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Report No: 73308-SL

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED GRANT FROM THE SIERRA LEONE INFRASTRUCTURE DEVELOPMENT
FUND

IN THE AMOUNT OF US\$16 MILLION

TO THE

REPUBLIC OF SIERRA LEONE

FOR THE

ENERGY ACCESS PROJECT

January 23, 2013

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CURRENCY EQUIVALENTS

(Exchange Rate Effective September 30, 2012)

Currency Unit = Sierra Leonean Leone (SLL)
SLL 4310.53 = US\$ 1
US\$ 1.542 = SDR 1

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
ASSL	Audit Service Sierra Leone
AWPB	Annual Work Plans and Budgets
BIS	Business Information System
CDM	Clean Development Mechanism
CFAA	Country Financial Accountability Assessment
CPIA	Country Policy and Institutional Assessment
DA	Designated Account
DFID	Department of International Development
ESMP	Environment and Social Management Plan
FAR	Financial Administration Regulation
FY13	Fiscal Year 2013
FM	Financial Management
GA	Grant Agreement
GBAA	Government Budget Accountability Act
GDP	Gross Domestic Product
GoSL	Government of Sierra Leone
GPN	General Procurement Notice
GWh	Gigawatt-hour
IC	Internal Control
ICB	International Competitive Bidding
IDA	International Development Association
IFR	Interim Financial Report
IsDB	Islamic Development Bank
ISR	Implementation Status Results Report
IRR	Internal Rate of Return
JCAS	Joint Country Assistance Strategy
JICA	Japanese International Cooperation Agency
KV	Kilovolt
KWh	Kilowatt-hour
MoEWR	Ministry of Energy and Water Resources
MoFED	Ministry of Finance and Economic Development

MV	Megavolt
MW	Megawatt
NCB	National Competitive Bidding
NPA	National Power Authority
NPV	Net Present Value
NRAA	National Revenue Authority Act
O&M	Operation and Maintenance
ONS	Office of National Security
ORAF	Operational Risk Assessment Framework
PDO	Project Development Objective
PEFA	Public Expenditure and Financial Assessment
PMU	Project Management Unit
PRS	Poverty Reduction Strategy
PRSP	Poverty Reduction Strategy Paper
PV	Photovoltaic
RAP	Resettlement Action Plan
RET	Renewable Energy Technologies
RoW	Right of Way
SAI	Sierra Leone Audit Service
SC	Steering Committee
SLIDF	Sierra Leone Infrastructure Development Fund
SoE	Statement of Expenditure
SPN	Specific Procurement Notices
ToRs	Terms of Reference
UK	United Kingdom
UNDB	United Nations Development Business
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
WTP	Willingness-to-pay

Regional Vice President:	Makhtar Diop
Country Director:	Yusupha Crookes
Sector Director:	Jamal Saghir
Sector Manager:	Meike van Ginneken
Task Team Leader:	Elvira Morella

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REPUBLIC OF SIERRA LEONE
Energy Access Project

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PAD DATA SHEET

Republic of Sierra Leone

Energy Access Project

PROJECT APPRAISAL DOCUMENT

Africa Region

Energy Practice 2 (West and Central Africa), AFTG2

Basic Information		
Date: January 23, 2013	Sectors: Power 100%	
Country Director: Yusupha Crookes	Themes: Infrastructure services for private sector development (100%)	
Sector Manager/Director: Meike van Ginneken /Jamal Saghir	EA Category: B-Partial Assessment	
Project ID: P126180		
Lending Instrument: Specific Investment Loan		
Team Leader(s): Elvira Morella		
Joint IFC:		
Borrower: Government of Sierra Leone		
Responsible Agency: Ministry of Energy and Water Resources (MoEWR); National Power Authority (NPA)		
Contact: Ibrahim Babatunde Wilson	Title: PMU Director and Technical Advisor Ministry of Energy and Water Resources	
Telephone No.: + 232-76-45-25-50	Email: ibrwilson@yahoo.com	
Project Implementation Period: Start Date: February 23, 2013 End Date: October 31, 2015		
Expected Effectiveness Date: April 23, 2013		
Expected Closing Date: October 31, 2015		
Project Financing Data(US\$M)		
<input type="checkbox"/> Loan	<input checked="" type="checkbox"/> Grant	<input type="checkbox"/> Other
<input type="checkbox"/> Credit	<input type="checkbox"/> Guarantee	
For Loans/Credits/Others		
Total Project Cost (US\$M) 16.0		
Financing Source	Amount(US\$M)	
BORROWER/RECIPIENT (US\$M)	00.0	
IBRD (US\$M)	00.0	
IDA: New (US\$M)	00.0	
IDA: Recommitted (US\$M)	00.0	
Sierra Leone Infrastructure Trust Fund (US\$M)	16.0	
Financing Gap (US\$M)	00.0	
Total (US\$M)	16.0	

Expected Disbursements (in US\$ Million)								
Fiscal Year	2013	2014	2015	2016				
Annual	0.7	2.6	8.0	4.7				
Cumulative	0.7	3.3	11.3	16.0				

Project Development Objective(s)

The Project Development Objectives are to: (i) reduce losses in electricity supply in Freetown Capital Western Area; (ii) improve commercial performance of the National Power Authority; and (iii) increase access to electricity in selected rural areas.

Components

Component Name	Cost (US\$ Millions)
Rehabilitation of Primary Distribution Network, Loss Reduction and Improvement of NPA's Operational and Commercial Performance	13.315 ¹
Rural Electrification	1.460
Project Implementation Management	1.225

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes []	No [X]
Does the project require any waivers of Bank policies?	Yes []	No [X]
Have these been approved by Bank management?	Yes []	No []
Is approval for any policy waiver sought from the Board?	Yes []	No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X]	No []

Safeguard Policies Triggered by the Project

	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04		X
Forests OP/BP 4.36		X
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11		X
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X
Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

Description of Covenants

Conditions for Grant Effectiveness:

- The PMU has recruited the following key staff: a. General Project Coordinator; b. Procurement Specialist; c. Financial Management Specialist; d. Supervising Engineer for Improvement of Electricity Supply in Urban Areas; and e. Project Coordinator for Rural Electrification;
- IDA has received a final Project Implementation Manual and an updated Financial Procedures Manual.

¹ Cost estimates include contingencies.

Dated covenants:

- (a) Within 2 months of effectiveness, an Environmental and Social Development Specialist has been recruited.
- (b) Within 4 months of effectiveness, a Procurement Assistant and a Financial Management Assistant have been recruited;
- (c) Within 4 months of effectiveness, a computerized accounting system using acceptable accounting software has been put in place.
- (d) Within 6 months of effectiveness, an external auditor for the Project has been recruited.

Team Composition

Bank Staff

Name	Title	Specialization	Unit
Elvira Morella	Energy Specialist	Task Team Leader	AFTG1
Karan Capoor	Sr. Financial Specialist	Energy Specialist	AFTG1
Mudassar Imran	Sr. Energy Economist	Team Advisor/Former Team Leader	SEGEN
Nikolay Nikolov	Sr. Energy Specialist	Technical Analysis/Policy Dialogue	AFTEG
Brent G. Hampton	Sr. Energy Specialist	Technical Analysis	AFTEG
Sameh Mobarek	Sr. Counsel	Legal	LEGPS
Christine Makori	Counsel	Legal	LEGAM
Arnaud Braud	Financial Analyst	Financial Analysis	AFTEG
Manuel Berlengiero	Energy Specialist	Technical/Economic Analysis	AFTEG
Maria Concepcion J.Cruz	Lead Social Development Specialist	Social Safeguard	AFTCS
Moses Y. Duphey	Environmental Safeguard Specialist	Environmental Safeguard	AFTEN
Joyce Olubukola Agunbiade	Financial Management Specialist	Financial Management	AFTME
Frederick Yankey	Sr. Financial Management Specialist	Financial Management	AFTME
Viorel Velea	Procurement Specialist	Procurement	AFTPE
Adu-Gyamfi Abunyewa	Sr. Procurement Specialist	Procurement	AFTPE
Raima Naomi Oyenyin	Language Program Assistant	Project Team Support – HQs	AFTEG
Fatu Karim-Turay	Team Assistant	Project Team Support – Sierra Leone	AFMSL

Non-Bank Staff

Name	Title
Peter Meier	Lead Consultant (Economic Analysis)

I. STRATEGIC CONTEXT

A. Country Context

1. ***Sierra Leone is one of the world's poorest countries.*** Despite a decade of peace since the end of the civil war, living conditions in Sierra Leone continue to be a challenge. During the period of civil unrest (1995-1999), Sierra Leone's physical and human capital was severely damaged. Physical infrastructure, particularly electricity, water, and sanitation, suffered widespread destruction and lack of maintenance. As of today, Sierra Leone ranks 180 out of 187 countries in the United Nations Human Development Index and has an estimated GDP per capita of US\$ 325, the fourth lowest in Sub-Saharan Africa². The latest poverty headcount estimates (2003) suggest that 67 percent of the population lives below the poverty line. The country has a territory encompassing approximately 72,000 km, slightly smaller than the U.S. State of South Carolina. This is home to a population of approximately 6 million³, a large segment of which is concentrated in the Freetown area, with one of the region's largest and poorest urban settlements. Poverty is even more severe in peri-urban areas outside the capital city and in rural areas. Annual population growth has averaged 3.4 percent during the last decade. The high unemployment rate also poses a major challenge, compounded by the very young population's age (43 percent between the ages of 0-14⁴).

2. ***Post-conflict recovery has been sustained,*** characterized by economic growth, infrastructure development, improvements in governance and public sector capacity building, and improved delivery of basic services. With a CPIA score of 3.3 in 2010, the country has moved beyond the threshold to be classified as fragile state. Also, it was ranked among the top ten global reformers in the 2012 Doing Business report⁵. Sierra Leone has conducted two successful elections since the end of the conflict. The third post-war elections for national, parliamentary and local levels were held in November 2012, and a smooth transition should put the country on a more secure path to peace and prosperity.

3. ***In the near future, Sierra Leone will have to grapple with some big changes in the country context, which have transformative potential.*** Sierra Leone's economic recovery has gathered strength since the global economic downturn. In 2011, real GDP increased by 6 percent. Growth was broad-based, led by agriculture, services and industry and was supported by a step increase in public spending during the second half of the year, especially capital spending on infrastructure projects including roads, energy, and water supply. The start-up of two large scale iron-ore projects and a recovery in other mining subsectors, including bauxite, gold and rutile, drove growth in the industrial sector. The mining sector is also expected to lead the economy in 2012 and generate a one-time increase in real GDP of approximately 20 percent. While these developments hold large transformational potential for Sierra Leone's economy and society at large, they also fuel new concerns, especially in terms of governance and corruption. Promoting sustainable and equitable investment-led growth will require Sierra Leone to build stronger institutions and accountability to ensure robust revenues management and maintain

² World Development Report, World Bank, 2010.

³ World Development Report, World Bank, 2010.

⁴ Ibid.

⁵ Doing Business Report, World Bank/IFC, 2012.

macroeconomic stability in the face of volatile foreign currency flows. To this extent, developing human capital and enhancing transparency in the public sector will constitute critical steps.

B. Sectoral and Institutional Context

4. ***Electricity access and consumption are among the lowest in Africa.*** Sierra Leone's limited and dilapidated power infrastructure base is a major constraint to expand electricity access in the country, which remains below 6 percent. Sparse coverage and unreliable service particularly exacerbates poverty conditions. Public electricity services are limited to selected areas. The urban distribution network operated by the National Power Authority (NPA) extends to Freetown and the surrounding Western area (Freetown Capital Western area), covering less than 40 percent of the residents. The other provincial distribution networks currently in operation are the isolated Bo-Kenema and Makeni systems in the south-east and north of the country. In rural areas, where the bulk of the population resides, electricity access is practically non-existent. In the meantime, electricity tariffs remain among the highest in Africa, with the actual tariff reaching 28¢/kWh, twice as much as the continental average. In order to meet energy needs, a large majority of Sierra Leone's population is forced to rely on inefficient and polluting traditional fuels such as kerosene for lighting and fuel-wood and charcoal for cooking, resulting in adverse impact on personal health and safety as well as on the environment.

5. ***Inadequate power supply is a binding constraint to the potential economic transformation led by the mining sector.*** The commissioning of the 50MW Bumbuna hydroelectric power plant (Bumbuna) in late 2009 has almost doubled Sierra Leone's installed capacity and changed its power-generation mix. Today, overall installed generation capacity is approximately 82.5 MW, including two thermal power plants at Kingtom (10MW) and Blackhall Road (16.5MW) that together with Bumbuna serve the Freetown Capital Western area; and 6MW feeding the isolated Bo-Kenema system. Nevertheless, current power generation capacity remains highly inadequate to accommodate the country's overall power demand. Hydropower from Bumbuna is seasonal, producing less than 20 MW during the dry season. High costs of imported fuel for the thermal power plants and transmission and distribution bottlenecks further reduce available capacity. As a result, existing supply can meet approximately half the demand in Freetown, let alone in the rest of the country⁶. Fast growth in the mining sector is associated to an exponential increase in energy demand. A recent basic review of demand by some of the major mining companies established in Sierra Leone suggests that power needs by the mining sector may reach over 900MW in the next ten years, ten times more than currently installed capacity. This calls for a major scale-up in generation capacity but also for diversified approaches that allow for exploiting synergies in electricity supply and facilitating sharing of benefits between the public and private sector.

6. ***Transmission and distribution bottlenecks pose major impediments to expanding electricity supply.*** Sierra Leone's transmission and distribution systems are in the incipient stage and not able to keep up with generation capacity expansion. The national transmission system consists of only one radial 161 kilovolts (kV) transmission line extending for 205 km from the substation at Bumbuna to the Freetown substation and connected to NPA's distribution network. Both transmission and distribution capacity is severely constrained due to high losses, which

⁶ Economic Intelligent Unit, 2008-11. Country Report Sierra Leone. London.

reach over 38 percent. While an exact breakdown of technical and non-technical losses is not possible, technical losses in the distribution system alone are likely to be in the 20-25 percent range, largely in excess than the 9-12 percent to be found for largely urban system such as NPA's one. Overall, it is estimated that the network can evacuate no more than 35 MW of power, less than half of total installed capacity. The low voltage levels in certain areas as well as the high level of fault occurrence contribute to poor quality of supply. At present, black outs and load shedding are common place. If not addressed, transmission and distribution bottlenecks will constrain the expansion of generation capacity and suppressed electricity demand will increase considerably in line with continued economic growth.

7. ***NPA's endemic structural and operational issues stand at the heart of Sierra Leone's power sector challenges.*** Lack of adequate technical, operational and financial management capacity impedes the national utility to effectively improve its performance. An inaccurate customer data base, inadequate metering, billing and revenue collection systems and poor accounting have led to low levels of commercial efficiency and challenges in managing utility operations. NPA's financial situation remains fragile and in the last years, NPA has been unable to fully honor payments for the purchase of Bumbuna's electricity. Overall, NPA's financial stability is heavily dependent on Government support.

8. ***A credible loss reduction program can help address some of the major power sector challenges.*** Reducing technical losses is a critical step to expand the evacuation capacity of the transmission and distribution network. Given the current state of the network, extensive rehabilitation investments spanning to the medium- and long-term are required. In the short term, the best prospects for reducing technical losses are on the 161kV line from Bumbuna and the primary distribution network in Freetown. Non-technical losses, which arise from defective, non-existing or bypassed meters, pilferage and illegal and unrecorded connections, can be brought to an acceptable level in the next 18-24 months. Over the past year, NPA has taken some preliminary steps to reduce technical and non-technical losses through investments in network upgrading and a re-metering program implemented. The re-metering program is based on a stated policy to provide all new residential customers and gradually replace all existing credit meters with pre-paid meters, except for MV customers. The program can only partially address the issue of non-technical losses, targeting those due to non-existing and bypassed meters and nonpayment by metered customers. However, it has proved to be an effective tool to raise collection rates and immediately relieve NPA's fragile financial situation. Roughly 37 percent of NPA's customers now have pre-paid meters and cash collection has been outsourced to local commercial banks. As result, in 2011 the collection rate has significantly increased from 67 to 76 percent.

9. ***Energy sector institutional and regulatory frameworks are at the incipient stage of development.*** Oversight of the sector falls under the Ministry of Energy and Water Resources (MoEWR). NPA is a single, vertically integrated national utility and there is no regulatory authority. Both the MoEWR and NPA are understaffed and lack the skills and resources needed to efficiently run the sector. A long-term sector development plan is now being defined and planning capacity remains to be strengthened.

10. ***A broad power sector reform process was recently initiated and is due to culminate in unbundling of the sector.*** Reforms are intended to lay the foundations for better governance and

regulation of the power sector, as well as for increased private sector participation and investment. Based on the National Energy Policy and Strategic Plan approved by Cabinet in 2010 and outlining sector priorities and objectives, a regulatory framework was designed and enacted through the Electricity and Water Regulatory Commission Law in October 2011. Shortly later, the Cabinet approved objectives and principles for setting electricity tariffs, which constitute the basis for a new tariff scheme soon to be adopted. Unbundling of the sector was established by the National Electricity Law also approved in November 2011. This envisages separation of responsibilities for operating and maintaining existing government-owned generation and transmission assets from NPA into a new company (Electricity Generation and Transmission Company). The GoSL further expects to encourage development of privately-financed independent power projects that sell their output to NPA under standardized power purchase arrangements approved by the new regulator.

11. ***Key challenges remain in implementing the envisaged reforms.*** The reform process remains at the inception stage and the skills and resources needed outstrip GoSL's current institutional, technical and funding capacity. The financial and economic impact of the unbundling exercise has not been quantified and the organizational structure and job descriptions of unbundled companies as well as of the regulator are yet to be designed. A full assessment of the power market and adequate sector policies are required before proceeding to develop the needed regulatory frameworks including licensing procedures, a standardized power purchase agreement and a tariff scheme. Institutional, regulatory and financing frameworks for rural electrification remain to be developed for access to be significantly and equitably expanded.

12. ***The proposed Project responds to the most impending priorities of Sierra Leone's power sector: increasing the transfer capacity of the transmission and distribution system; turning around NPA's operational and commercial performance; and supporting the scale-up of electricity access in rural areas.*** Sierra Leone's power sector is in a state of flux and a long-term process of building institutional capacity, improving sector governance and establishing and implementing a coherent sector development and investment strategy is ongoing. The scale of the challenges and the resources needed call for an integrated, long-term support program, well beyond the capacity of any one institution. Coordination among donors, partnerships with multiple stakeholders and a phased approach are critical components of an effective support program. In this context, the proposed Project has been designed with a view to: a) focus on the areas where results can be achieved in the short- to medium- term; and b) help remove some of the critical barriers that prevent long-term and sustainable sector development.

13. ***The Project will generate immediate benefits to the people and the economy of Sierra Leone.*** Investments under the Project will focus on removing critical distribution capacity bottlenecks along NPA's primary distribution network, which is the most urgent and practical step to enable expanded, stable and more reliable electricity supply. In rural areas, the pilot installation of photovoltaic (PV) systems will improve the living conditions of the populations targeted under the Project, while supporting the GoSL's long-term program to scale up rural access to electricity using solar energy. On the other hand, the Project will finance extensive technical assistance to address NPA's structural operational and commercial weaknesses, which will contribute to preparing the ground for long-term sector development. Unbundling of the

sector cannot be sustainably achieved without first improving NPA's performance and fixing its finances.

14. ***The Project will also focus on reducing non-technical losses and improving collection rates as urgent measures to improve NPA's finances.*** Part of investments will complement the re-metering program currently under implementation by NPA. In parallel, additional technical assistance under the Project will provide critical support to the implementation of a systematic loss reduction program, which has been established as one of the prior-actions for the next Governance Reform and Growth Credit (Budget Support) by the World Bank. In order to access the credit, the GoSL will need to demonstrate tangible progress in implementing the program by December 2012. The GoSL has recently prepared a loss reduction plan to be implemented by a dedicated unit within NPA. The plan envisages a phased implementation, new management and operational procedures to control losses and enforce revenue collection, a verifiable baseline against which progress can be measured, and systematic monitoring.

