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IDA/R2019-0111/1

April 30, 2019

Closing Date: Friday, May 17, 2019
at 6:00 p.m.

FROM: Vice President and Corporate Secretary

Sierra Leone - Energy Sector Utility Reform Project

Additional Financing

Project Paper

Attached is the Project Paper regarding a proposed additional credit to Sierra Leone for the Energy Sector Utility Reform Project (IDA/R2019-0111/1), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC, and MIGA

Document of

The World Bank

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Report No: PAD2897

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL CREDIT

IN THE AMOUNT OF SDR 36.1 MILLION
(US$50 MILLION EQUIVALENT)

TO THE

REPUBLIC OF SIERRA LEONE

FOR THE

ENERGY SECTOR UTILITY REFORM PROJECT

April 25, 2019

Energy and Extractives Global Practice
Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective March 31, 2019)

Currency Unit =		Sierra Leonean Leone (Le)
US$1.00	=	Leone 8390.068
US$1.00	=	SDR 0.72033135

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
ARAP	Abbreviated Resettlement Action Plan
ATC&C	Aggregated Technical, Commercial, and Collection
CLSG	Côte d'Ivoire-Liberia-Sierra Leone-Guinea
CMS	Commercial Management System
DA	Designated Account
DFID	Department for International Development of the United Kingdom
EAP	Energy Access Project
EDSA	Electricity Distribution and Supply Authority
EGTC	Electricity Generation and Transmission Company
EIRR	Economic Internal Rate of Return
ERP	Enterprise Resource Planning
ESHIA	Environmental, Social and Health Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management Specialist
ESMU	Environmental and Social Management Unit
ESURP	Energy Sector Utility Reform Project
EWRC	Electricity and Water Regulatory Commission
FIRR	Financial Internal Rate of Return
FM	Financial Management
FMS	Financial Management Specialist
GBV	Gender-based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoSL	Government of Sierra Leone
GPC	General Project Coordinator
GRM	Grievance Redress Mechanism
HFO	Heavy Fuel Oil
IDA	International Development Association
IFC	International Finance Corporation

IsDB	Islamic Development Bank
ISR	Implementation Status and Results Report
JICA	Japan International Cooperation Agency
Le	Sierra Leonean Leone
LV	Low Voltage
MC	Management Contractor
MIS	Management Information System
MoE	Ministry of Energy
MV	Medium Voltage
NGOs	Nongovernmental Organizations
NPA	National Power Authority
NPV	Net Present Value
O&M	Operation and Maintenance
PAP	Project-affected People
PBCUOM	Performance-based Contract for Utility Operation and Management
PDO	Project Development Objective
PFMU	Project Fiduciary Management Unit
PIU	Project Implementation Unit
PMT	Project Management Team
PMU	Project Management Unit
PRSP	Poverty Reduction Strategy Paper
PV	Photovoltaic
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SDR	Special Drawing Rights
SLIDF	Sierra Leone Infrastructure Development Fund
SLIHS	Sierra Leone Integrated Household Survey
T&C	Technical and Commercial
WAPP	West African Power Pool
WTP	Willingness to Pay

Regional Vice President: Hafez M.H. Ghanem

Country Director: Henry G. R. Kerali

Senior Global Practice Director: Riccardo Puliti

Practice Manager: Wendy E. Hughes

Task Team Leaders: Jianping Zhao, Joseph Tawiah Quayson

BASIC INFORMATION – PARENT (Sierra Leone Energy Sector Utility Reform Project - P120304)

Country	Product Line	Team Leader(s)		
Sierra Leone	IBRD/IDA	Jianping Zhao		
Project ID	Financing Instrument	Resp CC	Req CC	Practice Area (Lead)
P120304	Investment Project Financing	GEE08 (9533)	AFCW1 (6547)	Energy & Extractives

Implementing Agency: Ministry of Energy, Electricity Distribution and Supply Authority (EDSA)

Is this a regionally tagged project?	

Bank/IFC Collaboration

No

Approval Date	Closing Date		Original Environmental Assessment Category	Current EA Category
18-Dec-2013	31-Aug-2020		Partial Assessment (B)	Partial Assessment (B)

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach [MPA]	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-Linked Indicators (DLIs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a Non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made disaster
[ ] Alternate Procurement Arrangements (APA)	

Development Objective(s)

The Project Development Objective is to improve the operational performance of the national electricity distribution utility.

Ratings (from Parent ISR)

	Implementation					Latest ISR
	01-Dec-2015	09-Jun-2016	22-Dec-2016	23-Jun-2017	25-Jan-2018	17-Dec-2018
Progress towards achievement of PDO	MU	MU	MS	MS	MS	MS
Overall Implementation Progress (IP)	MU	MU	MS	MS	MS	MS
Overall Safeguards Rating	S	S	S	S	S	MS
Overall Risk	H	H	H	H	H	H

BASIC INFORMATION – ADDITIONAL FINANCING (Sierra Leone Energy Sector Utility Reform Project Additional Financing - P166390)

Project ID	Project Name	Additional Financing Type	Urgent Need or Capacity Constraints
P166390	Sierra Leone Energy Sector Utility Reform Project Additional Financing	Scale Up	No
Financing instrument	**Product line**	**Approval Date**	
Investment Project Financing	IBRD/IDA	17-May-2019	
Projected Date of Full Disbursement	**Bank/IFC Collaboration**		
30-Apr-2023	No		

Is this a regionally tagged project?	
No	

Financing & Implementation Modalities

[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-Linked Indicators (DLIs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a Non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made disaster
[ ] Alternate Procurement Arrangements (APA)	
[ ] Contingent Emergency Response Component (CERC)	

Disbursement Summary (from Parent ISR)

Source of Funds	Net Commitments	Total Disbursed	Remaining Balance	Disbursed
IBRD				%
IDA	40.00	16.14	20.27	44 %
Grants				%

PROJECT FINANCING DATA – ADDITIONAL FINANCING (Sierra Leone Energy Sector Utility Reform Project Additional Financing - P166390)

FINANCING DATA (US$, Millions)

SUMMARY (Total Financing)

	Current Financing	Proposed Additional Financing	Total Proposed Financing
Total Project Cost	40.00	51.00	91.00
Total Financing	40.00	51.00	91.00
of which IBRD/IDA	40.00	50.00	90.00

Financing Gap	0.00	0.00	0.00

DETAILS - Additional Financing

World Bank Group Financing

International Development Association (IDA)	50.00
IDA Credit	50.00

Non-World Bank Group Financing

Counterpart Funding	1.00
Borrower/Recipient	1.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
National PBA	50.00	0.00	0.00	50.00
Total	**50.00**	**0.00**	**0.00**	**50.00**

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any other Policy waiver(s)?

[ ] Yes [✓] No

INSTITUTIONAL DATA

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

No

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

No

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

No

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Jianping Zhao	Team Leader (ADM Responsible)	Energy policy and power engineering	GEE08
Joseph Tawiah Quayson	Team Leader	Power engineering	GEE08
Thomas Kwasi Siaw Anang	Procurement Specialist (ADM Responsible)	Procurement	GGOPA
Innocent Kamugisha	Procurement Specialist	Procurement	GGOPA
Sydney Augustus Olorunfe Godwin	Financial Management Specialist (ADM Responsible)	Financial management	GGOAS
Alidu Babatu Adam	Social Specialist (ADM Responsible)	Social development	GSU20
Sekou Abou Kamara	Environmental Specialist (ADM Responsible)	Environment	GENA2
Collins S. Umunnah	Team Member	Assistant	GEE01
Dilip Kumar Prusty Chinari	Team Member	Disbursement	WFACS
Fatu Karim-Turay	Team Member	Assistant	AFMSL
Frank Anthony Fariello	Counsel	Legal	LEGAM

Gloria Malia Mahama	Social Specialist	Social and gender	GSU20
Jaeyoung Jin	Team Member	Economic and financial analysis	GEE08
Jenny Helena Dangre	Counsel	Legal	LEGAM
Jihane Obeid	Team Member	Finance	WFACS
Juliana Chinyeaka Victor	Team Member	Operations	GEE08
Maiada Mahmoud Abdel Fattah Kassem	Team Member	Finance	WFACS
Maman-Sani Issa	Safeguards Advisor/ESSA	Safeguards	OPSSP

Extended Team

Name	Title	Organization	Location

SIERRA LEONE

SIERRA LEONE ENERGY SECTOR UTILITY REFORM PROJECT ADDITIONAL FINANCING

TABLE OF CONTENTS

I. INTRODUCTION

1. This project paper seeks the approval of the Executive Directors to provide additional financing (AF) for the Sierra Leone Energy Sector Utility Reform Project (ESURP, P120304) – the parent project - in the form of an additional IDA credit in the amount of Special Drawing Rights (SDR) 36.1 million (US$50 million equivalent) to the Republic of Sierra Leone. The proposed AF includes also US$1 million counterpart funding. The parent project, financed through an IDA credit of SDR 26.1 million (US$40 million equivalent) was approved by the Board of Executive Directors on December 18, 2013, and became effective on December 15, 2014. This would be the first AF for the project bringing total IDA financing under the project to SDR 52.2 million (US$90 million equivalent).

2. The Project Development Objective (PDO) of the parent project is to improve the operational performance of the national electricity distribution utility. The parent project has three components: the first component supports the establishment of a fully functioning and effective national electricity distribution utility through a three-year performance-based management contract for the provision of utility management, operation, and capacity building; the second component supports an extensive investment program for the rehabilitation and expansion of the national distribution network; and the third component supports capacity building, project implementation, and project monitoring and evaluation.

3. The proposed AF is seeking to scale up the development effectiveness of the parent project by financing (a) the incorporation of a modern information management system and the provision of international utility experts to further strengthen the distribution utility; (b) the construction of additional medium voltage (MV) substations and sub-transmission lines and the strengthening and extension of the low voltage (LV) lines to connect to new customers and further improve the reliability and service quality of electricity services; and (c) the provision of international experts to assist in sector planning, project preparation and implementation, and capacity building. The activities supported by the proposed AF are consistent with the existing PDO of the parent project. Thus, no changes are proposed to the PDO. The parent project will be restructured to extend the closing date from August 31, 2020, to December 31, 2022, to provide sufficient time to implement the proposed additional activities. The disbursement schedule, implementation schedule, and the Results Framework are revised in line with the proposed new activities and proposed closing date extension. The safeguards instruments were updated to cover the new activities that are financed by the proposed AF.

II. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

A. Country Context

4. **After more than a decade of solid economic growth (7.8 percent on average over 2003–2014), Sierra Leone's economy contracted by 21 percent in 2015 due to the Ebola outbreak and downturn in international iron ore prices.** In March 2016, the country was declared Ebola free, after which an uneven economic recovery ensued, supported initially by agriculture and services. However, the recovery of the iron-ore-dominated industrial sector has remained slow, buffeted by low commodity prices and deferred

investments.[1] Compounding the challenge of post-Ebola recovery, in August of 2017, a landslide of rare magnitude hit the country's capital city, further disrupting economic activity and leading to significant losses of lives, productive assets, and public infrastructure. Recovery in 2016 and 2017 thus remained tepid, with economic growth remaining at 6.4 percent and 3.8 percent, respectively.

5. **Sierra Leone made significant strides in poverty reduction in the decade before the Ebola crisis, which has since been reversed.** According to the last two Sierra Leone Integrated Household Surveys (SLIHS), the share of population living below the national poverty line (roughly US$1 per day) declined from 66.4 percent in 2003 to 53.8 percent in 2011. Projections based on the 2011 SLIHS estimated that poverty further declined to 46 percent in 2014, before increasing to over 49 percent in 2015 as the crises hit. A new SLIHS was done in 2018, and although the estimates are not directly comparable,[2] provisional estimate puts the overall poverty headcount at 56.7 percent. As expected, poverty is higher in the rural areas. Poverty is the lowest in Freetown, at 18.4 percent, compared with 41.0 percent in other urban areas and 72.2 percent in rural areas. Poverty is also much lower in the Western region (17.7 percent) compared to other regions: 61.9 percent in the East, 65.7 percent in the South, and 67.3 percent in the North. The country ranks 151 out of 157 on the newly introduced World Bank Human Capital Index, and the provision of basic services in health and education remains far from satisfactory.

