



# Technical Assistance Report

---

Project Number: 40537  
December 2006

## Preparing the Central Asia–South Asia Regional Electricity Market Project

Asian Development Bank

## ABBREVIATIONS

ADB	–	Asian Development Bank
CASAREM	–	Central Asia–South Asia Regional Electricity Market
EIA	–	Environmental impact assessment
EMP	–	environmental management plan
MCWG	–	Multi-Country Working Group
TA	–	technical assistance

## TECHNICAL ASSISTANCE CLASSIFICATION

<b>Targeting Classification</b>	–	General intervention
<b>Sector</b>	–	Energy
<b>Subsector</b>	–	Energy sector development
<b>Themes</b>	–	Sustainable economic development, capacity development, private sector development, regional cooperation
<b>Subthemes</b>	–	Fostering physical infrastructure development, public-private partnership

## NOTE

In this report, "\$" refers to US dollars.

<b>Vice President</b>	L. Jin, Vice President Operations 1
<b>Director General</b>	J. Miranda, Central and West Asia Department (CWRD)
<b>Director</b>	S. O' Sullivan, Infrastructure Division, CWRD
<b>Team leader</b>	F. Kawawaki, Senior Investment Specialist, Infrastructure Division, CWRD
<b>Team member</b>	R. Stroem, Principal Energy Specialist, Infrastructure Division, CWRD
	L. Blanchetti-Revelli, Social Development and Resettlement Specialist, CWRD
	S.L. Tu, Environment Specialist, Infrastructure Division, CWRD

## I. INTRODUCTION

1. The Asian Development Bank (ADB) has been requested to provide technical assistance (TA) for a techno-economic assessment to help prepare the Central Asia–South Asia Regional Electricity Market (CASAREM) power transmission project (the Project). The World Bank was requested to support the countries through an institutional, financial, risk mitigation, and legal framework study (commercial assessment). The Kyrgyz Republic and Tajikistan in Central Asia, and Afghanistan and Pakistan in South Asia have been pursuing the development of a regional electricity market. To examine the possibilities for regional electricity trade, the countries, together with international financial institutions and private sector met in Islamabad (May 2006), Istanbul (June 2006), Manila (October 2006), and Dushanbe (October 2006). Significant progress was made during the Multi-Country Working Group (MCWG) meeting, which was hosted by ADB and held in Manila on 5 and 6 October 2006. Concept clearance was given on 24 October 2006. A memorandum of understanding on project development was signed between the countries on 29 October 2006 at the Second CASAREM Conference. Fact-finding was undertaken through consultations during the conferences and the MCWG meeting. The governments agreed on the impact, outcome, outputs, implementation arrangements, and outline terms of reference of the consultants. The TA framework is shown in Appendix 1.<sup>1</sup>

## II. ISSUES

2. Afghanistan and Pakistan have significant electricity shortages and need to meet increasing demand. Importing electricity is becoming more important in their strategies for energy supply security, in addition to building power generation plants. Neighboring Central Asian countries—the Kyrgyz Republic and Tajikistan—have electricity surpluses available for export and are actively looking for export markets. They also have the potential to increase supply by developing additional low-cost hydropower generation facilities. Some electricity interconnections already exist between Afghanistan and Central Asian countries, notably Tajikistan, Turkmenistan, and Uzbekistan, but there is scope for expansion. Construction of a 220-kilovolt line between Uzbekistan and Afghanistan is already under way (with financial assistance from ADB, the Government of India, and the World Bank), and a similar project is under consideration for an Afghanistan–Tajikistan connection with potential ADB financing.<sup>2</sup> The Kyrgyz Republic and Tajikistan, with their large hydropower resources, have been seeking opportunities to expand electricity exports to Afghanistan and beyond to South Asia.

3. Afghanistan, the Kyrgyz Republic, Pakistan, and Tajikistan have been pursuing the development of electricity trading arrangements and the establishment of CASAREM, together with international financial institutions and the private sector. The initial plan is to export a minimum of 1,000 megawatts (MW) from the Kyrgyz Republic and Tajikistan to Afghanistan and Pakistan. Although the preference for Pakistan would be year-round supply of 1,000 MW, agreement has been reached on seasonal supply for the initial period. Pakistan expressed interest in increasing imports over the medium term beyond the initial 1,000 MW.

4. Any electricity trade project has risks, and CASAREM has some specific ones. General risks include: governments basing their decisions more on political than economic rationales.

---

<sup>1</sup> The technical assistance (TA) first appeared in *ADB Business Opportunities* on 25 October 2006.