15. ***The Project will be complemented by an upcoming IDA operation and together with it form a larger Energy Access Program.*** Overall, the Program is meant to support the recovery of the electricity sector by further increasing availability and quality of electricity supply, improving NPA's finances and operational capacity and raising sector performance and financial viability. The IDA operation will complement and expand support under the proposed Project, sharing its objectives and most of its activities. In particular, the IDA operation is expected to continue: a) investments in the upgrade of Freetown distribution network focusing on other critical segments of the network; and b) support to the implementation of a loss reduction program. Preparation of the IDA operation, slated for Board approval later in FY13, will begin soon and its scope will be further defined in consultation with the GoSL.

16. ***The Project will be funded under the Sierra Leone Infrastructure Development Fund (SLIDF), whose parallel activities contribute to building technical capacity for implementing reforms.*** The SLIDF is a multi-donor trust fund established by the World Bank in 2010 with the U.K.'s Department of International Development (DFID) as anchor donor. The fund provides a vehicle for harmonizing and pooling donor support to Sierra Leone's Poverty Reduction Strategy (PSR) by: (i) facilitating expanded access to basic infrastructure services; (ii) raising the efficiency and effectiveness of infrastructure development by improving sector governance and accountability; and (iii) building government capacity to plan and manage development projects. In parallel to the Project, the SLIDF is financing the implementation of two key studies that will help strengthen the GoSL's preparedness to implement reforms. These are: a) a Tariff Study that will serve as a basis for the new tariff scheme to be adopted by the GoSL; and b) an Integrated Resource Planning Study, which will help define a sector development strategy, including a least-cost generation development plan and institutional and technical options for rural electrification.

C. Higher Level Objectives to which the Project Contributes

17. ***The Proposed Project is consistent with the Second Poverty Reduction Strategy Paper for Sierra Leone (PRSP II) – An Agenda for Change – covering the period 2008-2012.*** Expanding and improving electricity supply is one of the strategic priorities of the Government's national development program outlined in the PRSP II and will continue to be a critical priority

under the new Poverty Reduction Strategy – *Agenda for Prosperity* – for the period 2013-2017 that is currently under preparation.

18. ***The Proposed Project is also consistent with Sierra Leone’s Country Assistance Strategy for Sierra Leone.*** A Joint Country Assistance Strategy (JCAS) for Sierra Leone covering the period 2010-2013 was adopted by the World Bank, IFC and the African Development Bank to support the *PRSP II* with its two pillars: Human Development; and Inclusive Growth (focusing on energy) A recent Country Assistance Strategy Progress Report has reiterated the focus on energy as a means to support growth in the extractive sector. Also, the Progress Report has added a third pillar on Managing the Extractives Boom and put emphasis on building capacity for improved governance and service delivery within the government and civil society.

19. ***Activities under the Project are well aligned with previous Bank’s operations and support by other development partners.*** Both the proposed Project and the upcoming IDA operation build on and expand support provided through the Power and Water Project that closed on March 31, 2011. Investments under the power component of this project initiated the rehabilitation of the transmission and distribution network in the Freetown Capital Western Area, and financed initial installment of pre-paid meters. Priority investments in distribution network upgrade under the proposed Project have been identified based on an Electricity Master Plan Study completed with support from the Japanese International Cooperation Agency (JICA) in 2009 (JICA Master Plan) and in consultation with NPA. In addition, the Project complements similar investments undertaken or planned by NPA with funding from JICA and the Islamic Development Bank (IsDB). Finally, the proposed rural electrification component complements the activities envisaged as part of UNDP's Multi-stakeholders Group on Energy Access in Rural and Peri-Urban Areas.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

20. The Project Development Objectives are to: (i) reduce losses in electricity supply in Freetown Capital Western Area; (ii) improve commercial performance of the National Power Authority; and (iii) increase access to electricity in selected rural areas.

B. Project Beneficiaries

21. Project beneficiaries will be: (i) the electricity customers of NPA, who will benefit from the Project through improved and more reliable electricity service; and (ii) the residents of the rural villages where photovoltaic systems will be installed on public buildings, who will benefit from better living standards due to improved health care and education services. Overall, the Project will contribute to enhance management, operation and financial viability of the electricity sector, thus laying solid foundations for expanding electricity services to Sierra Leone’s people and firms. Also, the piloting of photovoltaic systems in selected villages will form the basis for scaling up access to modern and sustainable energy services in rural areas.

C. PDO Level Results Indicators

22. The key indicators for the PDO level results are the following:
- (a) Electricity losses per year in the project area (percentage);
 - (b) Collection rate by NPA (percentage);
 - (c) Public buildings in rural villages provided with access to electricity under the Project through photovoltaic systems (number);
 - (d) Direct project beneficiaries (number), of which female (percent);
23. Intermediate outcomes have been identified in relation to the various activities that will contribute to achieve the PDOs. These include:
- (a) Substations rehabilitated under the Project (number);
 - (b) Distributions lines rehabilitated under the Project (Km);
 - (c) Pre-paid meters installed under the Project (number);
 - (d) Statistical meters installed under the Project (number);
 - (e) Photovoltaic systems installed under the Project (number);
 - (f) Staff recruited at the Project Management Unit (PMU) under the Project (number).

III. PROJECT DESCRIPTION

A. Project Components

24. Component I: Rehabilitation of Primary Distribution Network, Loss Reduction and Improvement of NPA's Operational and Commercial Performance (US\$12.200 million)⁷. This component envisages multiple investment and technical assistance activities. Part of investments will focus on the rehabilitation of key components of the primary distribution network (33/11kV) in Freetown area, including overhead lines and substations, raising its transfer capacity by approximately 8MW and contributing significantly to raise system stability, reliability and quality of supply. In addition, the Project will finance supply and installation of approximately 20,000 pre-paid meters as well as an appropriate vending and control system to replace the current aging system. Since NPA currently has no means of precisely locating high loss areas in the network, the Project will also finance supply and installation of a statistical metering and data management system. Finally, an appropriate business information system will be installed to replace manual systems and improve utility management, particularly in the financial, commercial and logistics areas. Investments in each area will be complemented with extensive technical assistance to ensure optimal application of the investment support. Additional technical assistance will focus on strengthening NPA's expertise in two key areas: (i) operations, through focused training on system operation with an emphasis on operating regulations and safety; and (ii) commercial management, by providing support to the implementation of the loss reduction program. This component will also provide limited resources for compensation for new encroachments and temporary disturbances to households and businesses, based on the entitlement matrix outlined in the updated Resettlement Action Plan (RAP).

⁷ Cost estimate excludes contingencies.

25. Component II: Rural Electrification (US\$1.460 million). This component will launch a pilot program for the installation of PV systems in public buildings in 14 rural villages, to demonstrate applicability of the solar technology for larger deployment. Villages have been selected by the Ministry of Energy and Water Resources and the Ministry of Local Government and Rural Development from each administrative district, based on gender diversity, number of public buildings where the PV systems can be installed, and road accessibility. The development of small-scale decentralized solar power supply in rural areas has been included by the GoSL's in the National Energy Policy and Strategic Plan. Also, a roadmap for scaling-up renewable energy technologies (RETs) and markedly solar power has been identified. The pilot installation of PV systems is expected to complement current efforts by other donors as well as to leverage wider donor support to the GoSL's long-term program of rural electrification using solar energy. In the short term, this component promises high returns in terms of improved living standards for the populations of the villages targeted under the Project.

26. Component III: Project Implementation Management (US\$1.225 million). This component has been specifically designed to strengthen project implementation and management capacity. The component will finance external expertise that will support key project management functions as detailed in section IV.A.

B. Project Financing

27. The Project will be entirely financed under the SLIDF. The SLIDF is administered by the World Bank based on an Administration Agreement (AA) entered into with DFID, which spells out terms and conditions of the Trust Fund, including activities and categories of expenditures eligible for financing. SLIDF objectives, governance structures and relevant arrangements are included in Annex 3.

C. Lending Instrument

28. The lending instrument for the proposed Project is a Specific Investment Loan. The Ministry of Finance and Economic Development (MoFED) will receive a grant in the amount of US\$16 million established under the recipient-executed component of the SLIDF.

D. Project Cost and Financing

29. The estimate of total project costs is US\$16 million. Estimates have been prepared, reviewed and adjusted in consultation with NPA and the MoEWR. Cost estimates by component are detailed in Table 1. These include a contingency (including both physical and price contingency) envisaged to finance eventual additional investments and/or technical assistance under the same PDOs and project scope defined above.

Project Components	Project cost (US\$ million)	Source of financing		% of IDA Financing
		SLIDF	IDA	
1. Improvement of Electricity Supply in Urban Areas	12.277	12.277		
2. Rural Electrification	1.460	1.460		

3. Project Implementation Management	1.225	1.225		
Total Baseline Costs	14.962	14.962		
Contingencies	1.038	1.038		
Total Project Costs	16.00	16.00		
Total Financing Required	16.00	16.00		

E. Lessons Learned and Reflected in the Project Design

30. Design and preparation of the proposed Project builds on the following lessons learned from the implementation experience of the Power and Water Project and the Bumbuna Hydroelectric Environmental and Social Management Project (Bumbuna project) and ensuing country dialogue.

Table 2: Lessons Learned	
<i>Component/lesson</i>	<i>Reflection in the design of the new project</i>
<p>Project Implementation Capacity Weak implementation capacity of both NPA and MoEWR can delay execution of the Project and endanger quality of implementation and delivery of expected benefits.</p>	<p>Implementation will be entrusted to the Project Management Unit (PMU) already established at the MoEWR for externally funded development programs. Experience from the Power and Water project suggests that establishing a dedicated PMU in each of the project agencies may cause coordination issue and disrupt implementation.</p>
<p>Procurement and Financial Management Assessments of procurement and financial management capacity completed for the recently closed Power and Water Project and as part of the restructuring effort of the Bumbuna Project revealed inadequate capacity of NPA's Finance and Accounts department and of procurement processed at both NPA and the PMU of the MoEWR.</p>	<p>A Procurement Specialist and Procurement Assistant and a Financial Management (FM) Specialist and FM Assistant will be hired under the Project to reinforce the PMU. They will carry out procurement and FM functions for all project components as well as provide capacity building to NPA and MoEWR staff.</p>
<p>NPA's technical and commercial performance. Sustainability of investment hinges upon efforts to improve NPA's technical and commercial performance</p>	<p>Part of the investments under component I of the Project focuses on reducing non-technical losses and improving collection rates, which constitute the most urgent and practical measures in the short- to medium-term to improve NPA's commercial performance.</p> <p>Under the same component, extensive capacity building and training will be deployed to raise staff competences for adequate system operation and maintenance and raise NPA's technical and commercial performance.</p>

<p>Safeguards As a result of weak land and real property policies governing encroachments into state-owned lands, lack of enforcement and monitoring of the Right of Way of transmission and distribution lines is a recurring problem.</p>	<p>The Bank’s project team has been closely liaising with the GoSL to ensure consultation and coordination among different Ministries, Municipal Authorities and the Office of National Security.</p> <p>An Environmental and Social Development Specialist will be hired under the Project to oversee environmental and social management. The Project will also provide technical assistance for development of more effective encroachment control programs.</p>
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IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

31. The Project will be implemented by the Project Management Unit (PMU) already established at the MoEWR for implementing externally funded development programs. The PMU will closely coordinate with the two project agencies, NPA and the MoEWR.

32. A Project Oversight Committee comprising of the NPA General Manager and the MoEWR Permanent Secretary will provide guidance on policy and strategic issues, address high level implementation issues and meet every quarter or more often as required to discuss project progress.

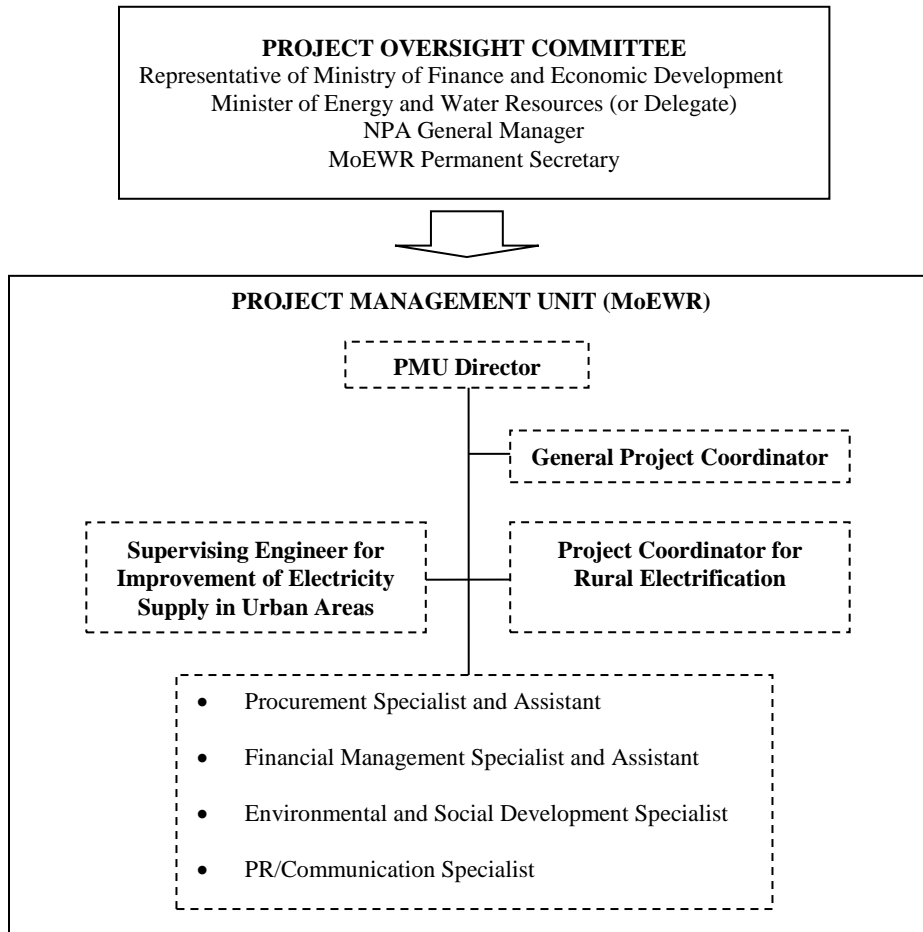
33. The PMU will be led by the current PMU Director appointed by the MoEWR, who will ensure general oversight of the Project and effective coordination between the PMU and the project agencies. The PMU Director will delegate day-to-day oversight to a General Project Coordinator, who will be competitively hired under component III of the Project (Project Implementation Management). The General Project Coordinator will have the following responsibilities: (a) supervise project implementation; (b) supervise procurement and monitor costs and financing; (c) facilitate coordination among project agencies as well as among all relevant institutions and development partners; (d) serve as a single-point for tracking progress of implementation and Project’s outcomes; and (e) provide reports and information to the GoSL and financiers.

34. The PMU will be reinforced with external experts also financed under component III, who will cover the key functions required for project implementation. The PMU staff assigned to this Project will be clearly identified and work only on the Project.

35. An external Supervising Engineer for Improvement of Electricity Supply in Urban Areas will be hired to oversee component I of the Project and carry out management and supervision, and reporting tasks related to the investments in distribution network upgrade, pre-payment meters, statistical metering and BIS. The Supervising Engineer will coordinate closely with NPA’s Deputy General Manager/Chief Operating Officer as well as with staff and managers of the concerned NPA departments. A Project Coordinator for Rural Electrification will be hired to oversee component II and carry out project management and supervision and reporting related to the investments for the installation of photovoltaic systems in the selected rural villages.

36. In addition, the following external experts will be hired under the component III of Project: (a) a Procurement Specialist and a Procurement Assistant; (b) a Financial Management (FM) Specialist and a FM Assistant; (c) an Environmental and Social Development Specialist; and (d) a Public Relations/Communications Specialist. Project Implementation Arrangements are summarized in Figure 1.

Figure 1: Project Implementation Arrangements



B. Results Monitoring and Evaluation

37. A Results and Monitoring Framework to document and measure the Project’s development impact has been discussed and agreed with the PMU, NPA and the MoEWR (Annex 1). The Framework identifies result indicators for the Project as a whole as well as for each of its components. The project agencies have provided annual target values for the results indicators and baseline data against which results can be measured.

38. Depending on the indicators, current data will be either provided by NPA from the utility database and accounts, or collected through direct observation, or from consultant’s technical reports. The PMU will be responsible for collecting, verifying and collating information and

submit progress reports to the Bank, on an annual basis for PDO indicators and on a semi-annual basis for the intermediate indicators at component level.

C. Sustainability

39. **Country context.** The GoSL attaches strategic importance to the objective of improving power supply, which has acquired additional political resonance in the run-up to the elections scheduled in November 2012. Continued commitment and cooperation by the GoSL are key factors to the sustainability of the Project and the Bank will stay engaged and continue dialogue to ensure that proper focus is maintained.

40. **Implementation capacity.** Component III of the Project has been specifically designed to strengthen staff and skills of the PMU, which will be reinforced with a dedicated group of personnel covering the full range of functions required for project implementation and management. The external experts will closely liaise with the staff of NPA and the MoEWR and provide training and capacity building to ensure long-term sustainability of Project's outcomes.

41. Investments in distribution network upgrade will be complemented with operational and maintenance training provided to NPA staff. Similarly, training and capacity building on relevant operational procedures will be provided to ensure adequate use and maintenance of pre-paid meters, statistical metering and business information system installed under the Project.

42. Rural communities where photovoltaic systems will be installed will receive maintenance training by the supplier. In addition, the Decentralization Law of 2006 has set standard and clear procedures concerning the transfer of responsibilities for operation and maintenance of facilities provided under rural projects to local governments and communities, including a set of agreements to ensure long-term sustainable use of facilities.

43. **NPA's commercial performance.** NPA's fragile financial situation is an important risk to the Project. As technical and commercial inefficiencies continue to drain NPA finances, the utility may not be able to allocate enough resources to properly operate and maintain the rehabilitated system and even less to continue investments. NPA's financial imbalance is a structural one and requires long-term solutions. To this extent, technical assistance under the Project has been specifically designed to help improve NPA's operational and commercial performance. Support under the Project and continued country dialogue will be geared towards maintaining focus on the loss reduction program and facilitate its effective and sustainable implementation. By these means, the Project will help the GoSL in meeting the prior-action identified for the next tranche of the Budget Support by the Bank.

V. KEY RISKS AND MITIGATION MEASURES

A. Risk Ratings Summary Table

<i>Risk</i>	<i>Rating</i>
Stakeholder Risk	Moderate
Implementing Agency Risk	
- Capacity	High
- Governance	High
Project Risk	
- Design	Moderate
- Social and Environmental	Moderate
- Program and Donor	Moderate
- Delivery Monitoring and Sustainability	High
Overall Implementation Risk	High

B. Overall Risk Rating Explanation

44. A detailed Operational Risk Assessment Framework (ORAF) has determined that the this is a high risk operation with a residual risk rating of Medium after mitigation efforts are implemented. Overall risk of the Project is driven by the following factors: (a) high country-level risks; (b) systemic power sector issues; and (c) weak project implementation capacity.

45. The fragile country context and the structural weakness of Sierra Leone's power sector pose major risks to the Project. Lack of sector regulatory institutions, systemic sector governance issues, continuing short-term sector emergencies are all factors that could potentially derail and/or delay project implementation. Also, GoSL's political will and commitment to the Project may weaken as a result of impending emergencies such as large power black outs and/or shifting development priorities prompted by private sector interest in new power generation projects.

