

Nepal Electricity Transmission Expansion and Supply Improvement Project (NEP
RRPXXXX)

Project Administration Manual

Project Number: xxxx
Loan Number: LXXXX
Grant Number: GXXXX
October 2011

Nepal: Electricity Transmission Expansion and
Supply Improvement Project

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Project Administration Manual Purpose and Process

The project administration manual (PAM) describes the essential administrative and management requirements to implement the project on time, within budget, and in accordance with Government and Asian Development Bank (ADB) policies and procedures. The PAM should include references to all available templates and instructions either through linkages to relevant URLs or directly incorporated in the PAM.

The executing and implementing agencies are wholly responsible for the implementation of ADB financed projects, as agreed jointly between the borrower and ADB, and in accordance with Government and ADB's policies and procedures. ADB staff is responsible to support implementation including compliance by executing and implementing agencies of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

At Loan Negotiations the borrower and ADB shall agree to the PAM and ensure consistency with the Loan agreement. Such agreement shall be reflected in the minutes of the Loan Negotiations. In the event of any discrepancy or contradiction between the PAM and the Loan Agreement, the provisions of the Loan Agreement shall prevail.

After ADB Board approval of the project's report and recommendations of the President (RRP) changes in implementation arrangements are subject to agreement and approval pursuant to relevant Government and ADB administrative procedures (including the Project Administration Instructions) and upon such approval they will be subsequently incorporated in the PAM.

ABBREVIATIONS

ADB	-	Asian Development Bank
ADF	-	Asian Development Fund
AFS	-	Audited Financial Statement
CLS	-	Core Labor Standard
DCS	-	Distribution Consumer Service Business Group Effective
EGM	-	Gender Mainstreaming
EIA	-	Environmental Impact Assessment
EMP	-	Environment Management Plan
ETFC	-	Electricity Tariff Fixation Commission
EUC	-	Electricity User Cooperative
GESI	-	Gender and Social Inclusion
IDC	-	Interest Charges During Construction
IEE	-	Initial Environment Examination
kW	-	Kilowatt
MW	-	Megawatt
NEA	-	Nepal Electricity Authority
PMU	-	Project Management Unit
PCR	-	Project Completion Report
RP	-	Resettlement Plan
SOE	-	Statement of Expenditures
S/S	-	Substation

I. PROJECT DESCRIPTION

1. The project is critical for reliability of energy supply in Nepal and its capacity for power import and export across the border. It will address three key areas in the electricity supply industry which suffers from years of under investment: (i) electricity transmission capacity expansion including facilitation of increased cross-border power flows which include 2nd circuit stringing of Kohalpur-Mahendranagar 132kV transmission line, construction of Tamakoshi (Kimthi) -Kathmandu 220kV/400kV transmission line and expansion of Chappali grid substation; (ii) strengthening of the distribution system in both DCS East and DCS West regions and along the Tamakoshi (Kimthi) -Kathmandu transmission line; and (iii) rehabilitation of Tinau (1MW) and Sundarijal (640kW) small-hydro power plants.

A. Impact and Outcome

2. The impact of the project will be increased access to reliable supply of electricity through improved electricity supplies and transmission and distribution systems. The outcome of the project will be improved electricity supply through improved connectivity between generation and load centers, distribution strengthening and enhanced small hydropower capacity.

B. Outputs

1. Physical

3. The project outputs can be grouped into three main parts, Part A, Part B and Part C.

a. Part A: Increased Electricity Transmission

- (i) 2nd circuit stringing of the Kohalpur-Mahendranagar 132 kV transmission line
- (ii) Construction of the 220kV/400kV Tamakoshi-Kathmandu transmission line and associated facilities
- (iii) Expansion of Chappali grid substation

b. Part B: Expanded Electricity Distribution

Rehabilitation of 12 distribution substations and associated facilities (DCS East region: Gaur S/S, Rautahat; Nijgarh S/S, Bara; Chandragadhi S/S, Jhapa; Jare S/S, Dhading; Belbari S/S, Morang. DCS West region: Gorkha S/S, Gorkha; Parasi S/S, Nawalparasi; Krishnanagar S/S, Kapilbastu; Taulihawa S/S, Kapilbastu; Amuwa S/S, Rupandehi; Mirmi S/S, Syangja) and new distribution systems along the Khimti-Kathmandu transmission line

c. Part C: Enhanced Electricity Generation

Rehabilitation of Tinau (1MW) and Sundarijal (640kW) Hydropower plants.

2. Non-Physical

4. In addition to the investments in Part A, Part B and Part C there will be capacity building subcomponents embedded in each of these parts covering; project implementation support and training support on operation and maintenance for the staff in NEA and the communities surrounding the proposed investments..

II. IMPLEMENTATION PLANS

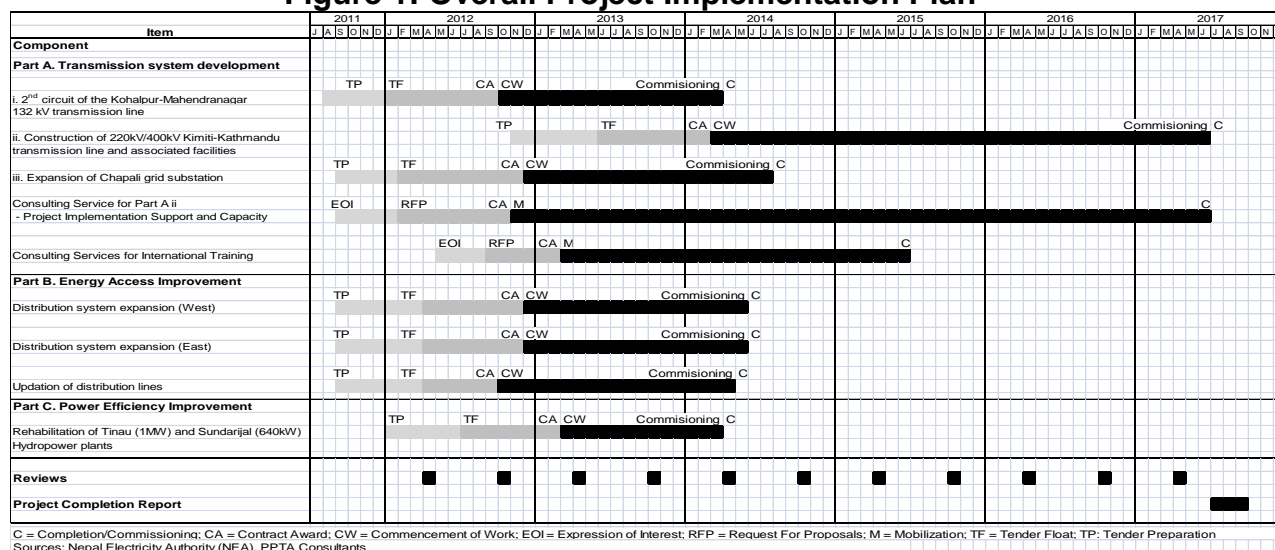
5. The Project implementation will be completed in 63 months but allowing possible delays in the process, project completion will be 30 June 2017 and the loan closing will be 31 December 2017. The implementation plan is shown in Figure 1.

A. Project Readiness Activities

Indicative Activities	Months										Who responsible
	1	2	3	4	5	6	7	8	9	10	
Advance contracting actions			X								NEA
Retroactive financing actions											
Establish project implementation arrangements		X									NEA
ADB Board approval			X								ADB
Loan signing						X					ADB and MOF
Government legal opinion provided								X			MOF/MOLJ
Government budget inclusion								X			MOF, MOE and NEA
Loan effectiveness									X		MOF and ADB

B. Overall Project Implementation Plan

Figure 1: Overall Project Implementation Plan



III. PROJECT MANAGEMENT ARRANGEMENTS

A. Project Stakeholders – Roles and Responsibilities

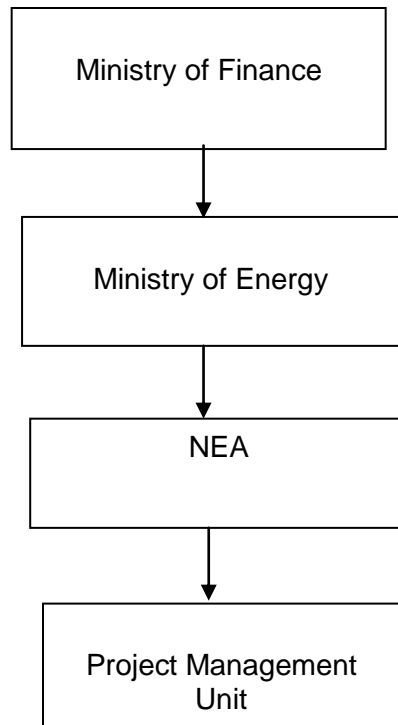
Project Stakeholders	Management Roles and Responsibilities
Executing Agency Nepal Electricity Authority (NEA)	Responsible for carrying out and execution of all components of the Project.
Project Management Unit (PMU)	<ul style="list-style-type: none"> PMU, headed by senior officers, specially for the Project e day-to-day project implementation activities with the concerned groups of NEA.
Asian Development Bank	<ul style="list-style-type: none"> Will undertake regular project reviews and facilitate the implementation of the project

B. Key Persons Involved in Implementation

Executing Agency	
NEA	Deependra Nath Sharma Managing Director Telephone: (977-1) 4153-007 Fax: (977-1) 4153-009 Email: neamd@mos.com.np
Asian Development Bank	
Division Director	Yongping Zhai Director, Energy Division Telephone No.: (63-2) 632-5976 Email: yzhai@adb.org
Mission Leader	Priyantha Wijayatunga Senior Energy Specialist Telephone No.: (63-2) 632-6131 Email: pwijayatunga@adb.org

C. Project Organization Structure

6. NEA will be the Executing Agency (EA) of all components of the Project. The project implementation will be undertaken and supervised by Project Management Units (PMU) to be set up specifically for the Project within NEA. PMU will be headed by senior officials and staffed by adequate personnel to supervise day-to-day implementation of the subprojects. The PMU responsibilities will include (i) overall coordination, macro level project management and monitoring; (ii) annual budget preparation and monitoring utilization of loan proceeds; (iii) progress reporting, including reports on cost management and project impact; and (iv) ensuring compliance with loan covenants. The PMU will also be responsible for administration, and financial and technical supervision of the subprojects, including procurement of goods and services, engagement of consultants, selection of contractors, and monitoring subproject operation performance. PMU will be responsible for communications with ADB on respective project components.

