



Technical Assistance Subproject Report

Project Number: 52112-003
Knowledge and Support Technical Assistance (KSTA)
February 2019

Regional Cooperation on Increasing Cross-Border Energy Trading within the Central Asian Power System Subproject 2: Provision of Solutions to Bottlenecks to the Regional Power Trade

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Asian Development Bank

ABBREVIATIONS

ADB	–	Asian Development Bank
CAPS	–	Central Asian power system
CAREC	–	Central Asia Regional Economic Cooperation
CDC	–	coordinating dispatch center
EDM	–	energy data management
HLT	–	high-level technology
kV	–	kilovolt
kWh	–	kilowatt-hour
TA	–	technical assistance

NOTE

In this report, "\$" refers to United States dollars.

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KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data		Project Number: 52112-003
Project Name	Regional Cooperation on Increasing Cross-Border Energy Trading within the Central Asian Power System - Provision of Solutions to Bottlenecks to the Regional Power Trade (Subproject 2)	Department/Division CWRD/CWEN
Nature of Activity Modality	Policy Advice Subproject	Executing Agency Asian Development Bank
Country	KAZ, KGZ, TAJ, UZB	
2. Sector	Subsector(s)	ADB Financing (\$ million)
✓ Energy	Electricity transmission and distribution Energy sector development and institutional reform	1.00 0.50
		Total 1.50
3. Strategic Agenda	Subcomponents	Climate Change Information
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Climate Change impact on the Project High
4. Drivers of Change	Components	Gender Equity and Mainstreaming
Governance and capacity development (GCD)	Institutional development	No gender elements (NGE) ✓
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas Knowledge sharing activities	
Partnerships (PAR)	Implementation Regional organizations South-South partner	
5. Poverty and SDG Targeting		Location Impact
Geographic Targeting	No	Regional High
Household Targeting	No	
SDG Targeting	Yes	
SDG Goals	SDG7, SDG13	
6. Risk Categorization	Low	
7. Safeguard Categorization	Safeguard Policy Statement does not apply	
8. Financing		
Modality and Sources		Amount (\$ million)
ADB		1.50
Knowledge and Support technical assistance: Regional Cooperation and Integration Fund		0.50
Knowledge and Support technical assistance: Technical Assistance Special Fund		1.00
Cofinancing		0.00
None		0.00
Counterpart		0.00
None		0.00
Total		1.50
Currency of ADB Financing: USD		

I. THE TECHNICAL ASSISTANCE SUBPROJECT

A. Overall Progress of the Technical Assistance Cluster

1. The cluster knowledge sharing technical assistance was approved on 29 November 2018. This is the second subproject which is being launched simultaneously with the first subproject “Modernization of Coordinating Dispatch Center (CDC) “Energiya” which was approved on 28 January 2019.

B. Subproject Outcome

2. The technical assistance (TA) subproject will have the following outcome: regional energy trade and cooperation enhanced. The identified regional investment projects, which will address the technical bottlenecks to the regional power trade, will be endorsed by the participating governments at the CAREC Ministerial Conference in 2021.

3. Implementation of these investment projects will contribute toward cross-border clean energy trade. Specifically, the subproject 2 outcome will contribute to the cluster TA outcome indicators (a) at least 11,000 million kilowatt-hours trade within CAPS annually (2017 baseline: 3,109 million kilowatt-hours) and (b) at least additional 5,587,560 tCO₂ reduction in emission achieved (2017 baseline: 0).

C. Subproject Outputs, Methods, and Activities

4. Subproject 2 output will directly contribute to the cluster TA output 2, “solutions to the bottlenecks to the regional power trade provided”, which will facilitate increase in the clean energy trade within the Central Asian power system (CAPS).

5. **Output 1: Solutions to the bottlenecks to the regional power trade provided.** This output will be delivered through an examination of the national grids of all CAPS countries to identify and propose technical solutions to the bottlenecks within each one that constrain electricity flow. The Central Asian Electricity Grid Coordination Board will endorse the final findings for implementation by Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan as well as Afghanistan and Turkmenistan.

