

Document of
The World Bank

Report No: ICR00004160

IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA–H2400, IDA–H7730, TF–93404)

ON A

GRANT
IN THE AMOUNT OF SDR 16.9 MILLION
(US\$25.5 MILLION EQUIVALENT)

AND A

GLOBAL ENVIRONMENT FACILITY GRANT
IN THE AMOUNT OF US\$4.5 MILLION

TO THE

GOVERNMENT OF GUINEA

FOR AN

ELECTRICITY SECTOR EFFICIENCY IMPROVEMENT PROJECT

June 6, 2017

Energy and Extractives Global Practice
Sustainable Development Practice Group
Country Department AFCF2
Africa Region

CURRENCY EQUIVALENTS

Exchange Rate Effective June 6, 2017

Currency Unit = Guinean Franc (GNF)

1 GNF = US\$ 0.00011

US\$ 1.00 = 9300 GNF

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
AGER	Agence Guinéenne d'Électrification Rurale
BERD	Bureau d'Électrification Rurale Décentralisée
CAS	Country Assistance Strategy
CPS	Country Partnership Strategy
CRI	Cash Recovery Index
CREST	Commercial Reorientation of the Electricity Sector Toolkit
CP	Comité de Pilotage
DSM	Demand Side Management
DNE	Direction Nationale de l'Énergie
EDG	Electricité de Guinée
EE	Energy Efficiency
ENELGUI	Entreprise Nationale d'Electricité de Guinée
ERD	Electricité Rurale Décentralisée
ESCo	Energy Services Company
ESEIP	Electricity Sector Efficiency Improvement Project
ESMAP	Energy Sector Management Assistance Program
FA	Financial Agreement
FM	Financial Management
FMRs	Financial Monitoring Reports
FERD	Fonds pour l'Électrification Rurale Décentralisée
GEF	Global Environmental Facility
GEO	Global Environment Objectives
GNI	Gross National Income
GHG	Greenhouse Gas
GNF	Guinea Franc
GoG	Government of Guinea
kWh	kilowatt-hour
ICR	Implementation Completion Report
IsDB	Islamic Development Bank
ISR	Implementation Supervision Report
KPI	Key Performance Indicator
LV	Low Voltage
MHE	Ministère de l'Hydraulique et de l'Énergie

MW	Mega Watt
NGO	Non-Governmental Organization
NPV	Net Present Value
PAD	Project Appraisal Document
PAESE	Projet d'Amélioration du Secteur de l'Énergie
PDO	Project Development Objective
PERD	Programme d'Électrification Rurale Décentralisée
PIU	Project Implementation Unit
PPP	Public and Private Partnership
PRSE	Projet de Réhabilitation du Secteur de l'Énergie
RETs	Renewable Energy Technologies
SDR	Special Drawing Right
SHS	Solar Home System
SOGEL	Société Guinéenne d'Électricité
UNDP	United Nations Development Program
VAT	Value Added Tax

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 Acting Country Director: Paola Ridolfi
 Practice Manager: Charles Joseph Cormier
 Project Team Leader: Yussuf Uwamahoro
 ICR Team Leader: Amadou Mamadou Watt

**REPUBLIC OF GUINEA
ELECTRICITY SECTOR EFFICIENCY IMPROVEMENT PROJECT**

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A. Basic Information			
Country:	Guinea	Project Name:	Guinea Electricity Sector Efficiency Improvement
Project ID:	P077317, P098742	L/C/TF Number(s):	IDA-H2400, IDA-H7730, TF-93404
ICR Date:	04/05/2017	ICR Type:	Core ICR
Lending Instrument:	SIL	Borrower:	REPUBLIC OF GUINEA
Original Total Commitment:	USD 24.10M, USD 3.86M	Disbursed Amount:	XDR 23.70M, USD 3.86M
Environmental Category: C		Focal Area: C	
Implementing Agencies : Électricité De Guinée			
Co-financiers and Other External Partners:			

B. Key Dates				
Guinea Electricity Sector Efficiency Improvement - P077317				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	11/29/2005	Effectiveness:	08/03/2007	08/03/2007
Appraisal:	04/21/2006	Restructuring(s):		12/18/2014
Approval:	06/22/2006	Mid-term Review:	01/16/2012	01/16/2012
		Closing:	12/31/2009	06/30/2016
Guinea- GEF- Electricity Sector Efficiency Improvement Project - P098742				
Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	11/29/2005	Effectiveness:	09/30/2011	09/30/2011
Appraisal:	04/21/2006	Restructuring(s):		11/19/2008, 05/01/2012, 12/18/2014, 08/17/2016
Approval:	05/15/2008	Mid-term Review:		
		Closing:	06/30/2013	06/30/2016

C. Ratings Summary	
C.1 Performance Rating by ICR	
Outcomes	Moderately Satisfactory
GEO Outcomes	Moderately Satisfactory
Risk to Development Outcome	High