6. **Following the end of the Ebola epidemic, the Government of Sierra Leone (GoSL) initiated structural reforms to boost productivity, restore fiscal stability, and gradually rebuild buffers.** The World Bank's first Productivity and Transparency Support Credit Development Policy Operation (P156651), approved by the IDA Board in June 2017, supported such reforms. In addition, following the landslide and flooding of August 2017 the World Bank provided a supplemental financing (in December 2017) to alleviate human suffering and fill the resultant financing gap. A three-year International Monetary Fund Extended Credit Facility program was approved in June 2017 to help address Sierra Leone's macroeconomic weaknesses—in particular, low revenue, elevated inflation, high public debt, and inadequate foreign exchange reserve buffers—which had been exacerbated by the Ebola crisis and a collapse in iron ore prices.

7. **Faced with an upcoming election (in March 2018), the Government was reluctant to take corrective measures to contain the deterioration in public finances and the broad macroeconomic policy environment.** Indeed, as in previous electoral cycles (2007 and 2012), spending pressures led to a deterioration in the fiscal position, governance slippages, and slow implementation of programs. In response to these concerns, the International Monetary Fund put on hold its first review of the Extended Credit Facility Program toward the end of 2017. As the World Bank and other development partners subsequently delayed or withheld their budget support to the Government, the financing gap widened, resulting in significant build-up of suppliers' arrears (amounting to about 4 percent of gross domestic product [GDP]) as of the first half of 2018.

[1] Since 2011 when iron ore production started and up until the crisis, large-scale mining had driven growth and exports in Sierra Leone, tripling the industrial sector's share in GDP to over 21 percent.

[2] This ratio may not be directly comparable to the ratio based on the 2011 SLIHS. The SLIHS 2018 analysis sets a provisional food poverty of SLL 1,919,000 per adult equivalent per year and a total poverty line of SLL 3,665,000 per adult equivalent per year. To address this divergence, the 2011 poverty estimate will be recomputed later in 2018 to reflect the new poverty line.

8. **Following the election of March 2018, a new Government assumed office on April 4, 2018, ushering in the second democratic change of party in power since the end of the civil war in 2002.** Recognizing the need to restore macroeconomic stability and improve public services, the Government has undertaken some critical steps. For the energy sector, the new Government recognizes the critical importance of increased electricity access in fostering economic development and improving people's living standards. It has started to embark on the ambitious agenda to more than double electricity access over the next decade and pay equal attention to districts and areas that are far from the main grid.

B. Sector and Institutional Context

9. **There is progress on sector reforms albeit at a very slow pace.** The National Power Authority Act, 1982 established the National Power Authority (NPA), as a single, vertically integrated national utility. The National Electricity Act, 2011 (the Electricity Act)[3] repealed the National Power Authority Act of 1982 and established two state-owned enterprises: (a) the Electricity Generation and Transmission Company (EGTC) and (b) the Electricity Distribution and Supply Authority (EDSA). The EGTC is responsible for power generation and transmission at high voltage levels while EDSA is in charge of the distribution network at 33 kV to LV customer connection. Some progress has been made since the promulgation of the Electricity Act in 2011 with the two utilities becoming functional on January 1, 2015. Oversight of the sector falls under the Ministry of Energy (MoE) while a newly set up body, Electricity and Water Regulatory Commission (EWRC), created by the Electricity Act, has the mandate to independently regulate the sector. The mandate of the MoE includes sector policy formulation, sector planning, and coordination. Due to the nonperformance of the former utility—the NPA—and overreliance on the funding interventions from the Government, the MoE is still involved in the day-to-day operations of the two utilities. This phenomenon is expected to diminish over time as the utilities become financially self-sustainable. The newly established EWRC which was commissioned in 2014 has low institutional capacity and little influence on the sector currently. Regulatory issues, including tariff setting, licensing procedures for potential developers, and technical regulation, are currently co-administered by the MoE.

10. **Sierra Leone has one of the lowest electricity access rates in the world.** Sierra Leone's main power network now consists of a 161 kV radial single circuit transmission line (of 70 MW capacity) connecting the existing Bumbuna hydropower plant to the distribution network in Freetown. The electricity access rate is about 16 percent, with about 90 percent of the 172,000 customers located in the urban parts of Freetown.[4] Only five of the 16 district capitals are partially supplied by a combination of small diesel units and mini hydropower plants. The electrification rate in the vast rural parts of the country is almost zero. The connected customers suffer from daily and long hours of power cuts. The current installed capacity connected to the main grid is about 104 MW, consisting of 50 MW hydropower (Bumbuna) and 24 MW heavy fuel oil (HFO) (Kingtom and Blackhall Road) owned and operated by the Government-owned EGTC as well as a 30 MW biomass (Adax) owned by the private sector. In addition, EDSA signed a two – three-year contract for the supply of 50 MW in the dry season and 30 MW in the rainy season from two HFO power barges owned by the private sector. However, the available generation capacity, including from the barges, is about 80 MW in the wet season and only about 70 MW or even lower in the dry season because (a) Bumbuna can supply only 10–15 MW in the dry season and in the wet

[3] Electricity Act 2011, Supplement to the Sierra Leone Gazette CXLII, No. 62, dated September 22, 2011.
[4] 2017 Annual Performance Monitoring Report on Management Contractor by the supervision consultant.

season, only about 40 MW can be evacuated by the 161 kV transmission lines due to high reactive loads; (b) Adax has limited biomass; and (c) the EGTC's poor financial standing makes it difficult to maintain the HFO plants and regularly procure HFO fuel. In addition to Freetown, Mekani and Magburaka are supplied by a shield wire from the Bumbuna hydropower plant. The Government has set the ambitious target to increase electricity access rate to over 30 percent by 2023, through both grid extension and mini-grid/off-grid solutions.

11. **The limited distribution capacity and poor reliability of the distribution network are bottlenecks to expanding electricity access and improving service quality.** During the last five years, the modest investment in the distribution network under the Sierra Leone Energy Access Project (EAP, P126180), funded by a grant from Department for International Development (DFID) of the United Kingdom and administered by IDA, together with funds from the Japan International Cooperation Agency (JICA) and the Islamic Development Bank (IsDB) has helped increase the distribution network's maximum capacity in Freetown from around 40 MW to about 75 MW. It is not yet adequate to deliver all the available generation capacity in the rainy season to customers. The investment was only able to finance about 10 percent of the nearly 1,000 km dilapidated LV lines/cables which have high technical losses and low reliability. Most of the lines and cables are single circuit and some are already overloaded. Despite some improvement, the distribution network remains limited and quite weak and operates with reliability well below internationally accepted standards. There is a great need for more investment to rehabilitate and strengthen the existing network to improve service quality for existing customers and to expand the network to provide electricity access to new customers.

12. **The sector's sustainable development could be achieved only through significantly improving EDSA's technical and financial performance and developing/acquiring low-cost generation.** There have been some improvements in EDSA's technical and financial performance. During the last two years, the total technical and commercial (T&C) losses have been reduced to around 36 percent from about 40 percent and the overall collection rate has increased from about 78 percent to about 85 percent. But the aggregate technical, commercial, and collection (ATC&C) losses are still over 45 percent and are much higher than the average losses of 20–25 percent in many Sub-Saharan Africa countries. At such high losses, the current average weighted consumer prices of US$0.18 per kWh (excluding goods and service tax) will not financially support the operations of any liquid-fuel-fired generation capacity. The tariff for commercial and industrial consumers is around US$0.20 per kWh and there is little room for further increase. Currently, the sector's deficit is financed by the Government's budget, which is putting a lot of stress on the Government's finances. The continued reliance on the Government's budget will be challenging as the sector grows. While liquid fuel power plants are essential to meet the minimum electricity service in the short term and may play a limited role in the medium term, especially as the system is adapted to integrating variable energy and during the dry season, the GoSL needs to adopt a strategy to move toward low-cost power in the future. The power from the Côte d'Ivoire-Liberia-Sierra Leone-Guinea (CLSG) interconnection, scheduled to be commissioned in 2020, and possibly some solar photovoltaic (PV) plants, are expected to address the demand growth in the medium term. On the other hand, it is critical for EDSA to significantly reduce ATC&C losses. The technical losses are estimated at around 15 percent, which could be reduced by up to 5 percent through rehabilitation of the remaining dilapidated LV network and optimization of load flow to minimize overloading. The commercial losses are estimated at around 20 percent, which could be reduced substantially through replacing all outdated meters and faulty meters and ensuring meters for all new consumers and cracking down on illegal

connection and meter bypassing and tampering. The collection losses could also be reduced substantially by substituting postpaid meters for the remaining large customers with prepaid meters of particularly government entities[5] which account for about 65 percent of the total receivables.

13. **Weak institution and staff capacity of key stakeholders is a key constraint to the development of a sustainable sector.** Overall, the capacity of the stakeholders is inadequate to carry out sector planning; develop and implement sector strategies and policies; and procure, evaluate, and implement generation projects by the private sector. The NPA's endemic structural and operational challenges such as lack of adequate technical, operational, and financial management (FM) capacity has been inherited by the two newly established entities, with little change in overall staffing at all levels. Ongoing interventions such as the operation and maintenance (O&M) contract with an international firm for the Bumbuna hydropower plant owned by the EGTC and Management Contractor (MC) for EDSA funded by the IDA credit is helping improve the situation. However, the staff and institutional capacity building needs to be a continuous and long-term effort and process. The MoE Planning Department has limited staff to enable it to perform its role of policy making, planning, and monitoring of the sector. The EWRC now has the required commissioners appointed but it lacks the requisite technical staff and tools to function properly.

14. **The proposed activity builds on IDA's sustained engagement in Sierra Leone's power sector.** IDA has been a partner in Sierra Leone's power sector with a portfolio of projects and continuing support to the government reform agenda. It has built a close working relationship with all sector stakeholders and has become a trusted partner with regard to policy, institutional development, and sector investment. Over the past few years, IDA has supported the following activities: (a) US$16 million under the EAP funded by a DFID grant through the Sierra Leone Infrastructure Development Fund (SLIDF), which supported the rehabilitation of the distribution network in Freetown to increase distribution capacity and improve supply reliability; (b) the US$40 million IDA-funded ESURP (P120304), the parent project, to further increase the network capacity in Freetown and improve the technical and financial performance of EDSA; (c) an AF of US$59.6 million of IDA credit under the CLSG Regional Interconnector Project (P163033), which would link the transmission network in Sierra Leone with the West African Power Pool (WAPP) network in facilitating power trade; and (d) IDA's assistance to the Government to promote solar PV development by the private sector through both the regional initiative and a technical assistance funded by Public-Private Infrastructure Advisory Facility. The proposed activity complements the programs of the development partners, primarily the European Union and (DFID), and nongovernment organizations (NGOs) which focus on supporting electricity access through mini-grids and off-grids options. IDA also made efforts to support the development of an HFO plant by the private sector through providing partial risk guarantee. While IDA is also exploring options to support the Government's efforts to provide electricity access in districts and areas that are not going to be connected to the main grid in the foreseeable future, the proposed AF will further extend the distribution capacity and improve the reliability and service quality of the main distribution network and improve financial performance of EDSA, which is vital to the financial sustainability of the sector.

[5] This excludes entities that provide essential services like hospitals that cannot be cut off due to non-payment. Special arrangement is required to address non-payment of bills by such entities.

