



Technical Assistance Report

Project Number: 43497
Policy and Advisory Technical Assistance (PATA)
November 2010

Islamic Republic of Afghanistan: Power Sector Master Plan (Financed by the Japan Fund for Poverty Reduction)

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 14 October 2010)

Currency Unit	–	afghani/s (AF)
AF1.00	=	\$0.0221631206
\$1.00	=	AF45.120000

ABBREVIATIONS

ADB	–	Asian Development Bank
ANDS	–	Afghan National Development Strategy
MEW	–	Ministry of Energy and Water
TA	–	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Type	–	Policy and advisory technical assistance (PATA)
Targeting classification	–	General intervention
Sector (subsectors)	–	Energy (conventional energy, large hydropower, renewable energy, electricity transmission and distribution, energy efficiency and conservation, energy sector development)
Themes (subthemes)	–	Economic growth (widening access to markets and economic opportunities), capacity development (institutional development)
Location impact	–	Rural (high), urban (high), national (high), regional (medium)
Partnership	–	Japan Fund for Poverty Reduction

NOTE

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

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I. INTRODUCTION

1. The technical assistance (TA) is intended to support the Government of Afghanistan in identifying power sector deficiencies and systematically prioritizing the sector's rehabilitation needs. Transmission will be optimized and integrated, and generation expanded, to promote interregional electricity trade, improve energy security and efficiency, and reduce greenhouse gas emissions. The TA will also increase the capacity of the Ministry of Energy and Water (MEW) to a level at which MEW can analyze the country's power sector needs without the help of a third party. During an Asian Development Bank (ADB) reconnaissance mission in March 2010, the government, through the MEW, requested financing for this TA.¹

2. The TA, to be funded by the Japan Fund for Poverty Reduction, has been reviewed by ADB support departments and sector experts, and received concept clearance from ADB in May 2010. It was endorsed by both the Government of Japan and the Embassy of Japan in Afghanistan in July 2010. This report reflects the agreements reached with MEW. The design and monitoring framework is in Appendix 1.

II. ISSUES

3. Years of war and neglect have left Afghanistan's electricity sector in poor condition. Electrification ratios and energy consumption rates are among the world's lowest. By some estimates,² less than 10% of the population have intermittent access to publicly provided power, and per capita electricity consumption is as low as 21 kilowatt-hours a year. Many load centers around the country get electricity only 2–3 hours a day. Such electricity shortage affects people in urban and rural areas alike, and constrains economic growth.

4. The government has been developing the Afghanistan National Development Strategy (ANDS)³ since 2004, with the support of the international community. The energy sector has top priority in the ANDS, which calls for investments in infrastructure in general, but particularly for energy security. Achieving energy security will require expanding and improving transmission and distribution networks, and increasing domestic generation capacity by using a mix of hydro and thermal resources.

5. The need for a master plan for the power sector was identified at the time the ANDS was first developed. The master plan was prepared in 2004 with the support of the World Bank. However, the master plan quickly became outdated, as MEW lacked the capacity to update it. MEW's power sector strategy, for instance, was based on the requirement assumed in the 2004 master plan. This requirement did not take into account the population increase between 2004 and 2007 and, therefore, significantly underestimated Kabul's needs in 2007.

6. Although power projects are an ANDS priority, the ANDS power sector investment program has not been implemented properly. Without an updated master plan, many activities under the ANDS have become ad hoc and lacking in strategic management. Many aid agencies have supported power investments without coordinating and consulting with one another. The North East Power System, a successful initiative of the ANDS, brought immediate power to

¹ The TA first appeared in the business opportunities section of ADB's website on 25 June 2010.

² ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranchise Finance Facility and Administration of Grant to the Islamic Republic of Afghanistan for the Energy Sector Development Investment Program*. Manila.

³ Islamic Republic of Afghanistan. *Afghanistan National Development Strategy*. Kabul (draft).

major load centers in the northeast, but there were incompatibility issues because seven different aid agencies were involved,⁴ In many instances, the same type of equipment had different specifications, complicating future maintenance. Coordination would have brought some sort of standardization within the system.