46. The implementation capacity of the two project entities, NPA and MoEWR, remains stretched. For this reason, implementation has been entrusted to the existing PMU established at the MoEWR. This arrangement has been selected also based on lessons learned from previous projects and advice from the GoSL not to create multiple implementation structures. The structure of the PMU includes a Director appointed by the MoEWR and personnel recruited under the various development programs. The current personnel have been hired under the Bumbuna Project and their contracts are set to expire soon. Nonetheless, given the limited number of staff, they would not be able to manage a second project in parallel. The recruitment of new staff will provide the PMU with a full team of qualified experts.

47. Prior experience from power sector projects also showed that low implementation capacity has resulted in financial management issues and increased risk of hiring unqualified firms for carrying out key service and work contracts. The low capacity available in the local

market and the limited competition for key services to be procured under the proposed Project compound the risk to award contracts to firms not capable to ensure the needed quality.

48. The project design has incorporated adequate measures to address these risks to the extent possible, including a number of strategic covenants that the Recipient will meet at key stages of implementation. The Bank will remain engaged with the GoSL and project counterparts to ensure focus on the Project. In particular, the Bank will closely liaise with the GoSL to ensure that recruitment of PMU personnel is timely completed. In addition, the following provisions under the Project promise to mitigate implementation risks: (a) hiring of a group of individual consultants for key PMU functions rather than a firm will allow for a more rapid hiring process and ensure more independence of the individual experts in supporting implementation; (b) given the size of the contracts, most of procurement will be conducted through international competitive means, in compliance with World Bank procurement guidelines and procedures. This may increase the number of bidders and raise the quality of contract implementation; (c) enhanced supervision will be ensured through site visits together with the Supervising Engineer for Improvement of Electricity Supply in Urban Areas and the Project Coordinator for Rural Electrification, to allow for immediate mitigation of issues that might be identified during implementation.

49. The Operational Risk Assessment Framework presented in Annex 4 provides detailed description of project risks and the corresponding mitigation measures.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analyses

Economic Analysis

50. The economic analysis of the Project has focused on component I, and assessed the benefits deriving from loss reduction. The detailed analysis is presented in Annex 6. An economic analysis of the rural electrification component has not been carried out due to the lack of survey information from which to derive credible and reliable quantitative estimates of economic benefits in the villages where PV systems will be installed.

51. The loss reduction program has high economic returns. The Net Present Value (NPV) is US\$26.7 million and the Economic Rate of Return (ERR) is 39 percent. Such high returns are typical of projects that remove distribution system bottlenecks. The rehabilitation of the 11/33kV system allows 8 MW of additional power to be evacuated from Bumbuna, whose incremental *economic* (variable) cost is zero. In addition, the investment in pre-paid meters has high financial returns, as it allows reducing the subsidy required to NPA. Welfare gains associated to the lower subsidy more than offset the consumer surplus loss experienced by pilferers.

52. Indeed, the distributional analysis shows that pilferers are the only losers from the Project, which therefore clearly promotes social equity. Paying consumers and the Government (i.e. *all* of society) are both winners. The US\$12.3 million capital investment in the loss reduction program from the SLIDF donors leverages US\$26.7 million in net economic benefits

(at 10 percent discount rate over a 20 year lifetime). Therefore, this is clearly a highly desirable Project. The hurdle rate is reached already in year 5 of operational benefits, and by year 10 reaches 36.8 percent.

53. The Project is robust with respect to a broad range of input assumptions. The switching value analysis shows that none of the individual risk factors (including lower additional power evacuation, construction cost increases, and implementation delays) would result in returns lower than the hurdle rate. Most importantly, for an economic analysis that depends on estimates of willingness-to-pay (WTP) to underpin changes in consumer surplus, the switching value for WTP (17.0US¢/kWh) lies well below the current actual tariff (28.0U¢/kWh).

54. The quantitative risk assessment, which examines all risk factors together, shows that the probability of economic returns falling below the 10 percent hurdle rate is around 5 percent. This is a reflection that the Project is robust with respect to the main uncertainty, namely that there may be delay in mobilizing the human and management resources needed to adequately implement the new systems. Even if the benefits associated with the business information system (to reduce collection losses) and anti theft-measures (to reduce pilferage) are only half of what is expected, the ERR is 27 percent.

Financial Analysis

55. The financial analysis of the Project (presented in detail in Annex 6) indicates that this is financially viable with an Internal Rate of Return (IRR) of 31 percent in the base case and a NPV of US\$10.1 million. In addition, sensitivity analysis shows strong resilience to key risks. Component I, focusing on reducing distribution losses and collection improvements, has an IRR of 36 percent and a NPV of US\$11.3 million; while the rural electrification component has a negative IRR and a NPV of minus US\$1.2 million, as customers will only pay for the O&M costs of the solar panels.

56. NPA's financial position is improving but remains weak. Sales have significantly increased after the Bumbuna hydropower plant came on line in late 2009 and Sierra Leone already has one of the highest average tariffs in Africa (28US¢/kWh). Financial losses have decreased but NPA's costs are still higher than its revenues. Therefore, the utility continues to be strongly dependent on Government subsidies to continue its activities.

57. The proposed Project will help improve NPA's financial position. Not only it will generate more revenues than costs to NPA; in general, improvements on losses and collection ratio will have a positive impact on NPA's capacity to generate cash.

B. Technical

58. **Upgrade of distribution infrastructure.** There is an urgent need to rehabilitate and upgrade the neglected and dilapidated distribution infrastructure in Freetown area. In particular the network is not able to evacuate all the power generated by either the Bumbuna Hydropower plant or the Blackhall Road thermal station. Network overloading is currently prevalent resulting in high technical losses while the poor condition of the network is causing unnecessary service interruptions. Based on the JICA Master Plan and consultations with NPA, the Project has

identified priority investments in network upgrade including the provision of an additional 161/11kV transformer at Freetown substation. Further investments will focus on the upgrading of other critical components of the primary MV network, including the 33kV line from Blackhall Road to Wellington substations; a 33/11kV transformer at Wellington substation and related substation equipment at Blackhall Road, Wellington and Wilberforce substations. The focus of these upgrades is to: (i) improve evacuation capacity from the 16.5 MW Blackhall Road diesel power station during times when insufficient hydropower is available from Bumbuna; (ii) reduce overloading and hence technical losses; and (iii) improve network reliability and hence reduce the number of service interruptions. All these distribution system rehabilitation investments have been appraised as suitable for significantly improving network evacuation capacity, reducing technical losses and improving system reliability. Equipment specification will be based on European standards to ensure that proper quality standards are maintained.

59. **Tools, systems and technical assistance for improving NPA's commercial and operational performance.** The level of NPA commercial losses is currently unacceptably high. A review of utility commercial processes revealed significant gaps in the metering, billing and revenue collection process as well as in administration of the pre-payment metering and revenue collection system. Both the billing system and pre-payment vending and management system utilize outmoded technology and need urgent upgrading. In addition, there is need for a utility management information system. The systems and associated technical assistance that will be provided under component I of the Project have been appraised as suitable for addressing these deficiencies. In particular the provision of 20,000 pre-payment meters and associated vending system coupled with appropriate technical assistance to develop the related commercial processes and procedures will have a meaningful impact in terms of reduced non-technical losses, higher collection rates and improved commercial management. The provision of an appropriate business information system, including modules for billing, financial management, management of information and logistics, in conjunction with technical assistance, will contribute significantly to improve NPA operations.

60. An inspection of NPA substations and review of utility operating processes and procedures, including assessment of application of safety standards, revealed significant gaps and lack of human capacity. This is due to an exodus of critical skills during the conflict and lack of training over a period of 20 years. The haphazard application of out of date operating regulations and safety standards affects the quality of network operation and considerably raises the risk of fatal accidents. Technical assistance to be provided under the Project has been appraised to be a vital first step in improving safety and operational standards in the utility. In particular, the Project will provide technical assistance to: (i) review and update current operating and safety regulations, to bring them in line with current international best practices; and (ii) provide intensive training to NPA staff, both theoretical and practical, to ensure a sustainable improvement in safety and operational standards. Apart from reducing the threat to human life, the envisaged technical assistance will also contribute to improve system reliability and therefore enable more reliable supply.

61. **Rural electrification.** In rural areas, the scale and nature of the electricity access gap and the locations involved impose to explore electrification solutions alternative to grid extension. The GoSL has recognized that off-grid solutions based on renewable technologies are the only

option to bring electricity to areas far removed from the main grid. Also, several donors have expressed interest in supporting rural electrification based on RETs. Apart from providing much needed energy access to key public institutions, the pilot solar panel project is appraised to be a useful mean for laying the foundation for further roll out of rural electrification using solar technology. The pilot program will provide demonstration of efficient utilization of this technology and leverage wider donor commitment in this area. Technical specifications will reflect the latest developments in PV technology. A consultant has visited the selected villages to assess buildings where facilities can be installed.

C. Financial Management

62. The PMU will provide financial management services for all project components. The Bank has conducted a limited financial management assessment of the PMU, since a previous one had been carried out only recently under the on-going IDA-financed Bumbuna Project. The assessment confirmed that the existing systems are still performing adequately. A Financial Management Specialist and a Financial Management Assistant will be competitively hired under the Project against ToRs acceptable to IDA.

63. The assessment concluded that the financial management residual risk is **Moderate**. The current financial management arrangements of the PMU satisfy the Bank's minimum requirements under OP/BP10.02. A set of measures and an action plan have been identified to reduce the financial management residual risk of the PMU and ensure that its FM systems are able to provide accurate and timely information on the status of the Project as required by IDA. These measures and action plan are documented in the financial management section of Annex 3, along with clear reference to the Anti-Corruption Guidelines of the World Bank (2011) that this operation is subject to.

D. Procurement

64. The PMU will carry out the Project's procurement activities under applicable World Bank procurement guidelines, namely, "*Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011, and "*Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011

65. An assessment of the procurement capacity of the project agencies – the MoEWR and NPA – concluded that neither of the two would have adequate experience and capacity to carry out the procurement activities required by the Project. Staff at MoEWR and NPA Procurement Units do not have practical experience and knowledge of World Bank procurement. The assessment of the PMU indicated that this is currently staffed with procurement consultants hired under the Bumbuna Project, who would not be able to carry out procurement activities for other projects. Also, their contracts are set to expire soon in conjunction with the closing of the Bumbuna Project.

66. As a result, procurement risk for the Project was rated *high*. As a main risk mitigation measure, a qualified Procurement Specialist (Consultant) will be recruited to reinforce the PMU and coordinate, manage and oversee procurement under all project components. The Procurement Specialist will be assisted by a Procurement Assistant. Both the Procurement Specialist and the Procurement Assistant will be financed under the Project. In addition, prior review will be applied to all project contracts, except for contracts procured under the Shopping method and other small contract as stated in the Procurement Plan. Detailed procurement risk mitigation measures are presented in Annex 3.

67. The PMU developed a procurement plan for the first 18 months of project implementation which provides the basis for the procurement methods applicable to each contract and indicates those requiring Bank's prior review. This plan has been agreed by the Bank and is available at the PMU's office in Freetown, Sierra Leone. It will also be available in the Bank's external website. The Procurement Plan will be updated in agreement with the Bank annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. A summarized version is presented in Annex 3.

E. Environmental and Social (including Safeguards)

68. The Project is anticipated to have environmental and social impacts from two sets of activities. One is the upgrade of distribution facilities in and around the Freetown area as envisaged under component I of the Project. These facilities include the existing distribution network, specifically the segment along the 33 kV line from Blackhall Road substation to the Wellington substation (Blackhall Road-Wellington line). There will also be substation upgrades for the 33/11 kV transformers at the substations in Wellington, Blackhall Road, and Wilberforce. Because these are existing facilities and no new construction will take place, the environmental and social impacts are expected to be minimal. Nonetheless, an Environmental and Social Impact Assessment (ESIA), also including an Environment and Social Management Plan (ESMP), has been prepared to ensure that adequate mitigation measures for addressing identified project impacts on the environment and surrounding communities are implemented. The ESIA was disclosed in Sierra Leone as well as at the World Bank's InfoShop on September 26, 2012.

69. The second set of activities, under component II of the Project (Rural Electrification), will likewise have minimal impacts. Any potential impacts from the installations of PV systems are covered in the ESIA/ESMP. Given these anticipated impacts, the project is classified under safeguards category B (partial environmental assessment).

70. **Affected populations.** The Freetown metropolitan areas covered by the existing distribution network have very high population densities and are continuously challenged by population pressures, especially migration into the right of way (RoW) of the distribution lines that are occupied by large slum settlements. The housing structures inside the RoW are largely makeshift dwellings made up of generally thatched roof and corrugated iron and other materials like plasters and mud, and with hardly any sanitary facilities and water services. Following a social assessment that was completed under the IDA- financed Power and Water Project (P087203), there are no groups that trigger the Bank's Indigenous Peoples policy (OP 4.10).

71. The major types of livelihood activities in the peri-urban and urban areas along the distribution network and around the substations are services and trading. Most of the households are workers, informal sellers and petty traders operating in makeshift kiosks. More than 60 percent of populations inside the RoW are classified as “tenants” who are employed in clerical jobs and retail marketing laborers. Households mainly use the bulk of their production for household consumption and only a small percentage of them have access to electricity.

72. The rural electrification pilot projects for installation of photovoltaic systems in/on existing public buildings will have positive benefits and minimal social and environmental impacts. Once energized, these facilities will allow refrigeration for medicines and expanded service outreach (e.g. 24-hour medical facility and night time education) and extend benefits beyond the 14 villages initially selected under the Project. While the precise installation locations for the photovoltaic systems have not been finalized, given that the systems are being installed in/on existing buildings, none of the works in this project component will involve land acquisition resulting in resettlement and/or loss of access to resources or livelihoods.

73. **Environmental Characteristics.** The distribution network and substations are located in the core urban centers of Freetown. The city is located on sloping land and foot hills. It is bordered on the north and east by the Sierra Leone River, to the south by the hills, and to the west by the Atlantic Ocean. The network line goes through the coastal low lands and avoids most of the densely populated areas. However, about one third of the RoW is occupied by overcrowded slum settlements. Overcrowding inside parts of the RoW has caused serious drainage and flooding problems, especially during the rainy season.

74. The entire distribution line in Freetown traverses rough, rocky and hilly terrain. Most of the line’s access ways are navigable through foot trails from the Eastern front to Leicester Road to Fourah Bay College. From Mount Aureol Terrace and up to Blackhall Road the line traverses more densely populated slum settlements. The Project covers the segment with the largest density of households from the Blackhall Road substation to Wellington substation.

75. **Potential Social Impacts.** The design of the Project has minimized, to the extent possible, adverse social impacts from land acquisition and displacement. Reinforcement of the distribution network in Freetown area had been already envisaged under the IDA-financed Power and Water Project, which closed in March 2011. A Resettlement Action Plan (RAP) was disclosed and completed, including full compensation of project affected households (the RAP completion report was finalized in October 2011 and disclosed in November 2011). In particular, 164 households were compensated for relocation of structures from the RoW for safety reasons. These included structures that were within the 5 meter vertical safety clearance between the highest point of the structure and the conductor. The RAP also covered structures within the 6 meter perimeter of the base of towers. 43 households among those affected by the Project were located in the area along the Blackhall Road-Wellington line. Affected households also received livelihood support under the RAP. Based on a needs assessment, the Project supported livelihood development for food processing, masonry, petty trading and skills training.

76. The settlements inside the RoW have been allowed by GoSL to remain under the line provided that they observe the acceptable safety rules. However, partly due to weak monitoring

of the RoW, some households have since moved into the area, including some of the former project affected persons. The occupancy of the RoW along the Blackhall Road-Wellington line poses safety issues, whose solution requires coordination among multiple Ministries, Municipal Authorities and the Office of National Security. The Bank's project team has closely liaised with the concerned Ministries during preparation and appraisal of the proposed Project. In order to address these encroachments, the GoSL has set up an inter-ministerial sub-committee comprising of representatives from the Ministry of Land, Country Planning and Environment; Works, Housing and Infrastructure; and Information and Communications. Additionally, the Office of National Security (ONS) and the Police under Freetown City Council have been asked to assist the committee especially throughout enforcement of the regulations governing land uses inside the RoW. An Environmental and Social Development Specialist will be hired under the Project to oversee environmental and social management. The Project also envisages technical assistance to support implementation and update of the ESMP; ensure risk mitigation; and build capacity for monitoring of the RoW, with a view to reduce the impacts from encroachments and land uses that may negatively affect the operation of distribution facilities. The RAP for the Power and Water project has therefore been updated to address these new risks and mitigation measures. It has been re-disclosed in-country and at the InfoShop on December 18, 2012.

77. **Provision for Compensation.** Provision has been made for any additional compensation as may be found appropriate under the updated RAP. Under the Bank-financed Sierra Leone Power and Water project, compensation was paid to PAPs for involuntary resettlement. The updated RAP addresses some outstanding and possibly new encroachments. Compensation, if any, will most likely be paid for new encroachments and temporary disturbances to households and businesses, based on the entitlement matrix outlined in the updated RAP.

78. **Potential environmental impacts.** Appropriate mitigation guidelines to deal with the waste, some of which is hazardous, that will be generated by the rehabilitation of substations are included in the ESMP, such as measures for reducing the impacts on ambient air quality during the process of rehabilitation and/or installation of new transformers and equipment. The Project is expected to result in change in land use especially in and around the substations. Land use control measures will be imposed, for example, along the existing gasoline station near the Wellington substation, as well as clearing of wastes that may block access to the substation's warehouse.

79. The ESMP also addresses potential environmental, safety and health risks during the construction of the substations and the siting of the towers for the distribution lines. These included consideration of environmental impacts in erecting base/foundation and towers for the lines, material storage facilities, substations and access roads which had minimal loss of vegetation. There are no visible signs of serious soil erosion and sedimentation of nearby aquatic/drainage systems, air pollution, soil and water contamination from both liquid and solid waste, and hazardous chemical poisoning. During the installation and upgrading of the substations and distribution line, careful monitoring will be ensured to minimize threats resulting from use of chemicals to clear RoW; unprofessional handling of paint, fuel and oil; electric and magnetic field emissions; transmission lines snapping; transmission line collapsing; theft and heavy rains causing flooding. All these threats should be manageable.

80. No discovery of chance finds of fossil or archaeological material is expected during the upgrades. Nevertheless, appropriate procedures for reporting discovery of chance finds to government authorities in charge of cultural and historical artifacts have been defined in the ESMP, in accordance with procedures outlined in the Bank's OP4.11 (Physical and Cultural Resources).

81. A full description of risk mitigation measures for potential environmental and social impacts is included in Annex 3.

82. **Grievance mechanism.** The Project has in place a functional grievance mechanism for handling disputes and grievances related to the project activities. Effective informal and formal grievance redress mechanisms are used for monitoring the resolution of grievances. Information on the grievance redress mechanisms will be strengthened by widely disseminating the procedures to the people affected by the Project. The entities responsible for grievance redressal have been identified in the updated RAP.