C. Higher -level Objectives to which the Project Contributes

15. The proposed AF is consistent with the Poverty Reduction Strategy Paper (PSRP-III) for Sierra Leone covering 2013–2018. Expanding and improving electricity supply is one of the strategic priorities of the Government's National Development Program outlined in PRSP-III. It continues to be a critical priority under the new Medium-Term National Development Plan (2019–2023), entitled 'Education for Development'. The proposed AF is in line with the Country Systematic Diagnostic (Report number 115408) disclosed on April 4, 2018, which identified electricity access as one of the nine priority areas of potential intervention to address the binding constraints to increased economic growth and poverty reduction in Sierra Leone. The proposed AF is also consistent with the World Bank Group's Country Partnership Framework for Sierra Leone for FY2019-2025, currently under preparation, which reiterates the focus on energy to support growth in the extractive sector, as well as with the World Bank Group's twin goals by increasing the availability and improving the quality of electricity services for economic activities, job creation and living standards improvement.

16. The proposed project supports the implementation of the Maximizing Finance for Development approach laid out in the World Bank's Development Committee paper by addressing the key operational issues of the distribution sector, as improved T&C performance of the distribution sector is critical to attracting private sector investment in the generation sector, as outlined in the country's power sector development strategy. Improvement in the reliability and sufficiency of electricity supply will also promote private investment in the industrial and business sectors. The proposed AF, which is fully aligned with the parent project, directly supports two key energy sector objectives of the Government: (a) the improvement of EDSA's technical and financial performance, which is the most critical factor to the sector's sustainable development, and (b) the strengthening and expansion of the distribution network to improve services quality and expand access.

D. Original Project Description and Performance

17. The parent project in the amount of SDR 26.1 million (US$40 million equivalent) was approved on December 18, 2013 and became effective on December 15, 2014. A level II project restructuring was approved on April 7, 2015, to designate the newly established and operational EDSA as the Project Implementing Agency for Components 1 and 2. A second level II project restructuring was approved on June 22, 2017, to extend the project closing date by 20 months from December 31, 2018, to August 31, 2020. The extension was needed to accommodate the contract duration of the MC for EDSA, which runs through to September 2019. The extension was also needed to provide sufficient time for the project activities to be implemented. The project has three components.

(a) **Component 1. Distribution utility capacity enhancement and performance improvement (US$10 million):** (a) This component supports the establishment of a fully functioning and effective national electricity distribution utility through a three-year performance-based management contract for the provision of utility management, operation, and capacity building.

(b) **Component 2. Improvement of electricity supply in urban areas (US$25 million).** This component supports: (a) the reinforcement, rehabilitation and extension of the primary MV

(33 kV) distribution network; and (b) the reinforcement, rehabilitation and extension of priority secondary (11 kV) and LV distribution network. The investment will help increase the distribution capacity of the system and improve the quality and reliability of electricity supply.

(c) **Component 3. Sector planning assistance, project implementation support, and monitoring and evaluation (US$5 million).** This component supports (a) policy formulation, planning, and capacity building of the MoE; (b) the strengthening of the Project Management Unit (PMU) through the provision of technical advisory services, goods, non-consulting services, and training and operating costs; and (c) the monitoring and assessing of the performance of the MC.

18. **Performance of parent project.** After almost a year's delay for the project to reach effectiveness and a further delay of more than one year in initiating procurement under the investment component due to the Ebola pandemic, implementation progress begun to pick up during 2017-2018. Progress toward achievement of the PDO and Implementation Progress have been rated Moderately Satisfactory over the past 12 months. The MC for EDSA under Component 1 has been on board since November 2016 and has made a lot of progress in laying the foundation for improving the performance of the utility. This includes (a) the preparation of the Strategic Plan; (b) restructuring of EDSA and realignment of existing staff to various departments; (c) setting up of a manual data and information system that provides a more reliable tool for monitoring and assessing the technical and financial performance of EDSA; and (d) development and implementation of many procedures for EDSA's O&M. These measures have largely contributed to the modest improvement in the operational performance of EDSA.

19. Since the commencement of project implementation in November 2016 when the Management Contractor (MC) came on board, the reliability of the distribution network in particular has improved a lot with significant progress on both PDO indicators—average duration of outages per year reduced from 117 hours as measured from data in December 2016 to about 60 hours as measured from data in the last three months of 2018 and average interruption frequency per year reduced from 35 times as measured from data in December 2016 to about 25 as measured from data in the last three months of 2018. The system losses have somewhat fluctuated. The average losses were about 36 percent in the last six months of 2018, compared with the average of 40 percent in 2016. The collection rate for the postpaid consumers has not improved significantly but about 65 percent of the arrears are owned by government agencies, including the military, schools, and so on. As more customers are now under prepaid meters, the overall collection rate has improved from about 78 percent to about 84 percent. The combined effect of system loss reduction and collection improvement has reduced the ATC&C losses from about 51 percent to 46 percent.

20. The main tasks of the MC in the remaining contract period is to put in place the necessary organizational structures and implement capacity-building programs for EDSA's local management and staff that would ensure further improvement of its operational performance. All contracts for the earmarked investment under Component 2 have been committed. Almost all the required consultants have been recruited, and the contracts for the priority activities under Component 3 have been signed and are under implementation. Currently, about 95 percent of the funds are committed. The disbursement rate as of March 20, 2019, stood at 38 percent but is expected to increase to about 70

percent by December 2019 as delivery of plant and equipment for the investment activities has commenced. The two largest contracts are expected to be completed by May 2020 and July 2020. There is no overdue audit report. FM performance is rated Moderately Satisfactory. The Environmental and Social Management Plan (ESMP) and Abbreviated Resettlement Action Plan (ARAP) for site-specific areas of the rehabilitation projects are completed and cleared by the World Bank. The ESMP was disclosed in-country on February 1, 2019 and in the World Bank's website on February 27, 2019. The ARAP was disclosed in-country on April 12, 2019 and in the World Bank's website on April 16, 2019. A Grievance Redress Mechanism (GRM) has been put in place. The safeguards performance is rated Moderately Satisfactory as the institutional capacity of EDSA for safeguards monitoring is still weak and is being further strengthened.

E. Rationale for Additional Financing

21. The proposed AF, fully aligned with the parent project, would contribute to the project objectives through enhancing the impact of the parent project by (a) further strengthening the commercial management of EDSA and enhancing EDSA's management and staff capacity under Component 1; (b) scaling up the investment activities of Component 2 to increase the capacity, efficiency, and reliability of the distribution network and connect new residential, commercial, and industrial users in Freetown; and (c) continuing to build the capacity and develop human capital for the MoE and other agencies for sector planning and policy formulation. With the proposed AF, the total financing for the project would amount to US$91 million.

a. Rationale for further support to enhance and improve EDSA's capacity and performance (additional activities under Component 1)

22. Since coming on board, the MC has succeeded in (a) identifying the key issues and challenges; (b) developing a Strategic Plan to address the issues; (c) setting up a manual data and information system that provides a more reliable tool for monitoring and assessing the technical and financial performance of EDSA; (d) developing and implementing many procedures for EDSA's O&M; and (e) realigning the functions of the T&C departments of EDSA. These have contributed to (a) enabling of the distribution and supply of significantly greater amount of electricity to consumers; (b) improved quality of electricity services, such as the reduction in the frequency and hours of electricity outages annually; and (c) a modest reduction in the ATC&C losses. However, EDSA is still financially and institutionally fragile, and its operational performance and service quality are still well below good international standards, because of the extremely low bases since its establishment and the limited availability of funding. Most of the billing, data collection, data management, and preparation of reports and documents are still done manually. As such, one of the top-priority investments identified in the Strategic Plan developed by the MC and approved by EDSA's Board included the implementation of a modern Management Information System (MIS) for effective resource planning, operational and commercial management, and customer management and services. The AF would support EDSA to continue the implementation of the Strategic Plan that is aimed at facilitating EDSA's operations and further improving the operational and commercial performance of EDSA through the establishment of an Integrated Management System. Despite the intervention of the MC in building the culture and enhancing staff capacity, EDSA's local management team and staff capacity are not yet fully capable of carrying out network planning, managing preventive network maintenance and operations, tackling commercial losses, and handling financial engineering and

customer services. Further external assistance would be required to assist EDSA and provide capacity building for EDSA to build on the progress made and further improve.

b. Rationale for further support to upgrade and expand the national distribution network (additional activities under Component 2)

23. As envisaged at preparation of the parent project, a consultant employed under the EAP prepared a Freetown Distribution Network Expansion Plan, which identified the priority investments that are urgently required to rehabilitate and expand the 33 kV sub-transmission, 11 kV, and LV distribution network to improve supply reliability, reduce technical losses, and increase the distribution capacity of the network from 50 MW to 120 MW. Funds under the EAP and the parent project could meet only 40 percent of the identified investment needs. Committed funding from other development partners, including JICA, IsDB, and the WAPP Secretariat, could meet another 20 percent of the required investments. The combined investments from the parent project and other donors, when all implemented, could increase the capacity of the distribution network to 92 MW. The AF will complement the parent project as well as the interventions by these development partners by strengthening and expanding the 33/11 sub-transmission network (part of Subcomponent 2A of the parent project that could not be financed) and scaling up the improvement and expansion of the 11 kV and LV network (Subcomponent 2B) to new customers, including major commercial and industrial users. This would significantly enhance the operational performance of EDSA through further improving reliability and reducing losses and increasing the capacity of the Freetown network to around 130 MW, so that the expected power import from the CLSG interconnection, scheduled to be commissioned in 2020/21, and possibly some PV power plants could be fully delivered to the consumers. There is also an urgent need to replace all faulty and non-statistical meters as well as postpaid meters for the remaining large customers with advanced prepaid meters. Sufficient and reliable metering, together with the Government's efforts to tackle electricity theft and non-payment by governmental entities, would help achieve major reduction in commercial and collection losses.

c. Rationale for further support to sector planning, project implementation support, and monitoring and evaluation (additional activities under Component 2)

24. The MoE and other government agencies' institutional capacity is still inadequate. It is essential to continue to build capacity for sector policy making, sector planning, and implementation monitoring and coordination so that the sector's generation, transmission, distribution, and electrification could be planned and developed in a sustainable manner. The MoE will continue to require the assistance of external experts in carrying out system planning, feasibility studies, and monitoring implementation.

F. Alternative Considered

25. The option of preparing a new IDA project was considered. An AF was judged to be more efficient given the alignment of the proposed activities with the PDO of the parent project. The proposed additional activities could be easily accommodated in the context of the parent project and be more effectively and efficiently implemented in conjunction with the existing project activities. The technical preparatory work for the expanded activities is largely completed and the procurement activities could be fast-tracked for the AF to meet the proposed implementation schedule through a 28-month extension of the project's

closing date. The AF also capitalizes on the Borrower's existing capacity for project implementation and commitment to improve the performance of the distribution utility. In view of the low disbursement of the parent project, which is primarily the result of prolonged delay in initiating procurement activities, the relatively short implementation time of the AF compared to a new project is addressed by advancing procurement activities. The bidding document for the main package (supply and installation of the 33 kV substations and lines), which typically takes 24 months to implement, is already under preparation.

III. DESCRIPTION OF ADDITIONAL FINANCING

A. Summary of Proposed Changes

26. The proposed changes are summarized as follows: (a) addition of activities to Component 1 (Distribution Utility Capacity Enhancement and Performance Improvement), Component 2 (Improvement of Electricity Supply in Urban Areas), and Component 3 (Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation); (b) a 28-month extension of the closing date of the parent project from August 31, 2020, to December 31, 2022, to align with the new project closing date; (c) amendment of the disbursement table under Section IV.A.2 of the FA for the parent project to include the categories financed under AF; (d) a revision and update of the Results Framework to reflect the AF and proposed new closing date; and (e) a change in the implementation schedule.

B. Project's Development Objectives

27. There is no change in the original PDO, which is to improve the operational performance of the national electricity distribution utility.

C. Change in Results Framework

28. **PDO indicators.** It is proposed to revise the PDO indicators to (a) reflect the impact of the additional activities under the AF and the revised implementation schedule and (b) make them more measurable and accurately reflect the outputs and outcomes attributable to the project. The proposed changes in the PDO indicators are as follows:

(a) Revision of an indicator - Reduction in 'Electricity losses per year in the project area (percentage)' is revised as 'Aggregate technical, commercial and collection (ATC&C) losses of EDSA (percentage)' to capture the improvement in the collection rate, which both Component 1 of the original project and additional activities of the AF will support;

(b) Revision of a second indicator – 'Direct project beneficiaries' is revised as 'People provided with new and improved electricity service (female) (number)' to be in line with the definition of the corporate indicator;

(c) Addition of a new indicator - 'The distribution capacity of the 33 kV and 11 kV network increased (MW)' to reflect the improvement in the capacity of the network to evacuate and distribute the available power;

(d) The end targets of the existing and revised indicators were revised to more accurately reflect the expected outcomes of both the parent project and AF.