7. MEW requested ADB to develop the power sector master plan, and requisite capacity within the Ministry to administer and update this master plan. This was thoroughly discussed with the other development partners during both the bilateral meetings as well as in the Inter Ministerial Commission for Energy, a forum of Afghan energy stakeholders comprising the government and key development partners in the sector. Other partners in the energy sector include United States Agency for International Development, Kreditanstalt für Wiederaufbau, and the World Bank. ADB, with its \$570 million multitranche financing facility approved in 2008⁵ and other ongoing projects to MEW, is the largest international agency supporting the energy sector. The government and international community agreed that ADB, as lead agency within the energy sector, would undertake the development of the power sector master plan.

8. Strategic prioritization of projects is needed, as priorities are difficult to determine and often vary among different officials. The government needs to prepare an updated master plan to prioritize power sector projects, and set reasonable goals and time frames. MEW should also be able to implement the master plan, and continuously update it.

9. Afghanistan will have to deal with the complexities of regional trade in its master plan. Within the region, Afghanistan imports power through the North East Power System to supply major load centers in the country's northeast. Once the new Tajikistan–Afghanistan transmission line is complete by mid-2011, Afghanistan can start to receive power from Tajikistan. New options for power imports from Turkmenistan, and the possibility of exporting to neighboring countries, such as Tajikistan and Pakistan, are being considered as well.

10. The Central Asian republics are also considering the advantages of intraregional and interregional trade in electricity. The Central Asian Regional Economic Cooperation action plan reflects the wish of the four Central Asian republics and Afghanistan to study the benefits of a regional approach to managing the central asian power system.

11. A regional master planning TA project⁶ is now being implemented by ADB in Central Asia⁷ and Afghanistan will identify deficiencies in the national power sectors, and optimize and integrate transmission and expand generation to resolve the deficiencies and promote electricity trade within the region and with other regions. The output of the Afghanistan master plan TA will be an input to the regional master plan study. The consultants for the regional study will also coordinate with, and provide input to, the proposed TA.

12. Lessons from previous assistance to the government in master planning point to the importance of building the capacity of MEW's planning cell to keep the new master plan relevant without external help. Updating is particularly needed in an environment like Afghanistan's where there is rapid growth in major load centers like the capital, Kabul. A capacity development

⁴ Afghan Reconstruction Trust Fund, ADB, Government of India, Islamic Development Bank, German development cooperation through KfW, United States Agency for International Development, and World Bank.

⁵ ADB. 2008. *Report and Recommendation of the President to the Board of Directors for a Proposed Multitranche Financing Facility and Administration of Grant Energy Sector Development Investment Program*. Manila

⁶ ADB. 2010. *Technical Assistance for Central Asia Regional Economic Cooperation: Power Sector Regional Master Plan*. Manila.

⁷ Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan.

component was thus included in the TA. To mitigate the risk that the commitment to update the plan may not be sustained given the relatively limited skills in areas related to this TA, a significant number of counterpart staff from MEW's planning cell will support the consultants in data collection and analysis throughout the TA, and thereby gain experience in drafting the master plan.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

13. The impact will be increased energy security in Afghanistan. The specific performance targets, to be developed by the TA project team and the government, will include increases in indigenous generation, and electricity trade within the region.

14. The outcome will be MEW's improved ability to analyze and program investments in the power sector. The identified investment projects, justified on economic, financial, safeguard, and technical grounds, will offer long-term solutions to the problem of balancing electricity demand and supply in the country. The TA will also find nonphysical opportunities for reform within the power sector (possibly with private sector participation), capacity development, and international aid agency coordination.

15. The TA outputs will be twofold: (i) a master plan identifying load centers and forecasting the long-term growth in demand, a generation strategy considering both indigenous and foreign power supply sources, and a transmission network development plan for interconnecting generation facilities and load centers; and (ii) trained MEW staff who can continually update the master plan and keep it relevant.

B. Methodology and Key Activities

16. The TA will be implemented over 12 months, during which time (i) the master plan developed in 2004 will be updated to suit the present environment, and (ii) MEW staff will be trained to update the master plan from time to time. Staff from MEW's planning cell will gain on-the-job experience by supporting the consulting team during the TA.

17. The TA consultants, together with MEW staff, will review the related reports produced over the past decade, and assess the studies and investment projects that are planned or being carried out. Wherever possible, the consultants will visit potential generation facility sites and future load centers to obtain data and meet with local utilities and government bodies. The consultants will also assess the planning software and hardware to be procured. The planning software will be used with the data for master plan preparation, with appropriate training provided.

