



Concept Paper

Project Number: 50059-002
July 2016

Proposed Loan and Technical Assistance Grant NEP: Power Transmission and Distribution Efficiency Enhancement Project

CURRENCY EQUIVALENTS

(as of 14 July 2016)

Currency unit = Nepali rupee/s (Rs)

Rs1.00 = \$0.0093220

\$1.00 = Rs107.2720

ABBREVIATIONS

ADB	–	Asian Development Bank
kV	–	kilovolt
MW	–	megawatt
NEA	–	Nepal Electricity Authority
SPS	–	Safeguards Policy Statement

NOTES

- (i) The fiscal year (FY) of the Government of Nepal and its agencies ends on 15 July. "FY" before a calendar year denotes the year in which the fiscal year ends, e.g., FY2015 ends on 15 July 2015.
- (ii) In this report, "\$" refers to US dollars.

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PROJECT AT A GLANCE

1. Basic Data		Project Number: 50059-002	
Project Name	Power Transmission and Distribution Efficiency Enhancement Project	Department /Division	SARD/SAEN
Country	Nepal	Executing Agency	Nepal Electricity Authority (NEA)
Borrower	Government of Nepal		
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Energy	Energy efficiency and conservation		100.00
		Total	100.00
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation (\$ million)	100.00
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	CO ₂ reduction (tons per annum)	10,000
	Urban environmental improvement	Climate Change impact on the Project	Low
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Client relations, network, and partnership development to partnership driver of change	Some gender elements (SGE)	✓
Knowledge solutions (KNS)	Institutional systems and political economy		
Partnerships (PAR)	Application and use of new knowledge solutions in key operational areas		
Private sector development (PSD)	Implementation		
	Private Sector		
	Public sector goods and services essential for private sector development		
5. Poverty Targeting		Location Impact	
Project directly targets poverty	No	Urban	High
6. Risk Categorization:	Low		
7. Safeguard Categorization	Environment: B	Involuntary Resettlement: B	Indigenous Peoples: C
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		100.00	
Sovereign Project loan: Asian Development Fund		100.00	
Cofinancing		0.00	
None		0.00	
Counterpart		25.00	
Government		25.00	
Total		125.00	
9. Effective Development Cooperation			
Use of country procurement systems		Yes	
Use of country public financial management systems		Yes	

I. THE PROJECT

A. Rationale

1. **Proposed project:** The Asian Development Bank (ADB) will provide a loan to the Government of Nepal (the government) to meet the immediate needs of electricity distribution network in Kathmandu Valley and strengthening of associated transmission lines by the Nepal Electricity Authority (NEA).¹ Major sections of the existing distribution network in the valley were constructed decades ago and despite significant increase in electricity demand and the number of consumers, minimal reinforcement of the distribution network has been carried out.² The project will enhance the distribution capacity and improve reliability and quality of electric supply in the Kathmandu Valley by reducing distribution system overloads and technical and commercial losses, which currently is about 20%. The project will also support implementation of other system efficiency upgrades and energy efficiency measures such as advanced grid operations software, distribution system automation, and smart metering. System efficiency improvements and loss reductions will improve NEA's financial health, while customers will benefit from a reliable and improved quality of electricity supply and reduced dependence on diesel generators to meet their daily electricity needs. Operational upgrades will also facilitate integration of new generation capacity scheduled to come on-line during the next three to four years. The project can be replicated in other cities in the country.

2. **Demand and supply situation in Kathmandu Valley:** Kathmandu Valley with electricity supply of about 400 MW only accounts for approximately 400,000 consumers or about 16% of NEA's total consumers in the country, and contributes to about 27% of the total revenue generated from the sale of electricity. These consumers are served through 10 distribution centers located at various places. Kathmandu Valley is served by distribution networks comprising of 11 kilovolt (kV) primary feeders and 0.4kV secondary distribution networks. The energy demand of the valley for FY 2014–2015 stood at 1,300 gigawatt hour (GWh) and is rising at the rate of more than 10% per year. More recently, the cooking load has grown significantly in Kathmandu Valley due to lack of liquefied petroleum gas and is estimated at 200 MW. This trend is still continuing, with demand in the Kathmandu Valley expected to exceed 2,500 MW in the near future.

3. **Alignment with government priorities and sector challenges:** Electricity is a necessary requirement for accelerating the economic development of any country and is considered an important input to improve quality of life. Overall, the electricity demand has far outgrown the supply, leading to load curtailment and increased dependence on imports from India in recent times. The peak suppressed demand in Nepal in FY2013–2014 has been around 1,200 megawatt (MW) as against installed capacity of 787 MW, hence resulting in a deficit of about 440 MW due to non-availability of generation. Government has plans to generate additional 10,000 MW in the next 10 years. About 63% of the population in Nepal has access to electricity but the supply quality is unreliable and inadequate. The government has recognized the immediate need for reinforcement and upgrade of outdated distribution systems crucial to deliver the required energy to the customers even if the generation and transmission lines are in place. In this regard, the need for immediate distribution network enhancement is included in the government's action plan to address energy crisis and provide universal access to reliable and

¹ The government requested ADB's financial assistance as an addition to the country operations business plan 2016–2018 and expedite the processing for approval within 2016. NEA has implemented several ADB projects and few are under implementation such as L2808-NEP; G0270/G0271-NEP: Electricity Transmission Expansion and Supply Improvement Project; L3139-NEP: SASEC Power System Enhancement Project..