Annex 1: Results Framework and Monitoring

REPUBLIC OF SIERRA LEONE: Energy Access Project - Sierra Leone Infrastructure Development Fund

Project Development Objectives (PDOs): (i) reduce losses in electricity supply in Freetown Capital Western Area; (ii) improve commercial performance of the National Power Authority; and (iii) increase access to electricity in selected rural areas.												
PDO Level Results Indicators	Core	Unit of Measure	Baseline (2012)	Cumulative Target Values					Frequency	Data Source/ Methodology	Responsibility for Data Collection	Description (indicator definition etc.)
				YR 1	YR 2	YR3						
Indicator One: Electricity losses per year in the project area	<input checked="" type="checkbox"/>	%	38%	37%	34%	33%			Annual	NPA utility database/ accounts	NPA	(Volume of electricity injected into the grid-volume of electricity billed)/Volume of electricity injected into the grid. All values refer to Freetown Western Capital Area.
Indicator Two: Collection rate by NPA	<input type="checkbox"/>	%	76 %	78%	84%	86%			Annual	NPA utility database/ accounts	NPA	Overall amount of electricity sales collected/ Overall amount of electricity sales billed.
Indicator Three: Public buildings in rural villages provided with access to electricity under the Project through photovoltaic systems	<input type="checkbox"/>	Number	0	0	0	28			Annual	Direct observation	MoEWR	Number of public buildings provided with photovoltaic systems in rural villages.
Indicator Four: Direct project beneficiaries in (number), of which are female (%)	<input checked="" type="checkbox"/>	Number, %	0	0	0	205,400 51%			Annual	NPA utility database/ Direct observation	PMU/NPA/ MoEWR	NPA customers+ Residents of villages selected for installation of photovoltaic systems.
INTERMEDIATE RESULTS												
Intermediate Result (Component One): Improvement of Electricity Supply in Urban Areas												
<i>Intermediate Result indicator One:</i> Substations	<input type="checkbox"/>	Number	0	0	4	4			Annual	Final technical report of	PMU/NPA	

rehabilitated under the project										contractors/ Direct observation		
<i>Intermediate Result indicator Two:</i> Distributions lines rehabilitated under the project	<input checked="" type="checkbox"/>	Km	0	0	7.5	0	7.5	7.5	Annual	Final technical report of contractors/ Direct observation	PMU/NPA	
<i>Intermediate Result indicator Three:</i> Pre-paid meters installed under the project	<input type="checkbox"/>	Number	8,000	17,000	20,000				Annual	NPA utility database	PMU/NPA	
<i>Intermediate Result indicator Four:</i> Statistical meters installed under the project	<input type="checkbox"/>	Number	80	150	200				Annual	NPA utility database	PMU/NPA	
Intermediate Result (Component Two): Rural Electrification												
<i>Intermediate Result indicator Five:</i> Photovoltaic systems installed under the project	<input type="checkbox"/>	Number	0	0	28				Annual	Final technical report of contractors/ Direct observation	PMU/MoEWR	
Intermediate Result (Component Three): Project Implementation Management												
<i>Intermediate Result indicator Six:</i> Staff recruited at the Project Management Unit (PMU) under the Project	<input type="checkbox"/>	Number	0	7	9				Annual	Direct observation	PMU	

Annex 2: Detailed Project Description

REPUBLIC OF SIERRA LEONE: Energy Access Project - Sierra Leone Infrastructure Development Fund

A. Project Components

Component I: Rehabilitation of Primary Distribution Network, Loss Reduction and Improvement of NPA's Operational and Commercial Performance (\$12.200 million)

1. A major component of the infrastructure upgrade will be the addition of a 161/33kV transformer at Freetown substation which is the intake point for Freetown area. This addition will strengthen a notably weak point in the system and improve evacuation capacity from the Bumbuna hydropower plant as well as reliability of the distribution network. Provision is made for the upgrade of other critical components of the network, including the 33kV line from Blackhall Road to Wellington substations; a 33/11kV transformer at Wellington substation and related substation equipment at Blackhall Road, Wellington and Wilberforce substations. The focus of these upgrades is to improve evacuation capacity from the 16.5MW Blackhall Road diesel power station and to improve safety and reliability levels on the network.
2. As a mean to improving commercial performance, NPA has embarked on a program to gradually replace all credit meters with pre-paid meters. This strategy has already paid dividends in terms of reduced non-technical losses and improved collection ratio. The latter has reached 76 percent in 2011 – up from 67 percent in 2010. The Project will complement NPA's ongoing re-metering program by financing supply and installation of approximately 20,000 pre-paid meters as well as an appropriate vending and control system to replace the current aging system. NPA currently has no means of precisely locating high loss areas in the network. Therefore, the Project will finance supply and installation of a statistical metering and data management system to enable NPA to assess the extent of losses in defined areas.
3. An appropriate business information system will also be supplied and installed under component I to replace manual systems and improve utility management, particularly in the financial, commercial and logistics areas.
4. Qualified consultants will be hired to carry out detailed planning, design and specification, preparation of bidding documents and supervision of works for each investment category (distribution system upgrade; installation of pre-paid meters and statistical metering; and BIS) envisaged under component I. As part of their tasks, consultants will provide focused on-the-job training to NPA staff on project preparation, supervision and management. In addition, capacity building will be dedicated to ensure sustainable use and maintenance of facilities, including: a. operation and maintenance of pre-paid meters; b. efficient utilization of data collected through the statistical metering and data management system; c. overall needs analysis, compilation of technical specifications and development of comprehensive procedures combined with training to ensure optimal use of the business information system.

5. Additional technical assistance will be provided by dedicated consultants to strengthen NPA's expertise in two key areas: (i) operations, through focused training on system operation with an emphasis on operating regulations and safety; and (ii) commercial management, through assistance with implementation of the loss reduction program, including development and implementation of procedures and staff training.

6. Technical assistance will be also procured to strengthen environmental and social safeguard under the Project and in particular support implementation and update of the ESMP, and ensure risk mitigation and monitoring of the RoW. Support will be especially targeted to strengthening NPA's distribution network monitoring program, to reduce impacts from population encroachments and land uses that may negatively affect the operation of distribution facilities.

7. Provision for any additional compensation has been made, as may be appropriate, under the updated RAP. It should be noted that, under the Bank-financed Sierra Leone Power and Water project, compensation was paid to PAPs for involuntary resettlement. The revised RAP addresses some outstanding and possibly new encroachments. Compensation, if any, will most likely be paid for new encroachments and temporary disturbances to households and businesses, based on the entitlement matrix outlined in the updated RAP.

Component II: Rural Electrification (\$1.460 million)

7. Under this component, the Project will finance the installation of PV systems on public buildings including clinics and schools in 14 rural villages. Villages have been selected by the Ministry of Energy and Water Resources and the Ministry of Local Government and Rural Development. The approach has been to select the headquarter village of one of the chiefdoms in each administrative district, which are 14 in total including Freetown, based on the following criteria: a. gender diversity; b. number of public buildings; and road accessibility. A consultant has therefore been hired to assess buildings in these villages where facilities can be installed.

8. The GoSL's National Energy Policy and Strategic Plan envisages the development of small-scale decentralized solar power supply to meet basic household needs in rural areas. The GoSL has identified a clear roadmap for developing RETs and solar power in particular, based on the following key steps: (i) set up relevant institutional arrangements, including a framework for rural electrification; (ii) support research and development for RETs; (iii) remove barriers to the development of RETs; (iv) pursue Clean Development Mechanism (CDM) initiatives; and (v) support training on RETs in tertiary and other learning institutions. The Integrated Resource Planning Study funded under the SLIDF program will provide critical support to the GoSL in implementing this roadmap. The Study will assess options for rural electrification and provide the GoSL with a sound basis for defining a strategy for large-scale deployment of RETs in rural areas.

9. The pilot installation of PV systems is expected to complement current efforts by other donors as well as to leverage wider donor support to the GoSL long-term program of rural electrification using solar energy. Several donors have showed interest in this area. Solar units have been installed with donor support in selected locations throughout the country for lighting

buildings and streets and in a few cases for water pumping. As part of its healthcare program, which envisages the provision of free medications to targeted social groups in selected rural areas, UNICEF has financed the installation of solar panels on health centers so as to ensure proper refrigeration of medications and vaccines. A market for PV systems is also firming up, as attested by the growing interest demonstrated by private developers in recent business forums.

10. While supporting the GoSL's long term strategy for scaling-up electricity access in rural areas in an efficient and sustainable manner, this component promises high returns in terms of better living conditions for the residents of the targeted villages, who will benefit from improved health and education services.

11. Technical assistance for feasibility studies, planning of investments and development of technical specifications and bidding documents will be provided by qualified consultants.

Component III: Project Implementation Management (\$1.225 million)

12. This component has been specifically designed to strengthen project implementation and management capacity, with a view to compensate for the lack of adequate staffing and technical skills within NPA and the MoEWR. Implementation of the Project will be entrusted to the PMU currently established at the MoEWR, and a dedicated group of personnel, including 7 specialists and 2 assistants, will be competitively hired under component III to reinforce PMU's staff and skills and cover the full range of functions required for project implementation and management.

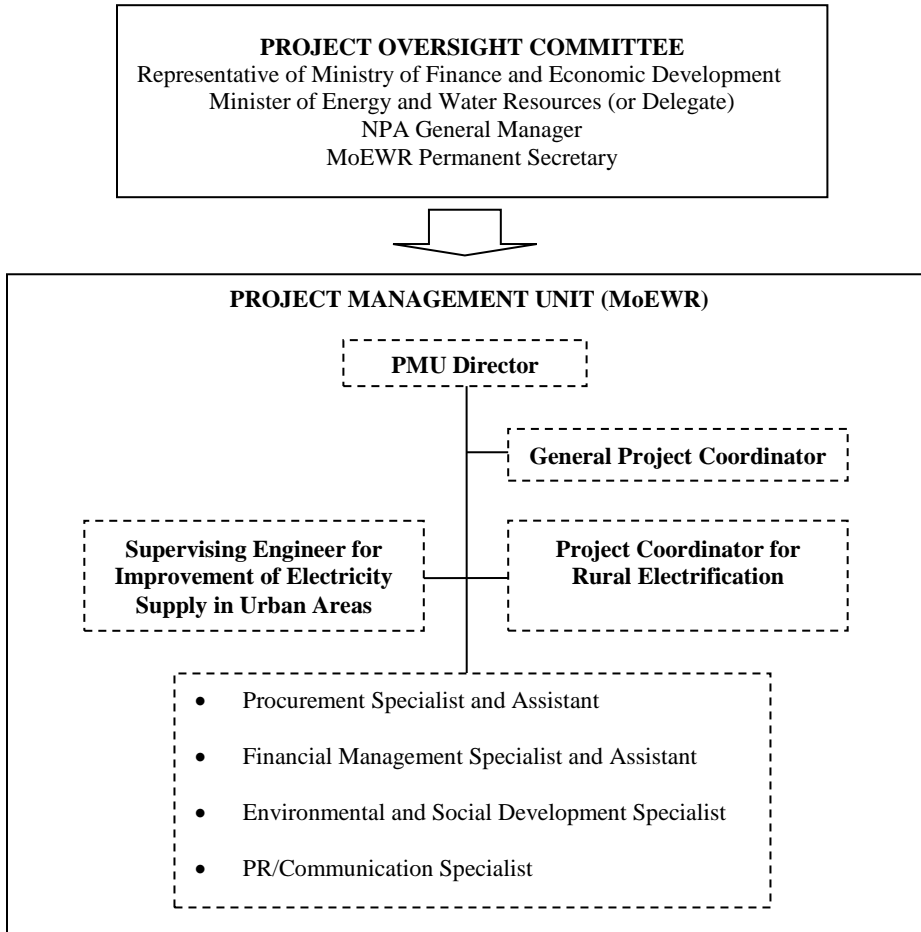
Annex 3: Implementation Arrangements

REPUBLIC OF SIERRA LEONE: Energy Access Project - Sierra Leone Infrastructure Development Fund

B. Project Institutional and Implementation Arrangements

1. The Project will be implemented by the Project Management Unit (PMU) already established at the MoEWR for implementing externally funded development programs. The PMU will closely coordinate with the two project agencies, NPA and the MoEWR.
2. A Project Oversight Committee comprising of the NPA General Manager and the MoEWR Permanent Secretary will provide guidance on policy and strategic issues, address high level implementation issues and meet every quarter or more often as required to discuss project progress.
3. The PMU will be led by the current PMU Director appointed by the MoEWR, who will ensure general oversight of the Project and effective coordination between the PMU and the project agencies. The PMU Director will delegate day-to-day oversight to a General Project Coordinator, who will be competitively hired under component III of the Project (Project Implementation Management). The General Project Coordinator will have the following responsibilities: (a) supervise project implementation; (b) supervise procurement and monitor costs and financing; (c) facilitate coordination among project agencies as well as among all relevant institutions and development partners; (d) serve as a single-point for tracking progress of implementation and Project's outcomes; and (e) provide reports and information to the GoSL and financiers.
4. The PMU will be reinforced with external experts also financed under component III, who will cover the key functions required for project implementation. The PMU staff assigned to this Project will be clearly identified and work only on the Project.
5. An external Supervising Engineer for Improvement of Electricity Supply in Urban Areas will be hired to oversee component I of the Project and carry out management and supervision, and reporting tasks related to the investments in distribution network upgrade, pre-payment meters, statistical metering and BIS. The Supervising Engineer will coordinate closely with NPA's Deputy General Manager/Chief Operating Officer as well as with staff and managers of the concerned NPA departments. A Project Coordinator for Rural Electrification will be hired to oversee component II and carry out project management and supervision and reporting related to the investments for the installation of photovoltaic systems in the selected rural villages.
6. In addition, the following external experts will be hired under the component III of Project: (a) a Procurement Specialist and a Procurement Assistant; (b) a Financial Management (FM) Specialist and a FM Assistant; (c) an Environmental and Social Development Specialist; and (d) a Public Relations/Communications Specialist. Project Implementation Arrangements are summarized in Figure 1.

Figure 1: Project Implementation Arrangements



7. The Government has also prepared a draft plan of action for building capacities for enforcing regulation and monitoring of the ROW, and has established an Inter-Ministerial Sub-Committee comprising of representatives from the Ministry of Land, Country Planning and Environment; Works, Housing and Infrastructure; and Information and Communications. In addition, the Office of National Security (ONS) and the Police under Freetown City Council have been asked to assist the committee especially throughout enforcement of the regulations governing land uses inside the ROW.

C. Financial Management, Disbursements and Procurement

Financial Management

Introduction

8. A financial management (FM) assessment of the PMU at the MoEWR, was completed by the Bank with the objective to determine whether: (i) implementing entity’s financial management arrangements are adequate to ensure that project funds will be used for the intended

purposes in an efficient and economical way; (ii) project financial reports will be prepared in an accurate, reliable, and timely manner; and (iii) project assets will be safeguarded. The FM assessment was carried out in accordance with the Financial Management Manual issued in March 2010 by the Financial Management Board.

9. The PMU at the MoEWR will provide financial management services for all project components. A limited assessment was conducted for the PMU established at MoEWR, since this had been recently subject to an FM assessment under the on-going IDA-financed Bumbuna Project. The assessment confirmed that the existing systems are still performing adequately. The Project will launch the recruitment of a new FM Specialist and a FM assistant. These staff will be competitively hired under the proposed Project against Terms of Reference (ToRs) acceptable to IDA. The existing Financial Procedures Manual currently in use at the PMU will be revised and updated to take into account the requirements of this Project. The accounting system will also be computerized, using an appropriate accounting software.

10. The PMU will have overall responsibility for internal control. The internal audit functions under the Project will be strengthened. The Internal Audit Department within MoFED will be requested to second an internal auditor to the MoEWR, whose work program will include reviewing the activities of the Project on a risk-based approach. Where required, the internal auditor will be trained to enhance his work and performance.

11. An external auditor will be engaged throughout the Project under ToRs acceptable to the Bank and with the approval of the SAI (Audit Service Sierra-Leone).

Country Issues

11. The Sierra Leone fiduciary environment has undergone substantial transformation since 2006. A Public Expenditure and Financial Assessment (PEFA) and a Public Financial Management Assessment (PFMA, 2010) for both central and local governments were successfully carried out to update findings reported in the previous PEFA completed in 2007. The results of the assessment indicate major improvements in the PFM systems and processes in Sierra Leone, both at central and local level, compared to the 2007 assessment, and continued improvements in the future as a result of the reforms currently underway and supported by development partners. The reports on central government and local councils highlight that, despite inherent weaknesses remain to be addressed, Sierra Leone is committed to confronting the challenges of PMF reforms. The government has embraced fundamental reforms, although at a slow pace, as recommended in the analytical assessments carried out since the Country Financial Accountability Assessment (CFAA) completed in 2002. In particular, a number of core institutional, legal and regulatory frameworks for PFM has been put in place through enactment of key legislation, including: (i) Financial Administration Regulations (FAR), 2007; Government Budgeting and Accountability Act (GBAA), 2005; National Revenue Authority Act (NRAA), 2003; Local Government Act, 2004; and Public Procurement Act, 2004. The wide ranging reform efforts signal that the GoSL is committed to enhancing its accountability framework notwithstanding some few legal inconsistencies that remain to be fully addressed

Table 1: Key financial management risks and mitigation measures

Risk	Risk rating	Risk mitigating measures	Conditions of Negotiations, Board or Effectiveness (Yes or No)	Residual Risk rating
INHERENT RISKS				
1	H	<p>Country Level Weaknesses in legislative scrutiny as well as low human capacity affecting timely and adequate intergovernmental fiscal transfers.</p>	No	H
2	H	<p>Entity Level Weak institutional capacity at the two project agencies (NPA & MoEWR).</p>	Yes	M
3	H	<p>Project Level Delays in project implementation due to lack of understanding of Bank's procedures and other project arrangements.</p>	No	S
CONTROL RISKS				
4	H	<p>Budgeting Budget preparation delayed and/or not comprehensive. Budgets prepared not reliable and not followed for project implementation.</p>	No	M
5	H	<p>Accounting Use of manual accounting system not generating timely and accurate accounting information acceptable to the Bank.</p>	Yes	M
6	H	<p>Internal Control. Project funds not being used for intended purposes because of inadequate internal control by management, lack of control measures and absence of internal audit.</p>	No	M

			for the Project. Internal and external auditors will be expected to clearly identify and report any cases of breach of internal control procedures during project management.		
7	Fund Flow Submission of Withdrawal Applications delayed. Fund disbursement to spending entities delayed due to a weak banking arrangement	M	Simplified flow of funds arrangements will be included in the Project's revised Financial Procedures Manual. The PMU at MoEWR is quite familiar with Bank's disbursement procedures. Staff will be trained to enhance their understanding of the required Bank's procedures.	No	L
8	Financial Reporting. Delays in the preparation and submission of un-audited interim financial reports (IFRs) and/or unreliable IFRs submitted.	M	The PMU at MoEWR will produce IFRs 45 days after each quarter to be submitted to the Bank. The content of the IFR will include Sources and Uses of Funds, Uses of Funds by project components and activities and category, bank accounts reconciliation, physical progress report, and a schedule of amounts drawn from the Grant. Refresher training will be provided to staff on the preparation of IFR. IFR formats will be made simpler and programmed as part of system reports during computerization of the accounting system.	No	L
9	Auditing Possible delays in the submission of project audits and/or inadequate scope of work. Delays by management in taking corrective actions on identified weaknesses.	H	Audit ToRs will be agreed and a qualified and acceptable auditor appointed with the approval of the Audit Service Sierra-Leone. Continuous satisfactory performance of the auditor will be the basis for continuous engagement. The audit will be performed in accordance with International Standards on Auditing and International Public Sector Accounting Standards. The audited financial statement is expected to be submitted to the Bank not later than 6 months after the end of each fiscal year. The ToRs for the external auditor has to be cleared by the Bank.	No	M
OVERALL RISK RATING		H			M

H- High, M — Moderate and L — Low.

Strengths and Weaknesses

12. Strengths:

- Acceptable FM arrangements at MoEWR's PMU are already in place.
- Formats for reporting under the Project are already agreed and in use.
- The Financial Procedures Manual currently in use at the MoEWR PMU meets minimum requirements, although it needs to be updated.

13. **Weaknesses**

- Absence of a suitable and fully computerized accounting system.
- Absence of resident internal auditor at the PMU.

Financial Management Arrangements

Budgeting Arrangement

14. The Annual Work Plans and Budgets (AWPB) will be prepared and approved based on the policy guidelines and strategy planning as laid-out in the Project's Implementation Manual. The AWPBs is expected to be prepared in a participatory manner and will be approved before each new financial year begins. The financial part will be monitored during project implementation using unaudited IFRs. The PMU will ensure timely preparation, review, consolidation, and approval of the annual work program. Prior to commencement of project implementation, an effective Budgeting Committee will also be set-up to coordinate budgetary activities for the various project components. The AWPB will be subject to the Bank's review.