<sup>2</sup> ADB. 2006. Draft Report and Recommendation of the President on the Proposed REG: Regional Power Transmission Interconnection Project. Manila (Afghanistan: loan of \$35 million and TA of \$1.2 million; Tajikistan: loan of \$21.5 million and TA of \$1.5 million)

This has delayed or and impeded other projects. Electricity trade projects have financial risks as off-take risk of the importers and compensation risk of the transmission providers and exporters when they fail to meet their contracted obligations. Legal and regulatory risks include inability to enforce contracts and changes in laws or regulations, which makes projects economically unsustainable. Projects can likewise face political violence or sabotage. CASAREM also faces technical risks in crossing high mountains and rugged terrain, and technical losses. These risks must be mitigated if the Project is to be economically attractive for the countries and to attract financing from commercial partners. Active partnership to address all risks and clear decision points before progressing with the Project will be necessary to start the electricity trade by 2010. The first decision point was the memorandum of understanding (MOU) for CASAREM signed at the Dushanbe conference. The second will be the intergovernmental agreement scheduled for mid 2007 when the final decision to proceed with the Project is made.

5. ADB has been active in CASAREM meetings and conferences. At the first MCWG meeting in Manila, the countries reconfirmed their keen interest in going forward with the Project and agreed to accelerate its processing and implementation to start the electricity trade by 2010. The MCWG requested ADB support for the techno-economic feasibility study. Through the MOU, the countries endorsed the terms of reference for the two studies to be undertaken by ADB and World Bank. The signing of the MOU in Dushanbe also commits the countries to pursue the feasibility of the transmission and trading system with the concomitant institutional and legal framework for the 1,000 MW power transfer and confirms that private sector participation will be given preference. Once its feasibility is established, the MOU commit the countries to pursue it until financial closure.

### **III. THE PROPOSED TECHNICAL ASSISTANCE**

#### **A. Impact and Outcome**

6. The purpose of the project preparatory TA is to enhance the electricity trade and optimize the region's power resources. It will prepare the Project, which in its initial stage will export 1,000 MW of electricity from Tajikistan and the Kyrgyz Republic to Pakistan and Afghanistan. The resulting Project will support the Government of Pakistan's strategy of increasing power supply to meet its economic growth targets, enable the Kyrgyz Republic and Tajikistan to earn revenues through the use of their hydroelectric resources, and enable Afghanistan to earn wheeling charges for the transit of electricity and have access to an additional source of electricity.

#### **B. Methodology and Key Activities**

7. The study will have two phases. Phase 1 will confirm the preliminary feasibility and economic viability of the Project. It will involve (i) an assessment of power availability and the cost of power supply options in the Kyrgyz Republic and Tajikistan for export and domestic demand; (ii) an assessment of the need for power in Pakistan and the marginal cost of alternatives compared with imports to satisfy the need, as well as Afghanistan's need and ability to import power; (iii) a preliminary analysis assessing the transmission route and the costs from the Kyrgyz Republic to Tajikistan and through Kabul, Afghanistan, to Pakistan and additional routes including those through eastern Tajikistan; (iv) an estimate to identify and provide the costs for the preferred transmission link options, including alternative technologies and voltage levels; and (v) route survey and preliminary environmental and social impact assessments.

8. If the countries decide to proceed, phase 2 will prepare the full feasibility study to establish the detailed route and costs. Full social and environmental impact assessments will also be carried out. Phase 2 will identify the Project's technical risks and ways of mitigating them.

9. The consultants will be required to use, to the extent possible, existing data and studies and analyses and will undertake extensive field work. The outputs are the technical and economic viability assessment and social and environmental impact assessments. The consultants will work closely with the commercial assessment team to ensure that there is no duplication of effort and that assessments from each study are reflected in the other. At each phase of the TA, the consultants will transfer knowledge to the staff of the governments and electric utilities by working closely with them. The consultants will train staff to use the software developed or augmented in the course of the TA, including that for load flow simulation.

### **C. Cost and Financing**

10. The estimated cost of the TA is \$3,337,000 equivalent. The MCWG has requested ADB to finance \$3,000,000 equivalent. The TA will be financed on a grant basis from ADB's TA funding program. The governments of Afghanistan, the Kyrgyz Republic, Pakistan, and Tajikistan will provide \$337,000 equivalent to finance counterpart staff, office facilities, and other expenditures (Appendix 3). The governments have been informed that approval of the TA does not commit ADB to finance any ensuing project.