² The last planned systematic reinforcement was carried out about 15 years ago with the assistance from Japan International Cooperation Agency.

efficient electricity for all by 2030. This will contribute in promoting sustainable energy for all (Sustainable Development Goal #7) and Nepal’s Intended Nationally Determined Commitments for the United Nations Framework Convention on Climate Change.

4. **Alignment with ADB priorities:** ADB’s Nepal country partnership strategy 2013–2017 supports the government’s development objective of accelerated and inclusive economic growth. It seeks to address the infrastructure bottlenecks in the key areas such as energy services and creating an enabling environment for increased business and employment opportunities. ADB’s support for the energy sector in Nepal has largely focused on generation and transmission with some distribution extension. This project will be ADB’s first investment in Nepal specifically targeting energy efficiency through distribution system enhancements measures.³

B. Impact, Outcome, and Outputs

5. The project’s impact will be reliable and efficient electricity for all achieved, aligned with the Government of Nepal’s action plan to address energy crisis in the country.⁴ The project’s outcome will be improved access to efficient, adequate and good quality of power supply in Kathmandu Valley. This will be achieved through the following outputs: (i) transmission grid capacity reinforcement to feed the primary distribution networks for Kathmandu Valley; (ii) Kathmandu Valley distribution network capacity increased; and (iii) operational and financial performance of NEA distribution centers enhanced. Capacity building of NEA staff to operate and manage advanced distribution system, intelligent energy network (“smart grid”) technology⁵ and end-user awareness programs will be conducted. Preliminary design and monitoring framework is given in Appendix 1. Problem tree is in Appendix 2.

C. Investment and Financing Plans

6. The Government of Nepal has requested a loan equivalent to \$100 million from ADB to finance the project and will provide the remaining funds required to implement the project. A project loan financing modality is considered for this project.

Table 1: Tentative Financing Plan

Source	Amount (\$ million)	Share of total (%)
Asian Development Bank	100.0	80.0
Government of Nepal and Nepal Electricity Authority	25.0	20.0
Total	125.0	100.0

Sources: Asian Development Bank staff estimates based on discussions with Nepal Electricity Authority; and Ministry of Energy.

D. Indicative Implementation Arrangements

7. NEA will serve as the executing agency and will implement all activities under the ADB loan. It will be implemented and supervised by the project management unit under the Project

³ An earlier project included components for more efficient lighting (CFL promotion) and demonstration of roof-top solar systems.

⁴ Government of Nepal. 2016. *National Energy Crisis Reduction and Electricity Development*. http://www.moen.gov.np/pdf_files/Rastriya-Urja-Sankat-Niwaran-2072.pdf

⁵ Project preparation will be supported by a PPTA which will focus on due diligence, including assisting NEA in developing a medium to long term plan of distribution system enhancement in the valley. The PPTA will evaluate a variety of options including upgrading existing grid control software to improve operational efficiency and security. Smart grid options include: automated demand response, advanced metering infrastructure, distribution automation systems, substation automation, and dynamic line ratings.

Management Directorate of NEA. NEA will assign a dedicated team headed by the Project Director for this project. Project Supervision Consultant will be hired to support NEA in implementing the project. All consultants will be engaged in accordance with the Guidelines on the Use of Consultants (2013, as amended from time to time). As requested by NEA, advance contracting and retroactive financing will be considered, subject to a ceiling of 20% and a time limit of not more than 12 months prior to the date of the respective loan agreement. ADB's Procurement Guidelines (2015, as amended from time to time) will be followed.

8. The project is expected to be completed by December 2021. Turnkey contracts will be tendered for project implementation. The total time for project implementation after loan effectiveness is estimated at four years for detailed design, engineering, tender preparation, evaluation, and contract award. Construction activities will require 36 months to complete. The government will also set up a high level coordination committee representing key government agencies and other stakeholders to ensure proper coordination during implementation of this project.

II. DUE DILIGENCE REQUIRED

9. Expected due diligence will include the following:

- (i) **Sector and Technical.** The project outputs will be further discussed and refined to ensure logical prioritization of system loss reductions, demand side management, and smart grid introduction in parallel with ongoing tariff evolution and cater future electricity demand growth. Viability of upgrading distribution system to 22kV, use of advanced transformers, smart meters, and other smart grid elements will be carefully assessed. Quantification of benefits in efficiency gains, technical and commercial loss reduction, and greenhouse gas reduction etc. will also be determined. The project will also be assessed to ensure that the energy efficiency investments are climate resilient, in accordance with ADB procedures.
- (ii) **Economic and financial.** The projects economic and financial viability and financial sustainability will be assessed in accordance with ADBs guidelines for the economic analysis and financial due diligence of projects. This will include review of NEA's medium-term business plan and its projected financial performance.
- (iii) **Governance.** The financial management, procurement, anticorruption and integrity, policy and legal capacity, and general portfolio management capability of NEA will be assessed. Financial Management Assessment will also consider assessments and results of other similar projects with NEA.
- (iv) **Safeguards.** Safeguards assessments will be conducted for environment, involuntary resettlement, and indigenous peoples in accordance with ADB's Safeguards Policy Statement (SPS) 2009. Environment safeguards due diligence includes preparation of an initial environment examination incorporating an environment management plan in accordance with SPS 2009.⁶ For social safeguards, assessments will be undertaken and if there are social safeguards impacts, resettlement plans and indigenous peoples development plans will be prepared in accordance with SPS 2009.
- (v) **Poverty and Social.** Due diligence will be carried out to assess the anticipated impact of the project on household expenditure, particularly the poor households;

⁶ The potential environmental impacts are predictable, localized, temporary, and reversible, and can be readily mitigated with good engineering practices; environment Category B is therefore appropriate. Climate risk is low; the project should result in improved climate resilience in the distribution network in the Kathmandu Valley.

identify other social benefits and risks; as well as explore possible entry points for gender mainstreaming.