29. **Intermediate indicators:**

(a) Addition of a new intermediate indicator – 'MIS installed (Yes/No)';

(b) Addition of new intermediate indicators on 'citizen engagement' - (i) 'Grievances resolved within the stipulated period of time (percentage)'; and (ii) 'Beneficiary feedback surveys undertaken (number)';

(c) Addition of a new indicator — 'Energy meters replaced and installed (number)';

(d) Addition of a new indicator – 'Staff trained (number)';

(e) Revision of an indicator – 'Substations rehabilitated under the project (number, custom)' is revised as 'Substations constructed and rehabilitated under the project (number)'.

30. The Results Framework and monitoring table will be further revised to reflect the revised implementation schedule.

D. Change to Components and Cost

31. The scope of Component 1 (Distribution Utility Capacity Enhancement and Performance Improvement), Component 2 (Improvement of Electricity Supply in Urban Areas), and Component 3 (Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation) will be expanded through the inclusion of additional activities. As a result, the cost of each of these components will increase. The activities under the AF include the following.

Component 1: Distribution Utility Capacity Enhancement and Performance Improvement (US$8 million equivalent)

32. The new activities under this component will further support EDSA to strengthen its T&C management and continue to build the local capacity within the utility to ensure continued performance improvement and sustainability of the results. Improving T&C performance of EDSA is a necessary condition for the utility to become financially viable. The additional activities are described in the following paragraphs.

33. **Subcomponent (b): (i) Incorporation of a modern MIS.** This subcomponent will finance the tools required to assist EDSA to manage its business and improve its operational performance in the key areas of modernization of data and information management; production of standardized statements, reports, and documents in a timely manner; and attention and resolution of incidents in electricity supply to its customers. This will be achieved through the acquisition and incorporation of an integrated system comprising Enterprise Resource Planning (ERP), a Commercial Management System (CMS), an Incident Recording and Management System, and a Complaints and Grievance Redress Mechanism (GRM). Creating an avenue for public feedback and complaints of incidents in electricity supply, including

reporting of power theft, illegal connections, and so on, will allow for real-time course correction, thereby leading to more responsive service delivery. The implementation of the MIS is one of the investment needs identified by the MC and approved by the EDSA Board in the investment plan for EDSA, but the MIS could not be implemented under the original project due to lack of funds.

34. **Subcomponent (b): (ii) Technical Assistance to EDSA.** Although the MC has improved the technical and operational performance of EDSA to some extent, the improvement is considered to be below the government's expectations. The cost of the MC contract is also considered quite significant. It is also considered that the MC arrangement could limit the role and enthusiasm of the local management team. Therefore, a group of experts with special technical expertise and distribution utility managerial experiences will be engaged to assist EDSA once the current contract of the MC expires. This team would work closely with the local management team to manage EDSA's operations and business and help build local management capacity within EDSA at the mid and top levels. The group of qualified experts with technical expertise and managerial experience will partner with the local management staff to constitute the new EDSA management team. The individual experts would be competitively selected by a search firm that is being procured under the ESURP. The AF will finance this professional technical management team during the initial phase of its work (between two and three years), after which the team will be on the payroll of EDSA, should EDSA decide to maintain their services.

Component 2: Improvement of Electricity Supply in Urban Areas (US$40 million equivalent equivalent)

35. The additional activities under this component would finance the upgrading and expansion of the 33 kV, 11 kV, and LV network, including connection of new customers, and project management by EDSA. New activities to be added for each subcomponent are described in the following paragraphs.

36. **Subcomponent (c): (i) Primary MV distribution network upgrade and extension (US$19 million).** This subcomponent will finance the construction of four new 33/11 kV substations and upgrade of one existing 11 kV switching station to a 33/11 kV substation as well as the construction of new 33 kV sub-transmission lines to link the proposed substations. This would help increase the capacity of the network to evacuate power from the bulk electricity supply point to the load centers in the distribution network.

37. **Subcomponent (c): (ii) Secondary and LV distribution network strengthening and extension (US$19 million).** This subcomponent includes investments on strengthening and extension of the 11 kV and LV network and customer connections, complementary to those in the parent project, to major unserved residential, commercial, and industrial centers, which are the most critical constraints to increase the distribution capacity and supply reliability of the network in Freetown. It would also include the supply and installation of prepaid meters to replace all existing faulty meters, non-standard transfer specification meters, and postpaid meters for large consumers, including government entities, to reduce commercial losses and increase the collection rate. The increased network capacity is critical for the national distribution network to take and distribute the expected new generation capacity, including power import from the WAPP CLSG interconnection. The extension of electricity services to new high-demand industrial and commercial customers will also help improve EDSA's revenue base.

38. **Subcomponent (d): Project Implementation Support (US$2 million).** This subcomponent is newly added and will cover the cost of strengthening the capacity of the project implementing team in EDSA to

manage and monitor project implementation. It will include the financing of the necessary safeguard studies (ESMP and Resettlement Action Plan [RAP]) and the costs of employing specialized consultants (technical, financial, procurement, audit, social, and so on), including young professionals to support the project management team (PMT).

Component 3: Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation (US$3 million equivalent)

39. **Subcomponent (c):** The additional activities include consulting services for preparing and implementing strategies and projects for electrification through mini-grid solution, training, study tours, and other capacity building for the MoE and other sector players such as EWRC.

Table 1. Cost Estimates by Component

Current Component Name[a]	Current Cost (US$, millions)	Proposed AF Cost (US$, millions)	Total Cost (US$, millions)	Action
Component 1: Distribution Utility Capacity Enhancement and Performance Improvement	10	8	18	Cost revised
Component 2: Improvement of Electricity Supply in Urban Areas	25	40[b]	65[b]	Cost revised
Component 3: Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation	5	3	8	Cost revised
Total	**40**	**51**	**91**	

Note: a. There is no change in the project component name.
b. Including an estimated US$1 million counterpart funding by the Government for compensation of project-affected people (PAP).

E. Change in Implementation Schedule

40. The implementation of the additional activities under the AF will extend the project implementation period by 28 months. Therefore, it is proposed that the project closing date be extended by 28 months from August 31, 2020, to December 31, 2022, to provide sufficient time for the new activities supported under the AF to be satisfactorily completed.

F. Institutional and Implementation Arrangements

Implementing Agencies

41. The MoE and the now legally established national electricity distribution utility (EDSA) will continue to be the two implementation agencies for the parent project and the AF. The MoE would continue to implement Component 3 while EDSA will be responsible for the implementation of Components 1 and 2. The MoE, as the supervising ministry of the energy sector, would oversee the overall coordination of the project.

Implementation Arrangement

42. At project preparation, EDSA was not fully established and so the implementation arrangement was centered around the PMU at the MoE that was implementing the EAP at the time. This was to enable the PMU to spearhead the procurement of the initial activities, including procurement of the MC and the supervision consultant for the MC and carrying out of preparatory engineering and tendering activities for the emergency investment projects under Component 2. EDSA is now fully functional and most of the critical preparatory activities (to support Components 1 and 2) under Component 3 are also completed. As such the implementation arrangement was streamlined during the midterm review mission of May 9 to 18, 2018, to provide more implementation control of activities under Components 1 and 2 to EDSA. Figure 1 provides the streamlined project implementation arrangement.

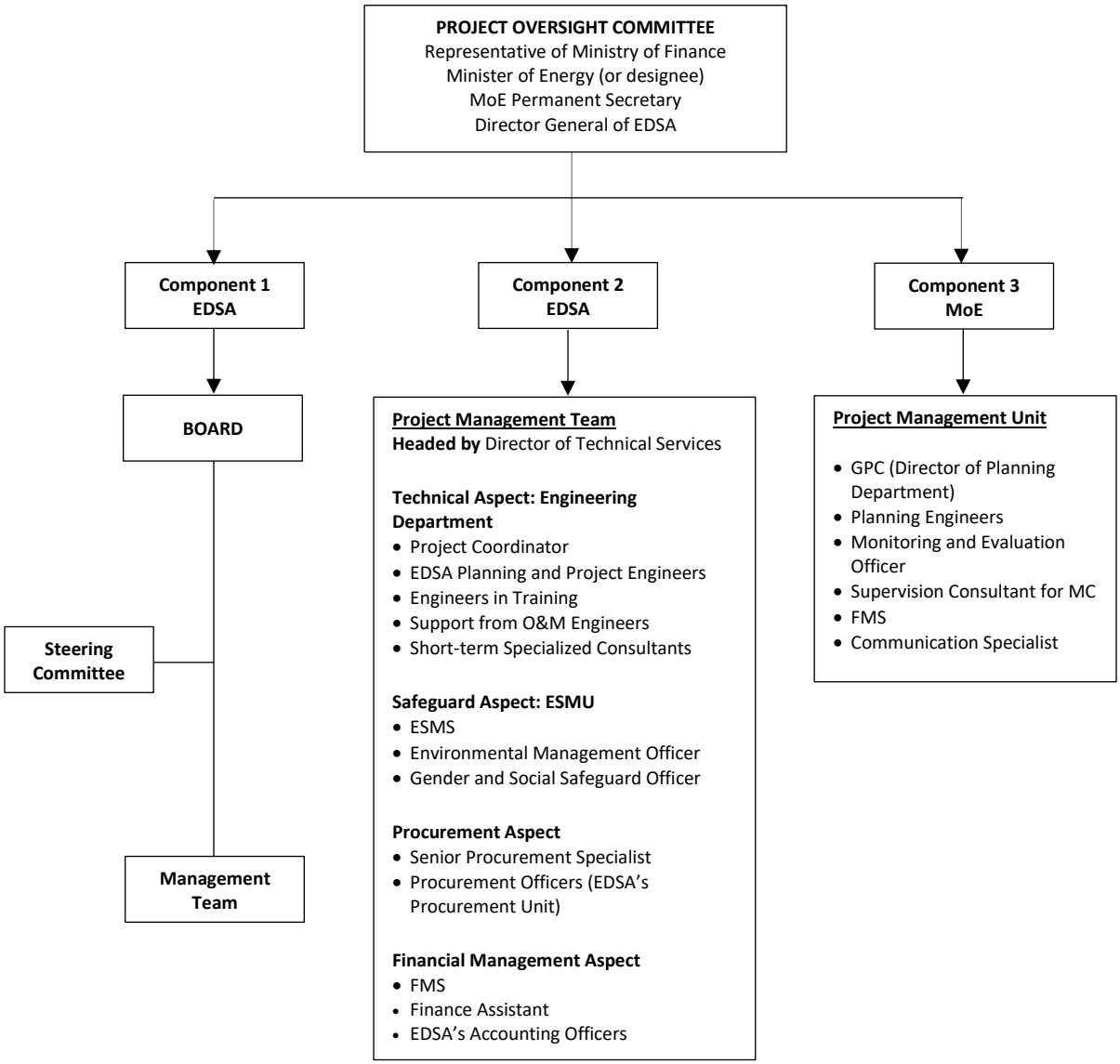
43. **MoE (for Component 3).** The MoE/PMU for the parent project comprised a General Project Coordinator (GPC), an FM specialist (FMS), a communication specialist, a supervision engineer, and an environmental and social management specialist (ESMS). The technical wing (Planning Department) of the MoE was not involved in the implementation of Component 3 and this affected the effectiveness of the MoE in policy formulation, planning, and capacity building of the ministry. As such the streamlined MoE/PMU now includes the director of the Planning Department of the MoE, who would serve as the GPC to oversee the implementation of the component activities, planning engineers, monitoring and evaluation officers, supervision consultant for the MC/management team, FMS, and communication specialist. The FMS would provide FM services for all activities under Component 3. The FMS would continue to support EDSA with FM of Component1 and 2 of the parent project until the establishment of EDSA's FM system is completed and assessed by the World Bank to be adequate. The FMS would be located at the MoE and would report to the GPC. The Project Fiduciary Management Unit (PFMU)[6] under the Ministry of Finance is effective and functional, it is agreed the FMS of the project would continue to be located at the PMU and financed under the project. The communication specialist would provide public relation services for the whole energy sector including citizen engagement with the PAP of Component 2. The current supervision consultant of the MC would continue to report to the EDSA Board and to the MoE through the GPC. The terms of reference for the supervision consultant would be revised to reflect the change from a firm to individual utility management experts after the expiration of the MC.