Figure 2: Organization Structure

IV. COSTS AND FINANCING

7. The project is estimated to cost \$128.05 million, including taxes, duties and interest charges during construction (IDC). The government and NEA will provide equivalent \$28.05 million to fund a portion of the local costs including taxes and duties.

8. A loan in various currencies equivalent to Special Drawing Rights SDR Thirty Five Million Five Hundred Thousand... SDR 35,500,000 million) from ADB's Special Funds resources will be provided to finance Parts A, B and C, with an interest charge at the rate of 1.0% per annum during the grace period and 1.5% per annum thereafter; a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft financing and project agreements. ADB will finance the interest during construction.

9. A grant of \$ 19 million from ADB's Special Funds resources and a grant equivalent to \$25 million in Norwegian Krona by the Government Norway will also be provided to finance the project.

10. The government will relend the loan proceeds to NEA under a subsidiary loan agreement upon terms and conditions satisfactory to ADB with interest at the rate of 5% per annum on the amount of the subsidiary loan and a repayment period of 32 years including a grace period of 8 years. The grant proceeds (including cofinanced) will be made available to NEA under a subsidiary equity investment agreement upon terms and conditions satisfactory to ADB.

A. Detailed Cost Estimates by Expenditure Category

SI No	Item	(NR Million)			(US \$ Million)			% of Base Costs
		Foreign Currency	Local Currency	Total Cost	Foreign Currency	Local Currency	Total Cost	
A	Investment Costs							
1	Civil Works & Erection	0.00	673.19	673.19	0.00	9.35	9.35	8%
2	Equipment	6,531.88	0.00	6,531.88	90.72	0.00	90.72	79%
3	Consultants							
	a. Project Management	126.00	0.00	126.00	1.75	0.00	1.75	2%
	b. Project Workshops/Capacity Development of EA	36.00	0.00	36.00	0.50	0.00	0.50	0%
4	Taxes and Duties	0.00	211.82	211.82	0.00	2.94	2.94	3%
	Sub-Total (A)	6,693.88	885.01	7,578.88	92.97	12.29	105.26	91%
B	Other Investment Costs							
1	Land & Resettlement	0.00	375.12	375.12	0.00	5.21	5.21	5%
2	Environmental and Social Mitigation	0.00	119.52	119.52	0.00	1.66	1.66	1%
3	Overhead	0.00	236.95	236.95	0.00	3.29	3.29	3%
	Sub-Total (B)	0.00	731.59	731.59	0.00	10.16	10.16	9%
	Total Base Costs (A) + (B)	6,693.88	1,616.59	8,310.47	92.97	22.45	115.42	100%
C	Contingency							
1	Physical Contingency	331.54	80.83	412.37	4.60	1.12	5.73	5%
2	Price Contingency	86.85	297.86	384.71	1.71	4.14	5.84	5%
	Sub-Total (C)	418.39	378.69	797.08	6.31	5.26	11.57	10%
D	Financial Charges During Implementation							
1	Interest During Implementation	51.75	22.86	74.61	0.72	0.32	1.04	1%
2	Commitment Charges	0.00	0.00	0.00	0.00	0.00	0.00	0%
	Sub-Total (D)	51.75	22.86	74.61	0.72	0.32	1.04	1%
	Total Project Cost (A)+(B)+(C)+(D)	7,164.01	2,018.14	9,182.16	100.00	28.03	128.03	111%
Assumptions:								
1. Cost based on August 2011 Prices, estimated by NEA;								
2. Physical contingency is computed at 5% of base costs;								
3. Price contingency is computed using domestic and international inflation index, in accordance with ADB's Financial Management and Analysis of Projects 2005.								
4. Interest during implementation (IDC) has been computed at the Asian Development Fund (ADF) interest rate of 1% for ADF loan component during construction period.								
5. Tax will be funded by GON, with 1% customs levy on imported equipment and 13% value added tax on construction.								

B1. Allocation and Withdrawal of ADB ADF Loan Proceeds

CATEGORY				ADB FINANCING BASIS
Number	Item	Total Amount Allocated for ADB Financing (SDR) [US\$ million]		Percentage and Basis for Withdrawal from the Loan Account
		Category	Subcategory	
1	Equipment	47.22		
1A	Part A-1**		13.77	100% of total expenditure claimed*
1B	Part A-2***		14.52	43% of total expenditure claimed [#]
1C	Part A-3, B & C		18.93	100% of total expenditure claimed*
2	Implementation Consulting Service	1.75		100% of total expenditure claimed*
3	Training/Fellowships	0.50		100% of total expenditure claimed*
4	Financing charges	0.72		100% of total amount due
5	Unallocated	5.81		
6	Total	56.00		

* Exclusive of all duties and taxes imposed within the territory of the Borrower.

** Equipment (Part A-1) is financed by the Loan and Norway Grant, with front-loading of the Norway Grant until fully disbursed. The remaining cost of Part A-1 will be financed 100% from proceeds of the Loan.

*** Equipment (Part A-2) is financed by the Loan, Grant and Norway Grant, with front-loading of the Norway Grant hereunder until fully disbursed. The remaining cost of Part A-2 will be financed 43% from proceeds of the Loan and 57% from proceeds of the Grant.

B2. Allocation and Withdrawal of ADB ADF Grant Proceeds

CATEGORY				ADB FINANCING BASIS
Number	Item	Amount Allocated for ADB Financing US\$ million		Percentage and Basis for Withdrawal from the Grant Account
		Category	Subcategory	
1	Equipment (Part A-2)**	19.00		57% of total expenditure claimed*
	Total	19.00		

* Exclusive of all duties and taxes imposed within the territory of the Recipient.

** Equipment (Part A-2) is financed by the Loan, Grant and Norway Grant, with front-loading of the Norway Grant hereunder until fully disbursed. The remaining cost of Part A-2 will be financed 43% from proceeds of the Loan and 57% from proceeds of the Grant.

B3. Allocation and Withdrawal of Norwegian Grant Proceeds

CATEGORY				ADB FINANCING BASIS
Number	Item	Amount Allocated for ADB Financing US\$ million		Percentage and Basis for Withdrawal from the Grant Account
		Category	Subcategory	
1	Equipment	24.50		
1A	Part A-1**		9.80	100% of total expenditure claimed*
1B	Part A-2***		14.70	100% of total expenditure claimed*
2	Unallocated****	0.50		
	Total	25.00		

* Exclusive of all duties and taxes imposed within the territory of the Recipient.

** Equipment (Part A-1) is financed by the Loan and Grant, with front-loading of the Grant hereunder until fully disbursed. The remaining cost of Part A-1 will be financed 100% from proceeds of the Loan.

*** Equipment (Part A-2) is financed by the Loan, ADB Grant and Grant, with front-loading of the Grant hereunder until fully disbursed. The remaining cost of Part A-2 will be financed 43% from proceeds of the Loan and 57% from proceeds of the ADB Grant.

**** May be used toward administration fee, audit costs, bank charges, and a provision for foreign exchange fluctuations (if any), to the extent that these items are not covered by the interest and investment income earned on this grant.

B4. Indicative Norwegian Fund Disbursement Schedule

Unit: US\$ Million							
	2011	2012	2013	2014	2015	2016	2017
Norwegian Fund	0.0	2.4	10.0	15.0	25.0	-	-

Notes: The indicative schedule will be adjusted subject to future project implementation.

C. Detailed Cost Estimates by Financier

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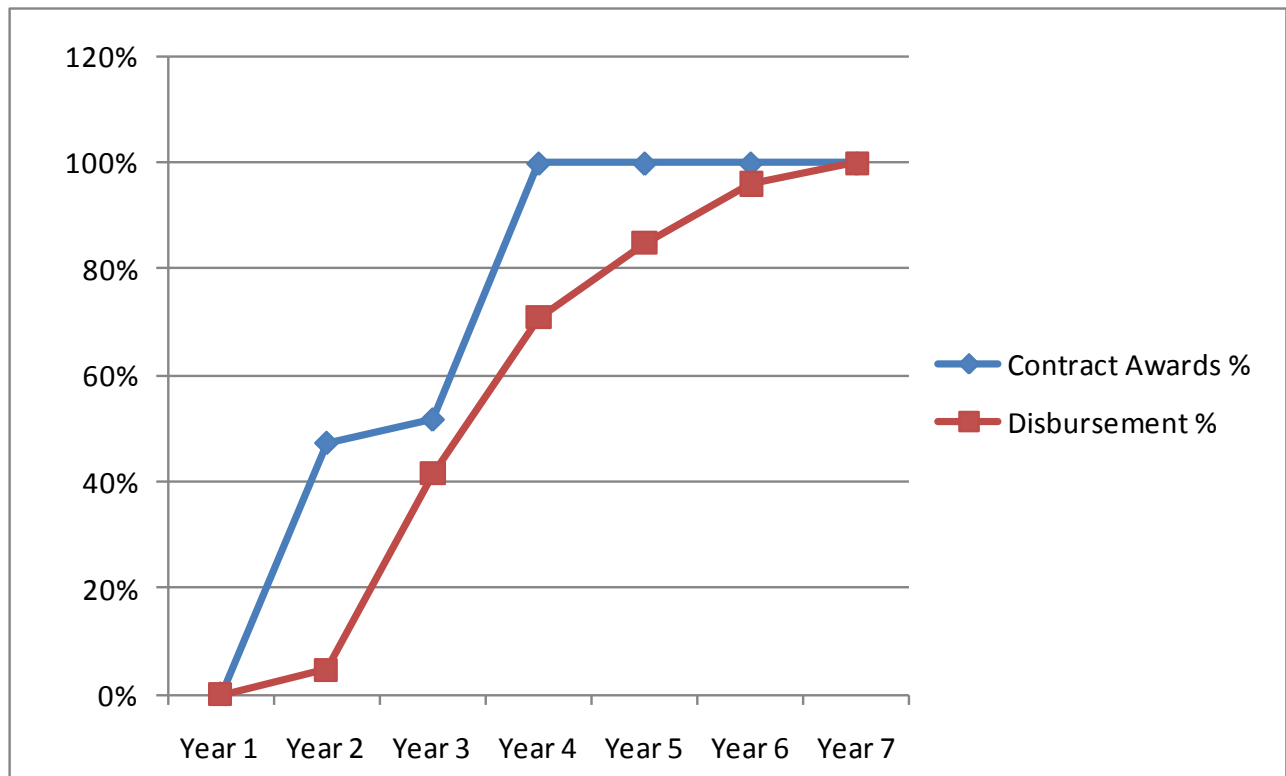
D. Detailed Cost Estimates by Component