III. PROCESSING PLAN

A. Risk Categorization

10. Project risk is proposed to be categorized as “low” for the following reasons: (i) the project loan does not exceed \$200 million; (ii) ADB has a positive record of energy sector interventions in Nepal; (iii) the executing agency has reasonably good experience with externally financed project administration, including implementing similar projects financed by a development partner; and (iv) the project safeguard categorization is expected to be B for environment, B for involuntary resettlement, and C for indigenous peoples.

B. Resource Requirements

11. Staff requirements for project processing involve the South Asia Energy Division and Nepal Resident Mission teams, and require about 10 person-months of effort. Experts’ inputs of 31 person-months of international and 46 person-months of national consulting services will also be required in the areas of system planning, smart grids, economic and financial analysis, safeguard, and procurement. For the project preparation and capacity development, \$1,500,000 will be financed on a grant basis by the Clean Energy Fund⁷ under the Clean Energy Financing Partnership Facility and project preparatory technical assistance is included in Appendix 3.

C. Processing Schedule

12. The proposed project processing schedule is described in Table 2.

Table 2: Proposed Processing Schedule

Milestones	Expected Completion Date
Concept paper approval	July 2016
Loan fact finding	September 2016
Staff Review Meeting	October 2016
Loan Negotiations	November 2016
Board Approval	January 2017
Loan Effectiveness	March 2017

IV. KEY ISSUES

13. The key issues for the project at this stage include the following:

- (i) **Implementation capacity.** It will be important for NEA to assure sufficient and capable staff resources allocated for this project. Similarly, status of electricity generation and other transmission projects will also be assessed without which the utilization of the rehabilitation and modernization network will not be maximized.
- (ii) **Broader energy efficiency measures.** The distribution system upgrades must be complemented by other operational efficiency enhancements and broader energy efficiency measures such as policy and regulatory reforms which are under discussion.

⁷ Financing partners: the Governments of Australia, Norway, Spain, Sweden and United Kingdom.

PRELIMINARY DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with			
Reliable and efficient electricity for all by 2030 (National Energy Crisis Reduction and Electricity Development) ^a			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
<p>Outcome Access to efficient, adequate and quality power supply in Kathmandu Valley improved</p>	<p>By 2022:</p> <p>a. XX number of customers with 24/7 electricity supply</p> <p>b. System losses reduced to 10% (2015 baseline: 20%)</p> <p>c. Aggregate greenhouse gas emissions reduced by XX tCO₂-eq per year (2015 baseline: 0)</p>	<p>a-c NEA reports</p>	<p>Implementation of planned energy generation and transmission projects are delayed.</p> <p>Slow adoption of smart meters.</p>
<p>Outputs</p> <p>1. Transmission grid capacity to feed the primary distribution networks for Kathmandu Valley strengthened</p> <p>2. Kathmandu Valley distribution network capacity increased</p> <p>3. Operational and financial performance of NEA distribution</p>	<p>By 2020:</p> <p>1a. New 220/132kV 160 MVA and 132/22/11kV 45 MVA substations installed to complete the New Khimti-Kathmandu transmission link</p> <p>1b. 8 km of overhead and 2 km of underground transmission line installed to complete 132kV double circuit transmission ring around the Kathmandu Valley</p> <p>1c. 3 new 132/22/11kV substations established in Kathmandu Valley</p> <p>By 2021:</p> <p>2a. 1,200 km of new 22kV feeders constructed</p> <p>2b. 600 km 11kV feeders and 0.4kV distribution lines reconfigured and upgraded</p> <p>2c. Total capacity of XX distribution transformers increased to 600 MVA (2016 baseline: XX MVA)</p> <p>By 2021:</p> <p>3a. XX meters converted to smart meters and</p>	<p>1a-c. NEA reports</p> <p>2a-c. NEA reports</p> <p>3a-c. NEA reports</p>	<p>Significant delay in implementation due to political and security situation.</p>

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
centers enhanced	established distribution of SCADA system 3b. Smart metering operational and maintenance services started by XX local private sector company(ies) 3c. XX number of NEA staff trained (at least 30% female) on new technologies, operational, financial management and medium– to long–term distribution efficiency enhancement program		
Key Activities with Milestones			
1. Transmission grid capacity to feed the primary distribution networks for Kathmandu Valley strengthened			
1.1 New 220/132kV 160 MVA and 132/22/11kV 45 MVA substations to complete the New Khimti-Kathmandu transmission link by December 2020			
1.2 8 km of overhead and 2 km of underground transmission line to complete 132kV double circuit transmission ring around the Kathmandu Valley by December 2020			
1.3 3 new 132/22/11kV substations in Kathmandu Valley by December 2020			
2. Kathmandu Valley distribution network capacity increased			
2.1 Construction of 1,200 km of new 22kV feeders by December 2021			
2.2 Reconfiguration and upgrading of 600 km 11kV feeders and 0.4kV distribution lines by December 2021			
2.3 Capacity augmentation of XX distribution transformers with more efficient ones with total estimated capacity of 600 MVA by December 2021			
3. Operational and financial performance of NEA distribution centers enhanced			
3.1 Change/introduce XX smart meters and other smart grid elements in the distribution system by December 2021			
3.2 Conduct capacity assessment, training needs by December 2019			
3.3 Carry out training and capacity building activities by December 2017			
Inputs			
ADB: \$100 million loan			
Government: \$25 million			
Assumptions for Partner Financing			
Not Applicable			