44. **EDSA (for Components 1 and 2).** The original project has a Project Implementation Unit (PIU) in EDSA that is made up of a project manager, an accountant, an environmental officer, and a procurement officer who are all staff of EDSA but are located at the MoE. Not only do these officers lack the capacity to implement World Bank projects, they are also not under the control of their respective EDSA managers, a situation that contributed to slow implementation progress for Component 2. The PIU has been revised in the AF into a PMT comprising mainly staff of the Engineering Department (Planning and Projects) to be supported by EDSA's Finance Department and the Procurement Unit as well as an Environmental and Social Management Unit (ESMU) to be set up under the Engineering Department. The team will benefit from the support of specialized consultants to support implementation and build the capacity of the EDSA staff. This includes a supervision engineer, an ESMS, a senior procurement specialist, and an FMS supported by finance assistance and specialized consultants to be hired as needed. Young professionals (engineers, accountants, and social and environmental officers) would be recruited to augment the staff strength of the EDSA employees. The contracts for the supervision engineer and ESMS, who were

[6] The PFMU is a general unit set up to provide procurement and FM support for all World Bank-funded projects implemented by ministries and government agencies on Government payroll.

recruited under the MoE/PMU, would be transferred to Component 2 to make them an integral part of the PMT. The PMT would be headed by the Director of Engineering (Technical Services) but the day-to-day coordination of the overall implementation of Components 1 and 2 would be handled by an experienced project coordinator. In the interim, the scope of services for the current supervision engineer, who is an experienced electrical engineer, would be revised to make him the interim project coordinator.

Figure 1. Project Implementation Arrangements



Monitoring and Evaluation

45. In the original project, the two project implementing agencies were responsible for collecting, verifying, and collating information and submitting progress reports to the World Bank for the respective project components, on an annual basis for PDO indicators and on a semiannual basis for the intermediate

indicators at component level. Both the supervision consultant and the MC also submit separate monthly progress reports on the performance of the MC to the EDSA Board. The submission of these reports at different times makes it difficult to track progress toward achieving the common PDO that all three components are to together contribute. For the AF, each of the two entities would continue to collect and verify their respective data on quarterly bases but a single consolidated report would be prepared and submitted to the World Bank including input from the supervision consultant on the performance of the MC into a single quarterly progress report for submission to the World Bank. The EDSA project coordinator would lead the coordination and compilation the progress report from all the entities for the final review of the GPC. The realigned project implementation arrangement that was informed by the recommendations in the Implementation Completion and Results Report for the EAP (SLIDF TF-13246)[7] would make it easy for the agencies to gather data for monitoring and evaluation and prepare the reports. To this end the supervision engineer would lead the gathering of data for the component implemented by EDSA while the monitoring and evaluation officer at the MoE would be responsible for collating data for Component 3 activities.

46. **Overall project coordination.** The MoE GPC will coordinate with EDSA to carry out the reporting and other communications with the World Bank.

IV. KEY RISKS

47. The overall risk rating in the last Implementation Status and Results Report (ISR) for the parent project is high and for the AF currently is substantial. The decrease in overall risk rating is due to the risk decrease in several areas as explained below.

48. **Political and Governance.** The political and governance risk is reduced from high to substantial as the country has returned to calm after incidents of violence following the March 2018 general election. However, the country's political environment is still fragile and the country's transparency index is low. The political and governance risk in the project is mitigated through minimizing the Government's direct interference in project implementation and ensuring IDA's procurement regulation is strictly followed. The project is primarily implemented by the national utility, which is supported by independent consultants for procurement.

49. **Macroeconomic.** The country's macroeconomic risk is rated as high as the risk of continuing domestic and external imbalances are high. The risk is mitigated by minimizing the requirement of government funding support to the project and ensuring the dedicated use of the credit proceeds to the project activities. The risk is also mitigated through the strong focus of the project activities to improving EDSA's financial viability through management improvement and distribution losses reduction.

50. **Sector Strategies and Policies.** The sector strategies and policies risk is decreased from high to substantial as the new administration appears to remain committed to similar sector strategies and policies as in the past. However, the risk of a government shift on sector priority still exist. The risk is

[7] The lessons learned under the EAP identified weak capacity of the implementing agencies as the main reason for implementation delays. The World Bank team should more rigorously assess existing technical capacity at the implementation agency during project preparation to facilitate efficient planning and provision of adequate technical assistance.

mitigated through the strong sector dialogue and capacity building under the proposed AF and under IDA's other sector engagement and technical assistance activities.

51. **Technical Design of Project or Program.** This technical design of project risk is reduced from substantial to moderate as the on-going and proposed new activities under AF do not involve any new technologies and international experts have been employed to assist in technical design. Specialized consultants would continue to be engaged as needed to support the implementation of the AF while the AF would continue to build EDSA's technical capacity to enhance the prospect of a technically strong EDSA.

52. **Institutional Capacity for Implementation and Sustainability.** The institutional capacity for implementation and sustainability risk remains high as the capacity in both EDSA and MOE is still weak despite some enhancement made under the parent project. The risk will be mitigated through: (i) intensified and comprehensive training and capacity building for EDSA's management team and staff by MC during the eight months of the remaining contract period; and (ii) continued engagement of international specialists in various fields to assist EDSA to manage its operations, implement the project and enhance staff capacity after the termination of the MC and to assist MOE in project implementation and capacity building.

53. **Fiduciary.** The fiduciary risk is rated high as the FM system in EDSA is assessed as still not adequate and the procurement capacity to implement the Procurement Regulation is weak. The risk is mitigated through: (i) the PMU of MOE will continue to provide the necessary support until the appropriate system has been put in place in EDSA; (ii) an experienced international procurement specialist has been employed to assist in carrying out procurement activities; and (iii) IDA's FM and procurement team will conduct an intensive training capacity building for both EDSA and the MoE on FM system and requirement and the new Procurement Regulation.

54. **Environment and Social.** The environmental and social risk rating is substantial because the construction of the 33 kV distribution lines will be undertaken in the Greater Freetown area, which is densely populated with structures and small business activities, although the adverse impacts are not expected to be significant and will be of temporary nature. The construction activities will trigger temporary disruption of access and economic activities. Works involving the erection of power distribution poles and stringing of cables may also result in damage to structures. Primary environmental impacts will include noise, emissions, and dust and solid waste generated during construction activities. Other concerns relate to occupational safety and health of workers during construction and public safety and health caused by truck movements and construction activities. The project was also assessed for gender-based violence (GBV) risk with the World Bank's standard GBV risk assessment tool and this showed a low risk score of 12.25. The policies triggered for the parent project (OP 4.01 - Environmental Assessment, OP 4.11 - Physical Cultural Resources, and OP 4.12 - Involuntary Resettlement) remain for this AF to provide guidance for assessment and management of environmental and social risks. EDSA's capacity to oversee environmental and social implementation is identified as inadequate. The environmental and social risk is mitigated: (i) an Environmental, Social and Health Impact Assessment (ESHIA) with associated ESHMP has been prepared to help manage and mitigate the environmental, social and health impacts. The ESHMP will be included in the contracts of the contactors and supervising engineers; (ii) a Resettlement Policy Framework (RPF) has been prepared to provide guidance for the preparation of a RAP during project implementation; (iii) EDSA has assigned an environmental officer to

the PIU and will continue to recruit environmental and social/gender staff to enhance capacity for assessing and monitoring implementation of the ESHMP by contractors; and (iv) environmental, social and engineering supervising consultants will continue to be engaged to assist EDSA in monitoring and evaluating the implementation of ESHMP and RAP.

55. **Stakeholders.** The stakeholders risk is rated substantial as many stakeholders are involved and they may have divergent interests. The risk is mitigated through a number of stakeholder meetings with participation from relevant government agencies and community representatives during project design and preparation. During project implementation, EDSA will prepare and implement a detailed project-specific stakeholder engagement and communications plan. This plan will (a) provide the most effective methods and structures through which to disseminate timely project information to government agencies and the public; (b) provide measures to identify and meaningfully consult with PAP; and (c) ensure regular, accessible, transparent, and appropriate consultation throughout the project lifecycle.

V. APPRAISAL SUMMARY

A. Economic and Financial Analysis

Economic Analysis

56. The economic analysis (Annex 1) shows that the proposed AF will further generate substantial economic benefits to the Sierra Leone economy. The primary economic benefit is due to (a) incremental electricity consumption in the AF areas and (b) energy savings that will result from reduced technical losses along the rehabilitated grid lines. The economic analysis (Annex 1) shows an economic internal rate of return (EIRR) 'with AF' project scenario of 12.8 percent with a net present value (NPV) of US$33 million, using US¢19 per kWh as the average willingness to pay (WTP) for electricity in Sierra Leone and a discount rate of 1.5 percent[8]. The analysis has been undertaken for a period of 20 years.

Financial Analysis

57. The financial analysis of the proposed AF indicates that this is a financially viable project with financial internal rate of return (FIRR) of 7.4 percent and NPV of US$12 million at a discount rate of 1.5 percent. EDSA's revenues will benefit from the AF project because of the new customer connections in the urban areas and reduced T&C losses. The proposed AF will be provided as a grant by the government to EDSA.

58. EDSA's current revenue is not sufficient to cover all the operating and maintenance costs due to high cost of power purchase and high ATC&C losses. In 2018, EDSA had a deficit of about US$19 million. The project is expected to have a significant positive impact on EDSA's financial position through the reduction of ATC&C losses. With the projected electricity sales increase, a reduction in ATC&C losses from about 50 percent in 2016 to 30 percent in 2023 will increase EDSA's revenue by about US$40 million. This

[8] The World Bank's guideline on discount rate, issued in May 2016, recommends the use of a discount rate twice the expected long-term per capita growth rate. Because Sierra Leone had grown at an average rate of 0.73 percent over the last 5 years, a 1.5 percent discount rate is used in the base case in this analysis.

revenue increase coupled with the expected decrease in the average power purchase price will enable EDSA to achieve financial viability.

B. Technical

59. The priority investment activities were identified through a distribution network expansion study financed under the EAP and reconfirmed and modified through a load flow study, taking into consideration the locations of additional generation capacity. The project uses well-established technologies and presents no unusual construction or operational challenges. The equipment and the technologies involved in construction and operation of substations and distribution networks are standardized and well-known. Project costs are based on estimates derived from the recently contracted Freetown Distribution Network Rehabilitation financed by the parent project. EDSA is familiar with the technologies, and the technical specifications and bidding documents are readily available from the ongoing project for activities under Component 2.

60. The state-of-the-art information systems to support efficient, transparent, and accountable management of commercial functions (CMS) and attention and resolution of incidents in electricity supply (IMS) are used by well-performing electricity utilities worldwide (both in developed and developing countries), including utilities in the subregion. In Sierra Leone, the incorporation of these modern management tools and the technical assistance provided under the AF to recruit and train professionals in the use of these tools will strengthen EDSA's Commercial Department to improve its performance and the company's operational and financial viability. The cost estimates for the systems were derived from recent bids for a similar system being implemented in Liberia that has a similar market environment.