### **D. Implementation Arrangements**

11. ADB will be the Executing Agency in close consultation with the MCWG for CASAREM, consisting of representatives from the governments of Afghanistan, the Kyrgyz Republic, Pakistan, and Tajikistan. The TA will be coordinated with the World Bank's consultant team for the commercial assessment. Each country will have a project development unit, with designated staff from that country. A coordinating unit will be set up in one country and will include an international consultant who will be the project coordinator. The TA will provide funding for office equipment. The TA will engage international consultants for 54 person-months and national consultants for 81 person-months. The international consultants will have extensive experience in preparing a project of this nature. Specialists in transmission technology, substations, system operation, economic assessment, financial analysis and social and environmental impact assessment will be required. The national consultants will have expertise in these areas in addition to being abreast of developments in their countries and areas of specialization. Phase 1 is expected to take 3.5 months, and phase 2, 15.0 months. The outline terms of reference and reporting arrangements are in Appendix 4. Tripartite meetings, involving the MCWG, consultants, and ADB, will be held after the submission of the inception, interim, and draft final reports. The consultants will submit progress reports to the MCWG and ADB. A consulting firm will be selected and engaged in accordance with *Guidelines on the Use of Consultants* (April 2006, as amended from time to time). Consultants will be recruited in accordance with quality- and cost-based selection procedures, and simplified technical proposals will be requested. Procurement under the TA will be in accordance with ADB's *Procurement Guidelines* (April 2006, as amended from time to time). Equipment procured under the TA will be used to implement the Project and be turned over to the governments thereafter. The TA will begin in January 2007 and be completed by July 2008.

#### **IV. THE PRESIDENT'S RECOMMENDATION**

12. The President recommends that the Board approve the provision of technical assistance not exceeding the equivalent of \$3,000,000 on a grant basis for preparing the Central Asia-South Asia Regional Electricity Market Project.

## DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions And Risks
<p><b>Impact</b></p> <p>Enhanced cooperation in the energy sector, and optimize power resources in the region</p>	<ul style="list-style-type: none"> <li>• Mutually beneficial power trade between AFG, KGZ, PAK, and TAJ by the end of 2010</li> </ul>	<ul style="list-style-type: none"> <li>• National statistics in AFG, KGZ, PAK, TAJ</li> <li>• Annual power system reports and statistics</li> </ul>	<p><b>Assumptions</b></p> <ul style="list-style-type: none"> <li>• Regional stability and cooperation</li> <li>• Power purchase and transmission agreements signed</li> <li>• Government makes commercial rather than political decisions</li> </ul> <p><b>Risks</b></p> <ul style="list-style-type: none"> <li>• Financial risks not acceptably mitigated for commercial stakeholders</li> <li>• Legal and regulatory risk not sufficiently mitigated</li> </ul>
<p><b>Outcome</b></p> <p>Project design and feasibility study agreed on by governments and ADB</p>	<p>Memorandum of understanding (MOU) signed on proceeding with the Project, and funding secured to implement it</p>	<p>MOU and project agreements</p>	<p><b>Assumption</b></p> <ul style="list-style-type: none"> <li>• Appropriate stakeholder consultation</li> </ul> <p><b>Risk</b></p> <ul style="list-style-type: none"> <li>• Economic and financial viability does not meet expectations of ADB and governments</li> </ul>
<p><b>Outputs</b></p> <p>1. Phase 1 Preliminary feasibility and economic viability confirmed</p> <p>2. Phase 2 a. Technical assessment completed</p>	<p>Preliminary feasibility report (by June 2007)</p> <p>Project feasibility report, including technical, financial, economic, social</p>	<p>MCWG meeting summary of presentation and discussion of report</p> <p>Government confirming receipt of the project feasibility report ADB confirming receipt</p>	<p><b>Assumptions</b></p> <ul style="list-style-type: none"> <li>• Governments make timely decisions on progress of the Project</li> <li>• Project development unit is effective in coordinating support for consultants</li> </ul> <p><b>Risks</b></p> <ul style="list-style-type: none"> <li>• Restricted access to</li> </ul>