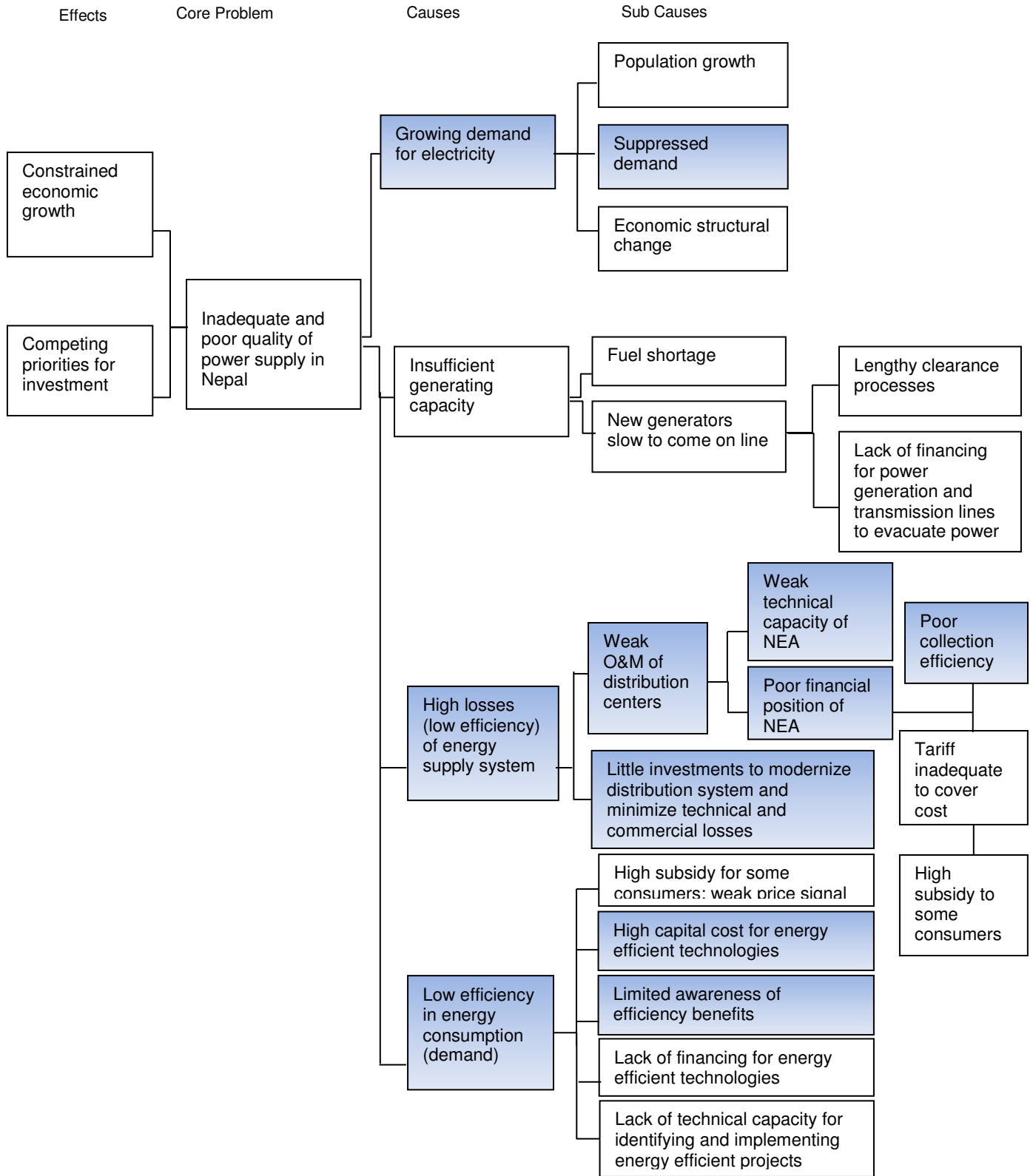
ADB = Asian Development Bank; CO₂ = carbon dioxide; km = kilometer; kV = kilovolt; kWh = kilowatt hour; NEA = Nepal Electricity Authority; MVA = megavolt ampere; MW = megawatt, SCADA = supervisory control and data acquisition system.

^a Government of Nepal. 2016. *National Energy Crisis Reduction and Electricity Development*. http://www.moen.gov.np/pdf_files/Rastriya-Urja-Sankat-Niwaran-2072.pdf; National Planning Commission. 2015. *Sustainable Development Goals 2016–2030*. National Preliminary Report. http://www.npc.gov.np/images/download/23rd_Jan_final_for_print_Sustainable_Development_Goals.pdf

Note: Unless otherwise indicated, output indicators are incremental with zero baseline.

Source: Asian Development Bank.