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		(US \$ Million)						
		Part A			Part B		Part C	
	Item	Total Cost	Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category
A	Investment Costs							
1	Civil Works & Erection	9.35	2.16	23%	5.25	56%	1.94	21%
2	Equipment	90.72	82.76	91%	6.02	7%	1.94	2%
3	Consultants							
	a. Project Management	1.75	1.50	86%	0.00	0%	0.25	14%
	b. Project Workshops/Capacity Development of EA	0.50	0.50	100%	0.00	0%	0.00	0%
4	Taxes and Duties	2.94	1.93	66%	0.74	25%	0.27	9%
	Sub-Total (A)	105.26	88.85	84%	12.01	11%	4.40	4%
B	Other Investment Costs							
1	Land & Resettlement	5.21	5.21	100%	0.00	0%	0.00	0%
2	Environmental and Social Mitigation	1.66	1.66	100%	0.00	0%	0.00	0%
3	Overhead	3.29	2.97	90%	0.27	8%	0.05	2%
	Sub-Total (B)	10.16	9.84	97%	0.27	3%	0.05	0%
	Total Base Cost	115.42	98.69	86%	12.28	11%	4.45	4%
C	Contingency							
1	Physical Contingency	5.73	4.93	86%	0.61	11%	0.18	3%
2	Price Contingency	5.84	4.54	78%	1.11	19%	0.19	3%
	Sub-Total (C)	11.57	9.48	82%	1.72	15%	0.37	3%
D	Financial Charges During Implementation							
1	Interest During Implementation	1.04	0.63	61%	0.37	36%	0.03	3%
2	Commitment Charges	0.00	0.00	0%	0.00	0%	0.00	0%
	Sub-Total (D)	1.04	0.63	61%	0.37	36%	0.03	3%
	Total Project Cost (A)+(B)+(C)+(D)	128.03	108.80	85%	14.38	11%	4.86	4%
Assumptions:								
	1. Cost based on August 2011 Prices, estimated by NEA;							
	2. Physical contingency is computed at 5% of base costs;							
	3. Price contingency is computed using domestic and international inflation index, in accordance with ADB's Financial Management and Analysis of Projects 2005.							
	4. Tax will be funded by GON, with 1% customs levy on imported equipment and 13% value added tax on construction.							

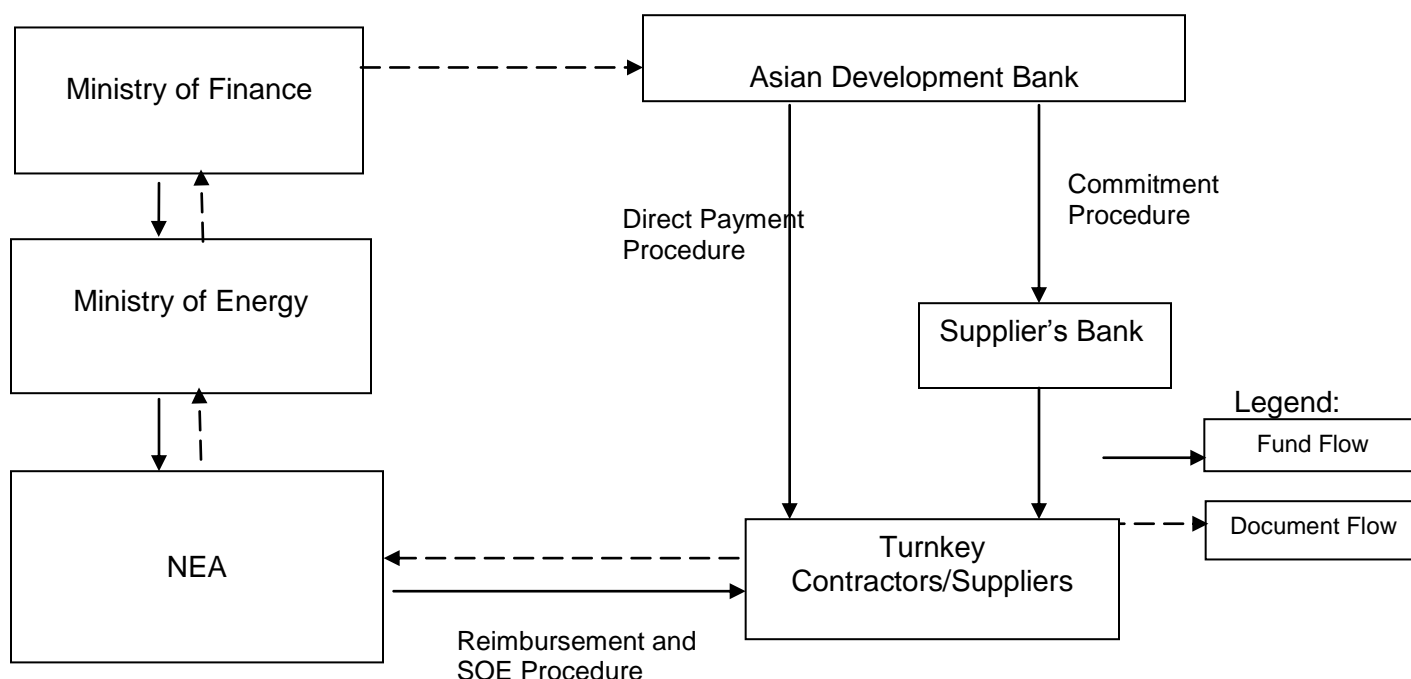
E. Detailed Cost Estimates by Year

		(US \$ Million)							
	Item	ADB and co-financer's Amount	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
A	Investment Costs								
1	Civil Works & Erection	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Equipment	90.72	0.00	4.25	33.65	26.86	12.75	10.20	3.02
3	Consultants				0.00				
	a. Project Management	1.75	0.00	0.08	0.65	0.52	0.25	0.20	0.06
	b. Project Workshops/Capacity Development of EA	0.50	0.00	0.02	0.19	0.15	0.07	0.06	0.02
4	Taxes and Duties	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-Total (A)	92.97	0.00	4.35	34.49	27.52	13.06	10.45	3.09
B	Other Investment Costs								
1	Land & Resettlement	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Environmental and Social Mitigation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Overhead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Sub-Total (B)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Base Cost	92.97	0.00	4.35	34.49	27.52	13.06	10.45	3.09
C	Contingency	6.31	0.00	0.30	2.34	1.87	0.89	0.71	0.21
D	Financial Charges During Implementation	0.72	0.00	0.03	0.27	0.21	0.10	0.08	0.02
	Total Project Cost (A)+(B)+(C)+(D)	100.00	0.00	4.68	37.10	29.60	14.05	11.24	3.33
	% of Total Project Cost		0%	5%	37%	30%	14%	11%	3%
Assumptions:									
	1. Cost based on August 2011 Prices, estimated by NEA;								
	2. Physical contingency is computed at 5% of base costs;								
	3. Price contingency is computed using domestic and international inflation index, in accordance with ADB's Financial Management and Analysis of Projects 2005.								
	4. Tax will be funded by GON, with 1% customs levy on imported equipment and 13% value added tax on construction.								

F. Contract Award and Disbursement S-curve**Figure F.1: Contract Award and Disbursement**

G. Fund Flow

Figure G.1: Fund Flow Diagram



V. FINANCIAL MANAGEMENT

A. Financial Management Assessment

11. NEA is an autonomous body corporate under the Nepal Electricity Authority Act, 1984. The financial management of NEA was reviewed using ADB's financial management assessment questionnaire and interviews. The responses by NEA to the questionnaire revealed that NEA has defined policies and procedures in place for accounting, budgeting, and auditing activities. NEA has implemented externally financed projects from ADB, World Bank and bilateral agencies including KfW, DANIDA, JICA and other countries.

12. NEA is required to prepare annual audited financial reports under Section 26 of the NEA Act. As per the annual reports by the statutory auditor, the financial statements comply with the Nepal Accounting Standards and presentation requirements under Companies Act 2063. NEA provides training on financial accounting, inventory management to staff. Training of staff on ADB processes is considered necessary for proper financial management, reporting, and implementation of the project, which will be supported by this project.

13. NEA is required to undertake periodic inventories of fixed assets and stocks on a yearly basis through physical inspections. While this is being done for stocks, it is partially being done for fixed assets. NEA has also developed an insurance fund to cover any loss of plant, property, equipment. NEA also has an internal audit department that is headed by a qualified accountant who reports to the Managing Director. NEA is implementing a new IT based financial accounting

system under the World Bank funded Institutional Strengthening Program that is currently ongoing.

B. Disbursement

14. No withdrawals shall be made from the Loan and Grant Accounts until such time as (i) the Council of Ministers of the Beneficiary shall have resolved to adopt the NEA Financial Restructuring Plan, containing the Key Features, and (ii) until the Electricity Retail Tariff Regulator shall have determined an average upward revision in tariffs, and it shall have entered into force in accordance with the Electricity Tariff Fixation Rules, 1993.

15. The Loan and grant (including ADB administered cofinancing) proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2007, as amended from time to time),¹ and detailed arrangements agreed upon between the Government and ADB. Norwegian grant fund will be front loaded during disbursement..

16. Pursuant to ADB's *Safeguard Policy Statement* (2009) (SPS),² ADB funds may not be applied to the activities described on the ADB Prohibited Investment Activities List set forth at Appendix 5 of the SPS. All financial institutions will ensure that their investments are in compliance with applicable national laws and regulations and will apply the prohibited investment activities list (Appendix 5) to subprojects financed by ADB.

17. Disbursements of loan and grant (including ADB administered cofinancing) funds under the project will be mainly for the supply of equipment. ADB's commitment, direct payment and reimbursement procedures for supply of equipment, installation and associated civil works will be followed as applicable. ADB's statement of expenditures (SOE) procedure may be used for reimbursement of eligible expenditures under all the components in accordance with ADB's *Loan Disbursement Handbook* and detailed arrangements agreed upon between the government, NEA and ADB.

18. Before the submission of the first withdrawal application, the NEA/borrower should submit to ADB sufficient evidence of the authority of the person(s) who will sign the withdrawal applications on behalf of the NEA/borrower, together with the authenticated specimen signatures of each authorized person. For reimbursement procedure, the minimum value per withdrawal application is US\$100,000, unless otherwise approved by ADB. The NEA is to consolidate claims to meet this limit for reimbursement account claims. For SOE, the ceiling is \$100,000 per payment. Individual payments exceeding the SOE ceiling should be supported by full documentation. SOE records should be maintained and made readily available for review by ADB's disbursement and review mission or upon ADB's request for submission of supporting documents on a sampling basis, and for independent audit. The NEA will be responsible for (i) preparing disbursement projections for each year, (ii) requesting budgetary allocations for counterpart funds, (iii) collecting supporting documents, and (iv) preparing and sending withdrawal applications. Withdrawal applications and supporting documents will demonstrate, among other things that the goods, and/or services were produced in or from ADB members, and are eligible for ADB financing.