<b>Design Summary</b>	<b>Performance Targets/Indicators</b>	<b>Data Sources/Reporting Mechanisms</b>	<b>Assumptions And Risks</b>
<p>b. Financial and economic analyses completed</p> <p>c. Social safeguard document completed</p> <p>d. Environmental safeguard document completed</p> <p>e. Project development unit staff trained through working with consultants</p> <p>f. Computers and peripherals for the project development office. Software, including for load flow simulation as necessary</p>	<p>safeguards, environment matters, submitted to the Government and ADB</p> <p>At least three staff members in each country (AFG, KGZ, PAK, TAJ)</p> <p>Project development units in each country furnished with computers and peripherals</p> <p>Software for technical analysis available</p>	<p>of the project feasibility report</p>	<p>project site</p>
<p><b>Activities with Milestones</b></p> <p>1.1 Inception report and meeting with MCWG (within 1 month)</p> <p>1.2 Phase-1 report (within 3.5 months)</p> <p>2.1 Periodic update reports</p> <p>2.2 Interim report and meeting with the MCWG (within 6 months)</p> <p>2.3 Draft country reports (AFG, KGZ, PAK, TAJ) (as prepared)</p> <p>2.3 Draft final report (within 15 months)</p> <p>2.4 Submission of final report (within 1 month of receiving comments)</p>			<p><b>Inputs</b></p> <ul style="list-style-type: none"> <li>• ADB \$3,000,000</li> <li>• Consultants <ul style="list-style-type: none"> <li>○ 54 person months international</li> <li>○ 81 person months national</li> <li>○ Equipment and others</li> <li>○ contingencies</li> </ul> </li> <li>• Governments \$337,000</li> </ul>

ADB = Asian Development Bank; AFG = Afghanistan; KYG = Kyrgyz Republic; MCWG = Multi-Country Working Group; MW = megawatt; PAK = Pakistan; TAJ = Tajikistan.



## INITIAL POVERTY AND SOCIAL ANALYSIS

### A. Linkages to the Country Poverty Analysis

<b>Is the sector identified as a national priority in country poverty analysis?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>Is the sector identified as a national priority in country poverty partnership agreement?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <small>Not applicable</small>
<p><b>Contribution of the sector or subsector to reduce poverty.</b> The Project targets the Kyrgyz Republic, Tajikistan, Afghanistan, and Pakistan. The first two will contribute electricity to the network while the other two will take it. The Project will indirectly reduce poverty in the electricity-giving countries by financing the further development of all-year power sources. The more power there is, the lower electricity costs and possibly preferential tariffs for the poor. Construction of large hydropower plants and reservoirs will provide much-needed jobs to poor settlers in remote parts of Tajikistan and the Kyrgyz Republic. Poverty reduction impacts in Afghanistan and Pakistan will be limited to increased production resulting from having more electricity.</p>	

### B. Poverty Analysis

**Targeting Classification:** General Intervention

<b>What type of poverty analysis is needed?</b> Not applicable
--

### C. Participation Process

<b>Is there a stakeholder analysis?</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<b>Is there a participation strategy?</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

### D. Gender Development

<b>Strategy to maximize impacts on women:</b> As a transmission project, this initiative will have no specific gender dimension.			
<b>Has an output been prepared?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
<b>Affordability</b>	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Labor</b>	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input checked="" type="checkbox"/> None		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Indigenous Peoples</b>	<input type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None	So far not known. Appropriate action will be taken when the line route is selected.	<input type="checkbox"/> Yes <input type="checkbox"/> No

<b>Other Risks and/or Vulnerabilities</b>	<input type="checkbox"/> Significant <input checked="" type="checkbox"/> Not significant <input type="checkbox"/> None		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
---	--	--	--

**E. Social Safeguards and Other Social Risks**

Item	Significant/ Not Significant/ None	Strategy to Address Issues	Plan Required
<b>Resettlement</b>	<input checked="" type="checkbox"/> Significant <input type="checkbox"/> Not significant <input type="checkbox"/> None		<input checked="" type="checkbox"/> Full <input type="checkbox"/> Short <input type="checkbox"/> None

**COST ESTIMATES AND FINANCING PLAN**  
(**\$**)

<b>Item</b>	<b>Total Cost</b>
<b>A. Asian Development Bank Financing<sup>a</sup></b>	
1. Consultants	
a. Remuneration and Per Diem	
i. International Consultants	1,465,000
ii. National Consultants	408,000
b. International and Local Travel	235,000
c. Reports and Communications	20,000
2. Equipment <sup>b</sup>	200,000
3. Training, Seminars, and Conferences	160,000
4. Miscellaneous Administration and Support Costs	12,000
5. Contingencies	500,000
<b>Subtotal (A)</b>	<b>3,000,000</b>
<b>B. Government Financing</b>	
1. Office Accommodation and Transport	165,000
2. Remuneration and Per Diem of Counterpart Staff	144,000
3. Others	28,000
<b>Subtotal (B)</b>	<b>337,000</b>
<b>Total</b>	<b>3,337,000</b>

<sup>a</sup> Financed by the Asian Development Bank's technical assistance funding program.