PROBLEM TREE



NEA = Nepal Electricity Authority, O&M = operation and maintenance.

PROJECT PREPARATORY TECHNICAL ASSISTANCE
(Power Transmission and Distribution Efficiency Enhancement Project)

A. Justification

1. A technical assistance (TA) is required to conduct due diligence on the proposed loan from the Asian Development Bank (ADB) and to support the implementation of the ensuing project. The TA will conduct project due diligence covering technical, economic, financial, procurement, and social and environmental safeguards as well as preparing medium to long term planning for the electricity distribution enhancement in Kathmandu Valley. It will include some capacity development support essential to prepare for and expedite implementation.

B. Major Outputs and Activities

2. The outputs of the TA are (i) a fully prepared loan, including completed social and environmental analysis, technical, economic and financial due diligence; (ii) a capacity building support to the Nepal Electricity Authority (NEA) staff on using advanced and smart distribution technologies, improving operational and financial performance of the distribution centers, and medium- to long-term distribution planning document, including opportunities for expanding distribution enhancement in other parts of the country.

3. The major outputs and activities of the TA are summarized in Table A3.1.

Table A3.1: Summary of Major Outputs and Activities of the TA

Major Activities	Expected Completion Date	Major Outputs	Expected Completion Date
1. Fielding consultants	July 2016	Deliverable 1: Inception Report	August 2016
2. Conduct due diligence	August 2016	Deliverable 2: Progress Report	September 2016
3. Finalize summary of recommendations	September 2016	Deliverable 3: Progress Report	December 2016
4. Assessment of operational and financial performance of distribution centers and undertake capacity building activities	December 2017	Final Report	December 2019

Source: Asian Development Bank estimates.

C. Cost Estimate and Proposed Financing Arrangement

6. The TA is estimated to cost \$1,600,000 equivalent, of which \$1,500,000 will be financed on a grant basis by the Clean Energy Fund¹ under the Clean Energy Financing Partnership Facility, and \$100,000 will be provided by NEA as counterpart support in the form of counterpart staff, provision of office space, communication facilities for consultants, and other in-kind contributions. The detailed cost estimate is presented in Table A3.2.

¹ Financing Partners: the Governments of Australia, Norway, Spain, Sweden, and United Kingdom.

Table A3.2: Cost Estimates and Financing Plan
(\$'000)

Item	Total Cost	
Clean Energy Fund^a under the Clean Energy Financing Partnership Facility		
1. Consultants		
a. Remuneration and per diem		
i. International consultants (31 person-months)	615.0	
ii. National consultants (46 person-months)	185.0	
b. International and local travel	280.0	
2. Surveys and studies	40.0	
3. Equipment ^b	35.0	
4. Workshops, training, seminars, and conferences ^c	175.0	
5. Miscellaneous administration and support costs	20.0	
6. Contingencies	150.0	
Total	1,500.0	
^a Financed by the Clean Energy Fund under the Clean Energy Financing Partnership Facility (\$1,500,000).		
^b Equipment		
Type	Quantity	Cost
Computers, printers, software, etc.	TBD	\$35,000.00
^c Workshops, training, seminars, and conferences		
Purpose	Venue	
Capacity building activities	National and international events	

Source: Asian Development Bank estimates.

D. Consulting Services

7. The TA will require 31 person-months of international consultants and 46 person-months of national consultants. Consultants will have expertise in the areas of system planning, transmission, distribution, smart grids, supervisory control and data acquisition system (SCADA), economic and financial analysis, social and environmental safeguard, and procurement. ADB will hire consultants through a firm using quality- and cost-based selection process (90:10). Some individual consultants with expertise in areas such as intelligent energy network technologies, geographic information systems, safeguards, finance and economics may be recruited in instances where pre-existing knowledge of local conditions is required and the firm may not be able to rapidly mobilize experts with relevant expertise. Output-based (lump-sum) contracts will be considered for all consulting services where possible. Consultants' selection will be done in accordance with the Guidelines on the Use of Consultants (2013, as amended from time to time). The proceeds of the TA will be disbursed in line with ADB's Technical Assistance Disbursement Handbook (May 2010, as amended from time to time). Table A3.3 summarizes the requirements for consulting services for both phases.

Table A3.3: Summary of Consulting Services Requirement

International Name of Positions	Person- months	National Name of Positions	Person- months
Power System Specialist (Distribution)	6.0	Power System Expert (Distribution)	8.0
Power System Specialist (Transmission)	4.0	Power System Expert (Transmission)	8.0
Power System Specialist (Substation)	5.0	Power System Expert (Substation)	3.0
Power System Specialist (Smart Grid)	3.0	Power System Expert (Smart Grid)	2.0
Procurement Specialist	3.0	Procurement Expert	3.0
Economist/Financial Specialist	3.0	Economist/Financial Expert	3.0
Structural Engineer	2.0	Structural Engineer	3.0
Environmental Specialist	2.0	Environmental Expert	8.0
Social Development Specialist	3.0	Social Development Expert	8.0
Total:	31.0	Total:	46.0

Source: Asian Development Bank staff estimates.