C. Financial Management Analysis

61. The FM rating in the last project ISR was moderately satisfactory. The current financial arrangements are expected to remain the same during the implementation of the AF. The FMS of the PMU will be responsible for managing all activities under Component 3 and payment of contract fees to the MC under Component 1. The Finance Department of EDSA backed by an FMS would provide FM for the implementation of Component 2 of the ESURP and Components 1 and 2 of the AF. An FM assessment carried out in line with OP/BP 10.02 and OP/BP 8.0 on June 26, 2018, identified some weakness in the FM system and recommended actions to address the inadequacies. It was concluded that with the implementation of the proposed action plan, the MoE's PMU and EDSA's Finance Department will have adequate systems to manage the IDA project funds. The overall FM residual risk of the project is rated Substantial.

62. **Funds flow.** Funds flow arrangement for the parent project is assessed as satisfactory. The MoE/PMU will continue to maintain the current Designated Account (DA-1) to finance activities related to Component 3 of ESURP. A second DA (DA-2) would be opened by EDSA to finance activities related to Component 2 of the ESURP. Similarly, for the AF, two DAs would be opened by the MoE and EDSA as follows:

- **DA-3** to finance activities of Component 3 to be maintained by the MoE

- **DA-4** to finance activities of Components 1 and 2 to be maintained by EDSA

63. **Disbursement.** Disbursement arrangements will remain the same, and there will be two new disbursement categories for the AF which are included in the disbursement table of the entire project as: (3) goods, works, non-consultants' services, consultant services, and operating costs under Part 1(b), 2(c) and 2(d) of the project and (4) non-consultants' services, consulting services, training, and operating costs under Part 3(c) of the project.

Table 2. AF Eligible Expenditures

Category	Amount of the Financing Allocated (expressed in SDR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consulting services and operating costs under Parts 1 and 2 of the project, except under Parts 1(b), 2(c) and 2(d).	0	0
(2) Consulting services, non-consulting services, training and operating costs under Part 3 of the project, except Part 3(c).	0	0
(3) Goods, works, non-consulting services, consulting services and operating costs under Parts 1(b), 2(c) and 2(d) of the Project.	33,900,000	100 %
(4) Consulting services, non-consulting services, training and operating costs under Part 3(c) of the project.	2,200,000	100 %
TOTAL AMOUNT	36,100,000	

D. Procurement

64. The procurement will be carried out using the New Procurement Framework, in accordance with the 'World Bank Procurement Regulations for IPF Borrowers' dated July 2016 (Procurement Regulations), revised November 2017 and August 2018, and the World Bank's 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by International Bank for Reconstruction and Development (IBRD) Loans and IDA Credits and Grants' (revised as of July 1, 2016), as well as the provisions stipulated in the Financing Agreement. The bidding documents to be used under the AF will be the Standard Procurement Documents which were recently enhanced with environment, social health, and safety guidelines.

65. The procurement arrangements for the AF will be based on the streamlined implementation arrangement. The Procurement Unit at the MoE (or at the PFMU when it becomes effective) would provide procurement management of the remaining activities under Component 3. The Procurement Unit in EDSA would provide procurement management to the Project Implementation Team in EDSA. EDSA now has an experienced international procurement specialist to support project implementation at EDSA and conduct intensive capacity building for both the EDSA and the MoE. Procurement performance is assessed as moderately satisfactory and the risk rating as High.

E. Social (including Safeguards)

66. The proposed activities under Component 2 of the AF involve (a) the upgrading of one existing 33/11 kV substation and construction of four new 33/11 kV substations and about 46 km 33 kV lines that is part of the general scope of work under the parent project that could not be implemented due to limited budget and (b) the rehabilitation and expansion of the 11 kV and LV distribution network, which is the scaling up of the Component 2 activities. These additional activities are being implemented in densely populated areas in Upper Freetown and are expected to require the demolishing of private structures, damage to private properties, and disruption of private businesses and people's livelihood. Even though the MV lines are expected to be constructed on either side of the right-of-way of the main roads, the best route has not yet been determined. The scale and scope of resettlement impacts will be known when detailed construction designs are firmed up and the route determined. This, however, has not been completed. Outcome of the ESHIA report will also help inform the most feasible route with minimal adverse impacts. The RPF for the parent project is updated to reflect the additional activities of the AF. The updated RPF was disclosed in-country on March 13, 2019, and on the World Bank website on March 14, 2019. A RAP will be prepared, consulted, disclosed, and implemented before construction commences on the specific sites. To further reduce the possible social impact by the construction of the 33 kV lines in densely built-up areas, it is proposed to adopt the technology used on the projects financed by JICA. This technology uses self-supporting steel tubular poles with footprint of about 1 m diameter as against the traditional lattice tower or monopoles that require a minimum of 5 m x 5 m working area.

67. **Gender.** The original project was not gender informed. The proposed AF will adopt the World Bank's new approach to integrate gender into operations. During project implementation, the following activities will be carried out: (a) conduct gender analysis to (i) identify the key gender gaps in access to job and employment opportunities in EDSA and the energy sector; (ii) learn about the possibility of getting an electricity connection or successfully applying for and obtaining a connection; and (iii) ensure there is no gender inequality in terms of compensation for loss of assets or loss of access to businesses as a result of the project; (b) design and implement measures to address the gaps; and (c) adopt monitoring and evaluation mechanism to measure the changes in outcomes.

68. **GBV risk.** The project was assessed for GBV risks using the World Bank's standard GBV risk assessment tool and this showed a low risk score of 12.25. Despite the low risk rating, the project location in densely populated business areas could facilitate high interaction between workers/laborers and street vendors. It is expected that the search for jobs and procurement opportunities from the project could also provide grounds for sexual harassment and transactional sex, including sexual exploitation of young girls. The project will include precautionary and preventive measures to respond to GBV risks. At the minimum (a) all bidding documents for works and supervision contracts will include declarative statements and commitments against sexual harassment and GBV; (b) construction managers will ensure adequate training and orientation of workers on GBV issues and will apply a proportionate code of conduct with prohibitive phrases against GBV in the terms and conditions of hire; (c) contractors' ESMP will include a GBV action plan indicating, among others, measures for internal protocols for confidential reporting and addressing SEA and GBV complaints; and (d) budgeting for environmental and social risk mitigation will include additional allocation for SEA incidence to facilitate access to free health services, psychosocial services, legal aid, safe shelter where required, and so on. EDSA gender and social safeguards officer will

be trained on case management, support survivors to access support services, and continually monitor contractors' GBV implementation plan.

69. **Labor issues.** The project is in the urban areas and the majority of unskilled and semiskilled workforce are expected to be hired from the towns. Risk of labor influx is expected to be minimal. At this stage, the project is not required to prepare a specific labor influx plan; however, the ESMP will institute measures to ensure worker safety on site, avoid differential treatment for local and foreign staff on site, provide a mechanism for worker complaints, and prevent any form of child labor. The supervising engineer and the safeguards specialist will assist EDSA in monitoring for compliance.

F. Environment (including Safeguards)

70. The expected activities of the AF remain within the scope of the parent project and there is no change to the project's current environmental category classification of 'B'. The three safeguards policies triggered under the parent project (OP 4.01 - Environmental Assessment, OP 4.11 - Physical Cultural Resources, and OP 4.12 - Involuntary Resettlement) remain relevant for this AF. The Data Sheet was checked "yes" for triggering change in Safeguards Policy only to allow the updating of the Integrated Safeguards Data Sheet. The works associated with the new 33/11 kV substations, the 30 km extension and rehabilitation of the LV network, and the 80 km 33 kV line have similar environmental impacts as the parent project. Potential environmental risks could include noise and dust generation, air pollution, road accidents, waste generation, oil leaks, transport and construction safety, and so on. The requirements of OP 4.01 - Environmental Assessment have therefore been addressed in the ESHIA. In addition, a chance-find procedure in fulfillment of OP 4.11 - Physical Cultural Resources has also been included as part of the ESHIA in the unlikely event of the envisaged excavations and potential to expose physical cultural resources of importance during project implementation. As part of the ESHIA, an ESMP was prepared to mitigate and manage the potential adverse impacts. The ESHIA was disclosed in-country on March 13, 2019, and on the World Bank's website on March 14, 2019. A contractor-level ESMP will be incorporated in the bidding documents to ensure that contractors cost and implement the mitigation measures for the identified risks. The safeguards officer will work with the technical team to ensure that the bidding documents include the ESMP requirements and are costed accordingly to ensure that mitigation measures are implemented. The safeguards officer in the PMU will also provide technical support to the EDSA safeguards team to strengthen the monitoring and reporting function once the works begin. The additional safeguards staff to be hired by EDSA after the establishment of the Environmental Unit will also receive training and capacity building to be able to support the utility provider during project implementation.

71. **Greenhouse gas (GHG) accounting.** This accounting has been undertaken for the project, which will result in GHG emission reductions. Through distribution network upgrade and rehabilitation, the project will reduce the technical losses by 4 percent, which will avoid 48,007 tCO_2 over the economic life of 20 years. In addition, the project will provide new or improved electricity services to users through grid extension. It allows grid electricity to substitute for self-generation using GHG-intensive fuel such as diesel. Using the World Bank's GHG guidance on energy access operations and the total generation required for new or improved connection, the project will therefore avoid 94,269 tCO_2 over the economic life of 20 years. Overall, about 109,760 tCO_2 will be saved during the project economic lifetime.

72. **Social value of carbon.** The project will help reduce overall net GHG emissions by 109,760 tCO_2 over the life of the project through displacing diesel self-generation and reducing technical losses. Consistent with World Bank guidance on the social value of carbon, carbon emission reductions are valued in the low case at US$38 per tCO_2 in 2019, increasing to US$50 per ton in real terms by 2030. As a result, the environmental benefits add 1 percentage point to the EIRR and US$4.4 million to the NPV.

G. Climate and Disaster Risks

73. A climate risk and disaster risk screening has been completed for the proposed AF. The screening used Intergovernmental Panel on Climate Change data showing climate projections for future climate out to 2030 and 2050. The screening identified three key drivers for climate hazards in Sierra Leone, namely extreme temperature, increased flooding due to increase in precipitation, and winds. It is projected that the temperature, precipitation, and chance for strong wind could all increase slightly. It is confirmed that the overall climate risk to the project's operation and outcome is very low due to the nature of the project. These adverse climate effects will be mitigated by building more resilient infrastructure facilities. Both the specifications of the equipment and standards of construction will be designed to resist likely increased impacts due to climate change.

H. Citizen Engagement/Beneficiary Feedback

74. **GRM.** Citizen engagement is critical to the achievement of the PDO of improving the operational performance of the national electricity distribution utility. Component 1 seeks to support EDSA to strengthen its commercial management. Paying attention to public feedback and creating avenues for complaints of incidents in electricity supply including report of power theft, illegal connections, and so on will allow for real-time course correction, thereby leading to more responsive service delivery, and will help strengthen commercial management. The project will incorporate a section for complaints logging and tracking in the MIS. A hotline for free phone calls and text messaging will be instituted within EDSA. The GRM will also include complaints uptake channels through the contractors, supervising consultants, PMU, and local counsellors. The grievance structure will be elaborated, made functional, and widely publicized before implementation. The project will monitor the percentage of grievances addressed within the agreed time frame and reported in all routine project progress reports. The project will also incorporate an annual beneficiary feedback survey and monitor how project implementation has incorporated such feedback.

75. **Public consultations.** During project design, stakeholder meetings with participation from the MoE and other relevant government agencies and community representatives were held to discuss project implementation issues and provide a platform to articulate and address concerns about community and social and environmental aspects of project implementation. During the detailed design, EDSA will prepare and implement a detailed project-specific stakeholder engagement and communications plan. This plan will (a) provide the most effective methods and structures through which to disseminate timely project information to the public; (b) provide measures to identify and meaningfully consult with PAP; and (c) ensure regular, accessible, transparent, and appropriate consultation throughout the project lifecycle.

76. These interventions will leverage the platform to support ongoing dialogue, transparency, information sharing, and community outreach programs.