<sup>b</sup> The TA will support the financing of the augmentation or purchase of software, computers, and peripheral equipment.

Source: Asian Development Bank estimates.

## OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. The consultants' scope of work for this project preparatory technical assistance (TA) for the Central Asia South Asia Regional Electricity Market will have two phases and four tasks. Phase 1 will be the preliminary feasibility and economic viability study. Based on the study's recommendations, the governments will confirm that they would like to proceed with the Project. The tasks are as follows: (i) assess the availability and cost of power supply options in Tajikistan and the Kyrgyz Republic; (ii) assess the need for power in Pakistan and the cost of alternatives to imports to satisfy these needs, and Afghanistan's ability to take and use additional power; (iii) determine the transmission options, route, and costs, and identify, as part of the foregoing, the Project's technical risks and ways of mitigating them; and (iv) conduct an environmental and social assessment to determine the route, and a detailed assessment of the route chosen. The legal, regulatory, and financial risks are being examined through the commercial study supported by the World Bank. Because of the intertwining nature of the risks and other components of the two studies, the consultants for both teams will work together to reflect their findings as well as to avoid duplication of efforts.

2. The phase-2 feasibility study will cover four major areas: (i) compliance with the Asian Development Bank's (ADB) safeguard policies; (ii) economic and financial evaluations; (iii) links between economic growth, poverty, and the power sector; and (iv) technical project design.

3. The consultants will work with the Multi-Country Working Group (MCWG) and the project director, who will be responsible for the overall coordination and project development units in each country. For all material and software resulting from or used to conduct the project preparatory TA, the consultants will transfer knowledge and provide hands-on training to the members of the units and others as requested.

### **A. Engineering Aspects** (international, 30 person-months; national, 33 person-months)

4. The engineering consultants will have in-depth knowledge of transmission lines and have experience in dealing with difficult terrain. Experience in cross-border export of electricity will be necessary. One of the international engineering consultants will be the team leader. A national consultant from each country will be the deputy team leader for that country. The national consultant should be an expert in the power sector of the country. The consultants' outline terms of reference will include, but will not necessarily be limited to, the following:

- (i) **Phase 1**
  - (a) Review the countries' power systems and their midterm investment plans, and their ability to meet the requirements of the Project. Identify requirements now met in the existing plans.
  - (b) Provide region-wide interconnected simulation based on short-run avoidable costs, with and without the long interconnection.
  - (c) Recommend routing and ways to divide the Project into subprojects from a technical point of view, and estimate project costs for the routing options.
  - (d) Recommend the transmission technology to be used.
  - (e) Review and provide input to the demand and supply analysis drafted by the economist.
  - (f) Provide a technical risk assessment and suggest remedies.
- (ii) **Phase 2**
  - (a) Review in detail the countries' power systems and their midterm investment plans, and their ability to meet project requirements. Identify requirements now met in the existing plans using load flow analysis for each country with and without the Project.

- (b) Conduct further detailed analysis to determine whether the Project provides the least-cost solution.
- (c) Provide detailed project cost estimates, separating foreign exchange and local currency, and prepare a list of materials, equipment, and works necessary to implement the subprojects. Based on the result of the route survey, prepare a transmission line profile and tower spottings.
- (d) Prepare project implementation and procurement arrangements, including contract packaging in accordance with ADB's *Procurement Guidelines* (as amended from time to time). Prepare a project implementation schedule.
- (e) Prepare (a) engineering designs and technical specifications of transmission lines, including towers, conductors, insulators, ground wires, among others, in accordance with technical standards; (b) engineering designs and technical specifications of substations in accordance with relevant technical standards; (c) a bill of quantities for all materials required, based on the engineering design; and (d) detailed cost estimates for contract packages, specifying whether costs are in foreign exchange or local currency.
- (f) Prepare (a) detailed project implementation schedules showing anticipated progress of works and expenditures for each contract package, taking into account seasonal climatic conditions; (b) engineering drawings required to prepare bidding documents; and (c) bidding documents for the subprojects following ADB's *Procurement Guidelines* and standard bidding documents.