6. **Methods and Activities.** A consultant firm will be recruited to assess the electricity grids of Kazakhstan, Kyrgyz Republic, and Uzbekistan as well as Afghanistan and Turkmenistan in order to determine the technical bottlenecks to energy trade and recommend technical solutions¹. The consultant will closely coordinate with the assessment work of the Tajikistan’s electricity grid, which is done under a separate project². The solutions to the bottlenecks are expected to be derived after the consultant completes the updating of the Regional Power Sector Master Plan, which was first completed under a regional cooperation technical assistance³ financed by ADB. The master plan needs to be updated to take into account recently completed infrastructure projects and the latest geopolitical situation.

¹ The assessment of the Tajikistan’s entire grid is proposed to be carried out by the Government of Tajikistan using ADB financing, per a request on 28 February 2018.

² ADB. 2018. *Report and Recommendation of the President to the Board of Directors: Proposed Grant, Republic of Tajikistan: Reconnection to the Central Asian Power System Project*. Manila. <https://www.adb.org/sites/default/files/project-documents/52122/52122-001-rrp-en.pdf>

³ ADB. 2010. *Technical Assistance Report: Central Asia Regional Economic Cooperation: Power Sector Regional Master Plan*. Manila. <https://www.adb.org/sites/default/files/project-document/63522/43549-01-reg-tar.pdf>

7. The original master plan study was endorsed by the by the ministers at the CAREC Ministerial Conference in October 2009. The regional power sector master plan was completed in 2012. The updating of the master plan was endorsed by the CAREC Energy Sector Coordinating Committee (ESCC) in March 2018.

8. The updating of the regional power sector master plan will be closely coordinated with the recently completed and ongoing preparations of the national master plans of CAPS countries.

9. The proposed solutions will need to be developed in close coordination with each of the national grids, national generation companies and holdings, and CDC Energiya. They may require the endorsement of the Central Asia United Power System Council (CAUPSC) for implementation by each country. The proposed solution will focus primarily on transmission assets (220kV and 500kV power lines and substations) whether new or upgrading. The priority shall be given to the solutions which maximize the trade of the renewable and clean energies with resulting reduction of greenhouse emissions.

D. Subproject Cost and Financing

10. The TA subproject is estimated to cost \$1.5 million, of which (i) \$1,000,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-6) and (ii) \$500,000 will be financed on a grant basis by the Regional Cooperation and Integration Fund⁴. The key expenditure items are listed in Appendix 2.

11. The grant funds from RCIF will be utilized first then TASF-6.

12. The government will provide counterpart support in the form of staff, office space and supplies, secretarial assistance, domestic transportation, and other in-kind contributions.

E. Subproject Implementation Arrangements

13. ADB will administer the TA subproject. The Energy Division of ADB's Central and West Asia Department will be the executing agency (EA) in close coordination with ADB resident missions. An energy sector coordinating committee (ESCC) subcommittee will be created to oversee the project. The subcommittee and ADB will direct, assist, and supervise the TA consultants. The subcommittee and ADB will meet with the consultants as required during project implementation but not fewer than 3 times to review inception, interim, and final reports. In each country, the consultants will work primarily with utilities and government bodies responsible for planning.

14. The TA will be administered and monitored by ADB as part of the ongoing CAREC program. The consultants will design a project performance monitoring system and submit quarterly progress reports measuring performance against the project performance monitoring system. Interim and final reports will be presented at ESCC meetings to ensure compliance with the terms of reference and the needs of participating countries.

15. The subcommittee will work closely with the Central Asia United Power System Council (CAUPSC). High level meetings will be organized periodically during the implementation of the subproject to update and seek guidance from ESCC and CAUPSC.

⁴ Established by ADB. Financing partner: the Government of Japan.