Risk to GEO Outcome	High
Bank Performance	Moderately Satisfactory
Borrower Performance	Moderately Satisfactory

C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry	Moderately Unsatisfactory	Government:	Moderately Unsatisfactory
Quality of Supervision:	Moderately Satisfactory	Implementing Agency/Agencies:	Moderately Satisfactory
Overall Bank Performance	Moderately Satisfactory	Overall Borrower Performance	Moderately Unsatisfactory

C.3 Quality at Entry and Implementation Performance Indicators

Guinea Electricity Sector Efficiency Improvement - P077317			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating:
Potential Problem Project at any time (Yes/No):	Yes	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	Yes	Quality of Supervision (QSA)	None
DO rating before Closing/Inactive status	Moderately Satisfactory		

Guinea- GEF- Electricity Sector Efficiency Improvement Project - P098742			
Implementation Performance	Indicators	QAG Assessments (if any)	Rating:
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA)	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA)	None
GEO rating before Closing/Inactive Status			

D. Sector and Theme Codes

Guinea Electricity Sector Efficiency Improvement - P077317		
	Original	Actual
Sector Code (as % of total Bank financing)		
Energy and Extractives		
Other Energy and Extractives	21	21
Renewable Energy Wind	3	3
Renewable Energy Solar	3	3
Non-Renewable Energy Generation	67	67

Renewable Energy Geothermal	3	3
Renewable Energy Biomass	3	3
Theme Code (as % of total Bank financing)		
Environment and Natural Resource Management		
Climate change	20	20
Mitigation	20	20
Private Sector Development		
Business Enabling Environment	20	20
Regulation and Competition Policy	20	20
Jobs	13	13
Job Creation	13	13
Public Private Partnerships	10	10
Public Sector Management		
Public Administration	20	20
Administrative and Civil Service Reform	20	20
Urban and Rural Development		
Rural Development	13	13
Rural Infrastructure and service delivery	13	13
Urban Development	13	13
Urban Infrastructure and Service Delivery	13	13

Guinea- GEF- Electricity Sector Efficiency Improvement Project - P098742		
	Original	Actual
Sector Code (as % of total Bank financing)		
Energy and Extractives		
Other Energy and Extractives	21	21
Renewable Energy Wind	3	3
Renewable Energy Solar	3	3
Non-Renewable Energy Generation	67	67
Renewable Energy Geothermal	3	3
Renewable Energy Biomass	3	3
Public Administration		
Central Government (Central Agencies)	22	22
Energy and Extractives		
Other Energy and Extractives	13	13

Energy Transmission and Distribution	65	65
Theme Code (as % of total Bank financing)		
Environment and Natural Resource Management		
Climate change	20	20
Mitigation	20	20
Finance		
Financial Stability	13	13
Financial Sector Integrity	13	13
Financial Sector oversight and policy/banking regulation & restructuring	13	13
Private Sector Development		
Business Enabling Environment	20	20
Regulation and Competition Policy	20	20
Jobs	13	13
Job Creation	13	13
Public Private Partnerships	10	10
Public Sector Management		
Public Administration	20	20
Administrative and Civil Service Reform	20	20
Urban and Rural Development		
Rural Development	13	13
Rural Infrastructure and service delivery	13	13
Urban Development	13	13
Urban Infrastructure and Service Delivery	13	13

E. Bank Staff		
Guinea Electricity Sector Efficiency Improvement - P077317		
Positions	At ICR	At Approval
Vice President:	Makhtar Diop	Nankani Gobind
Country Director:	Paola Ridolfi (Acting)	Mats Karlsson
Practice Manager/Manager:	Charles Joseph Cormier	S. Vijay Iyer
Project Team Leaders:	Moez Cherif & Yussuf Uwamahoro	Prasad V. S. N. Tallapragada
ICR Team Leader:	Amadou Mamadou Watt	
ICR Primary Author:	Fernando Lecaros	

Guinea- GEF- Electricity Sector Efficiency Improvement Project - P098742		
Positions	At ICR	At Approval
Vice President:	Makhtar Diop	Nankani Gobind
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ICR Primary Author:	Fernando Lecaros	

F. Results Framework Analysis

Project Development Objectives (from Financing Agreement)¹

The Project Development Objective was to support the Recipient in its efforts to improve the technical, commercial and operational efficiency of its power sector through critical investment support and capacity building.

The Project contributes to reduction of carbon dioxide (CO₂) emissions by addressing the large inefficiencies in the distribution sector and reducing energy losses.

¹ There was a wording mismatch with the Project Appraisal Document PDO, which was corrected during Additional Finance/ restructuring. See section 1.4, para 14, 14

Revised Project Development Objectives (as approved by original approving authority)
The PDO was not revised.

Global Environment Objectives (from Project Appraisal Document)

The Project will be instrumental in containing CO2 emissions by improving the efficiency of the electricity distribution system, and by introducing end-use energy management practices.