18. Interim and draft final reports will be presented to MEW management. The consultants will also work with international aid agencies whose studies and projects in Afghanistan and the region present opportunities for synergy with the TA. The key activities will be as follows:

- (i) Identify present demand and projected demand growth over the next 20 years in the major load centers.
- (ii) Assess the condition of generation and transmission assets.
- (iii) Review planned construction and rehabilitation projects.

- (iv) Obtain the input on import and export potential from the consultants for the Central Asia Regional Economic Cooperation regional master plan, while providing them with data on the Afghanistan power system.
- (v) Identify power supply alternatives, including renewable energy options and the efficient use of power (through load management and other demand-side management measures). Investigate alternative generation scenarios with the objective of reducing greenhouse gas emissions. Define the priorities for energy efficiency and renewable energy use.
- (vi) Identify opportunities for reform within the power sector (possibly with private sector participation) for capacity development, and international aid agency coordination.
- (vii) Update the master plan completed in 2004 to match present issues in the power sector.
- (viii) Develop the future transmission network in steps, taking into consideration the interconnection of future load centers and potential generation facilities.
- (ix) Develop the capacity of MEW's planning cell to update the master plan.

C. Cost and Financing

19. The cost of the TA is estimated at \$1.5 million equivalent. The entire cost will be financed on a grant basis by the Japan Fund for Poverty Reduction and administered by ADB. The cost estimates and financing plan are in Appendix 2.

20. MEW will provide office space and counterpart staff, and appropriate data and reports. The consultants will work with Da Afghanistan Breshna Sherkat (Afghanistan Electric Company), which will also provide counterpart staff, if needed, and appropriate data and reports.

D. Implementation Arrangements

21. ADB will be the executing agency for the TA. The TA will be administered and monitored from ADB's headquarters and Afghanistan Resident Mission. Both MEW and the Afghanistan Electric Company will be consulted closely in developing the master plan.

22. Disbursements will conform to ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time). Major equipment and software will be purchased according to ADB's Procurement Guidelines (2010, as amended from time to time).

23. ADB will hire a firm of consultants or a consortium according to its Guidelines on the Use of Consultants (2010, as amended from time to time) using quality- and cost-based selection. A full technical proposal will be required, and an 80:20 ratio will be used in assessing the technical and financial aspects. The TA will require the services of 7 international consultants for 31 person-months, and 7 national consultants for 41 person-months, in the areas of system planning, power generation, power transmission, environment, social analysis, energy efficiency, and energy economics and financial analysis. The terms of reference are in Appendix 3. The consultants are expected to be mobilized by January 2011 and complete their assessment after 12 months. The TA is expected to be completed by the end of December 2011.

24. The consultants will design a project performance monitoring system and submit quarterly progress reports measuring performance against qualitative and quantitative indicators in the project performance monitoring system. Inception, interim and final reports will be

presented to both MEW and ADB to ensure compliance with the terms of reference and the needs of the country. ADB's TA completion report procedures will be used in TA evaluation.

IV. THE PRESIDENT'S DECISION

25. The President, acting under the authority delegated by the Board, has approved ADB administering technical assistance not exceeding the equivalent of \$1,500,000 to the Government of Afghanistan to be financed on a grant basis by the Japan Fund for Poverty Reduction for the Power Sector Master Plan, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>Impact Increased energy security in Afghanistan</p>	<p>Increase in indigenous generation from about 500 MW in 2009 to 1,000 MW in 2014</p> <p>Increase in regional electricity trade from 300 GWh in 2009 to 1,000 GWh in 2013</p>	<p>DABS and MEW energy and national statistics</p>	<p>Assumptions Implementation of the master plan by the government</p> <p>Availability of funding by the government and donor agencies</p> <p>Agreement among Afghanistan and neighboring countries on future energy trade</p> <p>Availability of electricity in neighboring countries for Afghanistan</p>
<p>Outcome Improved MEW ability to analyze and program investments in the power sector</p>	<p>Investment programming in accordance with the master plan</p>	<p>Monthly reports of interministerial commission on energy</p>	<p>Assumptions Continual updating of the master plan according to consultants' recommendations</p> <p>Prompt decision making from MEW and stakeholders</p> <p>MEW's ability to acquire and retain the requisite skills</p>
<p>Output A master plan with the following features: 1. Major load centers identified, including growth forecast over the next 20 years 2. Generation strategy considering both indigenous and foreign sources of power supply 3. Transmission network development plan for interconnecting generation facilities and load centers</p> <p>MEW staff trained to update the master plan from time to time and keep it relevant</p>	<p>Electricity sector data analysis and investment designs agreed on by MEW and ADB</p> <p>At least 5 staff completed the training course by December 2011</p>	<p>Consultants' reports</p>	<p>Assumptions Availability of necessary data to conduct the study</p> <p>Open stakeholder consultation</p> <p>Risk Security threats preventing on-site investigations</p>