16. The implementation arrangements are summarized in the table.

Subproject Implementation Arrangements

Aspects	Arrangements		
Indicative implementation period	February 2019–March 2021		
Executing agency	ADB (Focal point: Energy Division, Central and West Asia Department)		
Implementing agencies	CDC Energiya, national utilities, and national dispatch centers.		
Consultants	To be selected and engaged by ADB		
	Firm: Optimization of Central Asia power system	QCBS (90:10)	\$1,000,000.00*
	Individual: individual selection	National TA Coordinator (24 person-months)	\$48,000.00
	Individual: individual selection	International Power Systems Expert (7 person-months)	\$120,000.00
	Resource Persons	Capacity Building (3 person-months)	\$30,000.00
Disbursement	The TA resources will be disbursed following ADB's <i>Technical Assistance Disbursement Handbook</i> (2010, as amended from time to time).		
Asset turnover or disposal arrangement upon TA completion	The hardware, if any, and software for power system planning will be turned over at TA completion to the EA and IAs		

* includes procurement of planning softwares and associated hardware, if any, for CDC and NDCs as the need assessment may show. It will be financed from the consultant's provisional sum (noncompetitive item) and procured in accordance with ADB Procurement Policy and the Procurement Regulations for ADB Borrowers (2017, as amended from time to time)

ADB = Asian Development Bank, CDC = Coordinating Dispatch Center, EA = executing agency, IAs = implementing agencies, QCBS = quality- and cost-based selection, TA = technical assistance.

Source: Asian Development Bank

17. **Consulting services.** The firm will be recruited using the quality- and cost-based selection with a 90:10 quality-to-cost ratio. The firm will be recruited under a phased contract where the terms of reference portion concerning subproject 3 will be optional (non-committal) and activated through subsequent call-off subject to confirmation of need and budget. The international and national consultants will be recruited individually with optional (non-committal) package for subproject 3 to provide technical expertise and logistical support to ADB and the implementing agencies, to be activated when requirement materializes. The consultants will be engaged in accordance with the ADB Procurement Policy (2017, as amended from time to time) and the associated project administration instructions and/or staff instructions.

18. For both firms and individuals, the initial selection will be competitive and include optional subproject 3 tasks to be given directly to the incumbents.

19. Procurement by the consultant will follow the ADB Procurement Policy (2017, as amended from time to time).

20. **Cofinancier requirements.** TA subproject implementation will follow the additional monitoring and reporting requirements specific to the Regional Cooperation and Integration Fund.

SUBPROJECT DESIGN AND MONITORING FRAMEWORK

Impact{s} the TA is Aligned with: CAREC 2030 Program Results Framework¹			
Countries' emissions reductions target achieved, ^a Regional cooperation framework accomplished, ^b Energy security in selected CAREC countries enhanced			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Regional energy trade and cooperation enhanced	By 2021 Participating governments endorsed the identified regional investment projects at the CAREC Ministerial Conference in 2021 (2017 baseline: 0)	ESCC meeting and CAREC Ministerial Conference Proceedings	Change in the geopolitical climate in the region Individual countries may view energy security risk as overriding regional benefits
Output Solutions to the bottlenecks to regional power trade provided	By 2021 a. Regional Power Sector Master Plan updated (2017 baseline: 0) b. At least three technical solutions to electricity grids provided to member countries for implementation including: i. transmission line systems ii. substations systems iii. protection systems iv. others, if needed (2017 baseline: 0)	a, b. Annual CAREC Energy Progress Report	Unavailability of information on the electricity grids
Key Activities with Milestones			
1. Solutions to the bottlenecks to regional power trade provided			
1.1 Issuance of RFP and award of contract to the selected firm (Q2 2019)			
1.2 Engage individual consultants (Q2 2019)			
1.3 Update Regional Power Sector Master Plan (Q4 2019)			
1.4 Identify and propose solutions for endorsement by the Central Asia United Power System Council (Q1 2021)			
1.5 Organize high- and working-level meetings (Q1 2019–Q1 2021)			
Inputs			
Asian Development Bank:			
Technical Assistance Special Fund (TASF-6): \$1,000,000			
Regional Cooperation and Integration Fund: \$500,000			
Note: The government will provide counterpart support in the form of staff, office space and supplies, secretarial assistance, domestic transportation, and other in-kind contributions.			
Assumptions for Partner Financing			
Not Applicable			

CAREC = Central Asia Regional Economic Cooperation, ESCC = Energy Sector Coordinating Committee, Q = quarter, RFP = request for proposal, TA = technical assistance.