**B. Financial Analysis** (international, 6 person-months; national, 6 person-months)

5. The international financial analysts will have experience in power transmission projects and be familiar with ADB requirements and guidelines. The consultants' outline terms of reference will include, but will not necessarily be limited to, the following:

- (i) **Phase 1.** Preliminary cost estimates. In conjunction with the engineers' estimated cost of export to Pakistan and Afghanistan, which will include cost at generation and of transmission from the Kyrgyz Republic and Tajikistan. Explore possible qualification for carbon credits.
- (ii) **Phase 2.** In accordance with *Guidelines for the Financial Management and Analysis of Projects*<sup>1</sup> (2005), conduct a financial analysis of the Project (or subproject) and the relevant utilities or entity that will execute the Project (or subproject). This will include preparing relevant sections of the report and recommendation of the President of ADB. The consultant will do the following:
  - (a) Assess the financial impact of the Project (or subproject) to determine the financial rate of return in accordance with *Guidelines for the Financial Management of and Analysis of Projects*. Identify all risks to project revenue and costs and conduct sensitivity analysis.
  - (b) Prepare an entire project cost estimate, separating foreign exchange and local currency, including physical and price contingencies, interest during construction, commitment fee, and other financing charges.
  - (c) Prepare a financing plan for the Project (or subproject), including any proposed ADB lending, prospective cofinancing, and counterpart funds for local currency expenditures.
  - (d) Review the power tariff structure to determine whether the true cost of supply is adequately recovered and/or subsidized through a transparent mechanism. Identify the specific sources and projection of revenue from the

---

<sup>1</sup> ADB. 2005. *Guidelines for the Financial Management and Analysis of Projects*. Manila.

- Project to ensure its financial viability, taking into account reductions in technical line losses and improvements in operational efficiency.
- (e) Review the audited and unaudited financial statements of the utility to assess (1) historical financial performance, (2) retail tariff levels, (3) capital structure, and (4) whether the utility has sufficient internal funds to ensure sustainability of ongoing operations (i.e., to finance a reasonable percentage of capital expenditures and to service existing debt). Review recent audited project accounts of the utility to determine whether proper accounting and cost control are in place.
  - (f) Prepare an appendix to the report and recommendation of the President briefly summarizing past and projected financial performance, which will include 10-year pro-forma financial statements (balance sheet, income statement, statement of cash flows) for the utility, recommend financial performance measures and/or ratios for the utility, and assess compliance with such measures and/or ratios in pro-forma statements.
  - (g) Assess the utility's financial management capabilities, including a review of ADB and other lender studies of the utility, and a review of the diagnostic study of accounting and auditing<sup>2</sup> prepared for the country. From these documents and the consultant's own assessment, recommend ways to institutionally strengthen financial management and recommend a time-bound implementation plan.

**C. Economic Evaluation** (international, 6 person-months; national, 6 person-months)

8. The consultant will have an advanced degree in economics, with expertise in development economics and energy economics or closely related fields. The consultant will also have experience in the design and analysis of development projects in general, and power projects in particular. The consultant will use existing information, including reviews of estimates and forecasts.

- (i) **Phase 1.** The consultant will do the following:
  - (a) Task 1. Assess the availability and cost of power supply options in Central Asia (Tajikistan and the Kyrgyz Republic). Assess the volume of electricity that may be available for export from 2007 to 2030 (annually, seasonally). Forecast domestic electricity demand. Forecast the supply of electricity, using scenarios with existing and planned additional generating capacity (ranked by feasibility). Implement planned technical and commercial loss reduction programs. Continue planned rehabilitation of existing facilities.
  - (b) Task 2. Conduct a preliminary demand assessment of (1) incremental generation requirements in Pakistan, (2) the cost of such alternative generation, and (3) Afghanistan's ability to take additional power from the Kyrgyz Republic/Tajikistan–Pakistan link in the near and longer term.
- (ii) **Phase 2.** In accordance with ADB's *Guidelines for the Economic Analysis of Projects* (footnote 1), *Handbook for Integrating Risk Analysis in the Economic Analysis of Projects*, *Handbook for Integrating Poverty Impact Assessment in the Economic Analysis of Projects*, and *Operations Manual-G1 on Economic Analysis of Projects* (2003), the consultant will undertake, but will not be limited to, the following tasks:

<sup>2</sup> ADB. 2000. *Diagnostic Study of Accounting and Auditing: Financial Management and Governance Issues in Pakistan*. Manila.