C. Accounting

¹ Available at: http://www.adb.org/Documents/Handbooks/Loan_Disbursement/loan-disbursement-final.pdf

² Available at: <http://www.adb.org/Documents/Policies/Safeguards/Safeguard-Policy-Statement-June2009.pdf>

19. NEA will maintain separate project accounts and records by funding source for all expenditures incurred on the project. Project accounts will follow international accounting principles and practices or those prescribed by the Government's accounting laws and regulations.

D. Auditing

20. NEA will cause the detailed consolidated project accounts to be audited in accordance with International Standards on Auditing and/or in accordance with the Government's audit regulations by an auditor acceptable to ADB. The audited accounts will be submitted in the English language to ADB within 6 months of the end of the fiscal year by NEA. The annual audit report will include a separate audit opinion on the use of SOE procedure. The Government of Nepal and NEA have been made aware of ADB's policy on delayed submission, and the requirements for satisfactory and acceptable quality of the audited accounts. ADB reserves the right to verify the project's financial accounts to confirm that the share of ADB's financing is used in accordance with ADB's policies and procedures. For revenue generating projects only, ADB requires audited financial statements (AFS) for the executing agency.

VI. PROCUREMENT AND CONSULTING SERVICES

A. Advance Contracting

21. In order to expedite project implementation, the Borrower has requested and ADB has approved advance contracting actions.

22. All advance contracting will be undertaken in conformity with ADB's Procurement Guidelines (2010, as amended from time to time)³. The issuance of invitations to bid under advance contracting will be subject to ADB's prior approval. The Borrower and the NEA have been advised that approval of advance contracting does not commit ADB to finance the Project.

B. Procurement of Goods, Works and Consulting Services

23. All procurement of goods and works will be undertaken in accordance with ADB's *Procurement Guidelines*.

24. All the consulting firms will be recruited by using the quality and cost-based selection method in accordance with *ADB's Guidelines on the Use of Consultants* (2010, as amended from time to time)⁴. The outline terms of reference (TOR) for the consulting services are in Section D.

C. Procurement Plan

Basic Data

³ Available at: <http://beta.adb.org/documents/procurement-guidelines>

⁴ Available at: <http://beta.adb.org/documents/guidelines-use-consultants-asian-development-bank-and-its-borrowers>

Project Name Nepal Electricity Transmission Expansion and Supply Improvement Project

Country Nepal

Executing Agency Nepal Electricity Authority (NEA)

Financing Amount \$100 million

Loan Number XXXXXXXXXXXX

Grant Number

Grant Number

Date of First Procurement Plan August 2011

Date of this Procurement Plan October 2011

Process Thresholds, Review, and 18-Month Procurement Plan

1. Project Procurement Thresholds

25. Except as the Asian Development Bank (ADB) may otherwise agree, the following process thresholds shall apply to the procurement of goods, works and consulting services.

Procurement of Goods, Works, and Consulting Services

Procurement Method	Threshold
Procurement of Works and Goods	
International Competitive Bidding (ICB) for Works	At least \$1,000,000
International Competitive Bidding for Goods	At least \$500,000
National Competitive Bidding (NCB) for Works	Beneath that stated for ICB, Works
National Competitive Bidding for Goods	Beneath that stated for ICB, Goods
Shopping for Works	Below \$100,000
Shopping for Goods	Below \$100,000

2. ADB Prior or Post Review

26. Except as ADB may otherwise agree, the following prior or post review requirements apply to the various procurement and consultant recruitment methods used for the Project.

Procurement Method	Prior or Post	Comments
Procurement of Works and Goods		
ICB (goods)	Prior	
ICB (works)	Prior	
ICB (Plant/ Turnkey)	Prior	
Recruitment of Consulting Firms		
Quality and Cost Based Selection (QCBS)	Prior	

3. Goods and Works Contracts Estimated to Cost More Than \$1 Million

27. The following table lists goods and works for which procurement activity is ongoing or expected to commence within the next 18 months.

General Description	Contract Value (US\$ million)	Procurement Method	Prequalification of Bidders (Y/N)	Advertisement Date (Quarter)
Part A1: Second Circuit Stringing of Kohalpur -Mahendranagar 132 kV Line Lot-1: Stringing of second circuit Lot-2: Substations	\$24.28 million \$8.40 million \$15.86 million	ICB	N	2 nd Quarter 12
Part A2: 220/400 kV Tamakoshi (Khimiti) - Kathmandu Transmission Line Lot-1: Transmission line Lot-2: Substations	\$49.14 million \$24.14 million \$25.00 million	ICB	N	1 st Quarter 13
Part A-3: Expansion of Chappali Sub-Station	\$12.92 million	ICB	N	3 rd Quarter 12
Part B1: Augmentation of distribution services <i>Lot-1: Augmentation of distribution services (East)</i> <i>Lot-2: Augmentation of distribution services (West)</i> <i>Lot-3: Upgradation of distribution line</i>	\$12.01 million \$3.69 million \$3.54 million \$4.78 million	ICB	N	1 st Quarter 12
Part C: Rehabilitation of Sundarijal HPP (640KW) and Tinau HPP (1MW)	\$4.15 million	ICB	N	4 th Quarter 12

4. Consulting Services Contracts Estimated to Cost More Than \$ 100,000

28. The following table lists consulting services contracts for which procurement activity is either ongoing or expected to commence within the next 18 months.

General Description	Contract Value (US\$ million)	Recruitment Method	Advertisement Date (quarter/year)	International or National Assignment
Consulting services for implementation support for 220/400 kV Tamakoshi (Khimiti) -Kathmandu Transmission Line, and capacity building for NEA staff	\$1.5 million (1 package)	QCBS 80:20	4 th Quarter 11	International
Consulting services for design and implementation support of Part C	\$0.25 million (1 package)	Individual	4 th Quarter 11	International/ national

5. Indicative List of Packages Required Under the Project

29. The following table provides an indicative list of all procurement (goods, works, and consulting services) over the life of the Project.

Contract	Item	Estimated Value		Domestic	Procurement
No.		(NR million)	(\$ million)	Preference	Mode
Procurement					
Part A	Increased Electricity Transmission	11,502.35	159.75		
A-1	Second Circuit Stringing of Kathmandu Mahendranagar 132 kV Line	1,699.64	24.28	N	ICB (Turnkey)
Lot-1	String of second circuit	588.00	8.40		
Lot-2	Substations	1,111.60	15.88		
A-2	220/400 kV Tamakoshi Kathmandu Transmission Line	3,439.56	49.14	N	ICB (Turnkey)
Lot-1	Transmission line	1,689.80	24.14		
Lot-2	Substations	1,750.00	25.00		
A-3	Expansion of Chappali Sub-Station	904.24	12.92	N	ICB (Turnkey)
Part B	Expanded Electricity Distribution	864.75	12.01		
B-1	Augmentation of distribution services	864.75	12.01	N	ICB (Turnkey)
Lot-1	Augmentation of distribution services (East)	265.73	3.69		
Lot-2	Augmentation of distribution services (West)	254.88	3.54		
Lot-3	Upgradation of distribution line	322.86	4.78		
Part C	Enhanced Electricity Generation	299.12	4.15		
C-1	Rehabilitation of Sundarijal HPP (640KW) and Tinau HPP (1MW)	299.12	4.15	N	ICB (Turnkey)
Subtotal: Procurement (5 packages)		7,379.98	102.50		
Consulting Services					
a-A	Consulting services for implementation support for 220/400 kV Tamakoshi Kathmandu Transmission Line, and capacity building for NEA	108.00	1.50	N	QCBS
a-C	Individual Consultant for design and implementation support of Part C	17.50	0.25	N	Individual
Subtotal: Consulting Services (2 packages)		122.50	1.75		
Total Cost:		7,297.48	104.25		

D. Outline Terms of Reference for Consulting Service for Part A-2 (Appendix 1), Part C (Appendix 2)

VII. SAFEGUARDS

30. The NEA will ensure the timely and adequate implementation of the environmental management plan (EMP) and resettlement plan (RP) for the project and will ensure that all activities comply with the applicable national and local environmental laws and regulations, in addition to ADB's Safeguard Policy Statement 2009. In the event a sub project requires modifications to its design or configuration prior or during project construction, NEA will ensure to revise and update the EIA, IEE, EMP and RP accordingly, and will submit these to ADB for

approval and clearance. NEA will ensure that all construction-based contracts are implemented in an environmentally and socially sustainable and responsible manner. Contracts shall include provisions that comply with host country employment laws and ADB guidance on labor standards, including fair wages; reasonable occupational health and safety standards in the workplace; the provision of acceptable working conditions and practices; the prohibition of forced and compulsory labor and of child labor; equal opportunity, gender inclusive and pro-poor employment targets; equal pay for equal work; the deterrence of discriminatory practices on the basis of sex, ethnicity or caste; and public awareness and sensitization of the risks and prevention of the spread of HIV/AIDS. Ensuring these measures are implemented will be the responsibility of the NEA.

31. The mitigation measures will be incorporated into the contractor's contract document. NEA will monitor, audit, and report to ADB on the implementation of the EMP for each subproject semiannually during construction and annually during operation. Summary appraisal reports will be submitted to ADB subsequent to the NEA's approval.

32. The contractor/subcontractor shall prepare and submit the semi-annual progress reports in conformance with the EMP to NEA and shall indicate when, how and at what cost the contractors plan to satisfy the requirements as per detailed design. The construction schedules shall detail the resources to be provided or utilized and any related sub contracting proposed.

33. Project implementation is expected to pose minor impacts of a temporary and reversible nature on peoples living in the direct/indirect area of influence of construction sites. NEA and its contractors will be responsible for designing and implementing culturally acceptable and sensitive measures to manage and address significant community, health, safety, and labor issues, in consultation with locally affected peoples, and in accordance with national laws and ADB safeguard requirements.

34. Implementation of involuntary resettlement activities, and those associated with impacts to indigenous peoples, will be implemented in accordance with host country laws and regulations and ADB safeguard policy requirements, including loan provisions and covenants as stated herein. Implementation of activities is the sole responsibility of NEA and shall be closely monitored by the responsible party. Performance shall be reported back to the ADB on a six monthly basis. During this process, NEA will ensure to improve or at least restore the quality of life of all displaced and affected persons.