Revised Global Environment Objectives (as approved by original approving authority)
The GEO was not revised.

(a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Number of low voltage customers in Kaloum			
Number	11,300	13,693		14,963
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The indicator was adopted to reflect the increase in legalized users associated with the project; a large increase is associated with lower commercial losses. The target was exceeded by nine percent.			
Indicator 2:	Total distribution losses in Kaloum			
Percent	21.5%	16%		14.7%
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	Target exceeded by 9 percent (lower losses than targeted, which indicates overachievement)			
Indicator 3:	Bill collection rate in Kaloum			
Percent	70%	95%		81.5%
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	Partially achieved with an improvement of 11.5 percent, however the target was missed by 13.5 percent.			
Indicator 4:	Project Beneficiaries			
Number	71,258	86,348		94,566
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was exceeded by 10 percent. The beneficiaries at completion are the number of persons benefitting from project investments in the Kaloum district, calculated according to the number of customers, assuming that 79			

	percent are households with an average eight persons per household based on the 2014 census data ²			
Indicator 5:	Of which female (beneficiaries)			
Percent	50%	50%		50%
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	Target achieved.			

(b) GEO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Reduction in CO2 emissions			
Metric tons	0	36,448		35,510
Date achieved	12/31/2016	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was 97.4 percent achieved. The values are based on avoided CO ₂ emissions associated with the low consumption CFLs (light bulbs) distributed.			

(c) Intermediate Outcome Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Indicator 1:	Availability rate of Garafiri hydropower plant			
Percentage	95.8%	98.5%		96.9%
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was 98 percent achieved.			
Indicator 2:	Generation of unit 33G at Tombo thermal plant			
MWh	0	211,779.00		83,132
Date achieved	12/31/2006	06/30/2016		06/30/2016

² Presidential Decree D/2015/ 229 / PRG / SGG of December 31, 2015

Comments (incl. % achievement)	The target was 39 percent achieved. The rehabilitation fell short of control equipment and the unit broke down in 2013 shortly after it was re-commissioned due to poor operation and maintenance.			
Indicator 3:	Number of rehabilitated/installed substations			
Number	0	42		35
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was 83 percent achieved. The target was not achieved because the initial technical design overestimated the number of new substations required (in addition to those rehabilitated). .			
Indicator 4:	Replaced underground cables			
kilometers (km)	0.00	55.5		25.5
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was 46 percent achieved. The technical design overestimated the length of underground cable required for replacement and new additional cable.			
Indicator 5:	Meters installed			
Number	0	13,693		566
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was 4 percent achieved. The meters were acquired, but the overwhelming majority were not installed based on the Government's decision to halt the installation following consumer protests.			
Indicator 6:	High efficiency lamps distributed			
Number	0	600,000		584,565
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was 97 percent achieved.			
Indicator 7:	Energy audits executed			
Number	0	30		71
Date achieved	12/31/2006	06/30/2016		06/30/2016
Comments (incl. % achievement)	The target was exceeded by a factor of 2.4.			

G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	GEO	IP	Actual Disbursements (USD millions)	
					Project 1	Project 2
1	10/05/2006	S		S	0.00	0.00
2	12/23/2006	S		S	0.00	0.00
3	06/25/2007	MS		MU	0.00	0.00
4	12/17/2007	S		S	0.80	0.00