Activities with Milestones	Input
<ol style="list-style-type: none"> 1. ADB recruits and mobilizes consultants for the field assignments by the fourth quarter of 2010 2. Consultants start field work, gather and analyze data, consult with stakeholders, and submit inception report by March 2011 and interim report by July 2011 3. ADB and consultants conduct workshops and consultations and present findings by October 2011 4. MEW staff undergo training in the planning software by October 2011 5. Consultants finalize the draft final report by November 2011 and the final report by December 2011 	Japan Fund for Poverty Reduction \$1.5 million

ADB = Asian Development Bank, DABS = Da Afghanistan Breshna Sherkat (Afghanistan Electric Company), GWh = gigawatt hour, MW = megawatt, MEW = Ministry of Energy and Water.

Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Total Cost
Japan Fund for Poverty Reduction Financing^a	
1. Consultants	
a. Remuneration and per diem ^b	
i. International consultants	795.0
ii. National consultants	164.0
b. International and local travel	68.0
c. Reports, translation, and communications	30.0
2. Master planning software training ^c	5.0
3. Workshops, seminars, and conferences	20.0
4. Surveys	5.0
5. Miscellaneous administration support costs	10.0
6. Miscellaneous support costs ^d	300.0
7. Contingencies	103.0
Total	1,500.0

^a Administered by the Asian Development Bank.

^b Assumes 31 person-months of international consulting services at an average of \$25,600 per month, and 41 person-months of national consulting services at \$4,000 per month.

^c Includes power system simulator for engineering software training to be used in future system analysis by the planning cell staff. The software was already provided in a previous project.

^d Includes costs relating to support for the technical assistance consultants (strengthening of security through the hiring of armored vehicles, and use of global positioning system technology and other necessary project-specific technologies).

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Background

1. The Government of Afghanistan lacks an updated power sector master plan that establishes priorities, time frames, and costs associated with power sector goals. The government's strategic priorities are difficult to identify, and often vary among the different Afghan officials that international aid agencies work with. Afghanistan needs an updated power sector master plan to prioritize projects, and establish reasonable goals and time frames.

2. The Asian Development Bank (ADB) will recruit an international consulting firm or consortium of firms in line with its Guidelines on the Use of Consultants (2010, as amended from time to time) for a proposed technical assistance (TA) project involving master plan development. The government, through the Ministry of Energy and Water (MEW), has requested ADB to support the preparation of the master plan identifying projects that will increase energy security, efficiency, transmission, and generation expansion within Afghanistan.

3. The TA will finance the master plan study to (i) forecast demand, and assess the conditions of plants; (ii) assess alternatives for meeting the forecast demand, including new domestic generation and transmission plants, and import and export projects; (iii) address policy measures that will promote security and efficiency; and (iv) analyze the technical requirements for the interconnection of the Afghan system with the Central Asian power system. The TA also includes a training component where the consultants will train MEW staff to update the master plan after the TA.

4. ADB will be the executing agency, and MEW the implementing agency. They will work in close consultation with Da Afghanistan Breshna Sherkat (Afghanistan Electric Company). The expected outputs of the TA are as follows:

- (i) identification of future load centers and forecasts of demand of electricity for the next 20 years;
- (ii) a strategy for meeting such increasing demand though both imports and domestic generation, including an analysis of domestic fuel sources and consideration of the balance between energy security and regional cooperation;
- (iii) a transmission grid development plan for interconnecting generation facilities with expected load centers to meet the forecast demand; and
- (iv) a capacity development component under which MEW staff will be trained to continually update the master plan after the study.

B. Scope of Services

5. To meet the TA objectives, the consultants' scope of work will cover the following:

- (i) Identify present demand and projected demand growth over the next 20 years in the major load centers.
- (ii) Assess the condition of generation and transmission assets.
- (iii) Review planned construction and rehabilitation projects.