VIII. GENDER AND SOCIAL DIMENSIONS

35. A Gender and Social Inclusion (GESI) Plan has been prepared for the project and the NEA will be responsible for overseeing the timely and appropriate implementation of the GESI and any other technical assistance or grant-related funds / activities that may be mobilized for the project to optimize social and gender benefits. All consultative and participatory processes will be socially and gender inclusive, ensure timely disclosure of information, be factually accurate, and provide a platform for open, fair and transparent dialogue and communication. Implementation of consultation and participatory approaches will be the responsibility of the NEA and the project implementation and monitoring unit. Results from the consultation and participation process will inform project development and will be monitored on a periodic basis and reported back to ADB as and when required. The GESI will enable poor women and men's participation in the energy sector, through the provision of technical and skills training, increase employment opportunities and energy-related livelihood and entrepreneurial activities. The NEA will receive capacity development on how to improve gender equity and community participation

in projects. Training will aim to pilot and replicate a resource for the energy sector in Nepal. NEA shall ensure that implementation of core labor standards (CLS) and dissemination of information on sexually transmitted diseases including HIV/AIDS to employees and local communities surrounding the facilities is closely monitored, and progress is reported to ADB periodically. The participation of poor female-headed households will be given special priority during project implementation. A gender-mainstreamed PPMS system will monitor GESI implementation and assess social and gender impacts of the Loan. Reporting will be semi-annual during implementation, along with reporting of environmental and social provisions and covenants.

36. The NEP 41155: Electricity Transmission Expansion and Supply Improvement Project is classified as “Effective Gender Mainstreaming (EGM)” category according to ADB’s Guidelines for Gender Mainstreaming. The Gender and Social Inclusion Plan seeks to empower women by increasing their rights, knowledge and economic development through access to energy based resources, opportunities, and services. The GESI contains specific targets for ensuring project benefits reach rural poor women and disadvantaged groups along the transmission line projects.

GENDER AND SOCIAL INCLUSION PLAN

	Activities	Indicators & Targets		Timeline e	Resp.
Output B: Expanded Electricity Distribution					
2(a)	Identify needs, scope and geographic coverage of assistance	▪ Needs assessment carried out to determine eligibility for rural-based community/household-level electrification	TASF	Project Imple. Period	EA Local NGO
2(b)	Increase electrification rates in rural communities	▪ Electricity access provided to 20% of new electrified households along the K-K line (target: 30% women and marginalized groups) (baseline: 9,000)			
2(c)	Women's livelihood opportunities enhanced through awareness building in the use of renewable energy	▪ Increased public awareness of newly electrified households (2,000) in: (i) safe and efficient use of electricity (incl. compact fluorescent lamps (CFL)); (ii) energy related livelihood opportunities; (iii) energy consumption patterns for household tasks			
Output C: Enhanced Electricity Generation					
3(a)	Women's livelihoods enhanced through skills training	▪ Training on local product processing and marketing skills targeting local communities (20 HHs) in the Sundarijal VDC (9 wards). ▪ Training in public health activities in Tamang Village [target: 30% women participation]	TASF	Project Imple. Period	EA Local NGO
3(b)	Small-scale gender-sensitive infrastructure development	▪ Construction of male/female public toilet facilities in pipeline source in Sundarijal hydro plant in Sundarijal VDC ▪ Maintenance support of local suspension bridge in Tinau Hydro plant at Dovan VDC (used primarily by women for accessibility)	NEA		NEA, PMU, Consultant
Complementary and Supporting Activities ^b					
4(a)	Monitor the project's impact on target groups	▪ Establish a M&E system in PMU to collect sex, caste/ethnicity disaggregated data in project monitoring, evaluation	NEA/PMU	Project Imple. Period	PMU

⁵ Complementary activities will be financed under the Nepal Component of JFPR 44135 *Improving Gender Inclusive Access to Clean and Renewable Energy in Bhutan, Nepal and Sri Lanka* (2011) and indicated in the GESI under the JFPR heading (see below). Implementation of the GESI will be for 60 months.

4(b)	Conduct gender sensitization workshops to the PMU and Transmission Line Project Staff.	<ul style="list-style-type: none"> Workshop modules developed on the importance of social and gender concerns in project development, handling of grievances during the project, and about holding open, transparent and inclusive public consultation and dialogue with direct and indirect stakeholders. 			
4(c)	Ensuring electricity access for rural poor and vulnerable groups	<ul style="list-style-type: none"> Electricity access provided to selected (8-10) electricity user cooperatives (EUCs), or approximately 8,000-10,000 households⁶, through support provided to the community rural electrification program of the Distribution Consumer Service Business Group (DCS) 	JFPR		EA Consultant
4(d)	Strengthening technical, organizational, and end-user capabilities	<ul style="list-style-type: none"> Support provided for strengthening the technical and organizational capabilities of (selected) EUCs under the DCS program through: (a) community cooperatives training for 5 people from 8-10 the EUCs, with a target of at least 15 women participants (30%); and (b) user training (estimated 8,000 to 10,000 households in nine districts, with 50% target: women participation) 			

IX. PERFORMANCE MONITORING, EVALUATION, REPORTING AND COMMUNICATION

A. Project Design and Monitoring Framework

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Increased access to reliable supply of electricity	Access to grid-based electricity increased to 65% of the households by 2020 (2011 baseline: 40%)	NEA annual reports	Assumptions The Government of Nepal emphasis on energy sector development will continue. Sufficient development of private sector power plants Risk Resistance to large-scale hydropower projects
Outcome Improved electricity supply	280 km of 220kV or 400 kV and 132 kV transmission lines added by 2017 9,000 new households connected to the	NEA annual reports NEA annual reports	Assumptions Improved regulatory environment Timely implementation of

⁶ Under the program, cooperatives formed in communities bear 20% of the cost of installation, while the government invests on the remaining 80%. Special attention will be paid to ensuring that access to electricity, including household connections, is provided to households headed by women and/ marginalized groups.

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
	<p>grid by 2017</p> <p>1.14 MW of additional generation capacity (or 4 gigawatt-hours of additional annual energy) provided to the system by 2017</p>	NEA annual reports	NEA financial restructuring plan
<p>Outputs</p> <p>1. Increased electricity transmission</p> <p>2. Expanded electricity distribution</p> <p>3. Enhanced electricity generation</p>	<p>Second circuit on the 132 kV transmission line between Kohalpur and Mahendranagar (188 km) constructed by 2017</p> <p>220 kV/400 kV Tamakoshi–Kathmandu transmission line and related facilities constructed by 2017</p> <p>Chapali grid substation expanded by 7 x 15 megavolt-amperes capacity by 2017</p> <p>30% of project workforce recruited locally, with preference given to women and marginalized groups (2011 baseline: 2,000)</p> <p>Energy-based livelihood training provided to 1,500 people, with focus on income-generating activities (target: 80% women and marginalized groups)</p> <p>Distribution systems in 11 towns in the Eastern and Western regions rehabilitated (50 km of 400 V lines) by 2017</p> <p>Distribution systems (155 km of 400 V lines) along the planned Tamakoshi–Kathmandu transmission line installed by 2017.</p> <p>Electricity access provided to 20% of new electrified households along the Tamakoshi–Kathmandu line (target: 30% women and marginalized groups) (2011 baseline: 9,000)</p> <p>Tinau (1 MW) and Sundarijal (640 kilowatts) hydropower plants rehabilitated by 2017</p> <p>2,500 tons of CO₂ saved annually from 2017</p>	<p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p>	<p>Assumption</p> <p>Timely availability of counterpart funds from the government</p>

Design Summary	Performance Targets and Indicators	Data Sources and Reporting Mechanisms	Assumptions and Risks
4. Efficient project management	<p>Livelihood enhancement through training of 1,000 households in the surrounding villages in energy conservation and efficiency</p> <p>Project management unit operational by 30 November 2011</p> <p>Project implemented on time and within budget</p>	<p>NEA annual reports</p> <p>NEA annual reports</p> <p>NEA annual reports</p>	
Activities with Milestones			Inputs
1. Increased electricity transmission			ADB (ADF grant): \$19 million
1.1 Acquisition of land (completed by March 2012)			Item Amount (\$ million)
1.2 Site clearance and compensation (completed by June 2012)			Part A 19.00
1.3 Construction of lines (June 2012–June 2017)			
1.4 Implementation of environment management plan (from June 2012 onward)			
2. Expanded electricity distribution			ADB (ADF loan): \$56 million
2.1 Removal of existing transformers and replacement with new transformers (June 2012–June 2017)			Item Amount (\$ million)
2.2 Replacement of aging distribution lines (June 2012–June 2017)			Part A 47.27
2.3 Identification of those areas that can be handled by communities (December 2012)			Part B 6.43
2.4 Transfer of distribution responsibility to communities (December 2013)			Part C 2.30
3. Enhanced electricity generation			Government of Norway: \$25 million
3.1 Detailed assessment of specific components to be replaced (June 2012–June 2013)			Item Amount (\$ million)
3.2 Replacement of the components (June 2014–June 2016)			Part A 25.00
4. Efficient Project Management			
4.1 Recruitment of an individual consultant to support recruitment of implementation consultant for 220/400kV transmission line (Dec 2011-Jan 2012)			Government and NEA: \$ 28.03 million
4.2 Recruitment of implementation consultants (Jan 2012 – June 2012)			Item Amount (\$ million)
4.3 Procurement of goods and works (June 2012 – June 2013)			Part A 17.54
4.4 Construction work and commissioning of subprojects (Dec 2012-June 2017)			Part B 7.93
			Part C 2.56
			Grant Technical assistance:
			ADB: \$0.250 million
			Government: \$0.05 million

ADB = Asian Development Bank, ADF = Asian Development Fund, CO₂ = carbon dioxide, km = kilometer, kV = kilovolt, MW = megawatt, NEA = Nepal Electricity Authority, V = volt.

Source: Asian Development Bank.

B. Monitoring

37. **Project performance monitoring.** NEA will undertake overall monitoring of the Project in terms of progress. ADB, the government and NEA will conduct semiannual reviews throughout the implementation of the Project. The review will monitor the (i) project output quality, (ii) implementation arrangements, (iii) implementation progress, and (iv) disbursements. Performance will be monitored based on indicators and targets stipulated in the design and monitoring framework.

38. **Compliance monitoring.** In addition to the standard assurances, compliance with the specific assurances will be monitored. They will be based on the Loan Agreement and Project Agreement as well as Consulting Services, Procurement and Disbursement Guidelines. All consultants will be recruited according to ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). The procurement of goods, related services, and works financed by the loan will follow procedures outlined in the ADB's Procurement Guidelines (2010 as amended from time to time). The loan proceeds will be disbursed in accordance with ADB's Loan Disbursement Handbook (2007, as amended from time to time).