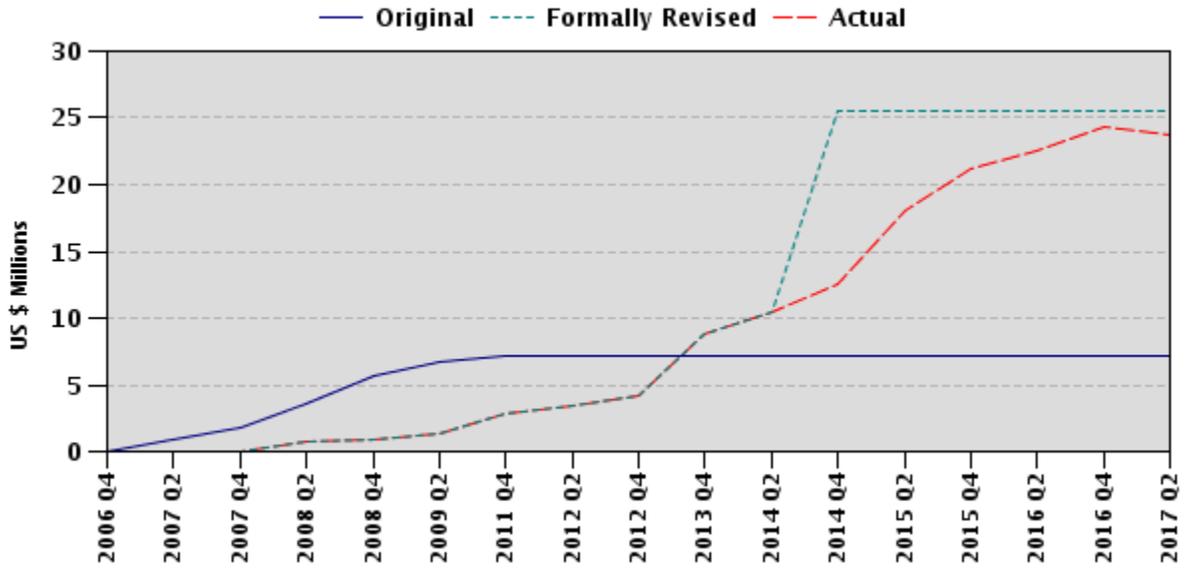
5	05/31/2008	S		MS	0.88	0.00
6	12/22/2008	S	S	S	1.28	0.00
7	06/10/2009	MS	MU	MU	2.03	0.00
8	12/22/2009	U	U	U	2.03	0.00
9	03/29/2011	U	U	U	2.03	0.00
10	07/19/2011	MU	MU	MU	2.81	0.00
11	01/11/2012	MS	MS	MS	4.12	0.00
12	06/27/2012	MS	MS	MS	4.22	0.40
13	04/28/2013	MS	MS	MS	8.01	3.31
14	11/29/2013	MS	MS	S	10.40	4.08
15	05/17/2014	MS	MS	MS	11.66	4.08
16	12/17/2014	MS	MS	MS	15.64	3.02
17	07/14/2015	MS	MS	MS	21.27	3.13
18	01/25/2016	MS		MS	22.62	3.35

H. Restructuring (if any)

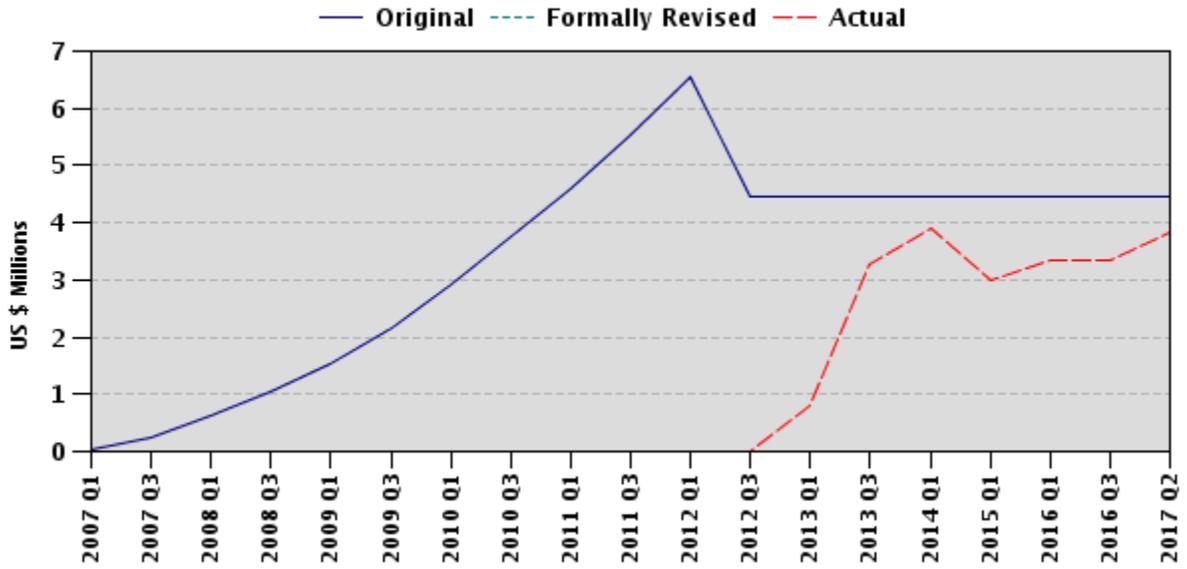
Restructuring Date(s)	Board Approved		ISR Ratings at Restructuring			Amount Disbursed at Restructuring in USD millions		Reason for Restructuring & Key Changes Made
	PDO Change	GEO Change	DO	GEO	IP	Project1	Project 2	
11/19/2008	N	N		0.00	Reallocation of funds among disbursement categories, including to take into account GEF funding.
05/01/2012	N	N	MS	MS	MS			Additional Financing (US\$18.3 million) to cover a cost overrun, a financing gap, and some scaled up planned activities, mainly related to: (i) distribution equipment for Kaloum area (Component 1); (ii) spare parts for the Garafiri hydropower plant (Component 2); and (iii) technical assistance EDG to improve its commercial management and to support the pilot program for energy saving lamps (Component 3); and restructuring to align better the activities with current sector needs and extend the project closing date.
12/18/2014	N	N	MS		MS	15.64		Reallocation of funds, simplification of disbursement categories, extension of project closing date.
08/17/2016	N	N	MS		MS			Cancellation of undisbursed balance.