Accounting Arrangements

15. **Books of accounts.** The PMU will maintain books of accounts set up specifically for this Project and similar to those for other IDA-funded projects. Books of accounts will include a cash book, ledgers, journal vouchers, a fixed asset register, and a contracts register. A chart of accounts will be drawn up for the Project, in which the account codes will match the classification of expenditures and sources and application of funds indicated in the Grant Agreement. The chart of accounts will be developed in a way so as to allow project costs to be directly related to specific project activities and outputs. The project accounts will be consolidated by the PMU.

16. **Internal control.** The PMU has internal control systems in place with satisfactory levels of segregation of duties and controls. It also has adequate staffing and controls arrangements (including those on relevant approvals & expenditure authorization procedures).

17. **Internal auditing.** MoEWR's internal audit functions, overseeing all transactions beyond those entailed by the Project, will be strengthened through secondment of a competent internal auditor from the Internal Audit Directorate of MoFED, who will be trained on the internal risk-based audit methodology. The auditor will be required to carry out quarterly reviews and later on reviews every six months and report his findings to project management. Copies of the Internal Audit reports will be sent to the Bank for review as well.

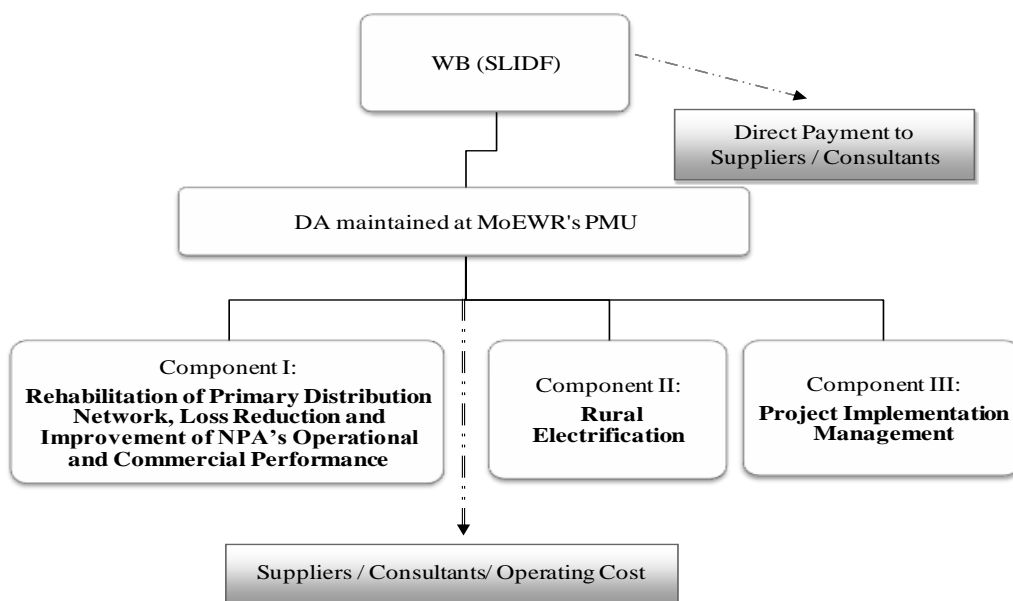
Governance and Anti –Corruption. Anti-corruption guidelines (

18. The Bank's Anti-Corruption Guidelines (revised January 2011)⁸ apply to this operation. Sections of these guidelines, especially those relating conflict of interest, procurement and contract administration monitoring procedures, procedures undertaken for replenishing the Designated Account and use of projects asset shall be provided as an annex to the Project's Financial Procedures Manual. Additional mitigation measures will include advocating good governance, close monitoring and spot checks by the internal audit units of the implementing entities, as well as enhanced social responsibility by the GoSL and implementing entities.

Fund flow arrangements

19. **Bank Accounts.** One Designated Account (DA) denominated in US dollars will be opened and maintained by the authorized signatories at the PMU. Disbursements from the Grant will be deposited in this account, to ensure that funds are available to make payments for eligible expenditures incurred during implementation of the Project.

20. **Illustrative Fund flow arrangements for SLIDF:**



Key:
 Flow Channel for fund →
 Flow of Documentation/Invoices/Report →

21. Upon effectiveness of the Grant Agreement and subject to meeting the disbursement condition, an initial authorized allocation will be made, whose ceiling will be based on a six-month cash-flow forecast for the three project components based on an approved work plan and

⁸ Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15 2006 and revised in January 2011.

budget. The requested authorized allocation will be deposited into the DA upon submission of withdrawal application.

22. The Disbursement Unit will process the withdrawal application and deposit an advance on the Project's Designated Account.

23. Subsequent withdrawal applications will be made at regular intervals, based on submission of documentation justifying the expenditures to be paid from the DA. Project disbursement activities for all project components will be centralized at the PMU.

24. Funds from the Designated Account can be used to pay project expenditures if denominated in foreign currency, or by direct payment, where applicable and justifiable.

Disbursement Arrangements

25. The Project will initially use transaction-based disbursement against full documentation (SoE) and in line with the threshold as stated in the Disbursement Letter. The financial management and accounting systems in place at the PMU will facilitate SoE-based disbursement. These systems will also produce unaudited IFR within 45 days after the end of the calendar year quarterly period. Upon a sustained satisfactory financial management rating during implementation, the Project may move from transaction-based to report-based disbursement. Other methods of disbursement include the use of direct payments to suppliers and special commitments. Details will be spelled out in the Disbursement Letter.

26. The Beneficiary will be obligated to refund the Bank for any ineligible expenditures paid from the Designated Account.

27. The Beneficiary may be requested to refund to the Bank the amounts advanced to the Designated Account if this remains inactive for more than six months.

Financial Reporting Arrangements

28. The PMU will be responsible for the preparation & submission of quarterly Interim Financial Reports (IFR) and an annual Audited Financial Report within 45 days after the end of the period to monitor the use of project funds.

29. Formats for these reports (which are to be agreed) should be generated from the project entities' financial management system. Information in these reports will be clearly linked with the chart of accounts for the Project.

30. The quarterly IFRs and the annual Financial Report produced by the Project will include:

- a. a statement of sources and uses of funds for the reported quarter and cumulative period starting from project inception, reconciled to opening and closing bank balances; and
- b. a statement of uses of funds (expenditures) by project activity/component, comparing actual expenditures against budget, with explanations for significant variances for

both the quarter and cumulative period. The annual financial statements should be prepared in accordance with International Public Sector Accounting Standards (which inter alia include the application of the cash basis of recognition of transactions) and International Standard on Auditing within 6 months after the end of each fiscal year.

31. The Grant Agreement will require the submission of audited financial statements to the Bank within six months after the end of the financial year. These financial statements will comprise:

- a Statement of Sources and Uses of Funds / Cash Receipts and Payments, which recognizes all cash receipts, cash payments, and cash balances controlled by the entities and separately identifies payments by third parties on behalf of the entities;
- a Statement of Affairs / Balance Sheet as at the end of the financial year, reporting all the assets and liabilities of the Project;
- the Accounting Policies Adopted and Explanatory Notes. The Explanatory Notes should be presented in a systematic manner with items on the Statement of Cash Receipts and Payments being cross-referenced to any related information in the notes. Examples of this information include a summary of fixed assets by category and a summary of SoE Withdrawal Schedule, listing individual withdrawal applications; and
- a Management Assertion that Bank funds have been used in accordance to the intended purposes as specified in the relevant World Bank legal agreement.

32. Indicative formats of these statements will be developed by the FM Specialist at the PMU in compliance with fiduciary requirements and agreed with the Country Financial Management Specialist.

External Audit Arrangements

33. The audit of all government finances and projects is entrusted by law to the Audit Service Sierra Leone (ASSL). However, if deemed necessary for such reasons as capacity constraints or logistical challenges, the ASSL may subcontract audit services for the Project to an external auditor. The selection of the external auditor will be carried out in compliance with IDA/IBRD’s procurement guidelines for the selection of consultants and based on ToRs satisfactory to IDA. The audit will adhere to International Standards on Auditing (IFAC/INTOSAI pronouncements) and an audit report will have to be submitted within six months after the end of the financial year.

Table 2: Agreed Action Plan

	Action	Date due by	By Whom
i.	Update Financial Procedures Manual	An updated version to be submitted by effectiveness	PMU
ii.	Recruit FM Specialist	Recruitment completed by effectiveness	PMU
iii.	Recruit FM assistant	Within 4 months of effectiveness	

	Action	Date due by	By Whom
iv.	Put in place a computerized accounting system using an acceptable accounting software	Within 4 months of effectiveness	PMU
v.	Recruit external auditor	Recruitment completed within 6 months of effectiveness	PMU

Conditions and Financial Covenants

34. A number of conditions and financial covenants have been identified as detailed in the Agreed Action Plan presented above. As stated in the Grant Agreement, the financial covenants are the standard ones for Financial Management, Financial Reports, and Audits and Section 4.09 of the General Conditions.

35. The Project will be required to select external auditor within 6 months of effectiveness. These provisions are in line with the Bank's Financial Management arrangement under OP/BP 10.02.

Financial Management Supervision Plan

36. A supervision mission will be conducted at least once a year based on the risk assessment of the Project, with the objective to ensure that strong financial management systems are maintained throughout the life of the Project.

37. Regular reviews will also be carried out through the IFRs to ensure that expenditures incurred by the Project are eligible for funding.

38. The Implementation Status and Results Report (ISR) will include a financial management rating for project components, which will be produced by the Bank's Financial Management Specialist based on an appropriate review.

39. The following implementation support plan is proposed, based on the outcome of the financial management risk assessment.

Table 3: Implementation Support Plan

FM activity	Frequency
<i>Desk reviews</i>	
Interim financial reports review (IFRs)	Quarterly
Project audit report review	Annually
Review of other relevant information such as systems audit reports	As these become available
<i>On site visits</i>	
Review of overall operation of the FM system	6 months after effectiveness and Risk-based thereafter
Monitoring of actions taken on issues	As needed

highlighted in audit reports, auditors' management letters, systems audit report, and other reviews	
Transaction reviews (if needed)	To be done as needed in case of any issue arising
Capacity-building support & FM training sessions	Before Project start and thereafter as needed.

40. Supervision of the financial management arrangements will be risk-based. In this regard and in view of the overall financial management residual moderate risk rating with significant internal control issues, the supervision strategy by the Bank's will comprise at least one on-site supervision visit by the Bank's Financial management Specialist based in Freetown to the implementing entities.

41. The supervision visits will be complemented by desk review of the consolidated IFRs submitted to the Bank at the end of each calendar quarter. In addition, the FM team will review the audited project annual financial statements and the auditor's report and management letter thereon each year.

Conclusions of the Assessment

42. The overall FM risk is 'moderate'. The FM arrangements in place at the MoEWR's PMU satisfy the Bank's minimum requirements. Based on the agreed measures and action plan, the systems will be enhanced and should be adequate to provide, with reasonable assurance, accurate and timely information on the status of the Project as required by the Bank.

Procurement

Processes and Procedures

43. Procurement for the proposed Project will be carried out in accordance with the World Bank's "*Guidelines: Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011, and "*Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011; and the provisions stipulated in the Grant Agreement, the Sierra Leone Public Procurement Act (2004) and its Regulations on Public Procurement. "*Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants*", dated October 15, 2006 and revised in January 2011, shall also apply to the Project.

44. The general description of various items under different expenditure categories is presented below under *Procurement Arrangements*. For each contract, the different procurement methods or consultant selection methods, the need for prequalification, estimated costs, prior review requirements, and time frame are agreed between the Recipient and the Bank's in the

Procurement Plan. The Procurement Plan will be updated at least annually, or as required, to reflect the actual project implementation needs and improvements in institutional capacity.

45. In addition to prior review of contracts by the Bank as indicated in the Procurement Plan, the procurement capacity assessment recommends at least one supervision mission each year to carry out post-review of procurement actions and technical review. Post reviews focus on technical, financial and procurement reports carried out by implementing entities and/or consultants selected and hired under the Project. The procurement post-reviews and technical reviews should cover at least 20 percent of contracts subject to post-review.

46. **Advertising procedures.** In order to get the broadest attention from eligible bidders and consultants, a General Procurement Notice (GPN) will be prepared by the implementing entity and published in the United Nations Development Business online (UNDB online), on the World Bank's external website and in at least one newspaper of national circulation in the Recipient's country, or in the official gazette, or a widely used website or electronic portal with free national and international access. The Recipient will keep record of the responses received from potential bidders/consultants interested in the contracts and send them the Specific Procurement Notices.

47. Specific Procurement Notices for all goods, works and non-consulting services to be procured under International Competitive Bidding (ICB) and Expressions of Interest for all consulting services with a cost equal to or above US\$200,000 will be published in the UNDB online, on the Bank's external website, and in at least one newspaper of national circulation in the Recipient's country, or in the official gazette, or a widely used website or electronic portal with free national and international access. Specific Procurement Notices (SPN) for goods, works and non-consulting services to be procured using National Competitive Bidding (NCB) will be published in at least one newspaper of national circulation in the Recipient's country.

48. **National Competitive Bidding.** The procedures to be followed for Goods, Works and non-consulting services procurements under NCB shall be those set forth in the Recipient's Public Procurement Act 2004 ("the Act"), subject to the following additional procedures (i.e., exceptions to the Act):

- (a) Procuring entities shall use appropriate standard bidding documents acceptable to IDA.
- (b) The eligibility of bidders shall be as defined under Section I of the Procurement Guidelines. Accordingly, no bidder or potential bidder shall be declared ineligible for contracts financed by IDA for reasons other than those provided in Section I of the Procurement Guidelines.
- (c) No restrictions to the eligibility to participate in bidding for contracts shall be placed on the basis of nationality of the bidder and/or the origin of goods other than those imposed by primary boycotts.
- (d) Foreign bidders shall be allowed to participate in NCB procedures.
- (e) No domestic preference shall be given for domestic bidders and/or for domestically manufactured goods.
- (f) Bidding shall not be restricted to pre-registered firms, and foreign bidders shall not be required to be registered with local authorities as a prerequisite for submitting bids.

- (g) Foreign firms shall not be required to associate with a local partner in order to bid as a joint venture and joint venture or consortium partners shall be jointly and severally liable for their obligations.
- (h) Government-owned enterprises shall be eligible to participate in bidding only if they can establish that they are legally and financially autonomous, operate under commercial law and are not dependent agencies of the Recipient or Sub-Recipient. Such enterprises shall be subject to the same bid and performance security requirements as other bidders.
- (i) Subject to these provisions, procurement shall be carried out in accordance with the "Open Competitive Bidding" procedures set forth in the Act.
- (j) Bidders shall be given at least thirty days from the date of the invitation to bid or the date of availability of bidding documents, whichever is later, to prepare and submit bids.
- (k) Bids shall be submitted in a single envelope.
- (l) An extension of bid validity, if justified by exceptional circumstances, may be requested in writing from all bidders before the expiration date and for a minimum period required to complete the evaluation or award a contract, but not to exceed thirty days. No further extensions shall be requested without the prior concurrence of IDA.
- (m) All bids (or the sole bid if only one bid is received) shall not be rejected, the procurement process shall not be cancelled, and new bids shall not be solicited without IDA's prior concurrence.
- (n) Qualification criteria shall be applied on a pass or fail basis.
- (o) Bidders shall be given at least twenty-eight days from the receipt of notification of award to submit performance securities.
- (p) Each bidding document and contract financed out of the proceeds of the Financing shall include provisions on matters pertaining to fraud and corruption as defined in paragraph 1.16(a) of the Procurement Guidelines. IDA will sanction a firm or an individual, at any time, in accordance with prevailing IDA sanctions procedures, including by publicly declaring such firm or individual ineligible, either indefinitely or for a stated period of time: (i) to be awarded an IDA-financed contract; and (ii) to be a nominated sub-contractor, consultant, supplier, or service provider of an otherwise eligible firm being awarded an IDA-financed contract.
- (q) In accordance with paragraph 1.16(e) of the Procurement Guidelines, each bidding document and contract financed out of the proceeds of the Grant shall provide that bidders, suppliers and contractors, and their sub-contractors, agents, personnel, consultants, service providers, or suppliers, shall permit IDA to inspect all accounts, records, and other documents relating to the submission of bids and contract performance, and to have them audited by auditors appointed by IDA. Acts intended to materially impede the exercise of IDA's inspection and audit rights provided for in paragraph 1.16(e) of the Procurement Guidelines constitute an obstructive practice as defined in paragraph 1.16(a)(v)(bb) of the Procurement Guidelines.
- (r) IDA may recognize, if requested by the Recipient, exclusion from participation as a result of debarment under the national system, provided that the debarment is for offenses involving fraud, corruption or similar misconduct, and further provided that IDA confirms that the particular debarment procedure afforded due process and the debarment decision is final.

49. **Fraud and Corruption.** All procurement entities as well as bidders and service providers (i.e., suppliers, contractors, and consultants) shall observe the highest standard of ethics during the procurement and execution of contracts financed under the Project in accordance with paragraphs 1.16 and 1.17 (Fraud and Corruption) of the Procurement Guidelines and paragraph 1.23 and 1.24 (Fraud and Corruption) of the Consultants Guidelines, and the “*Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants*”, dated October 15, 2006 and revised in January 2011, in addition to the relevant Articles of the Sierra Leone Public Procurement Act 2004.

Procurement Arrangements

50. **Procurement of Works.** Works will be limited to the reinforcement of the 7.5 km distribution line between the Blackhall Road and Wellington substations, including replacement of two sets of poles along the line track and installation of other three sets of poles (one set at the Blackhall Road substation, one set at the Wellington substation and another set along the line track). One set includes two poles. These works will be part of the contract for procurement of sub-station equipment. No separate works contracts are envisaged under the Project.

51. **Procurement of Goods.** Goods procured under the Project will be of various kinds, including sub-station equipment, business information systems, pre-paid and bulk meters, equipment for distribution lines, solar power equipment, software, IT and office equipment, etc. Contracts with an amount equal or above US\$500,000 equivalent shall be procured through ICB. Goods orders shall be grouped into larger contracts wherever possible to achieve greater economy of scales. Contracts with an amount lower than US\$500,000, but equal to or above US\$50,000 may be procured through NCB. Contracts with an amount below US\$50,000 may be procured using shopping procedures in accordance with paragraph 3.5 of the Procurement Guidelines and based on a model request for quotations satisfactory to the Bank. Shopping consists of the comparison of at least three price quotations in response to a written request. Direct contracting may be used in exceptional circumstances only with the prior approval of the Association regardless of the amount, in accordance with paragraph 3.7 and 3.8 of the Procurement Guidelines.

52. **Procurement of non-consulting services.** Procurement of non-consulting services, such as services for organizing workshops, data collection, transport services, cleaning services and maintenance of office equipment, will follow procurement procedures similar to those stipulated for the procurement of goods, depending on their nature. The applicable methods shall include ICB, NCB, Shopping and Direct Contracting.

53. **Selection of Consultants.** Services of both national and international consultants will be required under the Project for development of bidding documents, feasibility studies, engineering design and technical supervision, project management and oversight, capacity building and technical assistance, and financial auditing. Selection of consultants will be carried out in compliance with the “*Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*” dated January 2011. The provisions vary for consulting services provided by firms and individual consultants as follows:

- (a) Firm. Selection of consulting firms will include launching a Request for Expressions of Interest, preparing short-lists and issuing a Request for Proposal using Banks' standard formats, when and as required by the Bank's Guidelines. The selection method shall be chosen among the following: Quality and Cost Based Selection (QCBS) whenever possible; Quality Based Selection (QBS); Selection under a Fixed Budget (FBS); Least Cost Selection (LCS); Single Source Selection (SSS) as appropriate; Consultant's Qualifications (CQS) for all consultancy services estimated to cost less than US\$200,000 equivalent. The shortlist of firms for assignments estimated to cost less than US\$200,000 equivalent per contract may be composed entirely of national firms in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines, provided that a sufficient number of qualified national firms are available and no foreign consultant desiring to participate is barred.
- (b) Individual Consultants. Individual consultants will be selected by comparing qualifications of at least three candidates and hired in accordance with the provisions of Section V. of the Consultant Guidelines.