VI. WORLD BANK GRIEVANCE REDRESS

77. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service.
For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VII. SUMMARY TABLE OF CHANGES

	Changed	Not Changed
Results Framework	✓	
Components and Cost	✓	
Loan Closing Date(s)	✓	
Reallocation between Disbursement Categories	✓	
Disbursements Arrangements	✓	
Safeguard Policies Triggered	✓	
Implementing Agency		✓
Project's Development Objectives		✓
Cancellations Proposed		✓
EA category		✓
Legal Covenants		✓
Institutional Arrangements		✓
Financial Management		✓
Procurement		✓
Other Change(s)		✓

VIII. DETAILED CHANGE(S)

COMPONENTS

Current Component Name	Current Cost (US$, millions)	Action	Proposed Component Name	Proposed Cost (US$, millions)
Component 1: Distribution Utility Capacity Enhancement and Performance Improvement	10.00	Revised	Component 1: Distribution Utility Capacity Enhancement and Performance Improvement	18.00

Component 2: Improvement of Electricity Supply in Urban Areas	25.00	Revised	Component 2: Improvement of Electricity Supply in Urban Areas	65.00
Component 3: Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation	5.00	Revised	Component 3: Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation	8.00
TOTAL	**40.00**			**91.00**

LOAN CLOSING DATE(S)

Ln/Cr/Tf	Status	Original Closing	Current Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
IDA-53330	Effective	31-Dec-2018	31-Aug-2020	31-Dec-2022	30-Apr-2023

REALLOCATION BETWEEN DISBURSEMENT CATEGORIES

Current Allocation	Actuals + Committed	Proposed Allocation	Financing % (Type Total)	
			Current	Proposed
IDA-53330-001 | Currency: XDR				
iLap Category Sequence No: 1		Current Expenditure Category: Gds,Wks,CS,NCS,OPCs 1(b), 2(c) and 2(d)		
22,800,000.00	14,516,443.16	22,800,000.00	100.00	100.00
iLap Category Sequence No: 2		Current Expenditure Category: CS,NCS,TRN and OPCs Prt 3 (c)		
3,300,000.00	1,636,010.29	3,300,000.00	100.00	100.00
Total **26,100,000.00**	**16,152,453.45**	**26,100,000.00**		

DISBURSEMENT ARRANGEMENTS

Change in Disbursement Arrangements

Yes

Expected Disbursements (in US$)

Fiscal Year	Annual	Cumulative
2014	0.00	0.00
2015	4,000,000.00	4,000,000.00
2016	21,648.26	4,021,648.26
2017	976,990.53	4,998,638.79
2018	5,150,607.10	10,149,245.89
2019	10,915,160.00	21,064,405.89
2020	15,200,000.00	36,264,405.89
2021	16,500,000.00	52,764,405.89
2022	30,705,350.00	83,469,755.89
2023	6,530,244.11	90,000,000.00

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Latest ISR Rating	Current Rating
Political and Governance	High	Substantial
Macroeconomic	High	High
Sector Strategies and Policies	High	Substantial
Technical Design of Project or Program	Substantial	Moderate
Institutional Capacity for Implementation and Sustainability	High	High
Fiduciary	High	High
Environment and Social	Substantial	Substantial
Stakeholders	Substantial	Substantial
Other		
Overall	High	Substantial

COMPLIANCE

Change in Safeguard Policies Triggered

Yes

Safeguard Policies Triggered	Current	Proposed
Environmental Assessment OP/BP 4.01	Yes	Yes
Performance Standards for Private Sector Activities OP/BP 4.03	No	No
Natural Habitats OP/BP 4.04	No	No
Forests OP/BP 4.36	No	No
Pest Management OP 4.09	No	No
Physical Cultural Resources OP/BP 4.11	Yes	Yes
Indigenous Peoples OP/BP 4.10	No	No
Involuntary Resettlement OP/BP 4.12	Yes	Yes
Safety of Dams OP/BP 4.37	No	No
Projects on International Waterways OP/BP 7.50	No	No
Projects in Disputed Areas OP/BP 7.60	No	No

LEGAL COVENANTS – Sierra Leone Energy Sector Utility Reform Project Additional Financing (P166390)

Sections and Description
Project Agreement, Section I, A, Institutional Arrangements "The Project Implementing Entity shall (ii) take all actions, including the provision of funding, personnel, and other resources satisfactory to the Association, to enable the project management team to perform functions, including, not later than three (3) months after the Effective Date, recruiting a social safeguard officer to the project management team."

Conditions

Type	Description
Effectiveness	(a) the Subsidiary Agreement has been duly executed on behalf of the Recipient and the EDSA;
Type	Description
Effectiveness	the Project Agreement has been duly executed on behalf of the EDSA and the Association.

IX. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Sierra Leone

Sierra Leone Energy Sector Utility Reform Project Additional Financing

Project Development Objective(s)

The Project Development Objective is to improve the operational performance of the national electricity distribution utility.

Project Development Objective Indicators by Objectives/ Outcomes

Indicator Name	DLI	Baseline	End Target
Improve Operational Performance of EDSA			
Aggregate Technical, Commercial and Collection (ATC&C) Losses of EDSA (Percentage)		51.00	30.00
Action: This indicator has been Revised	***Rationale:*** ***Revised to include the improvement in the collection rate, which both Component 1 of the original project and additional activities of the AF will support***		
Average duration of outages per year at the MV level in the project area (Hours)		117.00	45.00
Action: This indicator has been Revised	***Rationale:*** ***End target is revised to reflect the reduction expected from the additional activities.***		
Average interruption frequency per year at the MV level in the project area (Number)		35.00	18.00

Indicator Name	DLI	Baseline	End Target
Action: This indicator has been Revised	***Rationale:*** ***The wording revised.***		
Direct project beneficiaries (Number)		0.00	376,000.00
Action: This indicator has been Marked for Deletion			
Female beneficiaries (Percentage)		0.00	51.00
Action: This indicator has been Marked for Deletion			
The distribution capacity of the 33 kv and 11 kV network increased (Megawatt)		75.00	130.00
Action: This indicator is New			
People provided with new or improved electricity service (CRI, Number)		0.00	625,480.00
Action: This indicator is New			
People provided with new or improved electricity service - Female (CRI, Number)		0.00	318,995.00
Action: This indicator is New			

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	End Target
Component 1: Distribution Utility Capacity Enhancement and Performance Improvement			
Contractor for utility operation and management appointed (Yes/No)		No	Yes
New Management Information System (MIS) installed (Yes/No)		No	Yes
Action: This indicator is New			
Component 2: Improvement of Electricity Supply in Urban Areas			
Substations constructed and rehabilitated under the Project (Number)		0.00	10.00
Action: This indicator has been Revised	***Rationale:*** ***Wording revised to reflect the new substations to be constructed under the AF***		
Distribution lines (33kV, 11kV and LV) constructed or rehabilitated under the project (Kilometers)		0.00	600.00
Action: This indicator has been Revised	***Rationale:*** ***End target revised to reflect increased activities due to AF***		
Distribution lines rehabilitated under the project (Kilometers)		0.00	350.00

Indicator Name	DLI	Baseline	End Target
Action: This indicator has been Revised	***Rationale:*** ***End target revised to capture the rehabilitation works to be carried out under the AF***		
Energy Meters Replaced and Installed (Number)		0.00	50,000.00
Action: This indicator is New	***Rationale:*** ***To replace faulty meters, regularize illegal connections an install meters for new users all aimed at reducing losses***		
Component 3: Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation			
Reports of Contractor's performance submitted every year to the Steering Committee (Number)		0.00	2.00
Grievances resolved within the stipulated period of time (Percentage)		0.00	90.00
Action: This indicator is New			
Beneficiary feedback surveys undertaken (Number)		0.00	6.00
Action: This indicator is New	***Rationale:*** ***To test the citizens perception of the project***		
Number of Staff Trained (Number)		0.00	50.00
Action: This indicator is New			

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Aggregate Technical, Commercial and Collection (ATC&C) Losses of EDSA		Monthly	EDSA databas e/accounts	EDSA operational performance prepared monthly	EDSA Commercial Department
Average duration of outages per year at the MV level in the project area	Average duration of outages in the project area due to faults in the 33/11kV network, measured in terms of hours needed to restore power supply. Baseline includes 1-2 hrs to locate the fault, 3hrs for repair using electrical joint resin compound and 5 hours for the electrical joint resin compound to cool down. Outages under consideration relate to network faults only; outages related to interruptions of generation are not taken into account.	EDSA	National distribution utility database	EDSA network reliability data prepared monthly	Monthly
Average interruption frequency per year at the MV level in the project area	Average number of interruptions of service per year. The baseline is calculated based on the	Monthly	National electricity distribution utility	EDSA network reliability data prepared monthly	Annual

	observed average of one interruption every two days		database		
Direct project beneficiaries	All existing consumers have benefited from the reduced interruption frequency and reduced outage hours. The direct project beneficiaries refer to the customers that would benefit from the network rehabilitation activities. As these activities are still in the design stage, the direct project beneficiaries are still zero.	PMU	Direct observation		Annual
Female beneficiaries	Based on the assessment and definition of direct project beneficiaries, specify what percentage of the beneficiaries are female.	PMU	Direct observation		Annual
The distribution capacity of the 33 kv and 11 kV network increased		Once at end of project	EDSA	Network analysis and load flow analysis carried out at end of project	
People provided with new or improved		Yearly	MOE/EDSA	EDSA customer data	EDSA

electricity service				system	
People provided with new or improved electricity service - Female					

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Contractor for utility operation and management appointed	Indicators measuring intermediate results achieved in terms of building NPA's capacity and improving its performance will be agreedin the PBCUOM and reflected in the Business Plan for the comprehensive reengineering of the utility.	PMU	Signed contract available		Annual
New Management Information System (MIS) installed		once	EDSA	The contract for MIS is completed and MIS is operational by EDSA	
Substations constructed and rehabilitated under the Project		PMU	Final technical report of contractors/ Direct observation	Monitor construction progress and activity completion	Annual
Distribution lines (33kV, 11kV and LV)	This indicator measures the	Quarterly	Project	Measurement of	EDSA Projects

constructed or rehabilitated under the project	length of the distribution lines (33kV, 11kV and LV) constructed or rehabilitated/upgraded under the project. The baseline value for this indicator is expected to be zero.		Progress Reports	construction progress and completion	Department
Distribution lines rehabilitated under the project					
Energy Meters Replaced and Installed	Prepaid Energy Meters replace and Installed	Quaterlly	Data base of EDSA commercial department		EDSA commercial department
Reports of Contractor's performance submitted every year to the Steering Committee	The reports will be prepared on a quarterly basis (or more frequently if so agreed) by the independent technical consultant hired to track and monitor Contractor's performance and will certify whether the Contractor has achieved the results established in the PBCUOM.	PMU	Direct observation		Semi-annual
Grievances resolved within the stipulated period of time	measures the number of grievances received and the number resolved in the	Monthly	GRM data base		Environmental and Social Management Unit of EDSA

	reporting period				
Beneficiary feedback surveys undertaken	Citizen engagement and Feedback surveys	Biannual	Project Report	Survey conducted	ESMU and Communication wing of EDSA
Number of Staff Trained		yearly	MOE/EDSA	Activity and progress report	

Annex 1: Economic and Financial Analysis

Economic Analysis

1. **This section discusses the rationale for public financing of the AF and the value added from World Bank support and presents the analysis of the AF's development impact in terms of expected benefits and costs.** This economic analysis is consistent with the World Bank guidelines.[9]

2. **The AF includes the following components:**

- Component 1: Distribution Utility Capacity Enhancement and Performance Improvement (US$8 million)
- Component 2: Improvement of Electricity Supply in Urban Areas (US$40 million)
- Component 3: Sector Planning Assistance, Project Implementation Support and Monitoring and Evaluation (US$3 million)

3. **The evaluation of the components is restricted to the activities that generate benefits for which an economic value can be clearly identified and measured, notably benefits associated with investments under Component 2.** Components 1 and 3 are excluded due to the difficulty in valuing the economic outcomes.