I. Disbursement Profile

P077317



P098742



1. Project Context, Development and Global Environment Objectives Design

1.1 Context at Appraisal

1. **Political context.** At appraisal, the Government was presided by General Lansana Conte, who was in power for 24 years, from 1984 to 2008, initially through military seizure and subsequently (1993, 1998, and 2003) through elections. The Project Appraisal Document (PAD) noted poor governance practices, dysfunctional institutional structures, and predominant rent-seeking practices that compounded high inflation.

2. **Economy.** At appraisal (2007) it was noted that despite Guinea's generous endowment in natural resources (half of the World's known bauxite reserves, iron ore, gold, and diamonds), its relative political stability, and a strategic location that favors trade, 50 percent of Guineans were living in poverty. Real GDP growth had stagnated at the low level of 2.8 percent on average over the previous five years, jeopardizing the social and economic gains reaped during the 1990s when courageous structural reforms were undertaken. GDP per capita stood at US\$370 in 2005, with the United Nations Human Development Index ranking Guinea 156 out of 177 countries. Its population was around 10 million. Over 80 percent of the population lacked access to electricity.

3. **Electricity sector.** The Government-owned *Électricité de Guinée* (EDG) was the principal electricity sector entity in Guinea, responsible for generation, transmission and distribution. The sector was reformed in the mid-1990s and operated under an *affermage* (lease) contract with a consortium led by *Électricité de France* (EDF) and *Hydro Québec* (HQ). The arrangement was ultimately unsuccessful due to disagreements regarding tariff adjustments and cost recovery measures, and EDG reverted to the public sector in 2001. At appraisal, EDG had 1,563 employees and generated 662 GWh annually, serving 115,978 customers, almost 80 percent of whom were located in Conakry, the capital.

4. EDG's installed capacity consisted of 249 MW, of which 127 MW were thermal and 122 MW were hydroelectric power. Besides the generation in public domain, there was considerable private generation, for instance by the mining companies that self-generated most of their electricity needs. Such captive generation accounted for almost half of the electricity generation in Guinea. It was expected that rapid growth in the mining and aluminum sector would drive future demand to 1,100 MW by 2020; the growth in future demand was expected to outstrip the ability of the mining companies to self-generate. This increase in demand could be supplied by developing the country's large hydroelectric potential, which was estimated at 6,400 MW in 129 sites.

5. Issues in the electricity sector included: (a) low access rates (less than 20 percent overall); (b) insufficient supply (249 MW available in 2005, or around 30 Watts per capita³); (c) poor service quality (frequent outages and blackouts); (d) inefficiency as evidenced by a ratio of only 74 customers per employee; and, particularly, (d) an unsustainable financial and commercial performance.

6. **Project Concept.** The issues noted above are not independent of each other; in particular, the poor commercial performance crippled EDG financially as it did not

³ Compared, for example, to around 220 Watts per capita in Nicaragua, a small lower income country.

adequately execute the vital revenue collection role required to fund investments necessary to extend the transmission and distribution networks and increase generation supply. At preparation, energy production in 2005 amounted to 659 GWh, of which 268 GWh were billed; total bills amounted to 63,000 million GNF, of which 48,000 million GNF were collected. The resulting Cash Recovery Index⁴ (CRI) amounts to a mere 31 percent, whereas a functional utility should reach a level of at least 80 percent. In effect, the CRI indicates that EDG was recovering only 31 cents for every potential dollar it would produce, due to technical losses, theft, inadequate metering, or lack of billing and collection control. The sector, given its high loss making operations, was draining the economy instead of fueling it. Furthermore, highly unreliable and scarce supply of electricity stunts business investments, forces reliance on uneconomical captive generation, and deprives access to basic services. Reducing the sector's burden on the overall economy in the short run and restructuring the sector to be a net cash contributor to the economy in the long run was critical to growth and poverty reduction. Accordingly, the project was conceived to provide a guideline for addressing sector issues by concentrating on the rehabilitation of the Kaloum area, an important district in Conakry. The project focused on: (a) the reduction of technical losses by rehabilitating the distribution network in the Kaloum district of Conakry (the central section of the city); (b) the reduction of commercial losses by putting in place tamper-proof prepaid meters in the Kaloum district; (c) rehabilitating the thermal production plant (Tombo, also known as Kaloum) in Conakry; and (d) financing spare parts to ensure the availability of production at hydro plants. Complementary aspects of project design included the introduction of energy efficiency (EE) measures through the dissemination of efficient lamps and the organization of an EE cell within EDG, executing energy audits, utility support at the corporate level through the regular production of audited financial statements, and the introduction of remote meters, and anti-theft equipment.