54. Single-Source Selection (SSS) may be used for consulting assignments that meet the requirements of paragraphs 3.8 - 3.11 of the Consultant Guidelines and will always require Bank's prior review regardless of the amount. Procedures of Selection of Individual Consultants (IC) will apply to assignments which meet the requirements of paragraphs 5.1 and 5.6 of the Consultant Guidelines.

55. The recruitment of civil servants as individual consultants or as part of the team of consulting firms will strictly abide by the provisions of paragraphs 1.9 to 1.13 of the Consultants Guidelines.

56. **Operating Costs.** Operating Costs financed by the Project are incremental expenses arising under the Project and based on Annual Work Plans and Budgets approved by the Bank pursuant to the Grant Agreement. They are incurred based on eligible expenses as defined in the Grant Agreement and cannot include salaries of the Recipient's civil service. The procedures for managing these expenditures will be governed by the Recipient's own administrative procedures, acceptable to the Bank.

57. **Procurement Documents.** Procurement of goods under ICB and recruitment of consultants will be carried out using the latest Bank's Standard Bidding Documents (SBD) and, respectively, Standard Request for Proposal (RFP). For NCB, the Recipient shall submit a sample format of bidding documents to the Bank for prior review. Bidding documents shall incorporate the exceptions listed under par. 48 and shall be used throughout the Project once the format has been agreed. The Forms of Evaluation Reports developed by the Bank will be used. SBD for NCB will be updated to include clauses related to Fraud and Corruption, Conflict of Interest, Eligibility and Bank's inspection and auditing rights requirements consistently with the Bank's Procurement Guidelines dated January 2011.

Assessment of Procurement Capacity of the Implementing Agency and Risks

58. The PMU currently established within the MoEWR will carry out the Project's procurement activities.

59. A detailed assessment of the procurement capacity of the PMU as well as of the project agencies - MoEWR and NPA - was carried out by the Bank in February 2012 as part of its fiduciary requirements. The assessment concluded that the MoEWR and NPA would not have adequate experience and capacity to carry out the procurement activities required by the Project. The assessment revealed that NPA has a Procurement Unit consisting of four procurement staff. The MoEWR has only one Procurement Officer and its Procurement Unit is not fully operational. The staffs of both MoEWR and NPA Procurement Units do not have practical experience and knowledge of World Bank procurement. The PMU is currently staffed with procurement consultants hired with funding from the Bumbuna Project, who would not be able to carry out procurement activities for other projects. Also, their contracts are set to expire soon in conjunction with the closing of the Bumbuna Project. Key risks identified during the assessment mainly relate to: (i) lack of adequate capacity to manage procurement; (ii) lack of proficient skills and experience to undertake and manage normal and complex procurement; (iii) lack of experience within MoEWR and NPA with World Bank procurement procedures; and (iv) lack of capacity to manage contracts.

60. As a result, procurement risk for the Project was rated *high*. As a main risk mitigation measure, a qualified Procurement Specialist (Consultant) will be recruited to reinforce the PMU and coordinate, manage and oversee procurement under all project components. In order to ensure long-term sustainability of Project's outcomes and build procurement capacity within the two project agencies, the Procurement Specialist will also provide procurement training to NPA and MoEWR staff. The Procurement Specialist will be assisted by a Procurement Assistant. Both the Procurement Consultant and the Procurement Assistant will be financed under the Project. In addition, prior review will be applied to all project contracts, except for contracts under the Shopping method and other small contract as stated in the Procurement Plan.

61. The Table below summarizes key risks identified and proposed mitigation measures and/or actions to be agreed upon to reduce the risk from High to Substantial.

Table 4: Key procurement risks and mitigation measures

No	Key risks	Mitigation Actions	By Whom	By When
1	Lack of adequate capacity to manage procurement.	A qualified Procurement Specialist (Consultant) will be recruited to coordinate, manage and oversee procurement under all Project components and provide procurement capacity building (training) to NPA and MoEWR staff in order to ensure long-term sustainability of Project's outcomes. The Procurement Specialist will be assisted by a Procurement Assistant.	PMU	Prior to effectiveness
2	Lack of proficient skills and experience to undertake and manage normal and complex procurement.	Prior review applied to all project contracts, except for contracts under the Shopping method and other small contract as stated in the Procurement Plan.	World Bank	Throughout project life

No	Key risks	Mitigation Actions	By Whom	By When
3	Lack of familiarity with World Bank procurement guidelines and procedures.	Organization of a quick workshop for PMU, MoEWR and NPA procurement staff and decision makers to update them on current Bank procurement procedures. Close monitoring and collaboration by the World Bank Procurement Specialist.	World Bank	At Project launch Throughout project life
4	Delays in taking procurement actions like preparation of BD, RFPs, BER, TER, etc.	Close monitoring of the Procurement Plan on a monthly basis and close monitoring and quality control of all aspects of the procurement process, including evaluation, selection and contracts award.	Procurement Specialist (consultant) and General Project Coordinator	Throughout project life

Procurement Plan

62. The PMU developed a procurement plan for the first 18 months of project implementation, which provides the basis for the procurement methods applicable to each contract and indicates those requiring Bank's prior review. This plan has been agreed by the Bank and is available at the PMU's office in Freetown, Sierra Leone. It will also be available in the Bank's external website. The Procurement Plan will be updated in agreement with the Bank annually or as required to reflect the actual project implementation needs and improvements in institutional capacity. A summarized version is presented below.

Procurement Plan

October 16, 2012

Goods, Works and Consulting services

63. **Prior Review Threshold:** Procurement Decisions subject to Prior Review by the Bank as stated in Appendix 1 to the Guidelines for Procurement.

No.	Expenditure Category	Contract Value Threshold (US\$)	Procurement Method	Contracts Subject to Prior Review (US\$)
1	Goods	C \geq 500,000	ICB	All Contracts
		50,000= $<C < 500,000$	NCB	First contract and specified contracts as indicated in the PP
		C $<$ 50,000	Shopping	None
		All values	Direct Contracting	All Contracts
2	Consulting Services	C \geq 200,000 firms	QCBS	All Contracts
		100,000= $<C < 200,000$ firms	QCBS, FBS, CQS, LCS	All Contracts
		C $<$ 100,000	CQS, FBS, LCS	Only ToRs
		C \geq 50,000 individuals	IC	All contracts
		All Values	Single Source Selection	All Contracts
3	Training, Workshops, Study Tours	All Values	To be based on Annual Work Plan & Budgets	

Note: All Term of reference regardless of the value of the contract are subject to Association prior technical review

ICB – International Competitive Bidding

QCBS – Quality and Cost-Based Selection method

NCB – National Competitive Bidding

CQS – Consultants' Qualification Selection method

64. **Prequalification.** Pre-qualification of bidders is not required for any of the contracts financed under this Project.

65. **Any Other Special Procurement Arrangements** (including advance procurement and retroactive financing, if applicable). No special procurement arrangements are required.

66. **Procurement Packages with Methods and Time Schedule**

No.	Contract description	Procurement method	Pre-qualification	Prior Review	Domestic Preference (Yes/No)	Contract signing	Contract Completion date
	Goods						
1.	Sub-station equipment (transformers, circuit breakers, cables, termination kits, spares, DC system, restringing of 7.5km distribution line)	ICB	No	Yes	No	Nov 2013	Apr 2015
2.	Business Information System (BIS)	ICB	No	Yes	No	Nov 2013	Aug 2014
3.	20,000 pre-paid meters and revenue management system and 200 bulk meters and central station (pre-paid meters; vending system)	ICB	No	Yes	No	Nov 2013	Oct 2015
4.	Statistical metering (statistic (bulk) meters; central station)	ICB	No	Yes	No	Nov 2013	Oct 2015
	Consulting Services						
5.	Consultant for preparation of bidding documents and supervision of distribution system upgrade	IC	N/A	Yes	N/A	Mar 2013	Oct 2015
6.	Consultant for preparation of bidding documents and supervision of installation of pre-payment meters, statistical metering	IC	N/A	Yes	N/A	Mar 2013	Oct 2015
7.	Consultant for preparation of bidding documents and supervision of installation of BIS	IC	N/A	Yes	N/A	Mar 2013	Oct 2015
8.	Consultant for improvement of technical and commercial performance and financial management of NPA, incl. training and capacity building for NPA	QCBS	N/A	Yes	N/A	May 2013	Mar 2014
9.	Consultant for implementation of ESMP and RAP	QCBS	N/A	Yes	N/A	May 2013	Oct 2015
	Goods						
10.	Purchase and installation	ICB	No	Yes	No	Nov 2014	Oct 2015

	of solar power equipment on public buildings in 14 villages						
	Consulting Services						
11.	Consultant for feasibility studies, incl. tech specs and bidding docs for installing solar power equipment in 14 villages and supervision.	QCBS	N/A	Yes	N/A	May 2013	Nov 2013
	Goods						
12.	IT equipment and supplies	Shopping	No	No	No	Dec 2012	Jan 2013
13.	Office furniture	Shopping	No	No	No	Dec 2012	Jan 2013
14.	Project management accounting software	Shopping	No	No	No	Jan 2013	Oct 2015
	Consulting Services						
15.	General Project Coordinator	IC	N/A	Yes	N/A	Nov 2012	Oct 2015
16.	Supervising Engineer for Improvement of Electricity Supply in Urban Areas	IC	N/A	Yes	N/A	Dec 2012	Oct 2015
17.	Project Coordinator for Rural Electrification component	IC	N/A	Yes	N/A	Dec 2012	Dec 2014
18.	Procurement expert for PMU	IC	N/A	Yes	N/A	Nov 2012	Oct 2015
19.	Procurement assistant for PMU	IC	N/A	Yes	N/A	Dec 2012	Oct 2015
20.	FM expert for PMU	IC	N/A	Yes	N/A	Nov 2012	Oct 2015
21.	FM assistant for PMU	IC	N/A	Yes	N/A	Dec 2012	Oct 2015
22.	Environmental and social expert for PMU	IC	N/A	Yes	N/A	Jan 2013	Oct 2015
23.	Public Relations expert for PMU	IC	N/A	Yes	N/A	Feb 2013	Oct 2015
24.	Audit firm for 4 annual audits	LCS	N/A	Yes	N/A	Mar 2013	Oct 2015

Note: Short list comprising entirely of national consultants. Short lists of consultants for services, estimated to cost less than US\$ 200,000 equivalent per contract, may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

67. Project Agencies Capacity Building Activities with Time Schedule

<i>Expected Outcome And Activity Description</i>	<i>Estimated Cost</i>	<i>Estimated Duration</i>	<i>Start Date</i>	<i>Comments</i>
The Procurement Specialist (Consultant) contracted under the Project will provide on-going training/capacity building in World Bank procurement to MoEWR and NPA'S procurement staff (1-2 persons from the Procurement Units)	No separate cost. This will be part of the consultancy contract	3 years	November 2012	N/A
The procurement officers of the MoEWR and NPA (1-2 persons from the Procurement Units) shall receive on-the-job training in	N/A	3 years	October 2012	They will provide procurement inputs/assistance to project implementation, working

World Bank procurement				closely with the Procurement Specialist and Assistant contracted under the Project, and being involved in the activities of the Project.
The procurement officers of the MoEWR and NPA Procurement Units (2-3 persons) will attend the procurement workshops/clinics provided by the World Bank Country Office in Sierra Leone	N/A	During the project life	September 2012	N/A

D. Environmental and Social (including safeguards)

Table 5: Environmental and Social risk mitigation measures

PROJECT ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACTS	PROPOSED MITIGATION MEASURE(S) (including legislation & regulations)	INSTITUTIONAL RESPONSIBILITIES (incl. enforcement & coordination)	COST ESTIMATES	COMMENTS (eg. Secondary impacts)
<u>Upgrading of Distribution Line</u> - Transport equipment to site - Clearing RoW/tower route for safety - Stringing Lines and replacing existing cables/conductors - Install new Transformers and Equipment	- Noise, dust, air pollutants, road accidents - Loss of land use - Soil erosion, sedimentation and runoff - Waste generation - Historical/cultural finds - Health and safety risks workers doing upgrades - Visual intrusion - Waste generation – mostly metals, insulators etc - Disposal of transformers and other items, oil leaks	- RAP – compensation completed in 2011; RAP updated in October 2012 to address few remaining risks in project - Maintain native vegetation cover - Replant disturbed sites - Segregate and dispose as appropriate - Report to authorities - Personnel safety equipment - Improve alignment and tensioning - Segregate and reuse, recycle or dispose as appropriate - Adopt best practices and safety procedures	- Contractor - Contractor/NPA - Contractor - Contractor/NPA - Contractor - Contractor - NPA - Contractor/ NPA	- Contractor’s costs - Contractor’s costs - Contractor’s costs - N/A - Contractor’ costs - Contract costs - NPA sells as scrap and gets revenue to offset costs - US\$ 5000 for Supervision	- Appropriate contract clauses to be specified - Approx. 3100 persons affected - Appropriate contract clauses to be specified - Appropriate contract clauses to be specified - Appropriate contract clauses to be specified
<u>Operation and Maintenance of the line</u> - Vegetation control	- Loss of vegetation cover	- Replant as necessary - Compensate	- NPA - NPA	- To be determined - To be determined	

PROJECT ACTIVITY	POTENTIAL ENVIRONMENTAL IMPACTS	PROPOSED MITIGATION MEASURE(S) (including legislation & regulations)	INSTITUTIONAL RESPONSIBILITIES (incl. enforcement & coordination)	COST ESTIMATES	COMMENTS (eg. Secondary impacts)
	- Loss of income from fruit trees				
<u>Maintenance of Right of Way</u>	- Waste generation - Health and safety - Control encroachments	- Segregate and dispose as necessary - NPA Safety rules and personnel protection	- NPA - NPA	- US\$ 39,000 for RoW	- Annual maintenance cost (2 staff policing area)
<u>Tower maintenance</u>	- Waste generation - Health and safety - Erosion effects on tower pads	- As above - Shore up affected towers	- NPA - NPA	- As above - US\$ 15,000 for waste management	
<u>Special issues</u>					
- EMF	- Unknown health hazards	- Protect public from equipment - Public education	- NPA	- US\$ 37,000 for training and institutional strengthening in environmental management	
- PCB in insulating oils	- Health hazard	- Safe handling Procedures - Personnel Protection	- NPA		- Tests to be carried out to determine if PCB exists in NPA systems - Training in environmental issues
- Use of SF6 equipment	- Health hazards	- Safety Procedures - Training in environmental issues	- NPA		- Training in environmental issues
- Hazard management	- Health and safety Hazards	- Training in environmental issues	- NPA		
- Waste management	- Health, safety and pollution hazards	- Training in environmental issues	- NPA		
- Transformer oil leaks	- Pollution hazards - Health and safety hazards	- Construct bunds around transformers	- NPA	- US\$ 18,000	

Monitoring & Evaluation

68. A Results and Monitoring Framework to document and measure the Project's development impact has been discussed and agreed with the PMU, NPA and the MoEWR (Annex 1). The Framework identifies result indicators for the Project as a whole as well as for each of its components. The project agencies have provided annual target values for the results indicators and baseline data against which results can be measured.

69. Depending on the indicators, current data will be either provided by NPA from the utility database and accounts, or collected through direct observation, or from consultant's technical reports. The PMU will be responsible for collecting, verifying and collating information and submit progress reports to the Bank, on an annual basis for PDO indicators and on a semi-annual basis for the intermediate indicators at component level.

Role of Partners

70. The proposed Project is entirely financed under the second stage of the Sierra Leone Infrastructure Development Fund (SLIDF). Established by the World Bank in 2010, the SLIDF is a multi-donor trust fund intended to support Sierra Leone's Poverty Reduction Strategy (PSR) by: (i) facilitating expanded access to basic services; (ii) raising the efficiency and effectiveness of infrastructure development by improving sector governance and accountability; and (iii) building government capacity to plan and manage development projects.

71. The U.K.'s Department of International Development (DFID) is the anchor donor of the SLIDF and is expected to be joined by additional donors over the coming 1-2 years as the Fund and its program mature. The Trust Fund focuses on financing infrastructure development projects including, inter alia: power, water, wastewater, sanitation, transport, and roads that are consistent with Sierra Leone's PRS. These proposed projects could range from physical construction of new facilities to capacity building or institutional development of Sierra Leone's selected ministries or agencies. It is expected that the Trust Fund will fund power sector projects on a priority basis, and projects in other sectors may also be approved, subject to availability of funds.

72. The Bank acts as the administrator of the Trust Fund. In such capacity, the Bank carries out the fiduciary responsibility for management of Trust Fund resources and is responsible for supervising all uses of funds to ensure that projects are subject to the same policies and procedures as regular Bank-financed projects. The SLIDF is administered by the Bank based on an Administration Agreement (AA) entered into with DFID, which spells out terms and conditions of the Trust Fund, including activities and categories of expenditures eligible for financing.

73. The governance structure of SLIDF includes a Steering Committee (SC) co-chaired by the GoSL and the Bank and composed by up to three permanent members from the GoSL and representatives from the Bank and the active donor/s (DFID at present). Non-voting observers may participate in SC meetings with committee approval, including potential SLIDF donors and

other donors active in Sierra Leone's infrastructure sector. The SC meets on a quarterly basis, but ad-hoc meetings can be arranged as warranted. The main responsibilities of the SC are to: (a) ensure that projects funded by the Trust Fund support national priorities articulated in the PRS and national strategies guiding the infrastructure sector; (b) review initial project proposals received from Sierra Leone, based on the above criterion; and (c) address any bottlenecks facing Trust Fund operations.

74. The Trust Fund finances both Recipient-executed and Bank-executed activities. Recipient-executed activities relate to the identification, preparation and implementation by the GoSL of infrastructure and capacity building projects that are proposed to and reviewed by the SLIDF Steering Committee. Following the SC's review of a project proposal, the proposal is processed by the Bank's project team and approved by Bank's management in accordance with the Bank's standard procedures and guidelines for trust-funded operations. Therefore, the Bank, as administrator of the Trust Fund on behalf of the donor/s, enters into a Grant Agreement (GA) with the GoSL, which sets forth relevant terms and conditions for the use of grant funding by the recipient.

75. Bank-executed activities relate to the preparation, appraisal and supervision by the Bank of the selected projects as well as to Trust Fund management and administration.

76. The overall funding to the SLIDF is £14 million, provided by DFID in four tranches in the amount of £3,262,500 each, to be paid on or before September 30 of each year starting from 2011. In addition, £950,000 has been paid upon signature of the Administration Agreement. To date, the first tranche has been received.

77. The Bank shall provide the donor/s with an annual report on the progress of activities financed by the SLIDF. Within six (6) months of the final disbursement date currently set on April 30, 2016, the Bank shall furnish the donor/s a final report on the activities financed by the Trust Fund.

