mitigation is moderate.

29. Uzbekenergo's procurement capacity was assessed as average risk. As an institution, it has experience with multilateral and bilateral financiers, including ADB. However, the capacity of the project management unit (PMU) is weak. An international project preparatory TA consultant has provided procurement training for Uzbekenergo's key PMU staff. Consultants will be recruited to take part in the bidding process and handle project management and supervision. An early-warning system will be established to ensure timely procurement and project implementation.

30. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the Ministry of Finance and Uzbekenergo. The specific policy requirements and supplementary measures are described in the project administration manual (footnote 13).

## D. Poverty and Social

31. The increased efficiency and reliability resulting from the project will have a positive impact on economic growth and poverty reduction. Electricity is essential not only for rich and middle-income consumers but also for the poor to meet their basic needs. The project area of Karakalpakstan is a socially and environmentally vulnerable area. The Karakalpakstan and Khorezm regions, with 3 million people in urban and rural areas, are the direct beneficiaries of the project. Small local businesses, as well as service providers such as schools and health centers, will also benefit from more reliable power supply. Reliable power supply is also essential for large-scale industrial development projects, which would bring much-needed income opportunities to the regions.

32. The project features effective gender mainstreaming. More reliable power supply to households will benefit women, who are mostly the managers of household activities. Reliable lighting for homes, businesses, streets, and marketplaces is also critical for facilitating women's and girls' involvement in educational, entrepreneurial, and community activities. The project will construct a community social service center, which will be equipped with facilities to cater for the laundry, dry-cleaning, and carpet-cleaning needs of the local community, especially women, as well as Takhiatash TPP staff—in all, about 50,000 people. The center will generate employment for at least 20 women (50% of jobs created). This will provide significant gender benefits and reduce women's time poverty, given that more than 90% of households have no washing machines and women so far had to do laundry by hand. To promote gender equality, the key performance indicators to be developed under the capacity development component will include gender indicators.

## E. Safeguards

33. **Environment.** The project is categorized A for environment, and will involve improvement of existing facilities. In compliance with ADB's Safeguard Policy Statement (2009) (SPS), an environmental impact assessment for construction of the CCGT units and decommissioning of existing units was prepared, and was disclosed on 20 May 2013. An environmental compliance audit was also carried out. The environmental impact assessment covers the findings from the environmental compliance audit. The environmental management plan was prepared to mitigate impacts from the construction of the CCGT units. Corrective action is planned to improve the environmental performance of the existing facilities. Two consultations with potentially affected people were carried out in May 2013 and July 2013, and a grievance redress mechanism was established within the Takhiatash TPP to resolve any complaints.

34. Building the CCGT units will generate temporary and reversible impacts such as dust, noise, and vibrations. Operating the CCGT units will have positive impacts because ambient air quality will improve due to fewer emissions, and water use and noise levels will be lower than in the current units. The Takhiatash TPP will strengthen its health and safety unit by adding staff who will be responsible for implementing the environmental management plan, including the corrective action plan to improve the environmental performance of the existing facilities. Uzbekenergo is committed to implementing mitigation measures incorporated in the environmental management plan, which are considered adequate.

35. **Social safeguards.** The project is categorized B for involuntary resettlement. Building the CCGT units will require additional land next to the existing facilities. The land acquisition and resettlement plan (LARP) was prepared in compliance with ADB's SPS (2009) and was disclosed on 1 August 2013. The LARP was also prepared in accordance with the government's resolution on land acquisitions. Aside from individual consultations with affected people while surveying the inventory of losses, the official consultation with affected people was carried out on 10–13 May 2013. More consultations are planned if the LARP needs to be updated during detailed design, as well as during the implementation of the LARP.

36. Permanent land acquisition will involve 2.29 hectares and temporary acquisition will involve 4.55 hectares. This will affect 10 households, two private firms, and two farms, with 144 affected people. Buildings affected by land acquisition cover an area of 3,950 square meters, of which 1,980 square meters belong to two private businesses. Based on the government resolution and ADB's SPS (2009), it is estimated that compensation costs for land acquisition will be around $1.4 million. The social compliance audit revealed no past or present complaints about land being used for the existing facilities.