¹ ADB. 2017. *CAREC 2030: Connecting the Region for Shared and Sustainable Development*. Manila. <https://www.adb.org/documents/carec-2030-connecting-region-sustainable-development>

- ^a United Nations Framework Convention on Climate Change. 2016. Paris Agreement–Status of Ratification. Paris.
- ^b CAREC. 2015. *Strategy and Work Plan (2016–2020) for Regional Cooperation in the Energy Sector of CAREC Countries*. Ulaanbaatar. <https://www.carecprogram.org/uploads/2015-SOM-September-Strategy-Work-Plan.pdf>
Source: Asian Development Bank.

SUBPROJECT COST ESTIMATES AND FINANCING PLAN
(\$'000)

Item	Amount
A. Asian Development Bank^a	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	780.0
ii. National consultants	300.0
b. Out-of-pocket expenditures	
i. International and local travel	127.5
ii. Training, seminars and conferences	37.5
2. Goods (hardware and software) ^b	75.0
3. Training, seminars, workshops, forum, and conferences	
a. Facilitators	10.0
b. Travel cost of ADB staff acting as a resource person	35.0
c. Venue rental and related facilities	20.0
d. Participants ^c	40.0
4. Contingencies	75.0
Total	1,500.0

ADB = Asian Development Bank; CDC = coordinating dispatch center Energiya

Note: The technical assistance (TA) is estimated to cost \$1,500,000, of which (i) \$1,000,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-6); (ii) \$500,000 will be financed on a grant basis by the Regional Cooperation and Integration Fund. The government will provide counterpart support in the form of counterpart staff, office and office supplies, secretarial assistance, domestic transportation, and other in-kind contributions.

^a Financed by the Regional Cooperation and Integration Fund under the Regional Cooperation and Integration Financing Partnership Facility (established by the Asian Development Bank [ADB]) for \$500,000 and ADB's Technical Assistance Special Fund (TASF 6) for \$1,000,000. RCIF will be front loaded.

^b The hardware and software to be purchased, if any, will be computers and specialized software to be used for power system planning. Users or such tools will be government ministries or government owned, utilities or multi-government owned CDC depending on planning responsibilities and needs in each country. Such hardware and software will be handed over to government ministries or government owned entities responsible for planning on completion of the project

^c to cover expenses of working group members attending project meetings

Source: Asian Development Bank estimates.

TERMS OF REFERENCE FOR CONSULTANTS

I. FIRM

A. BACKGROUND

1. Power trade between the Central Asian countries has been declining since the collapse of the Union of Soviet Socialist Republic (USSR) in 1991. In 1990, 25,413 million kilowatt-hour (kWh) was traded between Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan. In 2010, the energy trade decreased to 2,256 million kWh following disconnection of Tajikistan from CAPS in 2009 and bottomed out in 2016 at 2,080 million kWh. Lack of energy trade caused widespread power outages in Tajikistan in winters and increased fossil fuel use by Turkmenistan, Uzbekistan, and Kazakhstan in summers. While the hydropower export from the Kyrgyz Republic continued, absence of Tajikistan hydropower in summer forced fossil fuel rich countries to generate electricity using gas and oil, instead of exporting them on the international market. Meanwhile, Tajikistan had to embark on substantial investments in generating capacities to produce electricity in winter, while being unable to export hydropower in summer. Tajikistan spills around five to seven billion kWh worth of water annually. The lack of electricity trading opportunities within CAPS also necessitated the Kyrgyz Republic to search for additional trading partners such as the People Republic of China and Pakistan.

2. During the Soviet Union time, the Central Asian energy flow between south of Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan electricity grids was regulated by United Dispatch Administration of Central Asia (based in Tashkent, Uzbekistan) subordinated to the central dispatch and planning institution (Central Dispatch Administration) in Moscow, USSR. Following the collapse of USSR, the function of overseeing the energy flows between the electricity grids was transferred to the newly established non-government organization Coordinating Dispatching Center (CDC) Energiya in 1993. The governance was assigned to Central Asia United Power System Council comprising the heads of the national power systems and responsible for administration and coordination of parallel operations of the CAPS. In 2004, an intergovernmental agreement related to coordination of relations in the sphere of electricity grids of Central Asia was concluded by Uzbekistan, the Kyrgyz Republic, Tajikistan, and Kazakhstan with the CDC given a status of international organization working under the guidance of the Central Asia United Power System Council. Turkmenistan withdrew from CAPS in 2003 and switched to parallel operations with Iran. The financing for CDC is provided by the signatories.