Annex 4: Operational Risk Assessment Framework (ORAF)

REPUBLIC OF SIERRA LEONE: Energy Access Project – Sierra Leone Infrastructure Development Fund Stage: RVP Approval

1. Project Stakeholder Risks	Rating	Moderate		
<p>Description: Although GoSL is fully supportive of the Project, emergencies may develop as result of the fragile context and shift GoSL’s focus to other development priorities.</p> <p>The positive impact on people’s living conditions and economic circumstances of the investments carried out in Freetown area may not be apparent in the near-term or be perceived as only indirect. As result, support for the Project from the civil society may be shallow.</p>	Risk Management: The Bank Team will maintain a close dialogue with GoSL. The Senior Energy Specialist located in Freetown will continue to work with the GoSL and multiple development partners on a day-to-day basis to ensure adequate consultation and dissemination. <p>As part of technical assistance activities, a Communication Specialist will be hired, who will be responsible for ensuring adequate dissemination, public awareness and participation by the civil society.</p>			
	Resp: PMU/Bank	Stage: Throughout	Due Date:	Status:
2. Implementing Agency Risks (including fiduciary)				
2.1. Capacity	Rating:	High		
<p>Description: Both NPA and the MoEWR have weak institutional and project management capacity and lack adequate staff for effectively implementing the Project.</p> <p>The recruitment of PMU personnel may be delayed given the limited staff available to the PMU, the MoEWR and NPA, and potential lower focus on the Project during election time.</p> <p>Weak procurement capacity and lack familiarity with World Bank procurement may affect project implementation.</p>	Risk Management: The Project will be implemented by the PMU currently established at the MoEWR. Under component III of the Project, a dedicated group of personnel will be competitively hired to reinforce the PMU’s skills and cover the full range of functions required for project implementation. Among the others, the newly recruited staff will include a General project Coordinator, who will be responsible for day-to-day oversight of the Project, as well as a Supervising Engineer for Improvement of Electricity Supply in Urban Areas and a Project Coordinator for Rural Electrification, who will be respectively responsible for management and supervision of component I and II of the Project. <p>The Bank will closely liaise with the GoSL to ensure that recruitment of PMU personnel is fast-tracked. Effectiveness conditions include that key PMU staff has been hired.</p> <p>A qualified Procurement Specialist (Consultant) will be recruited to join the PMU and coordinate, manage and oversee procurement under the Project. The Procurement Specialist will be assisted by a Procurement Assistant also to be recruited under the Project. In order to ensure long-term sustainability of Project’s outcomes and build procurement capacity within the two project agencies, the Bank project team and the external Procurement Specialist will</p>			

<p>Weak financial management (FM) capacity may affect oversight on the Project and long-term outcomes.</p> <p>The manual accounting system currently in use may not be able to generate timely and accurate accounting information acceptable to the Bank.</p> <p>NPA lacks adequate technical competencies for ensuring due maintenance of the distribution network.</p> <p>Social entities (schools, clinics, ect.) selected to participate in the pilot program for the installation of PV systems may lack the capacity to maintain and operate the equipment over the long-term.</p>	<p>provide tailored training to NPA and MoEWR. Prior review will be applied to all project contracts, except for small contracts as identified in the Procurement Plan.</p> <p>The PMU will be reinforced with a qualified FM Specialist (Consultant) and an FM Assistant, both competitively selected under the Project. The MoEWR will be encouraged to put in place policies that will allow it to retain its experienced staff throughout the project life. FM and disbursement procedures will be fully documented in the project Financial Procedures Manual.</p> <p>An accounting software will be installed under the Project. The Financial Procedures Manual currently in use at the MoEWR will be updated.</p> <p>Capacity building and training will be deployed under component I of the Project in synergy with investments to raise NPA’s competences for adequate system operation and maintenance.</p> <p>Rural communities where photovoltaic systems will be installed will receive maintenance training by the supplier. In addition, prior to turnover from the national government, there will be agreements with communities and local governments to ensure long-term sustainable use of the newly installed facilities.</p>			
<p>2.2. Governance</p>	<p>Resp: PMU</p>	<p>Stage: Throughout</p>	<p>Due Date:</p>	<p>Status:</p>
<p>Description:</p> <p>There are systemic weaknesses in governance and management processes of NPA responsible for development, operation and maintenance of the country’s power assets. These weaknesses have, over the years, led to significant deterioration in the utility’s financial health.</p> <p>Funds may be diverted away from intended purposes because of inadequate internal control by management, lack of control measures and absence of internal audit.</p> <p>Possible delays in the submission of project audits and/or inadequate scope of work.</p> <p>Delays by management in taking corrective actions on</p>	<p>Rating: High</p>	<p>Risk Management:</p> <p>The extensive technical assistance under the Project has been designed to build capacity to address these weaknesses.</p> <p>Internal Control (IC) over disbursement and accountability of funds for eligible expenditures will be strengthened. The internal auditors will be required to generate internal audit reports on a quarterly basis to be shared with relevant stakeholders including the Bank. The IC will also be documented in the revised Financial Procedures Manual. An external auditor will be hired based on ToRs acceptable to the Bank. Internal and external auditors will be expected to clearly identify and report any cases of breach of internal control procedures during project management.</p> <p>Same as above.</p>		

identified weaknesses.	Same as above			
	Resp: PMU	Stage: Throughout	Due Date:	Status:
3. Project Risks				
3.1. Design	Rating:	Moderate		
Description: The variety of skills and supervision needed for investments in urban and rural areas may pose coordination and implementation challenges.	Risk Management: The basic project design is simple and includes standard applications typical of energy programs. The Project complements activities initiated under previous projects financed by the World Bank and multiple donors. Component I and II of the Project will be overseen by a Supervising Engineer and a Project Coordinator for Rural Electrification respectively. Coordination will be ensured by the General Project Coordinator.			
	Resp: PMU	Stage: Throughout	Due Date:	Status:
3.2. Social and Environmental	Rating:	Moderate		
Description: The proposed Project is classified as environmental Category B. An Environment and Social Management Plan (ESMP) was prepared and included mitigation measures and capacity building programs. There is a risk that the implementation of the ESMP may be challenged by institutional constraints and weak capacities for comprehensive follow up of mitigation programs and monitoring quality of ESMP implementation Lack of enforcement and monitoring of the Right of Way along the distribution lines to be rehabilitated under the Project may pose safety issues.	Risk Management: The ESIA/ESMP was prepared by the implementing agencies (PMU and NPA) based on past experiences with IDA-financed energy projects. In particular, there were lessons learned from the implementation of the completed IDA-funded Power and Water Project, which carried out activities outlined in an ESIA and RAP. The use of a qualified and experienced Environmental and Social Development Specialist, who will be hired in the PMU specifically for the Project, addresses the capacity risk. Additionally, the ESMP has a set of actions for monitoring and evaluation. The RAP for the closed IDA-financed Power and Water project has been updated to address any remaining social safeguards issues in the project. The GoSL has set up an inter-ministerial sub-committee to address encroachment issues. The Office of National Security (ONS) and the Police under Freetown City Council have been asked to assist the committee especially throughout enforcement of the regulations governing land uses inside the RoW. The Project will support the strengthening of NPA's distribution network monitoring program to reduce the impacts from population encroachments and land uses that may negatively affect the operation of distribution facilities.			
	Resp: PMU/GoSL	Stage: Throughout	Due Date:	Status:
3.3. Program and Donor	Rating:	Moderate		
Description: Duplication and overlapping of project activities with support deployed by other development partners currently engaged in Sierra Leone's power sector may occur.	Risk Management: The Bank's project team has closely liaised with development partners while designing the Project and will continue to do so to ensure maximum impact. Distribution upgrading investments designed under the Project complement support provided by JICA in this area. Installation of pre-paid meters supports the re-metering program initiated with donor support. The proposed rural electrification component complements the activities envisaged as part of UNDP's Multi-stakeholders Group on Energy Access in Rural and Peri-Urban Areas.			

<p>The schedule and the volume of DFID’s contributions to SLIDF may not match the timing and the consistency of the commitments arising from project activities funded by SLIDF. As a result, financing gaps may emerge and delay project implementation.</p> <p>Implementation delays or underachievement of the results agreed for activities funded by SLIDF may provide ground for a unilateral cancellation of DFID’s support to the Project through the SLIDF.</p>	<p>The Project team will closely liaise with DFID and Bank management to anticipate any potential financing gap.</p> <p>The Project team will closely liaise with DFID. Technical assistance in support to the PMU is a key component of the Project and will help to strengthen project management. Close monitoring will be carried out by the Bank team to address any implementation issue that may arise.</p>			
<p>3.4. Delivery and Monitoring Sustainability</p>	<p>Resp: Bank</p>	<p>Stage: Throughout</p>	<p>Due Date:</p>	<p>Status:</p>
<p>Description: The Logical Framework agreed with DFID has significant requirements for monitoring and delivering results for the activities funded by SLIDF. This will add on the monitoring requirements for the Project</p>	<p>Rating: High</p> <p>Risk Management: The Project monitoring and reporting format has been designed so as to accommodate both WB and DFID requirements to the extent possible.</p>			
<p>3.5. Other</p>	<p>Resp: PMU/Bank</p>	<p>Stage: Throughout</p>	<p>Due Date:</p>	<p>Status:</p>
<p>Description:</p>	<p>Rating:</p> <p>Risk Management:</p>			
	<p>Resp: Client/Bank</p>	<p>Stage: Throughout</p>	<p>Due Date:</p>	<p>Status:</p>
	<p>Implementation Risk: High</p>			

Annex 5: Implementation Support Plan

REPUBLIC OF SIERRA LEONE: Energy Access Project – Sierra Leone Infrastructure Development Fund

1. **Strategy and approach to implementation support.** The strategy for implementation support (IS) has been developed on the basis of the nature of the Project and its risk profile. The IS has been designed so as to guarantee efficient and flexible support to the client and facilitate implementation of the risk mitigation measures defined in the ORAF.
2. **Country and sector environment.** The Bank's project team will maintain a close dialogue with the GoSL to ensure that proper focus on project implementation is maintained. In addition, the Integrated Resources Planning Study and the Power Tariff Study currently being delivered under the SLIDF will provide the basis for more thorough sector planning and informed tariff setting, contributing to strengthen the GoSL's preparedness to implement the recently approved sector reforms.
3. **Project preparation and implementation capacity.** The Bank will closely liaise with the GoSL to ensure that the recruitment of PMU personnel is timely completed. Terms of Reference for all PMU staffs to be hired under the Project have been reviewed by the Bank to ensure that tasks were appropriately defined and qualifications and experience are adequate to perform the key functions required for project implementation.
4. **Loss reduction program.** In coordination with NPA, the Bank's project team will closely monitor the installation of pre-paid meters and technical assistance activities deployed in support to the implementation of the loss reduction plan to timely address any issue that may arise and facilitate the completion of the prior-action required for accessing the next tranche of Budget Support.

Implementation support plan

5. Bank team members will be based both at headquarters and in the Sierra Leone Country Office to ensure timely, efficient and effective implementation support to the client. The Bank has a Senior Energy Specialist located in Freetown, who will continue to work with the Government, implementing agencies and other development partners to ensure adequate consultation, coordination and support. The Bank's Procurement Specialist and Financial Management Specialist supporting the Project are also based in Freetown and can ensure continued support, advice and monitoring to the implementing agencies. Formal IS missions and field visits will be carried out twice a year.
6. **Technical support.** Technical knowledge of primary distribution network and substations; installation and use of pre-paid vending and management systems, billing systems, business information systems and solar systems; and engineering works are required for proper assessment of technical specifications and other aspects of bids and contracts. During project implementation, technical supervision is required to ensure that contractual obligations are met.

The Bank's project team and PMU staff will conduct site visits to project sites on a regular basis throughout the duration of the Project. The PMU staff will include a Supervising Engineer and a Project Coordinator for Rural Electrification who will oversee investments and technical assistance in urban and rural areas respectively.

7. **Procurement requirements and inputs.** The PMU will discharge all procurement functions for the Project. The Bank's project team will help strengthen procurement management efficiency by: (i) reviewing relevant procurement documentation and providing timely feedback to the PMU; (ii) providing detailed guidance on the Bank's Procurement Guidelines to the PMU as needed; and (iii) monitoring procurement progress against the Procurement Plan, which will be updated as required to reflect project implementation needs and improvements in institutional capacity. In order to ensure long-term sustainability of Project's outcomes and build procurement capacity within the two project agencies, the Bank project team and the external Procurement Specialist hired under the Project will provide tailored training to NPA and MoEWR procurement staff as detailed in Annex 3.

8. **Financial management requirements and inputs.** The Bank's project team will perform regular supervision on financial management functions and provide advice and capacity building on financial planning, budget preparation, reporting and other relevant matters as detailed in Annex 3. The PMU will be responsible for the timely preparation and submission of project financial statements

9. **Audit.** Internal control functions will have to be strengthened under the Project as detailed in Annex 3. The Bank's project team will closely monitor financial management activities to identify in advance potential delays in the preparation of the financial and audit reports and undertake corrective measures. Project financial statements will be audited by an external auditor hired under the Project under terms of reference (ToRs) acceptable to the Bank and with the approval of the SAI (Sierra-Leone Audit Service).

10. **Environmental and Social safeguards.** Compliance with environmental and social safeguards related to the upgrading of the primary distribution network in Freetown and installation of solar panel in rural areas will be a primary responsibility of the PMU. The Bank's project team will pursue close monitoring of environmental and social management under the Project. The team will also continue to liaise with the GoSL to ensure continued focus on urban land reforms and commitment by multiple government entities to control encroachment along the RoW of transmission and distribution lines.

11. **Donor Coordination.** The project team will maintain close dialogue and coordination with relevant development partners, including DFID, JICA, EU and AfDB to avoid overlap of project activities with other donor initiatives. The team will also liaise with DFID on a daily basis to inform them on progresses on project activities and address any potential mismatch between project financing needs and the availability of DFID funds.

Table 1: Implementation Support Plan

Time	Focus	Skills needed	Resource estimate	Partner role
First Twelve Months	Recruitment of all PMU staff	Procurement, FM, environmental and social, communication		Close coordination with DFID for financing
	Hiring of a consultants for completion of the relevant engineering design and preparation of technical specification and procurement documents	Technical (engineer/procurement)		
	Establishment of FM arrangements and systems	FM		
	Implementation of environmental and social safeguards	Safeguards		
12-46 months	Technical supervision	Power Engineer		Close coordination with DFID for financing
	Safeguards supervision	Safeguards		
	M&E supervision	M&E		
	Procurement & FM supervision	Procurement/FM		

Table 2: Skills mix required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
General supervision and project management (TTL)	16	2/year	
Power Engineer	8	4/year	
Energy Specialist	10	Field Staff	
Procurement Specialist	10	Field Staff	
Financial Management Specialist	8	Field Staff	
Environmental and Social Development Specialist	4	2/year	
Legal	1		Support for eventual amendments to GA
Administrative support	4		Support staff based at headquarters
Country Economist	1	1/year	Support for monitoring of progress on loss reduction program in view of meeting prior-action for Budget Support
Disbursement Specialist/analyst	2		Support for TF administration/disbursement

Table 3: Partners

Name	Institution/ Country	Role
DFID	Donor	Financier

Annex 6: Economic and Financial Analyses

REPUBLIC OF SIERRA LEONE: Energy Access Project – Sierra Leone Infrastructure Development Fund

A. Economic Analysis

Methodology

1. The economic analysis has focused on component I of the Project, and assessed the benefits deriving from loss reduction as result of distribution system rehabilitation and collection improvements. Net economic benefits are measured by estimating the changes in consumer surplus. In a supply-constrained system like Sierra Leone, reduction in consumption when pilferers face metering does not result in reduced generation, because other customers whose consumption is presently curtailed will take up the previously pilfered consumption. In principle, the increased revenue would allow a reduction in tariff (which results in increased benefits to all electricity consumers). However, in Sierra Leone, NPA's finances are in such imbalance that the short-term impact is to lower the Government subsidy, which results in an equivalent increase in welfare. Consequently, the change in consumer surplus of electricity consumers is only part of the impact: this must be adjusted by the change in subsidy to NPA and the costs of the loss reduction program itself. Estimating the welfare gain associated with reduction in subsidy requires calculation of NPA's revenue requirements with and without the program.

Assumptions:

2. The following assumptions have been made for the calculation of economic returns:
 - The loss reduction targets are assumed to be phased in over a five year period, with a 1-year lag of benefits over investment outlays. Non-technical T&D losses are assumed to decline from 20 percent to 15 percent, and the collection ratio to improve from the 2011 rate of 76 percent to 86 percent. System-wide technical losses are assumed unchanged at 18.5 percent.
 - The investment in the 11kv/33kV primary distribution network is expected to improve reliability of supply, and will enable more power to be distributed. An additional 8MW is expected to be evacuated once these works are completed, about 31 GWh at the estimated load factor. It is assumed that this incremental energy is supplied from Bumbuna for 7 months of the year, and from the thermal plants for the remaining 5 months of the dry season. The variable (financial) cost of Bumbuna power is just 3.4 ¢/kWh.
 - Tariffs are expected to increase by 10 percent every 5 years.
 - Life of assets and of newly installed equipment is assumed as follows: 20-years for the 11kv/33kV distribution system; 7 years for business information system; and 10 years for pre-paid meters.

- The discount rate is set at 10 percent. No taxes and duties are included in the investment costs, which are taken at constant 2012 prices.

Results

3. The NPV of economic benefits to a 20-year life is US\$26.7 million. The ERR is 39 percent. The economic (and financial) returns are high. But this is to be expected, since the investment required for loss reduction programs is small. The economic returns are robust with respect to lifetime assumptions: the hurdle rate is reached already in year 5 of operational benefits, and in year 10 reaches 36.8 percent.

Risk assessment

4. The main risks to the Project are as follows:
- *Capital cost increases.*
 - *Additional power evacuation.* Even if the engineering estimates regarding the additional power evacuation are correct (8MW); in wet seasons of dry years, Bumbuna may not be able to increase its output as expected.
 - *Willingness to pay (WTP),* which may be overestimated.
 - *The collection ratio,* which may not improve by the forecasted 10 percent.
 - *Non-technical loss reduction,* which may not be achieved by the forecasted 5 percent.
 - *Implementation delays.* In the baseline it is assumed that benefits arise pro rata with capital investments, with a one-year lag. But realization of loss reduction benefits requires not just the purchase and installation of new meters. It also requires the management actions to organize human resources to enforce anti-theft measures, and implement the new business information system. The economic analysis model permits assessment of returns by increasing the assumed time-lag between investment and realization of benefits.
5. The switching values for each of the corresponding variables are shown in Table 1. It is evident that the economic returns are robust with respect to these uncertainties in input assumptions. In particular, it can be noted that the switching value for willingness to pay is below the average tariff - a reflection of the low variable cost of incremental energy from Bumbuna.

Table 1: Switching values

		Baseline assumption	Switching Value	Multiplier	Comments
Capital cost increase	US\$m	14.3	38.6	2.7	A 270 percent increase in capital cost for a straightforward distribution rehabilitation +metering project is extremely unlikely
Additional power evacuation	MW	8	-2	N/A	Difficult to imagine that the rehabilitation of the primary lines would result in a <i>decrease</i> in capacity.
WTP	\$/kWh	0.30	0.17	0.57	Switching value below the average tariff (by definition the lower bound of WTP)
Non-technical loss	[]	5 %	None	N/A	Even when assumed at zero, ERR is 29.3

reduction					percent
Collection ratio improvement	[]	10 %	none	N/A	Even when zero, ERR is 23.4%, i.e. above the hurdle rate
Implementation lag	[years]	1	none	N/A	Even when loss reduction benefits <i>never</i> achieved, ERR=12.3% (due to additional power evacuation)

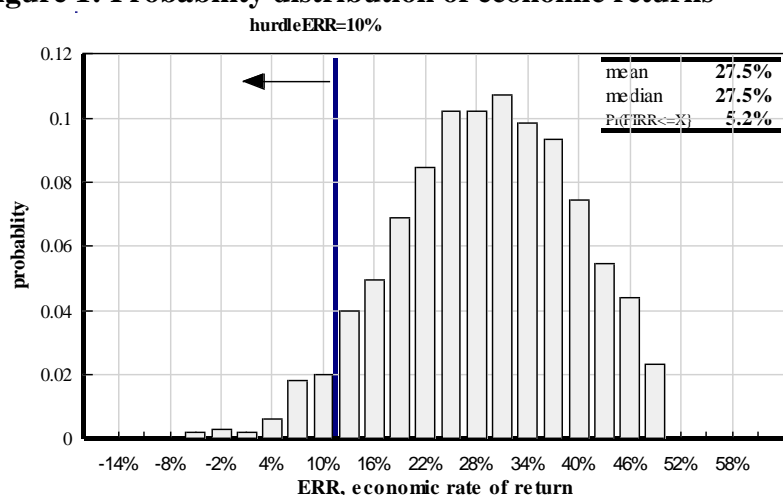
Quantitative risk assessment

6. The objective of quantitative risk assessment is to derive a *probability distribution* of economic returns. This is best achieved in a so-called Monte Carlo simulation, in which the input assumptions to the calculation of returns are specified as probability distributions. The ERR then is calculated for each random drawing from these probability distributions (typically repeated 3,000-10,000 times), from which the probability distribution for economic returns follows. The rationale for the hypothesized distributions for the input assumptions is as follows:

- *Capital cost increases*: generally expected to be higher than estimated, so skewed to the right.
- *Additional power evacuation*: more likely to be less than estimated, therefore skewed to the left (i.e. values lower than 8MW more likely). Distribution effectively truncated at zero (i.e. the possibility that Project would make power evacuation *lower* than at presented is discounted).
- *Willingness to pay*: truncated at the present tariff (because WTP cannot be less than the tariff, since consumers are *observed* to be willing to pay *at least* that amount).
- *Non-technical loss reduction*: skewed to the left, on grounds that loss reduction benefits are more likely to be lower than expected.
- *The collection ratio*: skewed to the left, again on grounds that loss reduction benefits are more likely to be lower than expected.
- *Implementation delay*: longer delays increasingly unlikely; distribution truncated at 1 year (i.e. benefits arise no sooner than 1 year after the investments have been made).