4. **The analysis finds that the proposed AF will generate substantial economic benefits to Sierra Leone's economy by increasing the capacity of the distribution network in Freetown with reduced system loss and displacing expensive diesel-based self-generation.** In the base case scenario, the EIRR of the 'with AF' scenario is 12.8 percent with an NPV of US$33 million. The EIRR includes environmental benefits with incremental returns to the AF of 1 percentage point and NPV of US$4.4 million.

Rationale for Public Financing

5. **The rationale for public financing for the additional investments rests primarily on the present characteristics of Sierra Leone's power sector:** (a) low electricity access in the country requiring government intervention as a development priority to ensure energy supply and increase access to electricity; (b) upgrading and expansion of distribution networks not normally conducive to public-private arrangements, particularly if those investments are not linked to a private and bankable project; and (c) the small customer basis. It is also highly unlikely that a private investor will finance the proposed investments given the status of Sierra Leone's power sector.

[9] This economic analysis is consistent with the following World Bank guidelines: (a) Operational Policy and Bank Procedure for Investment Project Financing; (b) Power Sector Policy and Investment Projects: Guidelines for Economic Analysis; (c) Guidance Note on Shadow Price of Carbon in Economic Analysis, 2017; and (d) Discounting Costs and Benefits in Economic Analysis of World Bank Projects, 2016.

Value Added of the World Bank's Support

6. **The World Bank has a comparative advantage in financing the AF in light of its experience in supporting the conceptualization, design, bidding, and execution of contracts of similar nature in other African countries.** The World Bank has been at the forefront in supporting utility reforms in Africa and can offer versatile and integrated support, leveraging different competencies from various departments, International Finance Corporation (IFC), and global partnerships. The World Bank is also particularly well positioned to convene development partners and provide coordinated and strategic support to a long-term vision of utility reform, as well as to gather resources for the rehabilitation and upgrade of the national distribution system.

Methodology and Assumptions

7. **The economic viability of the AF has been assessed through a standard cost-benefit analysis.** Net benefits for the AF were calculated by comparing costs and benefits for the 'with AF' and 'without AF' scenarios. A range of scenarios and sensitivities that meaningfully reflect the uncertainties of key input variables have been evaluated. The analysis includes a consideration of the relevant environmental and social externalities. Table 1.1 presents the main assumptions.

Table 1.1. Key Assumptions

Item	Value	Note
AF life (years)	20	
Discount rate (percent)	1.5	Twice the long-term growth rate of the country. Sierra Leone has grown at an average rate of 0.73 percent over the last 5 years (2013–2017).
WTP (US¢/kWh)	19	Current average tariff
Exchange rate (SLL/US$)	8,530	Exchange rate at the end of 2018
CAPEX (US$, millions)	37	Subcomponents 2A and 2B
O&M cost (percentage of CAPEX)	2	

Description of AF Benefits and Costs

8. **AF costs.** The main costs associated with such investments are (a) capital costs, including line rehabilitation and expansion and refurbishment of substations; (b) O&M costs of the grid infrastructure; and (c) average cost of generating additional electricity (except the energy saved from reduced technical losses). The capital costs under Subcomponents 2A and 2B are estimated as US$37 million and investments are assumed to be developed in three years, with a 30 percent, 40 percent, and 30 percent disbursement pattern. The O&M activities are estimated as 2 percent of the capital costs. It is assumed that import and HFO power plants will contribute to 70 percent and 30 percent of additional generation at US¢14 per kWh and US¢17 per kWh, respectively.

9. **AF benefits.** The proposed investments will increase the distribution capacity of the electricity network in the targeted areas, which in turn will enable (a) incremental electricity consumption in the AF

areas and (b) energy savings that will result from reduced technical losses along the rehabilitated grid lines. These are the more quantifiable benefits that are assessed under the economic analysis.

- **Incremental electricity consumption resulting from the improvements in service delivery.** A significant part of electricity demand remains unserved in Sierra Leone because of poor grid condition. The rehabilitation and expansion of 33/11 kV substations, 33 kV lines, and 11 kV and LV network will improve supply reliability and efficiency and increase the distribution capacity of the network by 70 MW.

- **Energy cost savings resulting from reduced losses.** Improvements in the technical condition of the grid will also have a substantial impact on the total system losses. The project is expected to reduce technical losses by 4 percent, from 16 percent to 12 percent.

- **Valuation of additional electricity made available.** The additional electricity made available by the AF can be valued at the consumers' WTP for electricity supply. The WTP analysis is typically determined by computing the area under a derived demand curve during each year of the AF's life. The key parameters needed to determine the area under the curve include total demand in each year of the AF, the price elasticity of demand, and the marginal tariff. However, given the difficulties in reliably establishing these parameters for Sierra Leone, this economic analysis uses estimates of average WTP for Sierra Leone of US¢19 per kWh based on the current average tariff, which is lower than residential customers' diesel self-generating cost.[10] Given this uncertain estimate of WTP, a sensitivity analysis has been carried out around this value.

Environmental Externalities

10. **Environmental externalities constitute another economic benefit of the proposed AF**, given that the AF will lead to decreases in technical loss and use of diesel-based self-generators, leading to a decrease in overall GHG emissions. GHG accounting has been undertaken for the project, which will result in GHG emission reductions. Through distribution network upgrade and rehabilitation, the project will reduce the technical losses by 4 percent, which will avoid 48,007 tCO_2 over the economic life of 20 years. In addition, the project will provide new or improved electricity services to users through grid extension. It allows grid electricity to substitute for self-generation using GHG-intensive fuel such as diesel. Using the World Bank's GHG guidance on energy access operations and the total generation required for new or improved connection, the project will therefore avoid 94,269 tCO_2 over the economic life of 20 years. Overall, about 109,760 tCO_2 will be saved during the project economic lifetime. The GHG emission factors for different sources of generation and grid emission factors are given in Table 1.2.

Table 1.2. GHG Emission Factors of Generation and Grid

	HFO	Diesel Self-Generator	Grid
Emissions (kg / KWh)	0.4325	0.4670	0.402

[10] Current fuel cost is estimated to SLL 6,000 per liter.

11. **Consistent with World Bank guidance on the social value of carbon, carbon emission reductions are valued in the low case at US$38 per tCO_2 in 2019, increasing to US$50 per ton in real terms by 2030.** Carbon emissions are valued at two 'high' and 'low' levels, both of them increasing at the rate of 2.25 percent per year.

12. **Climate change mitigation co-benefits.** Consistent with the Joint Multilateral Development Bank Methodology for Tracking Climate Finance, climate co-benefits in the proposed project will be realized through Subcomponents 2A and 2B to finance the upgrade and expand the 33 kV, 11 kV, and LV network since those components reduce energy use and technical loss.

Results

13. **The economic analysis demonstrates that the proposed AF is economically viable.** The baseline economic return of proposed AF against the 'without AF' scenario is 12.8 percent and NPV is US$32 million, including environmental benefits, which added 1.0 percentage points, or US$4 million, to the EIRR and NPV, respectively.

Table 1.3. Summary of the Economic Analysis

	Unit	Result
Economic Internal Rate of Return		
EIRR	Percent	11.8
EIRR with environmental benefits	Percent	12.8
Composition of NPV		
Total costs	US$, millions	508
Total benefits	US$, millions	536
NPV (before environmental benefits)	**US$, millions**	**29**
Environmental benefits	US$, millions	4
NPV (including environment benefits)	**US$, millions**	**32**

Risks and Sensitivity Analysis

14. **Sensitivity analysis has been conducted against all key parameters that have a significant impact on the AF's EIRR.** These include the average WTP, electricity supply disruptions, and the discount rate.

- **Average WTP.** The additional electricity evacuated by the AF is valued at the WTP based on the current average tariff, which is lower than diesel costs for a self-generator. The switching value for the WTP (to turn NPV to 0) is US¢17 per kWh.

Table 1.4. Sensitivity Analysis on WTP

WTP (US¢/kWh)	NPV (US$, millions)	EIRR (percent)
17	0	—
19	33	11.8
30	333	62.0

- **Discount rate.** The choice of discount rate is a critical assumption that has a significant impact on the NPV of an AF. As a result, a sensitivity analysis has been carried on the discount rates used in this analysis. Table 1.5 shows the relationship between discount rates and NPV for the proposed AF.

Table 1.5. Sensitivity Analysis on Discount Rate

Discount Rate (%)	NPV (US$, millions)
1.0	36
1.5	33
3.0	25

Financial Analysis

15. The financial benefit of the project would be the incremental cash flow through incremental electricity sales annually in the project area. The incremental revenue from additional power sales in the project area was valued at the current average weighted consumer tariff of US¢19 per kWh. The analysis also captures decrease in system losses from 38 percent to 24 percent, where technical losses and commercial losses are reduced by 4 percent and 10 percent, respectively.

16. On the cost side, assumptions on the capital cost, O&M costs, and additional power supply costs are the same as in the economic analysis. The capital costs are estimated to US$37 million and the O&M activities are estimated as 2 percent of the capital costs. Average additional generation cost is estimated as US¢14.9 per kWh.

Results

17. The financial analysis of the project confirmed that the project is financially viable, with FIRR of 7.4 percent and NPV of US$12 million at a discount rate of 1.5 percent.

18. EDSA's current revenue is not sufficient to cover all the operating and maintenance costs due to high cost of power purchase and high ATC&C losses. In 2018, EDSA had a deficit of about US$19 million. The project is expected to have a significant positive impact on EDSA's financial position through the reduction of ATC&C losses. With the projected electricity sales increase, a reduction in ATC&C losses from about 50 percent in 2016 to 30 percent in 2023 will increase EDSA's revenue by about $40 million. This revenue increase coupled with the expected decrease in the average power purchase price will enable EDSA to achieve financial viability.

19. Table 1.6 shows the summary of the calculations of the financial returns.

Table 1.6. Summary of Financial Returns

	Unit	2019	2020	2021	2022	2023	2024	2025	2026
Without Project									
Technical losses	%			16.0%	16.0%	16.0%	16.0%	16.0%	16.0%
Commercial losses	%			22.0%	22.0%	22.0%	22.0%	22.0%	22.0%
With Project									

Technical losses	%			14.0%	12.0%	12.0%	12.0%	12.0%	12.0%
Commercial losses	%			18.0%	15.0%	13.0%	12.0%	12.0%	12.0%
Difference									
Additional Energy Sent Out to grid	GWh			135.4	264.7	264.7	264.7	264.7	264.7
Additional Energy Sent Out to Customers	GWh			116.5	233.0	233.0	233.0	233.0	233.0
Additional Energy Sale to Customers	GWh			95.54	198.0	202.7	205.0	205.0	205.0
Additional supply from transmission loss reduction	GWh			(2.71)	(10.6)	(10.6)	(10.6)	(10.6)	(10.6)
Additional Energy Sale from commercial loss reduction	GWh			(4.66)	(16.3)	(20.9)	(23.3)	(23.3)	(23.3)
Additional Energy Sent Out to grid from HFO plants	GWh			40.64	79.44	79.44	79.44	79.44	79.44
Additional Energy Sent Out to grid from Import	GWh			94.83	185.3	185.3	185.3	185.3	185.3

Financial Analysis									
Generation Cost - HFO	US$m			6.9	13.5	13.5	13.5	13.5	13.5
Generation Cost - Import	US$m			13.3	25.9	25.9	25.9	25.9	25.9
Capital Cost	US$m	11.1	14.8	11.1	-				
O&M Cost	US$m	0.2	0.5	0.7	0.7	0.7	0.7	0.7	0.7
Total costs	**US$m**	**11.3**	**15.3**	**32.0**	**40.2**	**40.2**	**40.2**	**40.2**	**40.2**
Additional Energy Sale to Customer	US$m	-	-	19.0	40.7	42.5	43.4	43.4	43.4
Technical loss reduced	US$m	-	-	0.4	1.6	1.6	1.6	1.6	1.6
Total benefits	**US$m**	**-**	**-**	**19.4**	**42.3**	**44.1**	**45.0**	**45.0**	**45.0**
Total Financial flows	**US$m**	**(11.3)**	**(15.3)**	**(12.6)**	**2.1**	**3.9**	**4.8**	**4.8**	**4.8**