3. The original master plan study was endorsed by the by the ministers at the CAREC Ministerial Conference in October 2009. The regional power sector master plan was completed in 2012. The updating of the master plan was endorsed by the CAREC Energy Sector Coordinating Committee (ESCC) in March 2018.

B. OBJECTIVE

4. Subproject-2 of the cluster TA aims to identify and propose technical solutions to the bottlenecks which constrain the electricity flow for cross border trade. The proposed solutions to the bottlenecks will be derived from the updated Regional Power Sector Masterplan which was first completed under the regional cooperation technical assistance financed by ADB¹.

¹ ADB. 2010. *Technical Assistance Report: Central Asia Regional Economic Cooperation: Power Sector Regional Master Plan*. Manila. <https://www.adb.org/sites/default/files/project-document/63522/43549-01-reg-tar.pdf>

5. The projects identified under the master plan will increase energy security, energy efficiency and trade by optimizing integrated transmission and generation expansion between the four Central Asian republics (CARs) of Kazakhstan, Kyrgyz Republic, Tajikistan, and Uzbekistan as well as Afghanistan and Turkmenistan. The study will address export opportunities from the six countries to neighboring regions. The master plan will study the integrated development of the regional power system and identify long-term solutions to balancing demand and supply, taking into account current assets, demand projections, and trade opportunities. The study will address policy measures to promote security and efficiency. It will also analyze technical requirements for connecting Afghanistan and Turkmenistan with Central Asian power system (CAPS).

C. SCOPE OF WORK AND DETAILED TASKS

6. The consultant scope will be divided into two parts. Part I will be financed out of TA subproject-2, while Part II, will be financed out of TA subproject-3 when it approved for implementation by ADB.

PART I – Regional Power Sector Masterplan Update

7. The consultant firm will be engaged to:
- Update the Regional Power Sector Masterplan, which will include
 - Updating of demand forecast (analysis of the existing demand, including unmet demand, and produce updated 20-year country projections for high, low, and base case growth scenarios);
 - Assessment of existing assets (assess the condition of the existing generation and transmission assets. Identify when they will reach the end of their economic life and need to be rehabilitated or replaced);
 - Assessment of ongoing projects (review and assess construction and rehabilitation projects planned for individual countries and regionally. Confirm the need for these projects and their justification on technical, financial, economic and safeguard grounds while considering current and planned electric import and export)
 - Identification of alternatives (identify alternatives including RE options and efficient use of power including load management and other demand side management measures. Investigate alternative generation scenarios with the objective of reducing greenhouse gas emissions. Define energy efficiency and renewable energy priorities)
 - Review and assessment planned country and regional projects. Propose new projects as appropriate. Prepare a regional power sector master plan considering environmental, social, economic, financial, technical and country security issues)
 - Assess the adequacy of the current technical design of existing CAPS system. Analyze the technical and economic impacts caused by members joining or withdrawing;
 - Updating of investment planning (identify the benefits of a regional power sector plan compared with planning on a national basis. Quantify economic, financial, environmental, and social benefits, including those resulting in reduced emission of greenhouse gases. Prepare an updated 10-year investment plan for justified projects)
 - Assessment of trading arrangements (assess the adequacy of existing regional energy trading arrangements. Identify deficiencies and propose remedies)
 - Assessment of the adequacy of the existing CDC regional generation and transmission planning software. Propose new software and hardware as appropriate. Identify, procure, install and populate the new planning software. Train CDC staff in its

application. Run regional planning scenarios. The consultant firm will procure the identified equipment and software in accordance with the ADB Procurement Policy (2017, as amended from time to time) and the Procurement Regulations for ADB Borrowers (2017, as amended from time to time).

- Identify, justify and propose technical solutions which will enable greater energy trade within CAPS for implementation immediately (transmission line or substation asset rehabilitation or construction). The priority shall be given to the maximization of trade of the renewable and clean energies with resulting reduction of greenhouse emissions.