7. The resulting distribution of economic returns is shown in figure 1, with an expected value of 27.5 percent. Because the assumed input probability distributions are (intentionally) skewed (e.g. the probability of cost overrun much higher than cost underestimate), the mean is below the deterministic estimate based on most likely values for individual assumptions. The probability of returns below the hurdle rate (5.2 percent) is small. In part, the explanation is that even when non-technical loss reduction and collection loss reduction is lower than expected (as might result from NPA management failures), the additional power that can be evacuated as a result of the physical rehabilitation of the 11/33kV primary distribution system will ensure the returns associated with the infrastructure investment.

Figure 1: Probability distribution of economic returns



Distributional Analysis

8. Table 2 shows the distribution of economic costs and benefits among the stakeholders, which is derived from the reconciliation of economic and financial flows. Transfer payments among the stakeholders cancel out and show zero in column [6], which is the net economic return. The columns represent the stakeholders, the rows the individual elements of costs and benefits. The net (financial) impact on each stakeholder is shown in the bottom row: the assumption here is that NPA deficits are covered by subsidies from Government both with and without the Project, and therefore the net financial impact on NPA is zero.

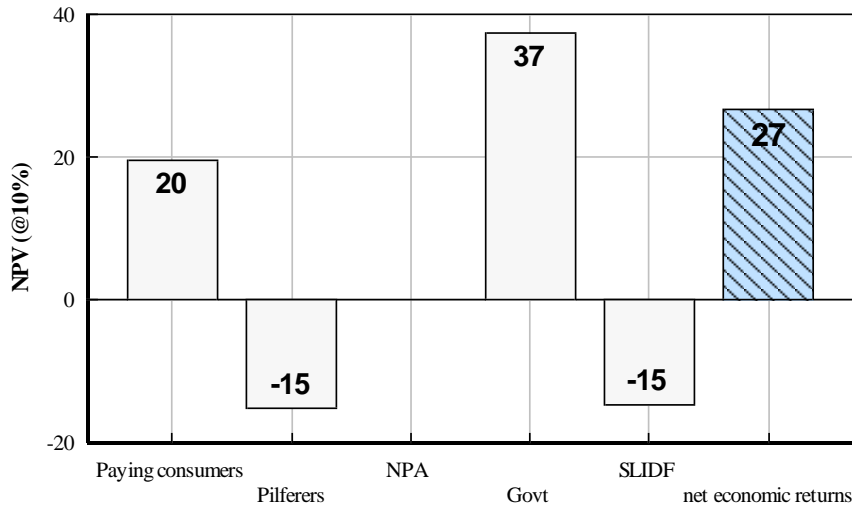
Table 2: Distribution of economic returns (as 20year NPVs at 10 percent discount rate, US\$ million)

	Paying consumers	Pilferers	NPA	Govt	SLIDF	Net economic returns
	[1]	[2]	[3]	[4]	[5]	[6]
No project						
WTP (benefits of consumption)	263.9	98.1				362.1
cost of electricity at tariff	-208.4	0.0	208.4			0.0
cost of supply			-294.5			-294.5
government subsidy			86.0	-86.0		0.0
Total	55.5	98.1	-0.0	-86.0	0.0	67.6
With project						
WTP (benefits of consumption)	340.8	82.8				423.6
cost of electricity at tariff	-265.8		265.8			0.0
cost of supply			-312.5			-312.5
donor contribution to capital cost			14.9		-14.9	0.0
investment cost			-14.9			-14.9
incremental project O&M costs			-1.9			-1.9
government subsidy			48.7	-48.7		0.0
Total	75.0	82.8	-0.0	-48.7	-14.9	94.3
Impact of project	19.5	-15.4	0.0	37.3	-14.9	26.7

9. Quite clearly, the losers from the Project are the pilferers. The Project therefore clearly promotes social equity. Paying consumers and the Government (i.e. *all* of society) are the winners. The US\$12.3 million from the SLIDF donors leverages US\$26.7million in net

economic benefits, so clearly this is a Project with high economic returns, and, as noted above, returns that are robust with respect to the main uncertainties and risk factors.

Figure 2: Distributional analysis



Rural Electrification component

10. An economic analysis of the rural electrification component has not been carried out due to the lack of survey information from which to derive credible and reliable quantitative estimates of economic benefits.

11. A detailed report from the consultant who surveyed the 14 candidate villages provides confirmation that the installation of solar panels would be technically possible, and would be welcomed by the beneficiaries. The survey notes that some clinics already use PV for freezers but not lighting (e.g. in Kent village), which confirms societal willingness to pay for PV for rural health purposes. In the absence of information about solar radiation, estimates of the available annual (and monthly) watt-hours from the proposed 750 Watt PV systems are entirely speculative (and dependant on further assumptions about battery capacity). Moreover, the levelized cost per kWh delivered (over an assumed 15-year panel life at 10 percent, for a US\$1.5 million expenditure) is US\$3.00/kWh, which is well above typical estimates of WTP for residential PV (as estimated by many international and World Bank surveys).

12. Societal WTP for electrification of health clinics and schools may be much higher. The equivalent levelized daily cost is US\$14.9 per day per installation, or US\$5,425 per facility per year. This may well be a reasonable benefit for the electrification of a health clinic or a school, given the importance that Government attributes to improving rural health and education. However, attempts to further quantify the concomitant benefits to health and education of the pilot scheme were not deemed appropriate at this time. In any event, as a small pilot program, one of the expected benefits is to develop the necessary information before a large scale rural PV program is launched.

B. Financial Analysis

Financial analysis of the Project

13. The financial analysis of the Project reveals that this is financially viable with an IRR of 31 percent in the base case and a NPV of US\$10.1 million. Component I has an IRR of 36 percent and a NPV of US\$11.3 million. Conversely, the rural electrification component has a negative IRR and a NPV of minus US\$1.2 million, as customers will only pay for the O&M costs of the solar panels.

14. A sensitivity analysis based on key risks to the Project shows that this is financially robust (table 3).

Table 3: Sensitivity Analysis

Scenario	Switching value so that IRR = 10 percent	Comment
Increase in investment cost	73%	The probability of such a high increase is low, especially since the Project already includes a 10% contingency provision.
Total losses reduction (instead of 5%)	-0.6%	The Project will not increase losses.
Collection ratio increase (instead of 10%)	2.9%	It is unlikely that the Project will increase collection ratio by only 2.9% instead of the 10% target.
Cost of additional generation needed with improved distribution network (instead of 9.6 USc/kWh)	17.6USc/kWh	Given the low variable cost of Bumbuna hydropower plant, this large increase is not likely. Additional power from Bumbuna would have to be only available less than a month of the year instead of seven as currently assumed.

15. Table 4 below presents key assumptions – same as those used in the economic analysis – and their source. The financial analysis is carried out over a 10-year period and based on a discount rate of 10 percent.

Table 4: Key Assumptions

Assumption	Value	Source/Justification
Investment cost	16.0US\$ million	IDA and NPA assessment
Cost of additional generation (needed with improved distribution network)	9.6USc/kWh	Assumption that Bumbuna hydropower plant provides additional generation seven months of the year (at variable cost of 3.4 USc/kWh) and thermal plants the remaining five months (at variable cost of 18.2 USc/kWh)
Increase in GWh for sales thanks to improved distribution	31GWh	IDA and NPA assessment
Number of connections through pilot rural electrification Projects	28 (provided in 2014)	Connections for clinics, schools and government buildings in 14 villages (two connections each)

Average consumption per connection in pilot rural electrification Projects	4,500 kWh/year/ connection	IDA and NPA assessment
Reduction in losses due to Project	5%	IDA and NPA assessment
Increase in collection ratio due to Project	10%	IDA and NPA assessment
Increase in sales independently of Project	2% per year	Increase in 2011 was 1.6 percent. We assume that upgrades to the network will be done to avoid reaching capacity limit
Tariff increase	10% in 2015 and 10% in 2020	NPA is not willing to increase tariff in the short term. However these increases are likely over the period at least to limit the decrease in real terms due to inflation
Domestic inflation	5%	IDA assumption
Discount rate	10%	IDA assumption
Tariff paid for rural electrification component	Users will pay for O&M costs, not the regular NPA tariff	Users are outside of NPA's network

Table 5: Overall Financial Analysis

INPUTS			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Discount rate	%	10%													
Exchange rate Le/US\$	Le/US\$	4,360													
Increase in sales independently of project	%	2%			2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Inflation	%	5%			5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Tariff increase	%				0%	0%	0%	10%	0%	0%	0%	0%	10%	0%	0%

CALCULATIONS															
COSTS			NPV												
Investment cost	US\$ M	12.0	-	4.0	9.2	2.1	0.6	-	-	-	-	-	-	-	-
O&M cost	US\$ M	1.8	-	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
Cost of additional generation with improved distribution	US\$ M	12.0	-	-	0.8	2.4	2.8	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Total costs	US\$ M	25.9	-	4.1	10.3	4.9	3.8	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.4

REVENUES															
Revenue increase due to a) improved distribution	US\$ M	16.0	-	-	1.0	3.5	4.1	4.1	3.9	3.7	3.9	3.7	3.7	3.5	
Revenue increase due to b) losses reduction & c) improved collection	US\$ M	19.5	-	-	1.3	4.1	4.8	4.8	4.7	4.5	4.9	4.7	4.6		
Revenue increase due to d) improved rural access	US\$ M	0.5	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
Total revenues	US\$ M	36.0	-	-	2.3	7.8	9.0	9.0	8.7	8.3	8.8	8.5	8.2		

PROJECT NET CASHFLOW - IRR															
Net cashflow	US\$ M		-	(4.1)	(8.0)	2.9	5.2	5.7	5.3	5.0	5.5	5.1	4.8		
Cumulative cashflow	US\$ M		-	(4.1)	(12.0)	(9.1)	(3.9)	1.8	7.2	12.2	17.6	22.7	27.5		
IRR	%	31.1%													
NPV	US\$ M	10.1													

Table 6: Distribution, Losses, and Collection Improvements – Financial Analysis

INPUTS		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
investment cost	US\$ M	14.3												
Investment timing	% of investment			0%	28%	53%	15%	4%						
Benefits phasing	%			0%	0%	28%	81%	96%	100%	100%	100%	100%	100%	100%
Variation in investment cost	%	0%												
O&M cost	% of investment	1.5%												
Share of additional generation from Bumbuna hydropower plant and cost	% and US\$/kWh	58%	3.4											
Share of additional generation from thermal plants and cost	% and US\$/kWh	42%	18.2											
Cost of additional generation	US\$/kWh	0.096		0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Increase in GWh for sales thanks to improved distribution	GWh	31		-	-	9	25	30	31	31	31	31	31	31
Reduction in losses due to project	%	5%		0%	0%	1%	4%	5%	5%	5%	5%	5%	5%	5%
Increase in collection ratio due to project	%	10%		0%	0%	3%	8%	10%	10%	10%	10%	10%	10%	10%

CALCULATIONS															
COSTS		NPV													
Investment cost	US\$ M	10.8		-	4.0	7.6	2.1	0.6	-	-	-	-	-	-	
O&M cost	US\$ M	1.3		-	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	
Cost of additional generation with improved distribution	US\$ M	12.0		-	-	0.8	2.4	2.8	3.0	3.0	3.0	3.0	3.0	3.0	
Total costs	US\$ M	24.2		-	4.1	8.6	4.8	3.7	3.2	3.2	3.3	3.3	3.3	3.3	

REVENUES															
Total GWh available for sales independtly of project	GWh	176.4	179.2	182.8	186.4	190.2	194.0	197.8	201.8	205.8	209.9	214.1	218.4	222.8	
Losses	%	42%	38%	38%	38%	37%	34%	33%	33%	33%	33%	33%	33%	33%	
Collection ratio	%	68%	76%	76%	76%	78%	84%	85%	86%	86%	86%	86%	86%	86%	
Total sales	GWh	102.1	110.6	112.8	115.1	125.5	144.1	151.4	155.4	158.0	160.8	163.6	166.5	169.4	
Total amount billed	US\$ M	28.5	31.2	30.3	29.3	30.4	36.6	36.6	35.7	34.5	33.3	35.6	34.4	33.2	
Total amount paid/revenues	US\$ M	19.4	23.6	22.9	22.2	23.9	30.7	31.2	30.5	29.5	28.5	30.5	29.5	28.5	
Average tariff	US\$/kWh	0.28	0.28	0.27	0.25	0.24	0.25	0.24	0.23	0.22	0.21	0.22	0.21	0.20	
Revenues <u>without</u> losses and collection improvements	US\$ M			22.9	22.2	21.5	23.0	22.3	21.6	21.0	20.3	21.8	21.1	20.4	
Revenues <u>with</u> losses and collection improvements	US\$ M			22.9	22.2	22.8	27.2	27.1	26.5	25.7	24.9	26.6	25.8	25.0	
Revenues increase directly due to the project															
Revenue increase due to a) improved distribution	US\$ M	16.0		-	-	1.0	3.5	4.1	4.1	3.9	3.7	3.9	3.7	3.5	
Revenue increase due to b) losses reduction & c) improved collection	US\$ M	19.5		-	-	1.3	4.1	4.8	4.8	4.7	4.5	4.9	4.7	4.6	
Total revenues	US\$ M	35.5		-	-	2.3	7.7	8.9	8.9	8.6	8.2	8.7	8.4	8.1	

PROJECT NET CASHFLOW - IRR															
Net cashflow	US\$ M			-	(4.1)	(6.3)	2.9	5.2	5.7	5.3	5.0	5.5	5.1	4.8	
Cumulative cashflow	US\$ M			-	(4.1)	(10.3)	(7.5)	(2.3)	3.4	8.7	13.7	19.2	24.3	29.0	
IRR	%	35.6%													
NPV	US\$ M	11.3													

Table 7: Rural Electrification – Financial Analysis

INPUTS			2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
investment cost	US\$ M	1.6													
Investment timing	% of investment				0%	0%	100%								
Benefits phasing	%				0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%
Variation in investment cost	%	0%													
O&M cost	% of investment	5.0%													
Number of connections through pilot rural electrification projects	Connections	28			-	-	-	28	28	28	28	28	28	28	28
Average consumption per connection in pilot rural electrification projects	kWh/year/connection	4,500													
CALCULATIONS															
COSTS			NPV												
Investment cost	US\$ M	1.2			-	-	1.6	-	-						
O&M cost	US\$ M	0.5			-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total costs	US\$ M	1.7			-	-	1.7	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
REVENUES															
Sales from pilot rural electrification projects	GWh				-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Losses	%		42%	38%	38%	38%	37%	34%	33%	33%	33%	33%	33%	33%	33%
Collection ratio	%		68%	76%	76%	76%	78%	84%	85%	86%	86%	86%	86%	86%	86%
Revenue increase due to d) improved rural access	US\$ M	0.5			-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PROJECT NET CASHFLOW - IRR															
Net cashflow	US\$ M				-	-	(1.7)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cumulative cashflow	US\$ M				-	-	(1.7)	(1.7)	(1.6)	(1.6)	(1.6)	(1.5)	(1.5)	(1.5)	(1.5)
IRR	%														
NPV	US\$ M														(1.2)

Financial assessment of the National Power Authority

16. NPA supplies 73,000 customers (26,000 of which have pre-paid meters) from its two thermal power plants and from electricity purchased from the Bumbuna hydropower plant.

17. Electricity sales have significantly increased since the Bumbuna plant came on line in late 2009, providing for about 80 percent of the electricity supplied by NPA. Sales rose from 76 GWh in 2009 to 110 GWh in 2011. Nevertheless, NPA continues to suffer from significant losses, despite a slight decline from 41 percent in 2010 to 38 percent in 2011. Such decline should be attributed to NPA's ongoing re-metering program and technical audits. As result, cash collection increased from 67 percent in 2010 to 76 percent in 2011. However, further improvements are needed to ensure NPA's financial sustainability.

18. Despite one of the highest average electricity tariffs in Africa at 28USc/kWh, NPA financial situation remains very weak. NPA's operating ratio is above 100 percent. About 80 percent of NPA's costs relate to power purchase from Bumbuna and fuel for NPA's two thermal plants. NPA is therefore still dependent on the Government to continue its activities.⁹ NPA's net cash flow in the last four years was negative, except in 2010, due to large Government grants and delays in paying providers. In particular, arrears to Bumbuna rose from US\$6.7 million in 2010 to US\$20.6 million in 2011.

19. NPA's equity was negative in 2008 and 2009 since accumulated losses outweighed grant contributions. In 2010, NPA's equity turned positive due to a JICA grant that covered the cost of a new thermal power plant and to a Government grant that financed new distribution equipment. However, these additional assets contributed to improve NPA's debt ratio.

20. Table 8 below presents the main financial results. For 2010 and 2011, the data provided by NPA is unaudited and as such should be taken with caution.

Table 8: Main Financial Results for National Power Authority (NPA) – Sierra Leone

Item	Unit	2008	2009	2010	2011
Total power for sales	GWh	139.1	130.6	176.4	179.2
Total sales	GWh	79.1	76.0	102.1	110.6
Losses	%	43	42	42	38
Total revenues	US\$ Mil.	16.2	22.3	28.9	31.6
Total costs	US\$ Mil.	45.3	36.0	30.9	36.0
Operating ratio	%	279	161	107	114
Net result	US\$ Mil.	-15.1	-4.3	-1.6	-1.8
Net cash flow	US\$ Mil.	1.6	0.8	-1.2	0.8
Subsidies	US\$ Mil.	22.8	10.3	0.5	0.7

⁹ The Board of Directors, while approving the 2009 financial statements in March 2011, noted that “the Authority remains reliant upon the continued financial support of the Government of Sierra Leone to continue as a going concern. The Government of Sierra Leone has indicated its intention to continue to provide financial support to the Authority and has signed a written agreement to provide such continued financial support”.

Current ratio	Ratio	1.5	0.7	1.4	0.6
Equity	US\$ Mil.	-11.3	-15.9	24.2	3.5
Debt ratio	%	181	171	46	96
Receivables	US\$ Mil.	4.2	7.3	11.9	12.1
Receivable turnover	Days	94	119	150	140
Payables	US\$ Mil.	3.5	15.0	9.7	21.7

Source: National Power Authority including audited 2009 financial statements (approved March 2011) and unaudited 2010 and 2011 financial statements.

21. Due to its large financial benefits, the proposed Project is expected to help improve NPA's financial situation. In particular, improvements on losses and collection ratio will have a positive impact on NPA's capacity to generate cash.

Annex 7: Map IBRD 39584

**REPUBLIC OF SIERRA LEONE: Energy Access Project – Sierra Leone Infrastructure
Development Fund**