8. The outline terms of reference for the TA consultants are described below.

Position	Summary Tasks	Qualification
Power System Specialist: Distribution (International: 6 person-months; National: 8 Person-months)	<ul style="list-style-type: none"> • Review NEA's existing distribution system in Kathmandu Valley and their plans for upgrade. • Conduct due diligence on the proposed upgrades in the distribution system such as distribution automation, advanced transformers and help define scope, cost etc. • Lead preparation of the medium-to long-term distribution efficiency enhancement plan • Provide training and support on the new technologies. 	Minimum 10 years of experience working in electricity distribution system
Power System Specialist: Transmission (International: 4 person-months; National: 8 Person-months)	<ul style="list-style-type: none"> • Review NEA's existing transmission system for Kathmandu Valley and their plans for upgrade. • Conduct due diligence on the proposed upgrades required in the transmission line and help define scope, cost, etc. • Support preparation of the medium- to long-term distribution efficiency enhancement plan • Provide training and support on the new technologies. 	Minimum 10 years of experience working in electricity distribution and transmission system
Power System Specialist: Substation (International: 5 person-months; National: 3 Person-months)	<ul style="list-style-type: none"> • Review NEA's existing substations in Kathmandu Valley and their plans for upgrade. • Conduct due diligence on the proposed upgrades required in the substations such as substation automation and help define scope, cost etc. • Support preparation of the medium- to long-term distribution efficiency enhancement plan • Provide training and support on the new technologies. 	Minimum 10 years of experience working in electricity distribution system
Power System Specialist: Smart Grid (International: 3 person-months; National: 2 Person-months)	<ul style="list-style-type: none"> • Review NEA's existing remote monitoring system, metering system in Kathmandu Valley and their plans for upgrade. • Evaluate possibility for upgrading existing grid control software to improve operational efficiency and security. • With other experts, assess various smart grid options including but not limited to automated demand response, advanced metering infrastructure, distribution automation systems, substation automation and dynamic line ratings. • Support preparation of the medium- to long-term distribution efficiency enhancement plan • Provide training and support on the new smart grid technologies. 	Minimum 10 years (and minimum of 3 years of experience for national expert) of experience working in smart grid technologies in the electricity distribution system (The international and national experts may be recruited under individual contracts.)
Procurement Specialist (International, 3 person-months, National 3 person-months)	<ul style="list-style-type: none"> • Review NEA's procurement system and draft risk assessment and mitigation measures. • Identify areas for further assessment or modification. 	10 years of experience handling procurement in the public sector; including with MDB guidelines.
Economist/Financial Specialist (International, 3 person-months)	<ul style="list-style-type: none"> • Review and finalize cost estimates and project financial viability following ADB's requirements. • Conduct economic analyses following ADB's guidelines. • Design the fund flow and disbursement 	Extensive experience in financial and economic modeling of energy projects for MDBs.

Position	Summary Tasks	Qualification
	<p>mechanisms for the project and assess capacity to manage the imprest fund and/or SOE procedures proposed under the project.</p> <ul style="list-style-type: none"> • Prepare financing plan, project financial evaluation, entity financial analysis and financial management assessment. • Conduct tariff analyses, including proposing policy dialogue and preparing action plans should tariff adjustment be necessary • Support preparation of the medium– to long–term distribution efficiency enhancement plan • Providing training on financial management. 	(The international expert may be recruited under individual contract. The position may be split into 2 separate consultants if no suitable person found.)
Structural Engineer (International, 2 person-months, and national 3 person-months)	<ul style="list-style-type: none"> • Review the design of transmission and distribution towers and poles, and other structures and provide inputs for technical specifications. 	Minimum of 10 years of experience
Environmental Specialist (International, 2 person-months, and national, 8 person-months)	<ul style="list-style-type: none"> • Review feasibility studies and conduct site visits to assess conformity with ADB Safeguard Policy Statement 2009 and Government requirements for ADB loan. • Prepare an IEE incorporating an EMP in accordance with SPS 2009 and EHS guidelines for transmission and distribution lines • Prepare other documents/templates, as required, to facilitate compliance with environmental requirements during project implementation. 	<p>10 years of experience (and 3 years for national) preparing and reviewing initial environmental examinations for energy projects, including for ADB.</p> <p>(The international and national experts may be recruited under individual contracts.)</p>
Social Development Specialist (International, 3 person-months, and national, 8 person-months)	<ul style="list-style-type: none"> • Conduct a socioeconomic analysis. • Undertake detailed due diligence on involuntary resettlement and indigenous peoples as per SPS 2009. • Help prepare all required social safeguard documents ensuring conformity with ADB policy and government guidelines. • Identify possible entry points for gender mainstreaming. • Support preparation of the medium– to long–term distribution efficiency enhancement plan • Assist NEA in developing consumer awareness programs related to the project. 	<p>10 years of relevant experience (and 3 years for national), including with ADB.</p> <p>(The international and national experts may be recruited under individual contracts.)</p>

ADB = Asian Development Bank, EHS = environmental health safety, EMP = environmental management plan, IEE = initial environmental examination, MDB = multilateral development bank, NEA = Nepal Electricity Authority, SPS = Safeguards Policy Statement.

E. Implementation Arrangements

9. NEA will be the executing agency for the TA. In-kind contributions would be provided by the government and NEA. The TA will be implemented from July 2016 to December 2019. The disposal of all equipment procured under the TA will follow ADB's disposal and turnover procedures. The proposed TA processing and implementation schedule is listed in Table A3.4.