- (a) In collaboration with the power system engineers, review data and reports relating to forecasted power demand of the importing country. Forecast 30-year load demand for the Project in terms of residential, commercial, industrial, agriculture, public services, and other sectors, using econometric or other techniques that incorporate the price of electricity.
- (b) In collaboration with the engineers, review the latest generation and long-term transmission expansion plans of the importer.
- (c) In collaboration with the power system engineers, undertake a least-cost analysis to determine the best alternative based on different load forecasts, including one based on socially efficient electricity prices.
- (d) Calculate the economic internal rate of return (EIRR) for each project section and for the Project as a whole. Undertake sensitivity analysis by identifying the most critical factors and determine their impact on the EIRR, including varying project cost and benefits, implementation period, power demand, and combinations of these factors. Calculate switching values.
- (e) Conduct a risk analysis (using the Monte Carlo method) by considering the possible values for key variables based on records, and their occurrence probability, in accordance with ADB's *Handbook for Integrating Risk Analysis in the Economic Analysis of Projects* (2002).
- (f) In collaboration with specialists, prepare a project framework in the ADB format, including monitoring indicators that will be used to assess project performance, and baseline and target values for the selected indicators.

**D. Environmental Aspects** (international, 6 person-months; national, 18 person-months)

6. The consultants' outline terms of reference will include, but will not necessarily be limited to, the following tasks:

- (i) **Phase 1.** Assess the environmental impact of the route options.
- (ii) **Phase 2.** In accordance with the guidelines and policies for environmental assessment, the consultants will undertake the following tasks, including preparing relevant sections of the report and recommendation of the President:
  - (a) Conduct an initial environmental examination for the transmission line and substations, taking into account the likely impacts associated with their location, design, and construction activities, as well as their long-term impacts during operation. Identify environmental issues from activities directly induced by the Project.
  - (b) Based on the review of rapid and comprehensive environmental impact assessment reports and the environmental management plan (EMP) prepared for the entire Project, including policy, provide the relevant government entity and utility with specific and detailed recommendations for revisions and/or additional studies, if needed, to make the environmental impact assessments (EIA) and conform to ADB's requirements based on *Operations Manual F1/BP and F1/OP* (2003), *Environment Policy* (2002) and *Environmental Assessment Guidelines* (2003), and consider lessons learned and ongoing transmission financed by ADB and other international financial institutions.
  - (c) Determine whether the proposed transmission components are within the protected areas. If they are, determine the regulatory procedures and protection measures needed to obtain environmental and forestry clearance from the relevant national and provincial government agencies. Further assess the adequacy of the EIA report and the EMP with specific reference

to riverine ecology and suggest additional measures, if the EMP is found to be inadequate.

- (d) Ensure that mitigation measures are in place, assess the adequacy of the cost estimates for the proposed EMPs, review the environmental management capability of management units of the utilities, and recommend institutional strengthening measures.
- (e) Prepare a summary EIA for the transmission and the substations in accordance with ADB's *Operations Manual F1/BP* and *F1/OP* (2003), *Environment Policy* (2002), *Environmental Assessment Guidelines* (2003), and any applicable procedures or guidelines for environmental assessment required by the Government. Ensure that components such as transmission lines and access roads specifically for the Project have environmental assessments even if they are not financed by ADB.
- (f) Recommend environmental mitigation measures for identified significant impacts, and monitoring plans to address them. Assess the environmental benefits of the proposed activities and any capacity-strengthening measures that may be needed to implement environmental management and monitoring plans.
- (g) If the initial environmental examination recommends a full EIA, conduct the EIA and prepare the report and its summary, including an EMP to implement mitigation measures.

**E. Involuntary Resettlement and Indigenous Peoples** (international, 6 person-months; national, 18 person-months)

7. In phase 1, the consultants will assess the environmental impact on the route options. In phase 2, in accordance with the guidelines and policies for environmental assessment, the consultants will undertake the following tasks, including preparing sections of the report and recommendation of the President as outlined below:

- (i) Review the national laws and policies on land acquisition and involuntary resettlement to verify their adequacy and consistency with ADB's *Involuntary Resettlement* (1995) and *Policy on Indigenous People* (1998). Recommend measures to bridge gaps, if any, and help the governments and utilities design the Project to minimize resettlement effects.
- (ii) In accordance with all relevant policies of ADB, particularly with *Involuntary Resettlement* (1995), *Operations Manual F2 on Involuntary Resettlement* (2006), and any applicable procedures or guidelines required by the Government, prepare and submit (a) a resettlement framework (compensation policy framework and procedural guidelines) for each country crossed by the transmission line, and (b) draft land acquisition and resettlement plans as needed and submit them to ADB for comments and approval, which should subsequently be incorporated in final plans agreed with the authorities.
- (iii) Identify and prepare socioeconomic profiles of the project-affected communities in the project areas in terms of household size, demographic trends, income source and level, occupation, socioeconomic conditions, social service infrastructure, and social organization, in accordance with ADB guidelines and publications and the requirements of Pakistan. Include gender and local ethnic minority profiles, assess the need for an indigenous peoples development plan and/or an indigenous peoples development framework based on ADB's *Operations Manual Section F3/OP* (2006), and conduct further surveys as necessary.