- (iv) Obtain the input on import and export potential from the consultants for the Central Asia Regional Economic Cooperation regional master plan,¹ while providing them with data on the Afghanistan power system.
- (v) Identify power supply alternatives, including renewable energy options and the efficient use of power (through load management and other demand-side management measures). Investigate alternative generation scenarios with the objective of reducing greenhouse gas emissions. Define the priorities for energy efficiency and renewable energy use.
- (vi) Identify opportunities for reform within the power sector (possibly with private sector participation) for capacity development, and international aid agency coordination.
- (vii) Update the master plan completed in 2004 to match present issues in the power sector.
- (viii) Develop the future transmission network in steps, taking into consideration the interconnection of future load centers and potential generation facilities.
- (ix) Develop the capacity of MEW's planning cell to update the master plan.

C. Deliverables

6. The consultants' key deliverables are as follows:

- (i) data and information for the master plan study, including power generation and sales and power purchase details, transmission and distribution network data, and load dispatching information;
- (ii) information on committed and planned future projects, including generation projects, power purchase agreements, and extension of transmission facilities;
- (iii) detailed long-term demand forecast for Afghanistan at the grid substation level for the next 20 years, assessing existing electricity demand and forecasting demand using bottom-up (location-specific) and top-down (macroeconomic) parameters, and covering sales energy and peak demand forecasts for the entire Afghanistan and for each province as well as peak demand in existing and planned substations;
- (iv) assessment of potential energy sources for generation development in Afghanistan, and comparison of the likely development costs of in-state generation versus the expected costs of interstate purchase of electricity, including the transmission development costs over the long term;
- (v) technically feasible, cost-optimized, long-term generation capacity expansion scenarios for the next 20 years considering prospects for in-state generation development and for generation from sources outside Afghanistan through interconnections with Iran, Tajikistan, Turkmenistan, and Uzbekistan;
- (vi) modelling of provincial transmission networks using power systems simulator for engineering software (PSS/E), and load flow, short circuit, transient stability, and reliability analyses to identify bottlenecks and remedial measures;

¹ A separate study for the Central Asian regional power sector master plan will be conducted in 2011 under the regional TA for the Central Asia Regional Economic Cooperation: Power Sector Regional Master Plan (TA 7558-REG). The consultants under TA 7558-REG will (i) address export opportunities for Afghanistan, Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan; (ii) study the integrated development of the regional power system; and (iii) identify long-term solutions to balance demand and supply, taking into account the current power network, demand projections, potential fuels for domestic generation, and trade opportunities. The output of the Afghanistan master plan study will be an input to the regional master plan study.

- (vii) transmission network planning criteria for planning the future Afghanistan transmission network, complying with standards to be fulfilled before interconnection with the Central Asian network;
- (viii) study of the required expansion in each islanded transmission network to cope with future demand for electricity and grid interconnection of power plants identified in the generation development plan, including the economic justification for interconnection of transmission islands into a national grid at the right stage;
- (ix) least-cost transmission expansion plans matched to the demand forecast and generation expansion scenarios ensuring an efficient and reliable power system for all possible operating scenarios;
- (x) economic assessments for all plans to justify voltage and conductors selected for the transmission system, optimum transformer size for grid substations, and planned reactive power sources to minimize transmission loss;
- (xi) cost database for evaluating the costs associated with each development proposal, including the method of updating costs as prices go up;
- (xii) assessment of the annual financial requirement and net present values of generation and transmission investments associated with each system identified in the master planning process;
- (xiii) detailed 20-year program of capital works, and detailed project reports for projects to be covered in the first 10 years;
- (xiv) on-the-job and classroom-based training for planning cell engineers in modern power system planning techniques and tools, as a capacity-building measure;
- (xv) regular workshops to update stakeholders on the progress of master plan preparation, and to discuss assumptions and scenarios;
- (xvi) transmission network modelling using power systems simulator for engineering software (PSS/E) at the planning cell;
- (xvii) load forecasting, generation planning study, and transmission development study to cover each year of the planning horizon of 20 years;
- (xviii) impact and benefit analysis, especially to establish a priority list of projects to guide the investment program for the energy sector;
- (xix) training to enable MEW staff to periodically update the master plan; and
- (xx) scenario analysis, given the high degree of political and security uncertainty in Afghanistan, and preparation of the master plan with different levels of power trading, providing the economic implications of each scenario.