Table A3.4: Technical Assistance Processing and Implementation Schedule

Major Milestones	Expected Completion Date
Concept paper approval	July 2016
Consultant recruitment start	July to August 2016
Inception report	September 2016
Progress report	October 2016
Progress report	October 2017
Progress report	October 2018
Final report and physical completion of TA	December 2019

TA = technical assistance.

INITIAL POVERTY AND SOCIAL ANALYSIS

Country:	Nepal	Project Title:	Power Transmission and Distribution Efficiency Enhancement Project
Lending/Financing Modality:	Project Loan	Department/Division:	SARD/SAEN

I. POVERTY IMPACT AND SOCIAL DIMENSIONS

A. Links to the National Poverty Reduction Strategy and Country Partnership Strategy

Approximately 25.2% of Nepalese live below the poverty line. Sustaining Nepal's recent strong growth trends requires addressing the infrastructure deficit plaguing the country, including the power deficit. In FY2015, per capita electricity consumption in Nepal was 132 kilowatt hours (kWh) per year which is one the lowest in South Asia.^a Global average per capita electricity consumption is 2,971 kWh.^b This low average usage reflects, in part, that only 58% of Nepal's households are connected to the national grid. The government plans to provide reliable and affordable energy supply to all of its population latest by 2030.

This project is aligned with the energy priorities in the Asian Development Bank's (ADB) Nepal country partnership strategy 2013–2017. The project will improve energy efficiency in the electricity distribution system. Since the majority of Nepalese still do not have access to reliable electricity supply, the project will result in reduced fossil fuel use, greenhouse gas emissions, and associated adverse health impacts. In addition to improved environmental sustainability, the project will reduce the financial losses incurred by the Nepal Electricity Authority (NEA). NEA is required to provide power at highly subsidized prices to some consumers, and collection efficiency among these consumers might also be low. The project targets reducing technical and commercial losses and improve the quality of services to the consumers, both of which will improve the financial position of NEA.

Improving the financial position of NEA supports the longer-term evolution of Nepal's power system into one that performs well and serves the needs of all. The generally weak position of NEA and greater focus on generation and transmission has been cited as a cause of deferred distribution system upgrades in addressing supply of quality and reliable power supply.

The project will also result in increased use of energy efficient smart grid technologies. Already, NEA has seen the price of efficient technologies such as smart meters come down with competitive procurement. Poor consumers will benefit through greater use of reliable grid electricity instead of using kerosene and other sources of energy. Raising consumer awareness and creating savings for consumers is critical because the project is being undertaken during a time when increasing attention is being paid to tariff rationalization. Successful project outcomes can be extended to other cities of Nepal.

B. Poverty Targeting

General Intervention Individual or Household (TI-H) Geographic (TI-G) Non-Income MDGs (TI-M1, M2, etc.)
Though the project will have indirect social benefits to end-users, power sector interventions in general are not viewed as the single contributing factor for achieving generalized poverty reduction and alleviation. The classification therefore recognizes that while power itself will not explicitly decrease poverty, it will provide the foundation for concrete poverty reduction strategies in the future.

C. Poverty and Social Analysis

1. Key issues and potential beneficiaries. The expected beneficiaries are NEA and domestic and commercial consumers. NEA is expected to benefit the most via reducing peak power purchases, reducing commercial losses, and through reductions in usage by highly subsidized consumers. Lifeline domestic consumers may experience the greatest relief from the project, as lighting is likely to make up a significant share of their energy consumption, and so more efficient and higher-quality lighting could improve well-being and reduce household expenditure on energy. Urban citizens will benefit from the improved quality of lighting and associated enhanced safety and security through the lighting shift.

^a Government of Nepal. 2016. National Energy Crisis Reduction and Electricity. http://www.moen.gov.np/pdf_files/Rastriya-Urja-Sankat-Niwaran-2072.pdf

^b <http://www.iea.org/publications/freepublications/publication/KeyWorld2014.pdf>

2. Impact channels and expected systemic changes. The project focuses on improving electricity distribution system using advanced smart grid elements. The poor will benefit as beneficiaries with reliable supply of grid electricity. The poor may benefit indirectly from the strengthened position of NEA, which may be able to provide better quality of service and expand service areas as a result of this and other interventions.
3. Focus of (and resources allocated in) the PPTA or due diligence. No potential adverse impacts are anticipated for the poor. The project preparatory technical assistance will conduct due diligence to ensure there are no unintended adverse impacts and evaluate the potential to ensure benefits accrue to the poor and to women.
4. Specific analysis for policy-based lending. Not applicable.

II. GENDER AND DEVELOPMENT

1. What are the key gender issues in the sector/subsector that are likely to be relevant to this project or program? There are no gender issues identified at this stage. However, increased and more reliable power supply have inherent gender benefits, such as job creation that benefits both men and women, and can contribute towards further electrification of households improving women's welfare and time-burden.
2. Does the proposed project or program have the potential to make a contribution to the promotion of gender equity and/or empowerment of women by providing women's access to and use of opportunities, services, resources, assets, and participation in decision making?
 Yes No Please explain. Women's self-help groups in Nepal have successfully championed the use of energy efficient lighting and appliances in Nepal and other neighboring countries such as India. . The project will explore means of promulgating similar programs in the project areas. This will include the establishment of 'energy clinics' which conduct user-awareness programs, led by women 'champions' promoting energy efficiency, targeting women consumers.
3. Could the proposed project have an adverse impact on women and/or girls or widen gender inequality?
 Yes No Please explain. The proposed project will make positive effects on women. There will be indirect benefits to women as a result of enhanced power supply.
4. Indicate the intended gender mainstreaming category:
 GEN (gender equity) EGM (effective gender mainstreaming)
 SGE (some gender elements) NGE (no gender elements)