C. Evaluation

39. ADB will field regular review missions every six months at the minimum to review status of contract awards, disbursements, physical progress, and implementation of the environmental management plan and resettlement plans. Within 6 months of physical completion of the Project, each NEA will submit the project completion report (PCR) to ADB. Subsequently, ADB will field a mission to finalize the PCR.

Table 1: Evaluation Methodology

Evaluation Activity	Purpose	Methodology	Who responsible and involved
Review Mission	Review the progress of the project and provide guidance to facilitate implementation	Site visits and meetings with NEA officials, contractors, consultants at least twice a year	ADB/NEA
Mid Term Review	Comprehensive review of the project	Not needed as review missions will be conducted regularly and the project implementation is only 3 years	
Project completion report	Evaluate the overall output of the project and its relevance and suitability	Site visit and meetings with NEA officials, contractors, consultants	ADB/NEA

D. Reporting

40. NEA will provide ADB with (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) semiannual progress reports on environmental and social monitoring during implementation in a format consistent with ADB's requirements; (iii) consolidated annual reports including (a) progress achieved by output as measured through the

indicator's performance targets, (b) key implementation issues and solutions; (c) updated procurement plan, and (d) updated implementation plan for next 12 months; and (iv) a project completion report within 6 months of physical completion of the Project. To ensure projects continue to be both viable and sustainable, project accounts and the AFSs, together with the associated auditor's report, should be adequately reviewed.

E. Stakeholder Communication Strategy

41. The Stakeholder Communications Strategy is described in the following table. NEA will post all relevant information on their websites. The website will include at minimum information regarding the bidding process, bidders, contract awards, use of funds disbursed under the Project and physical progress.

Table 2: Stakeholder Communication Strategy

Project information to be communicated	Means of Communication	Responsibility	Audience	Frequency
Report and Recommendation of the President (RRP) with linked documents	ADB website	ADB	ADB, Government of Nepal, Development Partners, Civil Society, Individuals	Once
Project information while planning/ designing	Discussions and stakeholder consultations	NEA	Project beneficiaries	Regular intervals during planning and design
Status of implementation during construction	Boards at site	NEA/ Contractors	Project beneficiaries	All the time at construction sites
Project Performance Reports and Project Information Documents	ADB website	ADB	ADB, Government of Nepal Development Partners, Civil Society, Individuals	Every quarter
Safeguards Monitoring during Implementation (i.e., Environmental and Social Monitoring Report)	ADB website	ADB and NEA	ADB, Government of Nepal, Development Partners, Civil Society, Individuals	Semiannual
Monthly progress reports	Website of EA	NEA	ADB, Government of	Monthly

			Nepal Development Partners, Civil Society, Individuals	
Project completion report	ADB website	ADB	ADB, Government of Nepal Development Partners, Civil Society, Individuals	Once

X. ANTICORRUPTION POLICY

42. ADB reserves the right to investigate, directly or through its agents, any violations of the Anticorruption Policy relating to the project. All contracts financed by ADB will include provisions specifying the right of ADB to investigate (with any audit through the Beneficiary's authorized auditor) and examine the records and accounts of NEA; and all project contractors, suppliers, consultants, and other service providers. Individuals/entities on ADB's anticorruption debarment list are ineligible to participate in ADB-financed activities and may not be awarded any contracts under the project. To support these efforts, relevant provisions are included in the loan and project agreements and the bidding documents for the project.

43. The Government of Nepal and NEA will ensure that (i) the project is carried out in compliance with all applicable Nepal anticorruption regulations and ADB's Anticorruption Policy, including cooperating fully with any investigation by ADB directly or indirectly of any alleged corrupt, fraudulent, collusive, or coercive practices relating to the project; and (ii) all relevant staff actively participate in training in Nepal's anticorruption regulations and ADB's Anticorruption Policy.

44. In accordance with ADB requirements, an assessment in the areas of public financial management, procurement, and anticorruption was undertaken. Certain governance, fiduciary, and anticorruption safeguards have been incorporated into the project to mitigate the risk of diversion of funds and to enhance and strengthen governance, accountability, and transparency. In particular, such transparency and accountability measures include (i) establishment of a publicly accessible project website within the existing NEA website wherein the borrower will disclose key project-related information including on costs, safeguards, and procurement; and (ii) establishment of a grievance redress mechanism satisfactory to ADB for receiving and resolving stakeholder complaints.

45. The government, through NEA, will ensure that a section of its website is dedicated to the project in the first year of project implementation, and that it will disclose details of the project, including the audited project financial accounts; project progress; and procurement activities including the publishing of short-lists, invitations for bid, and contract awards.

XI. ACCOUNTABILITY MECHANISM

46. People who are, or may in the future be, adversely affected by the project may address complaints to ADB, or request the review of ADB's compliance under the Accountability Mechanism.

XII. RECORD OF PAM CHANGES

47. To be inserted as and when any changes are necessary and agreed by both sides.

SIGNED IN Katmandu, Nepal ON

On behalf of NEA

On behalf of Asian Development Bank

OUTLINE TERMS OF REFERENCE FOR CONSULTING SERVICES

Project Implementation Support for Subproject A2 (Tamakoshi (Khimti) -Kathmandu Line)

A. Background

1. Subproject A2 includes Construction of the 220kV/400kV Tamakoshi-Kathmandu transmission line and associated facilities, which will be implemented by Nepal Electricity Authority (NEA). NEA is the Executive Agency (EA). The subproject will be designed and constructed for 400kV operation but will be operated at 220kV for several years after commissioning. The substations will be designed and laid out for 400kV but 220kV equipment will be installed initially. The line will run between the Khimti substation in the north east of Nepal and the new Moolpani substation on the north eastern side of the Kathmandu Valley, via the new Bahrabise substation. The associated facilities will include new bays at the Khimti substation, a new substation at Bahrabise and a new substation at Moolpani. SCADA, communications, protection and interfaces will be also included.

B. Objective of the Assignment

2. NEA plans to procure the transmission line and substations on a turnkey basis, with the supplier to be responsible for the, detailed design of towers, substations and structures, supply, delivery, erection, testing, and commissioning of the project. A consulting firm will be engaged to assist NEA in defining the project, preparing conceptual designs, assuring that all steps are undertaken properly, so that the completed project will deliver the quality, capacity, performance, reliability and economic life required. The assistance covers preparing technical specifications and bidding documents; support of the tendering process and bid evaluation; review and approval of contractor's detailed design information, supervision of construction from the owner's perspective; and supervision of the testing and commissioning of the line and substations from the owner's perspective; and handing over the completed project including issuance of provisional acceptance certificates and final acceptance certificates. In addition, the consultant will work closely with the NEA Project Management Unit (PMU), the Project Manager and NEA's specialized departments, through all stages of the assignment and provide capacity building and training for NEA counterpart professional staff.

C. Scope of Works for the firm

3. As a firm, the Consultant shall provide the services covering (i) preparation of technical specification and bidding documents; (ii) support in bidding process; (iii) supervision during construction, testing and commissioning of the project; (iv) capacity building for NEA staff.

a. Preparation of Technical Specifications and Bidding Documents

4. The consultant firm shall prepare the technical specification and bidding documents, including but not limited to the following:

- (i) Develop a full understanding of project requirements through discussion with NEA;
- (ii) Review all reports, drawings and plans prepared by or for NEA and related to the proposed subproject;

- (iii) Conduct necessary additional studies for the subproject to ensure that the line and substations meet NEA's overall requirements of the project;
- (iv) Review, approve and/or amend and updated as necessary, NEA's line routing and tower spotting plans and survey information;
- (v) Define line and substation design technical parameters, conductor configurations, insulator and tower types, taking account of NEA's requirements and Nepal-specific conditions including altitude;
- (vi) Prepare conceptual designs and layouts for the substations, line, SCADA, communications, protection etc;
- (vii) Prepare technical specifications, performance specifications, schedules, and drawings for bidding of the project on a turn-key basis.

b. Support in the Bidding Process

5. The Consultant shall review NEA's approach and schedule for the bidding process and provide comments and recommendations on the approach, activities, schedule, organization, and responsibilities. The Consultant will assist NEA through the bidding process including the following activities.

- (i) Assist NEA in clarifying queries from prospective bidders during the bidding period;
- (ii) Carry out technical and financial evaluation of bids received and submit bid evaluation reports to NEA; and
- (iii) Assist NEA in contract negotiations and finalize contract documents.

c. Supervision

6. The turnkey contract will cover detailed design, construction, testing and commissioning of the transmission line, Bahrabise and Moolpani substations, Khimti substation bays, SCADA, communications and protection facilities. The Consultant shall provide oversight of all aspects of the construction in order to assure that it is conducted properly. This includes assisting in developing and implementing a quality assurance program for construction, review and approval of design, monitoring schedule, inspection of materials upon arrival and upon erection, review of documents to assure quality of delivered goods, comparison of as-built drawings to design, and addressing shortcomings in any of these areas.

d. Testing and Commissioning

7. All components of the lines, substations, SCADA, communications and protection will be subject to an acceptance test to demonstrate their capability to meet warranted design criteria. For each component subject to test, the Consultant will review the contractor's test procedures for compliance with manufacturers' requirements and design criteria. The Consultant shall witness the tests and review the test results. If test results are not satisfactory, the consultant shall ensure require that any lack of compliance is addressed and that the equipment and overall systems shall be re-tested until compliant results are achieved.

8. During the commissioning phase, the Consultant shall provide training on the testing and commissioning of all aspects of the project. The Consultant shall assist NEA in this phase of the project and coordinate with the Contractor in addressing any issues with the project components that are unsatisfactory. At the end of this period, and when all acceptance tests have been

completed to the Consultant's satisfaction, the Consultant will advise NEA that the construction is complete and all the project components are ready to be declared fully operational.

9. The Consultant shall also prepare and recommend a provisional taking over certificate whenever due for the works or part of the works and alert NEA of work deficiencies and outstanding items, if any. The Consultant shall also confirm the remedial measures taken by the contractor, and recommend a final taking over certificate after expiry of the warranty period.

e. Capacity Building

10. During the Inception phase of the contract, the Consultant shall perform a skills assessment and develop a training program for NEA counterpart staff. The NEA counterpart staff will assist the consultant during all phases of the project. NEA counterpart staff may have 220kV and lower voltage project experience but not experience with 400kV rated lines and substations. All international experts will be expected to work closely with the NEA staff and shall ensure that the NEA staff achieve higher skill levels as a result of project involvement.

D. Expertise and tasks

a. Person-months

11. It is expected that about 72 person-months of international consulting services will be needed from a firm specializing in EHV transmission lines and substations.