8. The consultant firm shall closely coordinate the updating of the Regional Sector Masterplan with the already completed and on-going preparation for Kazakhstan, the Kyrgyz Republic, Tajikistan² and Uzbekistan³ as well as Afghanistan⁴ and Turkmenistan.

PART II – Connection of Afghanistan and Turkmenistan into CAPS

9. The consultant will perform the following tasks:

For Afghanistan:

- Analyze the current system technical requirements for connecting Afghanistan to CAPS based on the work already performed during implementation of CAREC: Power Sector Regional Master Plan and taking into account recently completed relevant investments and potential connection of Turkmenistan into CAPS. Unlike in the previous study, the connection shall be considered not only at 220kV level but at 500kV and higher also. Updating of technical actions required for Afghanistan to operate synchronously with CAPS
- Define technical actions requirement for Afghanistan to operate synchronously with CAPS

For Turkmenistan:

- Analyze the current system technical requirement for connecting Turkmenistan to CAPS taking into consideration eventual connection of Afghanistan into CAPS on parallel mode.
- Define technical actions requirement for Turkmenistan to operate synchronously with CAPS.

10. In addition, the consultant will prepare market analysis for prospective power trade (export and import) of CAPS countries, Afghanistan and Turkmenistan with the neighboring countries. The study shall take into account the updated regional power sector master plan together with the power needs analysis of the prospective countries. The report shall estimate the volume of the potential power trade (kWh annually) between the countries based on excess or shortage of

² ADB. 2010. *Report and Recommendation of the President to the Board of Directors, Proposed Grant, Republic of Tajikistan: Regional Power Transmission Project*. Manila. <https://www.adb.org/sites/default/files/project-document/63343/43150-02-taj-rrp.pdf>

³ ADB. 2017. *Report and Recommendation of the President to the Board of Directors, Proposed Loan and Administration of Technical Assistance Grant, Republic of Uzbekistan: Power Generation Efficiency Improvement Project*. Manila. <https://www.adb.org/sites/default/files/project-documents/49253/49253-003-rrp-en.pdf>

⁴ ADB 2010. Technical Assistance Report. Islamic Republic of Afghanistan: Power Sector Master Plan. Manila. <https://www.adb.org/sites/default/files/project-document/62522/43497-01-afg-tar.pdf>

ADB 2015. Addendum to the Afghanistan Power Sector Master Plan. Manila. <https://www.adb.org/projects/43497-013/main#project-documents>

the power. The report shall identify the necessary power transmission infrastructure (new and upgrade) and its estimated cost, which will be required for this trade. Priority for identification of projects will be given to the those that involve trade in the renewable energy.

D. INSTITUTIONAL ARRANGEMENT

11. ADB will be the executing agency working closely with the CDC Energiya (IA) and national utilities of Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan as well as Turkmenistan and Afghanistan.

12. A working group of members from each country will be created to oversee the project. The working group and the ADB project officer will direct, assist, and supervise the TA consultants. The working group and ADB project officer will meet with the consultants as required during project implementation but no fewer than three times to review inception, interim, and final reports.

13. In each country the consultants will work primarily with the government ministry responsible for planning. The consultants will also work with the appropriate power utilities. The transmission utilities (where unbundling has occurred) and vertically integrated utilities are in Kazakhstan by Kazakhstan Electricity Grid Operating Company, Kyrgyz Republic by National Electric Grid of Kyrgyzstan, Tajikistan by Barki Tajik and Uzbekistan by Uzbekenergo.

14. CDC Energiya and national utilities will provide data, office space and telecommunication connection, and technical staff, and assist in additional data collection, logistics, meeting arrangements and other arrangements needed to accomplish the tasks.

15. The consulting team will procure equipment to be financed under the TA in accordance with ADB Procurement Guidelines (2007, as amended from time to time). Disbursements under the TA will be made in accordance with ADB's Technical Assistance Disbursement Handbook. All equipment purchased under the TA will be turned over to the CDC at the end of the TA.

E. REPORTING AND OUTPUT REQUIREMENTS

16. The TA consultant will submit the following reports and project documents in English with a draft and final reports translated into Russian.

17. The consultants will prepare an inception report within 2 months, quarterly progress reports, an interim report within 6 months, draft final within 10 months, and final report within 12 months. The reports will be presented at the Energy Sector Coordinating Committee of CAREC.