III. PARTICIPATION AND EMPOWERMENT

1. Who are the main stakeholders of the project, including beneficiaries and negatively affected people? Identify how they will participate in the project design.
The main stakeholders are NEA, and domestic, commercial, and municipal consumers and other utilities.
2. How can the project contribute (in a systemic way) to engaging and empowering stakeholders and beneficiaries, particularly, the poor, vulnerable and excluded groups? What issues in the project design require participation of the poor and excluded?
The stakeholders will be consulted throughout the design stage. The projects will ensure that targeted households and commercial and industrial consumers will receive quality and reliable electricity supply from the grid. Yet they will benefit from reduced expenditure on electricity from reduced expenditure on diesel for electricity generation and increase income due to availability of reliable electricity supply for other productive applications.
3. What are the key, active, and relevant civil society organizations in the project area? What is the level of civil society organization participation in the project design?
 Information generation and sharing M Consultation M Collaboration M Partnership M
4. Are there issues during project design for which participation of the poor and excluded is important? What are they and how shall they be addressed? Yes No
Consultations will be easily managed through a mix of formal and informal consultations with the affected communities – on an as needed basis.

IV. SOCIAL SAFEGUARDS

A. Involuntary Resettlement Category A B C FI

1. Does the project have the potential to involve involuntary land acquisition resulting in physical and economic displacement? Yes No Land acquisition will be required for new substations. The extent of land acquisition and involuntary resettlement impacts are not expected to be significant. Distribution lines are expected to be re-built in existing right-of-way. While impacts are not expected to be significant, the exact magnitude of impacts will be assessed during due diligence. Necessary measures will be taken to ensure any potential involuntary resettlement issues will be addressed.

<p>2. What action plan is required to address involuntary resettlement as part of the PPTA or due diligence process?</p> <p><input checked="" type="checkbox"/> Resettlement plan <input type="checkbox"/> Resettlement framework <input type="checkbox"/> Social impact matrix</p> <p><input type="checkbox"/> Environmental and social management system arrangement <input type="checkbox"/> None</p>
<p>B. Indigenous Peoples Category <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> FI</p> <p>1. Does the proposed project have the potential to directly or indirectly affect the dignity, human rights, livelihood systems, or culture of indigenous peoples? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No The project will improve reliability of electricity supplies, which will improve livelihoods of all electricity consumers. Preliminary information, which will be verified, suggests that there are no IPs in project areas.</p> <p>2. Does it affect the territories or natural and cultural resources indigenous peoples own, use, occupy, or claim, as their ancestral domain? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Use of culturally significant resources is not anticipated.</p> <p>3. Will the project require broad community support of affected indigenous communities? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No There are no anticipated impacts on the way of life, customs, or religious traditions of communities through solar park development.</p> <p>4. What action plan is required to address risks to indigenous peoples as part of the PPTA or due diligence process?</p> <p><input type="checkbox"/> Indigenous peoples plan <input type="checkbox"/> Indigenous peoples planning framework <input type="checkbox"/> Social Impact matrix</p> <p><input type="checkbox"/> Environmental and social management system arrangement <input checked="" type="checkbox"/> None</p>
<p>V. OTHER SOCIAL ISSUES AND RISKS</p>
<p>1. What other social issues and risks should be considered in the project design?</p> <p><input checked="" type="checkbox"/> Creating decent jobs and employment <input checked="" type="checkbox"/> Adhering to core labor standards <input type="checkbox"/> Labor retrenchment</p> <p><input checked="" type="checkbox"/> Spread of communicable diseases, including HIV/AIDS <input type="checkbox"/> Increase in human trafficking <input type="checkbox"/> Affordability</p> <p><input type="checkbox"/> Increase in unplanned migration <input type="checkbox"/> Increase in vulnerability to natural disasters <input type="checkbox"/> Creating political instability</p> <p><input type="checkbox"/> Creating internal social conflicts <input type="checkbox"/> Others, please specify_____</p> <p>2. How are these additional social issues and risks going to be addressed in the project design? Project preparation will include detailed discussion with the executing agency to ensure that compliance to core labor standards and/or national labor laws as requirement of ADB Social Protection Strategy and they will be assessed and monitored during project implementation. Limited employment opportunities will be available during construction period with some additional opportunities on an ongoing basis. Preventive measures to avoid spread of communicable diseases, including HIV/AIDS, will be stipulated in the construction contracts.</p>
<p>VI. PPTA OR DUE DILIGENCE RESOURCE REQUIREMENT</p>
<p>1. Do the terms of reference for the PPTA (or other due diligence) contain key information needed to be gathered during PPTA or due diligence process to better analyze (i) poverty and social impact; (ii) gender impact, (iii) participation dimensions; (iv) social safeguards; and (v) other social risks. Are the relevant specialists identified?</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No PPTA consultants will confirm categorization, address any potential risks, and identify opportunities to maximize benefits to the poor and women.</p>
<p>2. What resources (e.g., consultants, survey budget, and workshop) are allocated for conducting poverty, social and/or gender analysis, and participation plan during the PPTA or due diligence? The TA has budgeted for the necessary consultants.</p>