7. **Project Rationale.** The 2002 Poverty Reduction Strategy Paper (PRSP) identified infrastructure as among the most important impediments to poverty reduction and growth. The 2003 Country Assistance Strategy (CAS) sought to facilitate and nurture sustainable and equitable growth, improve access and quality of basic social services, and strengthen governance along with institutional and human capacity. Accordingly, the CAS ranked the energy sector as a high country and World Bank priority. The CAS emphasized improving governance and developing innovative approaches to re-engage the private sector.

8. The project aimed to support these higher-level objectives by laying the foundation for improved governance of the utility and clarifying its financial and regulatory relationship with Government. The corresponding objective of sector rehabilitation would be initiated by focusing on a replicable project as outlined above, which would be a continuation of a Commercial Re-orientation of the Electricity Sector Toolkit (CREST) efficiency improvement program that was conceived prior to the project with World Bank team assistance, and was under implementation by EDG in the Kaloum area in Conakry. The CREST program was oriented mainly towards commercial practices improvements, and the

⁴ Alluded to in the Financing Agreement as "Performance Verification Index" and defined as $[(\text{GWh metered and billed})/(\text{GWh produced})] * [\$ \text{ collected}/\$ \text{ billed}]$. A utility with 15 percent energy losses and 97 percent collection rate would have a CRI of $(1-0.15) * 0.97 = 0.82$, or 82 percent.

project would provide the more important resources required for infrastructure rehabilitation, including the reduction of both technical and commercial losses.

1.2 Original Project Development Objectives (PDO) and Key Indicators (as approved)

9. **PDO:** The objective of the Project as stated in the Financing Agreement⁵ (FA) was to support the Recipient in its efforts to improve the technical, commercial and operational efficiency of its power sector through critical investment support and capacity building. This was slightly different from the version of the PDO in the PAD, which read: “The Project’s Developmental Objective is to improve sector operational and commercial efficiency, and sustainability.”

10. **Key indicators as approved in the FA and the PAD** included:

PDO indicators (from the PAD):

- Improve the financial profitability and sustainability of EDG;
- Undertake preparations for achieving increased private participation in the Guinean electricity market; and

Intermediate indicators (from PAD):

- Reduction in technical losses;
- Increase in billing, revenues and collection;
- Increase in the CRI;
- Increase in tail-end voltage;
- Implementation of customer care center, spot billing, rapid response vehicle systems in the project areas;
- Improvement in customer satisfaction as evidenced by surveys;
- Plant Availability Factor of the Garafiri hydro plant and the Tombo thermal plant;
- Production and disclosure of annual audited financial statements;
- Energy Audits completed;
- Reduction/substitution of peak load demand from Demand Side Management (DSM) activities;
- Training programs on Private Sector Participation (PPP);
- Identified areas for private sector participation, three training programs for outsourcing and Energy Services Companies (ESCOs) carried out;
- Launch technologies that assist in remote metering, anti-theft, and customer service.

1.3 Original Global Environment Objectives (GEO) and Key Indicators (as approved)

11. **Original GEO⁶:** The Project will be instrumental in containing CO2 emissions by improving the efficiency of the electricity distribution system, and by introducing end-use energy management practices.

⁵ Financing Agreement, November 7, 2006.

⁶ Global Environment Facility PAD, April 24, 2008, Report 42451-GN, p.19 and Annex 3.

12. **Key indicators**⁶:(i) improve the financial profitability and sustainability of EDG, (ii) undertake preparations for achieving increased private participation in the Guinean electricity market; and (iii) reduce total GHG emissions.

1.4 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification

13. In 2012, the project was restructured, and an Additional Financing (AF) of US\$18.3 million was approved to cover (i) higher costs than originally anticipated (US\$10.7 million), (ii) a gap due to a financing source that did not materialize (US\$1.9 million), and (iii) the need for more extensive rehabilitation investments (US\$5.7 million).

14. **PDO.** The AF paper confirmed that the PDO for the project was the original one stated in the FA as quoted above⁷; the AF project paper stated in unequivocal terms “the Project Development Objective remains unchanged”.⁸

15. **Revised Key Indicators.** The Results Framework was revised in order to reflect redefined activities, and to concentrate more closely on outcomes and intermediate results that could be directly attributed to the project (with a focus on the Kaloum area, where the bulk of project activities were being implemented). The following provides a summary of the revisions:

a. **Dropped PDO Indicators:**

- Improve the financial profitability and sustainability of EDG (too broad, not focused on Kaloum area);
- Undertake preparations for achieving increased private participation in the Guinean electricity market;

b. **New PDO indicators:**

- Number of low voltage customers in Kaloum area;
- Total distribution losses in Kaloum (percent);
- Collection rate in Kaloum (percent);
- Project beneficiaries (new); and
- Of which female (new).

c. **Dropped Intermediate Indicators:**

- Reduction in technical losses (too broad, not focused on Kaloum area)
- Increase in billing, revenues, and collections (too broad, not focused on Kaloum area)
- Increase in the CRI (too broad, not focused on Kaloum area)
- Increase in tail-end voltage (points of measurement undefined, depends on external factors as well as project)
- Launch customer care center (included in covenants)

⁷ The AF corrected a mismatch between the PDO in the PAD and the PDO in the original Financing Agreement.