D. Qualifications and Individual Terms of Reference

7. The firm or consortium of firms will have conducted at least one regional master planning study for the power sector in the last 5 years, and can demonstrate expertise in the latest generation and transmission planning techniques. Work experience in Afghanistan is desirable.

8. A team of seven international consultants providing 31 person-months of service and seven national consultants providing 41 person-months of service is envisaged. The estimated input is in Table A3.1. The qualifications and terms of reference of the international consultants are in Table A3.2.

Table A3.1: Consulting Input

Consultant	Number of Person-Months	
	International	National
Team leader and system planning expert	9	12
Power generation engineer	9	12
Power transmission engineer	9	12
Environment specialist	1	2
Social specialist	1	1
Energy efficiency specialist	1	1
Energy economist and financial analyst	1	1
Total	31	41

Source: Asian Development Bank estimates.

Table A3.2: Qualifications and Terms of Reference of the International Consultants

Consultant	Qualifications	Individual Terms of Reference
Team leader and power system planning expert	PD in engineering, 20 years PE, 10 of which in power system planning, and 5 years as project manager	Develop a comprehensive project work program and implementation schedule. Coordinate and lead activities of the consulting team. Ensure reports meet quality and milestone targets. Lead activities pertaining to demand forecasting, adequacy of MEW planning tools, optimized regional planning, and integration of Afghanistan into CAPS. Coordinate on-the-job training for the MEW staff supporting this assignment.
Energy economist and financial analyst	PD in economics or finance; 15 years PE, 10 of which in energy economics	Conduct economic assessment of (i) country generation and transmission plans, and (ii) optimized regional plan. Calculate economic returns using ADB procedures. Lead assessment of adequacy of trade arrangements. Assess the financial viability of country generation and transmission plans. Review adequacy of tariffs to finance investment plans. Calculate project financial returns using ADB procedures. Assist other team members as required.
Power generation engineer	PD in engineering; 15 years PE, 10 of which in power generation and 5 years in generation planning	Assess generation assets and generation plans. Assist other team members as required.
Power transmission engineer	PD in engineering; 15 years PE, 10 of which in power transmission and 5 years in transmission planning	Assess transmission assets and transmission plans. Assist other team members as required.
Energy efficiency specialist	PD in engineering; 15 years PE, 10 of which in the power sector and 5 years in energy efficiency.	Assess energy efficiency and demand-side management options at the country level, and identify benefits to be obtained at the country and regional levels. Identify costs and benefits. Propose necessary policy measures to realize benefits. Assist other team members as required.

Consultant	Qualifications	Individual Terms of Reference
Social specialist	PD in social science or related field; 15 years PE, 10 of which in social development activities associated with major infrastructure projects	Identify social costs and benefits from implementing current investment plans at the country level. Identify gains and losses from implementing the regional plan. Assist other team members as required.
Environment specialist	PD in environmental engineering/science; 15 years PE, 10 of which in environmental studies of infrastructure projects and ensuring their delivery	Identify environmental costs and benefits from implementing current investment plans at country levels. Identify gains and losses from implementing the regional plan. Assess potential reductions in GHGs. Assist other team members as required.

ADB = Asian Development Bank, CAPS = Central Asian power system, GHG = greenhouse gas. MEW = Ministry of Energy and Water, PD = primary degree, PE = professional experience
Source: Asian Development Bank.

9. The national consultants will have academic or professional qualifications at least equal to those of the international consultants, and at least 5 years' experience relevant to their expertise. They will help the international consultants in fulfilling their individual terms of reference. They will help the international consultants (i) collect data and information from national and local sources; (ii) review documentation, studies, and reports; (iii) organize consultations with stakeholders; and (iv) carry out field surveys. One national consultant will be appointed as deputy team leader.

E. Implementation Arrangements

10. MEW will provide office space and counterpart staff, and appropriate data and reports. The consultants will also work with Da Afghanistan Breshna Sherkat (Afghanistan Electric Company) which will provide counterpart staff, if needed, and appropriate data and reports.

11. The consulting team will procure software, and equipment, if any, to be financed under the TA according to ADB's Procurement Guidelines (2010, as amended from time to time). All software equipment will be turned over to MEW at the end of the TA. Disbursements under the TA will conform to ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).