37. The project is categorized C for indigenous peoples in accordance with ADB's SPS (2009). All the ethnic groups living in the project areas have equal access to all social and other services, including health, education, and water and sanitation. None of the groups are socially excluded either in terms of legislation or in terms of the actual social living conditions. Further, none of the ethnic groups maintain cultural or social identities and characteristics separate from the mainstream Uzbekistan society, that would classify them as ethnic minorities and/or indigenous peoples.

38. **Safeguard capacity**. Uzbekenergo has experience in implementing ADB's requirements for environmental and social safeguards. It has a capacity development program under an existing ADB-financed project, which aims to enhance its institutional safeguard capacity (footnote 7). Moreover, to step up its compliance with the safeguard requirements, Uzbekenergo will employ a safeguards expert through the project implementation consulting firm.

## F. Risks and Mitigating Measures

39. Major risks and mitigating measures are summarized in Table 5 and described in detail in the risk assessment and risk management plan.[14] The overall risk is low with the mitigation measures. The integrated benefits and impacts are expected to outweigh the costs.

**Table 5: Summary of Risks and Mitigating Measures**

| Risks | Mitigating Measures |
|---|---|
| Limited operational experience with CCGTs | (i) Training in operation and maintenance will be included in the turnkey contract. |
| Delayed procurement and implementation of turnkey contract | (i) An international consulting firm will be recruited during project implementation.<br>(ii) The PMU will recruit experienced procurement specialists.<br>(iii) Procurement training is provided through PPTA to the PMU staff.<br>(iv) The institutions responsible for contract registration assessment will be involved in the procurement and consultant recruitment process to avoid delays in the contract registration required for contract effectiveness.<br>(v) ADB will continue dialogue with the government to improve the contract registration and review process. |

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

| Risks | Mitigating Measures |
|---|---|
| Tariff level becomes suboptimal | (i) The government has increased the tariff regularly at a rate above the inflation rate, and confirmed that the same policy will be maintained. |
| Limited financial management capacity | (i) No imprest account will be established. An international consulting firm will support the PMU. Training on ADB procedures will be provided. Uzbekenergo, with the help of international consultants, will recruit and train staff for IFRS-based audits.<br>(ii) A capacity development program financed by ADB and other development partners will hire consultants to help Uzbekenergo achieve full consolidation of its accounts, IFRS implementation, and an upgrade of accounting and reporting systems. |

ADB = Asian Development Bank, CCGT = combined-cycle gas turbine, IFRS = International Financial Reporting Standards, PMU = project management unit, PPTA = project preparatory technical assistance.
Source: Asian Development Bank.

## IV. ASSURANCES AND CONDITIONS

40. 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.

41. 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 the terms. In addition, no disbursement for the turnkey contract will be made until a loan agreement between the Uzbekistan Fund for Reconstruction and Development 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

42. 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 Takhiatash Power Plant Efficiency Improvement 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

24 June 2014

## DESIGN AND MONITORING FRAMEWORK

| Design Summary | Performance Targets and Indicators with Baselines | Data Sources and Reporting Mechanisms | Assumptions and Risks |
|---|---|---|---|
| **Impact**<br>More reliable power supply in Uzbekistan | By 2023:<br>Total domestic power generated increased from 52 TWh (2010) to 65 TWh<br><br>Total installed power generation capacity increased from 12,400 MW (2010) to 14,400 MW<br><br>Total GHG emission intensity reduced from 4.53 kg $CO_2$e/dollar GDP (2009) to 3 kg $CO_2$e/dollar GDP | Uzbekenergo's annual performance report<br><br>Uzbekenergo's annual performance report<br><br>Key world energy statistics from the International Energy Agency | **Assumptions**<br>Stable economic growth. Power demand grows by at least 1.5% per annum.<br><br>Government continues to support power sector development and reform plans<br><br>Electricity tariffs regularly adjusted to cover costs<br><br>**Risk**<br>Limited investments in energy-efficient technologies |
| **Outcome**<br>Increased energy-efficient power supply in the Karakalpakstan and Khorezm regions | By 2020:<br>Power generated from Takhiatash TPP increased from 3,276 GWh (2011) to 3,896 GWh<br><br>Thermal efficiency of the new plant increased from 23.7% (2011) to 52%<br><br>Takhiatash TPP GHG emission reduced from 2.1 mt$CO_2$e (2011) to 1.7 mt$CO_2$e<br><br>Takhiatash TPP gas consumption decreased from 1,117 million $m^3$ (2011) to 799 million $m^3$<br><br>Takhiatash TPP water consumption decreased from 453 million $m^3$ (2011) to 51 million $m^3$ | Takhiatash TPP statistics<br><br>Takhiatash TPP statistics<br><br>Takhiatash TPP statistics<br><br>Takhiatash TPP statistics<br><br>Takhiatash TPP statistics | **Assumptions**<br>Sufficient power evacuation capacity is available.<br><br>Gas remains available for power generation.<br><br>Sufficient water remains available for power generation.<br><br>National investment plan for the energy sector executed without delay<br><br>Power sector investment environment improves (regulatory and legislative framework and transparency) |
| **Outputs**<br>1. Energy-efficient power generators operational in Takhiatash TPP | Two CCGT units with 230–280 MW each commissioned by 2018<br><br>Existing three units (total 310 MW) decommissioned by 2020<br><br>1.7 million $m^3$ of hot water generated for the local community (including the community social service center) | Commissioning certificate by Uzbekenergo<br><br>Decommissioning certificate by Uzbekenergo<br><br>Takhiatash TPP statistics | **Risks**<br>Delays in procurement and implementation of CCGT contract due to its technical complexity<br><br>Cost overruns due to unforeseen circumstances in the international market |