Table 1: Indicative Expertise and Person-Months: Transmission Line and Substations

Expertise	International Consultants (pm)	NEA Counterpart Staff (minimum pm)
Team Leader/Transmission Electrical Engineer	30	60
Line Survey Engineer	2	4
Geotechnical Engineer	3	6
Structural Engineer – Transmission/Substations	6	12
Electrical Engineer – Substations	10	20
Civil Engineer – Transmission/Substations	9	18
SCADA/Communications Engineer	6	12
Protection Engineer	6	12
TOTAL	72 pm	144 pm

b. Qualification/Experience of Each Expert

12. **Team Leader/Transmission Electrical Engineer (International):** With at least Bachelor's degree in a relevant engineering discipline and minimum 15 years' experience, 10 of which has been internationally in projects for developing countries. The expert shall have previous team leader experience on projects of similar size to the Khimti-Kathmandu project and shall have proven people skills including training experience. Experience shall cover 400kV or higher EHV transmission line design, specification, construction, testing and commissioning. It

is expected that the expert will be resident in Kathmandu for approximately 2 years, with frequent short visits for the remainder of the project until commissioning is completed.

13. Line Survey Engineer (International): With at least Bachelor's degree in civil engineering or surveying and minimum 7 years experience, with previous experience internationally in developing countries and with 400kV or above transmission lines and substations. Experience shall include route definition, and tower spotting and in mountainous terrain and environmentally and socially sensitive situations. The expert shall have an understanding of line clearances and safety considerations.

14. Geotechnical Engineer (International): With at least Bachelor's degree in civil engineering and minimum 7 years experience, with previous experience internationally in developing countries and with 400kV or above transmission line tower foundations soil testing and for substation structures.

15. Structural Engineer – Transmission/Substations (International): With at least Bachelor's degree in structural engineering, with minimum 10 years's experience in the selection and specification of transmission and substation towers and structures for 400kV or higher. The expert shall have previous experience on projects of similar size to the Khimti-Kathmandu project.

16. Electrical Engineer – Substations (International): With at least Bachelor's degree in structural engineering, with minimum 10 years's experience in the selection and specification of transmission and substation towers and structures for 400kV or higher. The expert shall have previous experience on projects of similar size to the Khimti-Kathmandu project and shall have previous international experience.

17. Civil Engineer – Transmission/Substations (International): With at least Bachelor's degree in civil engineering, with minimum 10 years's experience in the design of foundations for substation towers and substation structures for 400kV or higher. The expert shall have previous experience on projects of similar size to the Khimti-Kathmandu project and shall have previous international experience.

18. SCADA/Communications Engineer (International): With at least Bachelor's degree in electrical, communications or other relevant discipline, with minimum 10 years's experience in the selection and specification of SCADA and communication systems for 400kV or higher transmission lines, substations and control centre interfacing . The expert shall have previous experience on projects of similar size to the Khimti-Kathmandu project and shall have previous international experience.

19. Protection Engineer (International): With at least Bachelor's degree in electrical engineering with protection specialization and/or further qualifications and training in protection for 400kV transmission systems and substations, with minimum 10 years's experience. The expert shall have previous experience on projects of similar size to the Khimti-Kathmandu project.

c. Tasks for Each Expert

20. **Team Leader/Transmission Electrical Engineer (International)**

- (i) Oversee and lead the assignment and the consultant team, and act as the team's point of contact with NEA and ADB.
- (ii) With the assistance of the consultant team, perform a training needs assessment for counterpart staff and prepare a training program.
- (iii) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation technical matters.
- (iv) Prepare the Inception Report
- (v) Prepare regular reports in accordance with ADB requirements.
- (vi) Contribute to capacity building of NEA counterpart staff.
- (vii) Coordinate the preparation of project designs, documentation, bidding documents.
- (viii) Assist NEA in evaluation of technical and financial bids to be received against ICB for engagement of turnkey contractor, preparation of bid evaluation reports, contract negotiations and draft contract agreements, and advice on submission of documents to ADB for review and approval.
- (ix) Assist NEA in administration of the contract.
- (x) Assist NEA in review and approval of contractor's drawings and technical information.
- (xi) Assist NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.
- (xii) Review the contractor's health and safety plans.
- (xiii) Advice and assist NEA to develop and maintain a project quality assurance plan, and monitor contractor's designs and works are executed in line with the plan and project requirements. As and when referred by NEA speedily advise on acceptability of such designs and works, and suggest corrective measures to be undertaken.
- (xiv) Review and certify the contractor's testing and commissioning plans.
- (xv) Supervise testing and commissioning in conjunction with NEA and other team members.
- (xvi) Review, check and certify suppliers' equipment design, and approve the technical documents.
- (xvii) Witness and certify main equipment shop inspections.
- (xviii) Supervise the installation, testing and commissioning of the transmission line and substations. Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
- (xix) Review the contractor's claims for extension of time or additional costs; and prepare variation instructions and cost review; certify volume of works completed withdrawal applications and issue of monthly and final payment certificates
- (xx) Certify substantial completion and/or completion of main project components as defined in the contract documents.

21. **Line Survey Engineer (International):**

- (i) Assist the consultant team to perform a training needs assessment for counterpart staff and prepare a training program.
- (ii) Perform an on site route assessment in conjunction with the NEA survey team.
- (iii) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation survey and location matters.
- (iv) Contribute to the Inception Report
- (v) Contribute to capacity building of NEA counterpart staff.
- (vi) Assist with the preparation of project designs, documentation, bidding documents.
- (vii) Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

22. Geotechnical Engineer (International)

- (i) Assist the consultant team to perform a training needs assessment for counterpart staff and prepare a training program.
- (ii) Perform field sampling and measurements to assist in determination of site soil conditions in conjunction with other team members.
- (iii) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation geotechnical matters.
- (iv) Contribute to capacity building of NEA counterpart staff.
- (v) Contribute to the preparation of project designs, documentation, bidding documents.
- (vi) Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

23. Transmission/Substation Structural Engineer (International):

- (i) Assist the consultant team to perform a training needs assessment for counterpart staff and prepare a training program.
- (ii) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation structural matters.
- (iii) Contribute to the Inception Report
- (iv) Contribute to capacity building of NEA counterpart staff.
- (v) Assist and advise with the preparation of project design criteria for towers and substation structures, documentation, bidding documents.
- (vi) Assist NEA in evaluation of technical and financial bids to be received against ICB for engagement of turnkey contractor, preparation of bid evaluation reports, contract negotiations and draft contract agreements, and advice on submission of documents to ADB for review and approval.
- (vii) Assist NEA in review and approval of contractor's drawings and technical information.
- (viii) Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

24. Electrical Engineer - Substations (International):

- (i) Assist the consultant team to perform a training needs assessment for counterpart staff and prepare a training program.
- (ii) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation technical matters.
- (iii) Contribute to the Inception Report
- (iv) Contribute to capacity building of NEA counterpart staff.
- (v) Coordinate the preparation of project designs, documentation, bidding documents.
- (vi) Assist NEA in evaluation of technical and financial bids to be received against ICB for engagement of turnkey contractor, preparation of bid evaluation reports, contract negotiations and draft contract agreements, and advice on submission of documents to ADB for review and approval.
- (vii) Assist NEA in review and approval of contractor's drawings and technical information.
- (viii) Assist NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.
- (ix) Supervise site construction and installation works in conjunction with NEA and other team members.
- (x) Assist with the review and certify the contractor's testing and commissioning plans.
- (xi) Assist with the supervision of testing and commissioning in conjunction with NEA and other team members.
- (xii) Review, check and certify suppliers' equipment design, and approve the technical documents.
- (xiii) Witness and certify main equipment shop inspections.
- (xiv) Supervise the testing and commissioning of the substations.
- (xv) Assist with the review of contractor's claims for extension of time or additional costs; and prepare variation instructions and cost review; certify volume of works completed withdrawal applications and issue of monthly and final payment certificates
- (xvi) Assist with the certification of substantial completion and/or completion of main project components as defined in the contract documents.
- (xvii)
- (xviii) Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

25. Civil Engineer – Transmission/Substations (International):

- (i) Assist the consultant team to perform a training needs assessment for counterpart staff and prepare a training program.
- (ii) Make necessary inputs and advice to the project team and to NEA on transmission line, transmission substation, SCADA, communications and control centre technical matters.
- (iii) Contribute to capacity building of NEA counterpart staff.
- (iv) Coordinate the preparation of project designs, documentation, bidding documents.
- (v) Assist NEA in evaluation of technical and financial bids to be received against ICB for engagement of turnkey contractor, preparation of bid evaluation reports, contract

- negotiations and draft contract agreements, and advice on submission of documents to ADB for review and approval.
- (vi) Assist NEA in review and approval of contractor's drawings and technical information.
- (vii) Supervise site construction and installation works in conjunction with NEA and other team members.
- (viii) Assist with review, check and certify suppliers' equipment design, particularly with respect to foundations and bolting down, and assist, NEA in approving the technical documents.
- (ix) Assist NEA in supervising the installation, of the transmission line and substations. Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
- (x) Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

26. SCADA/Communications Engineer (International):

- (i) With the assistance of the consultant team, perform a training needs assessment for counterpart staff and prepare a training program.
- (ii) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation technical matters.
- (iii) Contribute to the Inception Report
- (iv) Assess NEA's existing SCADA and communications systems and prepare design concepts for interfacing with the transmission line and substations.
- (v) Contribute to capacity building of NEA counterpart staff.
- (vi) Coordinate the preparation of project designs, documentation, bidding documents.
- (vii) Assist NEA in evaluation of technical and financial bids to be received against ICB for engagement of turnkey contractor, preparation of bid evaluation reports, contract negotiations and draft contract agreements, and advice on submission of documents to ADB for review and approval.
- (viii) Assist NEA in review and approval of contractor's drawings and technical information.
- (ix) Assist NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.
- (x) Supervise site construction and installation works in conjunction with NEA and other team members.
- (xi) Advise and assist NEA to develop and maintain a project quality assurance plan, and monitor contractor's designs and works are executed in line with the plan and project requirements. As and when referred by EA speedily advise on acceptability of such designs and works, and suggest corrective measures to be undertaken.
- (xii) Review and certify the contractor's testing and commissioning plans.
- (xiii) Supervise testing and commissioning in conjunction with NEA and other team members.
- (xiv) Review, check and certify suppliers' equipment design, and assist EA in approving the technical documents.