- (iv) Review the institutional capacity and resources available at the country level to supervise the implementation of indigenous peoples development plans and/or indigenous peoples development frameworks.
- (v) Based on a design detailed enough to clearly identify transmission line routes and impact corridors, tower locations, and tower base areas, undertake a full census and inventory of lost assets (homes and agricultural and other lands, or access to current income-generating activities, including impacts caused by permanent or temporary acquisition) of affected people and a baseline socioeconomic survey of the affected population. Determine the scope and magnitude of likely resettlement effects, and list likely losses of households, agricultural lands, business and income opportunities, as well as affected communal assets and public buildings. Identify and enumerate all people likely to be affected, including impacts on the poor, indigenous people, ethnic minorities, and other vulnerable groups, including women, through a survey or census and asset inventory that identifies all types of losses.
- (vi) In consultation with governments and utilities, develop an entitlement matrix, on the basis of the socioeconomic survey, and inventory of losses that will determine the amount of compensation for a set of identified losses and other assistance to ensure that any affected households will not be any worse off with the Project than without the it in accordance with ADB's *Involuntary Resettlement* (1995); *Operations Manual F2 on Involuntary Resettlement* (2006); *Handbook on Poverty and Social Analysis* (2002); *Handbook on Resettlement: A Guide to Good Practice* (1998); and *Gender Checklist: Resettlement* (2001). Particular attention shall be given to indigenous peoples, as defined in ADB's *Policy on Indigenous Peoples* (1998), and other vulnerable groups, including poor households and women.
- (vii) Since the Project is likely to involve significant resettlement, prepare a resettlement plan with full stakeholder participation, including the Government and the utility, that is appropriate for the Pakistan context and still meets ADB policy requirements. Consult with affected persons and community-based organizations to ensure that all affected persons have been fully informed of their entitlements through the consultative processes initiated by the Government and utility. Ensure that communities and displaced persons understand the project, its impacts, and the responsibilities of the parties.
- (viii) Analyze and confirm the following aspects (nationally and locally) that will apply to land acquisition and resettlement in the project area: (a) laws and regulations, including local practices; (b) budgetary processes (tentative agreement from authorities on provision of outlays for land acquisition and resettlement); and (c) administrative arrangements and requirements.
- (ix) Identify an independent monitoring and evaluation mechanism (to be incorporated into the project structure) to help the Government and utility prepare a public consultation and disclosure plan to ensure full stakeholder consultation and disclosure of the resettlement plan and any relevant information to affected persons during resettlement planning and implementation.
- (x) On the basis of the socioeconomic survey, identify impacts on tribal groups, and determine required specific action consistent with ADB's policies and procedures on indigenous peoples: (a) an indigenous peoples action plan to be incorporated into the land acquisition and resettlement plans or (b) a stand-alone indigenous peoples development plan inclusive of a specific budget and schedule.
- (xi) In formulating development interventions, indigenous peoples will be consulted and allowed to participate to ensure that development plans adequately deal with their needs, priorities, and preferences.

## **F. Reporting and Workshop Requirements**

8. The consultants will prepare an inception report (within 1 month); a phase-1 report (within 3.5 months); and interim, draft final, and final reports. Meetings involving the MCWG, ADB, and the consultants will be held after the submission of the inception, phase-1, interim, and draft final reports. Other stakeholders will be invited to attend as needed. The consultants will prepare status reports (at least monthly) for the specific scope of work, highlighting issues that could become critical for the timely completion of the project preparatory TA and that require attention from the MCWG and/or ADB. Additional milestone reports will be submitted as and when components of the terms of reference are completed. For ease of reference and timing, reports will be submitted by country or divided into country sections where appropriate. The consultants will arrange for other workshops and on-the-job training for MCWG staff as required. Detailed reports and position papers will be required for each area of the project preparatory TA. These reports will form part of the interim and draft final reports but should be distributed immediately after they are completed.