| Design Summary | Performance Targets and Indicators with Baselines | Data Sources and Reporting Mechanisms | Assumptions and Risks |
|---|---|---|---|
| 2. Developed Uzbekenergo's capacity to become commercially bankable | Key performance indicator-based management system introduced by 2017<br><br>Tariff analysis and training completed for at least 30 staff (with at least 20% being women) by 2017<br><br>Uzbekenergo's risk profile assessment completed by 2018 | Uzbekenergo's annual performance reports<br><br>Tariff analysis and training report by Uzbekenergo.<br><br>Risk profile assessment report by Uzbekenergo. | **Assumptions**<br>Uzbekenergo senior management and Ministry of Finance are committed to improving corporate performance.<br><br>International financial reporting standards adopted for greater transparency |
| 3. Community social service center becomes operational | By 2018<br>Community social service center, equipped with dry-cleaning, laundry, and carpet-cleaning facilities, open to local community and TPP staff (50,000 people)<br><br>At least 20 new jobs (50% of jobs created) in the community social service center are for women | Commissioning certificate by Uzbekenergo<br><br>Takhiatash TPP statistics | |
| **Activities with Milestones**<br>**1. Efficient and clean energy**<br>1.1. Contractor will be selected by Nov 2015<br>1.2. CCGT unit 1 will be completed by Jul 2018<br>1.3. CCGT unit 2 will be completed by Oct 2018<br>1.4. Existing units 1–2 will be decommissioned by Jul 2020<br>1.5. Existing unit 3 will be decommissioned by Oct 2020<br><br>**2. Capacity development**<br>2.1. Program manager consultant will be recruited by Jan 2015<br>2.2. Tariff study and training starts by Apr 2015<br>2.3. Development of key performance indicators starts by Apr 2015<br>2.4 Risk profile assessment starts by Jun 2017<br><br>**3. Social development**<br>3.1. Social and gender consultant will be recruited by Mar 2015<br>3.2. Community social service center construction starts by Jan 2015 | | **Inputs**<br>**Loan**<br>ADB (OCR) $300 million<br>UFRD $270 million<br><br>Government $94 million<br>Uzbekenergo $36 million<br>Total: $700 million | |

ADB = Asian Development Bank, CCGT = combined-cycle gas turbine, $CO_2e$ = carbon dioxide equivalent, GDP = gross domestic product, GHG = greenhouse gas, GWh = gigawatt-hour, kg = kilogram, $m^3$ = cubic meter, $mtCO_2e$ = million ton carbon dioxide equivalent, MW = megawatt, OCR = ordinary capital resources, TPP = thermal power plant, TWh = terawatt hour, UFRD = Uzbekistan Fund for Reconstruction and Development.
Source: Asian Development Bank.

## LIST OF LINKED DOCUMENTS

http://adb.org/Documents/RRPs/?id=45306-001-3

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. Environmental Impact Assessment
13. Resettlement Plan
14. Risk Assessment and Risk Management Plan

**Supplementary Documents**

15. Technical Due Diligence Report
16. Capacity Development Report
17. Financial Management Assessment
18. Financial Performance and Projections
19. Procurement Capacity Assessment Report and Recommendations
20. Poverty and Socio-Economic Assessment