⁸ Project Paper on a Proposed Additional Grant in the Amount of SDR 11.9 million (US\$18.3 million equivalent) and Restructuring to the Republic of Guinea for the Electricity Sector Efficiency Improvement Project (ESEIP), May 1 2012, Report No. 68084-GN.

- Improvement in customer satisfaction (indicator not defined)
 - Reduction in peak load demand from DSM activities (point of reference undefined)
 - Training programs on PPP (does not monitor a key project activity)
 - Production and disclosure of annual audited financial statements (standard covenant)
 - Launch remote metering, anti-theft technologies (covered by monitoring number of meters installed)
- d. **Retained and New Intermediate Indicators**
- Number of sub-stations rehabilitated/installed (new, tracks project progress);
 - Replaced underground cables (km) (new, tracks project progress);
 - Meters installed (number);
 - Available capacity rate at Garafiri hydropower plant (percent) (unchanged);
 - Power generation of Unit 33G at Tombo power plant (MWh) (new, replaced availability capacity rate by a more targeted indicator as the purpose of the component is to reduce fuel consumption);
 - High efficiency lamps distributed (number); and
 - Energy audits executed (number).

1.5 Revised GEO (as approved by original approving authority) and Key Indicators, and reasons/justification

The GEO was not revised.

Key GEO indicators:

- Reduce total GHG emissions.
- **New GEO intermediate indicator:** High efficiency lamps distributed (monitor physical implementation and allows estimation of reduced GHG emissions). Table 1 provides a summary of the changes to the indicators, together with the target values.

Table 1. Summary of revisions to Project Indicators

	Indicator	Baseline (B) and End Target (T)	Changes	Comment
PDO Indicators	Improve the financial profitability and sustainability of EDG	Not determined	Dropped at restructuring	Too broad, not focused on Kaloum area
	Undertake preparations for achieving increased private participation in the Guinean electricity market	Not determined	Dropped at restructuring	Undefined

	Indicator	Baseline (B) and End Target (T)	Changes	Comment
	Number of low voltage customers in Kaloum area	B: 11,300 T: 13,693	New indicator adopted at restructuring	Reflects project objective of connecting more users
	Total distribution losses in Kaloum (percent)	B: 21.5% T: 16.0%	New indicator adopted at restructuring	Reflects benefits of new infrastructure
	Collection rate in Kaloum (percent)	B: 66% T: 95%	New indicator adopted at restructuring	Reflects improved commercial management
	Project Beneficiaries	B: 71,258 T: 86,348	New indicator adopted at restructuring	
	Of which female	B: 35,629 T: 37,335	New indicator adopted at restructuring	
GEO Indicator	Reduce Total GHG emissions (tons)	B: 36 T: 36,448	No change at restructuring	
Intermediate Indicators	Reduction in technical losses	B: 59% T: 8%	Dropped at restructuring	Too broad, not focused on Kaloum area
	Increase in billing, revenues and collection	B: 45% T: +10%	Dropped at restructuring	Too broad, not focused on Kaloum area
	Increase in the CRI	B: 75% T: +15%	Dropped at restructuring	Too broad, not focused on Kaloum area
	Increase in tail-end voltage	B: 180V T: +10%	Dropped at restructuring	Undefined points of measurement
	Implementation of customer care center, spot billing, rapid response vehicle systems in the project areas		Dropped at restructuring	Included in covenants
	Improvement in customer satisfaction	Undefined	Dropped at restructuring	Undefined baseline, target

	Indicator	Baseline (B) and End Target (T)	Changes	Comment
	as evidenced by surveys			
	Plant availability factor of the Garafiri hydro plant (percent)	B: 42% T: +10%	Retained with B: 95.8% and T: 98.5%	
	Plant availability factor of the Tombo thermal plant	B: 42% T: +10%	Dropped at restructuring	Replaced by Tombo generation
	Power generation of Unit 33G at Tombo power plant (MWh)	B: 0 T: 211,779	New indicator adopted at restructuring	Reflects objective of reducing fuel consumption
	Production and disclosure of annual audited financial statements		Dropped at restructuring	Standard covenant
	Energy audits completed	B: 0 T: 10	Retained with B: 0 and T: 30	
	Reduction/substitution of peak load demand from DSM activities	T: 12.15MW	Dropped at restructuring	Undefined point of reference
	Training programs on PPP	B: 0 T: 3	Dropped at restructuring	Does not monitor a project activity
	Launch technologies that assist in remote metering, anti-theft, and customer service		Dropped at restructuring	Covered by monitoring number of meters installed
	Number of substations rehabilitated/ installed	B: 0 T: 42	New indicator adopted at restructuring	Tracks project progress
	Replaced underground cables (km)	B: 0 T: 35.5	New indicator adopted at restructuring	Tracks project progress
	Meters installed	B: 0 T: 13,693	New indicator adopted at restructuring	Tracks project progress
	High Efficiency Lamps distributed	B: 0 T: 600,000	New GEO indicator adopted at restructuring	Tracks project progress