18. All reports will be in English and Russian. All documents and reports will be made available in an electronic format to ADB.

F. CONSULTING SERVICES

19. A consulting firm will be recruited using the quality- and cost-based selection method (quality: cost weighting of 90:10), using full technical proposals, following ADB's Procurement Policy (2017, as amended from time to time). The consulting team shall work closely with CDC Energiya and national utilities and ADB to efficiently and effectively perform the tasks. Significant field days will be required from the team during TA implementation.

20. For Part I of the assignment, a team of eight international consultants is envisaged providing 32-person months of services. It will be assigned by national consultants providing 60-person months. National consultant will assist the international consultants in (i) collecting data and information from national and local sources; (ii) reviewing existing documentation, studies, and reports; (iii) organizing consultations with stakeholders; and (iv) undertaking field surveys. The team of national consultants shall include one expert from each country. The composition of the international and national consultants and their estimated inputs are in table below:

	International Consultants			National Consultants		
	PM per Expert	No. of Expert	Total PM	PM per Expert	No. of Expert	Total PM
Team leader / power system planning	7	1	7	10	1	10
Energy economist	5	1	5	10	1	10
Power generation engineer	5	1	5	10	1	10
Transmission engineer	5	1	5	10	1	10
Energy efficiency specialist	2.5	1	2.5	5	1	5
Social specialist	2.5	1	2.5	5	1	5
Environment specialist	2.5	1	2.5	5	1	5
Financial analyst	2.5	1	2.5	5	1	5
		8	32		8	60

21. For Part II of the assignment, same team composition is expected to be maintained, providing additional 17-person months services from international consultants and 17-person months services from local consultants:

	International Consultants			National Consultants		
	PM per Expert	No. of Expert	Total PM	PM per Expert	No. of Expert	Total PM
Team leader / power system planning	4	1	4	4	1	4
Energy economist	3	1	3	3	1	3
Power generation engineer	3	1	3	3	1	3
Transmission engineer	3	1	3	3	1	3
Energy efficiency specialist	1	1	1	1	1	1
Social specialist	1	1	1	1	1	1
Environment specialist	1	1	1	1	1	1
Financial analyst	1	1	1	1	1	1
		8	17		8	17

22. Below are the minimum qualification requirements with working experience in the Central Asia countries together with Afghanistan as highly desirable :

Project Team Leader: demonstrate at least 10 years of team leadership in the field of power system planning. The expert should have a postgraduate degree in engineering, or another relevant field, and at least 20 years of working experience in power system planning, 10 of which as project manager.

Energy Economist: The expert should have a postgraduate degree in economics or another relevant field, and at least 15 years of working experience in economic analysis of the energy sector, preferably in constructing an energy demand and supply model.

Power Generation Engineer: The expert should have a postgraduate degree in engineering or another relevant field, and at least 15 years of professional experience, 10 of which in power generation and 5 years in generation planning.

Power Transmission Engineer: The expert should have a postgraduate degree in engineering or another relevant field, and at least 15 years of professional experience, 10 of which in transmission and distribution, and 5 years in transmission planning.

Energy Efficiency Specialist: The expert should have a postgraduate degree in engineering or another relevant field, and at least 15 years of professional experience, 10 of which in the power sector and 5 years in energy efficiency.

Social Specialist: The expert should have a postgraduate degree in social science or another relevant field, and at least 15 years of professional experience in technical feasibility assessment of investment project and planning in the energy sector, 10 of which in social development activities associated with major infrastructure project.

Environmental Specialist: The expert should have a postgraduate degree in environmental engineering/science or another relevant field, and at least 15 years of professional experience, 10 of which in environmental studies of infrastructure projects and ensuring their delivery.

Financial Specialist: The expert will have a degree in accounting, finance, or related field and will have a recognized professional accountancy qualification. The expert should have at least 15 years (international consultant) experience, including financial due diligence. In addition, the expert shall have working experience in corporate financial and managerial analysis, preferably with experience in conducting financial and managerial capacity assessment of state-owned enterprises in the energy sector.