- (xv) Witness and certify main equipment shop inspections.
- (xvi) Assist NEA in supervising the installation, testing and commissioning of the transmission line and substations SCADA and communication systems. Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
- (xvii) Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

27. Protection Engineer (International):

- (i) With the assistance of the consultant team, perform a training needs assessment for counterpart staff and prepare a training program.
- (ii) Make necessary inputs and advice to the project team and to NEA on transmission line and transmission substation technical and protection matters.
- (iii) Contribute to the Inception Report
- (iv) Assess NEA's existing protection systems and prepare design concepts for protection of the transmission line and substations.
- (v) Contribute to capacity building of NEA counterpart staff.
- (vi) Coordinate the preparation of project designs, documentation, bidding documents.
- (vii) Assist NEA in evaluation of technical and financial bids to be received against ICB for engagement of turnkey contractor, preparation of bid evaluation reports, contract negotiations and draft contract agreements, and advice on submission of documents to ADB for review and approval.
- (viii) Assist NEA in review and approval of contractor's drawings and technical information.
- (ix) Assist NEA with inspections and certifications of manufactured items prior to shipment and upon receipt.
- (x) Supervise site construction and installation works in conjunction with NEA and other team members.
- (xi) Review and certify the contractor's testing and commissioning plans.
- (xii) Supervise testing and commissioning in conjunction with NEA and other team members.
- (xiii) Review, check and certify suppliers' equipment design, and assist NEA in approving the technical documents.
- (xiv) Witness and certify main equipment shop inspections.
- (xv) Supervise the testing and commissioning of the transmission line and substation protection systems. Monitor project progress against plan, report on progress, and propose remedial measures as necessary.
- (xvi) Perform other functions as may be assigned or delegated by Team Leader from time to time during the time of assignment.

E. Output

28. The Consultant shall prepare an Inception Report within 6 weeks of commencement, monthly and quarterly progress reports as applicable based on field data and preparation of progress reports in a format and detail acceptable to NEA and ADB.

29. The Consultant shall maintain records documenting decisions made at meetings, progress on project implementation, financial records and changes to the contract plans. The Consultant will assist ADB in preparing a project completion report and monitoring and evaluation reports as required.

30. All documents and reports would be made available on electronic format to ADB.

31. All reports will be in English language.

TERMS OF REFERENCE
Hydro Electrical/Mechanical Engineer International Consultant
for Part C

A. OBJECTIVES AND ASSIGNMENT

36. Part C of the project loan will be implemented by the Nepal Electricity Authority (NEA) and covers package of Rehabilitation of Tinau (1MW) and Sundarijal (640kW) hydropower stations.

37. Tinau hydropower station comprises two 250kW turbines and generators plus one 500kW turbine and generator, including a 2.4km tunnel and with an underground silting chamber and powerhouse, near Butwal. The station was commissioned in 1978 but after flood damage, was re-commissioned in 1983.

38. Sundarijal hydropower station comprises two 340kW pelton turbines and synchronous generators fed from a 1.7km steel penstock, situated 15km northeast of Kathmandu. The station has been in operation since 1935 and has had minor upgrades to some electrical and mechanical aspects during its operational life. The penstock and station flows are part of the water supply system to Kathmandu.

39. The assignment of the consultant will be to assist NEA in defining the projects, preparing preliminary designs, assuring that all steps are undertaken properly, so that the completed projects will deliver the quality, capacity, performance, reliability and economic life required. The assistance covers preparing technical specifications and bidding documents; support of the tendering process and bid evaluation; review and approval of contractor's detailed design information, supervision of construction from the owner's perspective; and supervision of the testing and commissioning of the hydro stations from the owner's perspective; and handing over the completed projects including issuance of provisional acceptance certificates and final acceptance certificates. In addition, the Consultant shall work closely with the NEA Project Management Unit (PMU), the Project Manager and NEA's specialized departments and business groups, through all stages of the assignment and provide capacity building and training for NEA counterpart professional staff and local community representatives.

B. SCOPE OF WORK

5. The Consultant shall provide the following services including, but not be limited to the following:

a. Preparation of Needs Assessment

- (i) Develop a full understanding of project requirements through discussion with NEA;
- (ii) Review of all project proposals, reports, drawings and plans prepared by or for NEA and related to the proposed rehabilitation projects;
- (iii) Conduct necessary additional analyses and calculations for the projects to ensure that the proposed work meets all NEA overall requirements and current and future technical requirements. This is particularly relevant in relation to interconnection with surrounding networks, as networks have expanded and changed considerably since

- the hydro stations were originally designed. There is also a need to ensure that the rehabilitation is undertaken in a cost effective manner and to ensure that budgetary ceilings are taken into account;
- (iv) Visit each hydropower station and obtain data necessary for rehabilitation works preliminary designs, which shall include electrical, mechanical, civil, building and hydraulic aspects;
 - (v) Discuss station operational issues, maintenance issues, rehabilitation requirements and training requirements with station staff. It may also be necessary, with the assistance of station staff, to discuss training requirements with local community representatives;
 - (vi) Prepare notes of the station visits and discuss these with the relevant departments within NEA;
 - (vii) Conduct comprehensive cost benefit analysis on two scenarios: (i) replacement of part equipment; (ii) replacement whole set of equipment, taking into account the current technology status of hydropower E&M, the availability of such E&M in the market, environmental impact etc., and select the scenario which will maximize the benefit;
 - (viii) Prepare feasibility study documents, incorporating scenarios assessment, design and rehabilitation concepts, project descriptions, definitions of works required and preliminary cost estimates.

b. Preparation of Technical Specifications and Bidding Documents

6. The Consultant shall prepare technical specifications and bidding documents, including, but not limited to the following:

- (i) Concepts from the feasibility reports into preliminary designs, including simplified A4 drawings for equipment and powerhouse layouts and written definitions of scope and technical parameters. NEA will provide assistance in the preparation of drawings;
- (ii) Descriptions of the key technical parameters, equipment and works for rehabilitation;
- (iii) Specifications for equipment to be manufactured or refurbished;
- (iv) Detailed definitions of electrical, mechanical and civil works to be undertaken, including relevant drawings showing dimensions and any constraints on physical size;
- (v) Preliminary bills of materials and works quantities;
- (vi) Recommendations on contract arrangements;
- (vii) Prepare bidding documents including employer's requirements, technical specifications, performance specifications, schedules, and drawings for bidding of the hydro stations on a turn-key basis.

c. Support in the Bidding Process

7. The Consultant shall review NEA's approach and schedule for the bidding process and provide comments and recommendations on the approach, activities, schedule, organization, and responsibilities. The Consultant will assist NEA through the bidding process including the following activities.

- (i) Assist NEA in clarifying queries from prospective bidders during the bidding period;
- (ii) Carry out technical and financial evaluation of bids received and submit bid evaluation reports to NEA; and
- (iii) Assist NEA in contract negotiations and finalize contract documents.

d. Supervision

8. The turnkey contracts will cover manufacture and supply of equipment, repairs and installation, testing and commissioning of the hydro stations. The Consultant shall provide oversight of all aspects of the project in order to assure that they are conducted properly. This includes assisting in developing and implementing a quality assurance program for manufacture, review and approval of design, monitoring schedule, inspection of equipment and materials upon arrival and upon installation, other site works and review of documents to assure quality of delivered goods, comparison of as-built drawings to design, and addressing shortcomings in any of these areas.

g. Testing and Commissioning

9. All new equipment and components of the stations will be subject to an acceptance test to demonstrate their capability to meet warranted design criteria. Tests shall also include full station operational, functional and performance tests, in accordance with international standards, to ensure that new equipment and overall systems perform in accordance with specified requirements.

10. For each test, the Consultant shall review the contractor's test procedures for compliance with manufacturers' requirements and design criteria. The Consultant shall witness the tests and review the test results. If test results are not satisfactory, the consultant shall ensure require that any lack of compliance is addressed and that the equipment and overall systems shall be re-tested until compliant results are achieved.

11. During the commissioning phase, the Consultant shall provide training on the testing and commissioning of all aspects of the project. The Consultant shall assist NEA and coordinate with the Contractors in addressing any issues with the project components that are unsatisfactory. At the end of this period, and when all acceptance tests have been completed to the Consultant's satisfaction, the Consultant shall advise NEA that the construction is complete and all the project components are ready to be declared fully operational.

12. The Consultant shall also prepare and recommend provisional taking over certificates whenever due for the works or part of the works and alert NEA of work deficiencies and outstanding items, if any. The Consultant shall also confirm the remedial measures taken by the contractor, and recommend a final taking over certificate after expiry of the warranty period.

f. Capacity Building

13. During the first visit to Nepal, the Consultant shall perform a skills assessment and develop a training program for NEA counterpart staff and local communities from the vicinity of each station. The NEA counterpart staff will assist the consultant during all phases of the project. The Consultant will be expected to work closely with the NEA staff and shall ensure

that the NEA staff and local community personnel achieve higher skill levels as a result of project involvement.

C. EXPERTISE AND PERSON-MONTHS

14. It is expected that about 8 person-months of international consulting services will be needed from an individual who has specialized experience in small hydro power plants. NEA will provide counterpart staff from the relevant business groups and the power stations in accordance with the requirements for the different stages of the projects.

Table 1: Indicative Expertise and Person-Months

Expertise	International Consultants (pm)	NEA Counterpart Staff (minimum pm)
Hydro Electrical/Mechanical Engineer	8	16
TOTAL pm	8	16

D. QUALIFICATION/EXPERIENCE OF CONSULTANT

15. **Hydro Electrical/Mechanical Engineer (International):** With at least Bachelor's degree in electrical or mechanical engineering and minimum 15 years' experience in hydropower station projects, 5 of which have been internationally in projects for developing countries. The Consultant shall have comprehensive previous experience and knowledge of electrical and mechanical systems on projects of similar type to the Tinau and Sundarijal projects and shall also have an understanding of the civil engineering, hydraulic and hydrology aspects of hydro stations. Proven people skills including training experience are important. Experience shall cover hydro station design, specification, construction, testing and commissioning plus hydro rehabilitation projects.

16. It is expected that the Consultant will visit Nepal over a period of approximately 24 months, with an initial visit including field visits, skills assessment, preparation of a training program, preparation of the feasibility studies and bid documentation, then short visits for the remainder of the project until commissioning is completed.

E. OUTPUT

17. The Consultant shall prepare an Inception Report within 4 weeks of commencement, monthly and quarterly progress reports as applicable based on field data and preparation of progress reports in a format and detail acceptable to NEA and ADB.

18. The Consultant shall maintain records documenting decisions made at meetings, progress on project implementation, financial records and changes to the contract plans. The Consultant shall assist ADB in preparing a project completion report and monitoring and evaluation reports as required.

19. All documents and reports would be made available on electronic format to ADB.

20. All reports will be in English language.