II. INDIVIDUAL CONSULTANTS

A. TA Coordinator (national, 24 person-months)

Objective and Purpose of the Assignment

The purpose of the assignment is to provide administrative support during the implementation of the loan and TA subproject.

Scope of Work

The consultant will provide administrative support in administration and implementation of the division's loan and TA subproject.

Detailed tasks and/or Expected Output

- Provide assistance in the overall administration and implementation of the assigned energy sector loans and technical assistance (TA) subprojects;
- Coordinate and follow up with other TA consultants, EAs and IAs on required submissions and documents;
- Participate in CWEN review missions;
- Support reporting officers in meeting with Uzbekistan Government, JVC Uzbekenergo, JVC Uzbekhydroenergo by coordinating meetings and performing responsibilities of translator if required;
- Translate correspondence between reporting officers of CWEN and Uzbekistan Government, JVC Uzbekenergo, JVC Uzbekhydroenergo, as and when required;
- Coordinate meetings of CWEN and consultants with relevant Government departments.
- Assist in handling the day – to – day routine functions in support of CWEN/URM tasks and responsibilities.

Minimum Qualification Requirements

Qualified consultant preferably with master degree in energy, engineering, business administration or related field. The consultant will have administrative experience in projects financed by international financial institutions such as ADB and World Bank in Uzbekistan. The consultant should have excellent oral and written communication skills (English and Russian) and should be able to work well in teams, with executing agencies, and with government officials.

Minimum General Experience 7 Years

Minimum Specific Experience (relevant to assignment) 5 Years

Regional/Country Experience Required

B. Power System Expert (international, 7 person-months)

Objective and Purpose of the Assignment

The purpose of the assignment is to support ADB with coordinating regional power sector master plan updating with the recently completed power sector master plans of Afghanistan and Tajikistan as well as on-going work of the Kyrgyz Republic and Uzbekistan. In addition, the consultant will ensure that updated regional power sector master plan takes into account the ongoing regional power trade initiatives such as Turkmenistan-Uzbekistan-Tajikistan-Afghanistan-Pakistan (TUTAP) and Central Asia-South Asia power project (CASA-1000).

Scope of Work

The consultant will provide technical inputs during the review of the interim and final reports related to the regional power sector master sector master plan updating. The consultant will also provide input during the recommendation of the technical solutions to the power trade bottlenecks (transmission, substation etc). The consultant will also provide support during the technical discussions at CAREC ESCC meetings and other official meetings as necessary.

The consultant scope may be expanded to provide support for the subproject 3 “Regional Cooperation on Increasing Cross-Border Energy Trading within the Central Asian Power System” when it is approved.

Detailed tasks and/or Expected Output

- Review and provide input for the interim and final reports prepared by the firm, which will update the regional power sector master plan and recommend solutions for the implementation;
- Lead technical discussion during the finalization of the solutions to the power trade bottlenecks (transmission and dispatch solutions) to be proposed for approval of the countries for implementation;
- Provide technical support during CAREC ESCC and other official meetings;
- Prepare and deliver technical presentations at the CAREC and donor coordination meetings, as necessary.
- Provide an objective and balanced view on the regional power sector initiatives such as CASA-1000 and TUTAP;
- Technical support to ADB with the identification and preparation of the prospective power transmission projects for ADB financing in the Central Asia region;
- When the subproject 3 of the c-KSTA “Regional Cooperation on Increasing Cross-Border Energy Trading within the Central Asian Power System” is approved, support ADB with the work related to the reconnection of Turkmenistan and Afghanistan into the Central Asia Power System.

Minimum Qualification Requirements

Qualified consultant preferably with master degree in energy and engineering or related field. The qualified consultant shall have at least 15 years of experience related to the high voltage transmission and dispatch as well as regional power trade. The consultant shall have experience in preparation and administration in project financed by international financial institutions such as ADB in the five central Asian countries and Afghanistan. The consultant should have excellent oral and written communication skills (English) and should be able to work well in teams, with executing agencies, and with government officials.

Minimum General Experience 25 Years

Minimum Specific Experience (relevant to assignment) 15 Years

Regional/Country Experience (Afghanistan, Turkmenistan, Tajikistan, Kyrgyz Republic as a minimum) Required