1.6 Main Beneficiaries,

16. Beneficiaries were not directly identified at project preparation; they were indirectly implied as the company's customers, who would benefit from improved electricity service because of (a) direct investments in production equipment and networks, thereby reducing outages both in frequency and duration, and (b) the increased sustainability of EDG and the consequent permanence of the improved service benefits. When the project was restructured, the beneficiaries were directly identified and included among the key indicators as low voltage customers, who were households in the Kaloum area where the main distribution rehabilitation has taken place. The restructuring paper also included an analysis of affected people, apart from customers enjoying better quality service, such as utility employees who are colluding with customers to cheat the company through tampering with the bills, as well as those customers who are connected illegally; the latter were expected to be negatively affected by the measure under the project through which EDG would install meters and collect bills.

1.7 Original Components⁹ (as approved)

17. **Component 1: Distribution Efficiency Improvement.** This component comprised: (a) Upgrading of distribution lines for purposes of reconfiguration of distribution system from low- to medium-voltage, through the provision of goods such as small-capacity distribution transformers and insulators and the carrying out of related works; (b) Installation of low- and medium-voltage meters at various locations, with emphasis on high revenue-yielding customer premises, for purposes of enhancement of metering coverage and quality for low- and medium-tension customers, through the provision of goods such as meters, and the carrying out of related works; (c) Installation of capacitors on distribution grid for purposes of improvement in supply quality, through the provision of goods such as capacitors and the carrying out of related works; (d) Establishment of networked customer service centers, including segregation of technical and commercial functions, exclusive customer interface mechanism, internet-based interface mechanisms for bill verification and payment, broad-based payment facilities and a multi-level grievance mechanism, for purposes of addressing customer concerns, through the provision of related goods and the carrying out of related works; (e) Introduction of customer-friendly billing systems such as spot billing and staggered payment due dates for purposes of improvement in cash-flow management and metering, billing and collection process, through the provision of related goods and technical advisory services and the carrying out of related works; (f) Establishment of rapid response outage management program, including rapid response units on a pilot basis in Conakry, for purposes of improvement in attention to customer concerns, through the provision of related goods and technical advisory services and the carrying out of related works.

18. **Component 2: Generation Efficiency Improvement.** This component included: (a) Rehabilitation of Garafiri hydropower plant, through the provision of related goods such as spare parts and the carrying out of works; (b) Rehabilitation of Tombo thermal generation plant, through the provision of goods such as critical spares for Thermal Unit III thereof and

⁹ As referred to in the Financing Agreement ("parts").

the carrying out of related works; (c) Improvement of generation facility efficiency and overall generation capacity planning in the power sector, through the provision of technical advisory services for the purpose of studies.

19. Component 3: Technical Assistance for Energy Efficiency and Institutional and Business Process Strengthening, which included:

(a) **Energy efficiency and conservation:** (i) identification and implementation of corrective measures based on energy audit of industrial and commercial establishments, buildings and other significant energy consumption facilities and prudent load management, with possible emphasis on capacity building for the carrying out of energy audits and establishment of an energy audit program; (ii) development of tariff, fiscal and other incentives for energy efficiency; (iii) development of strategy for participation of private sector (energy service companies) in design and implementation of energy efficiency and conservation programs; (iv) development of institutional capacity in the Ministry of Energy and the Project Implementing Entity for implementation of said programs; (v) development of policy framework for implementation of said programs; and (vi) implementation of communication strategy for purposes of creating awareness of energy conservation, all through the provision of related goods, non-advisory services such as for purposes of installation, technical advisory services and training and the carrying out of works.

(b) **Assessment of possible strategies for private sector capacity development and partnerships**, including distribution function and business outsourcing, through the provision of technical advisory services for the purpose of studies.

(c) **Development and adoption of a comprehensive power sector policy and strategy**, through the provision of technical advisory services to the Recipient's Ministry of Hydraulics and Energy.

(d) **Strengthening of financial and accounting systems of the Project Implementing Entity**, through the provision of goods such as accounting information technology, technical advisory services and training and the carrying out of works relating to the installation of support systems.

(e) **Introduction of and capacity building in management information system and operational information technology** use relating to anti-electricity theft measures, energy audits, remote metering techniques, customer billing and customer and human resource databases, through the provision of goods such as management information system and information technology, technical advisory services and training and the carrying out of related works.

(f) **Monitoring and evaluation of Project implementation**, including the carrying out of surveys, site inspections and civil society consultations, through the provision of technical advisory services and the financing of Operating Costs.

1.8 Revised Components

20. The restructuring associated with the AF did not revise the scope of the project. It retained the same three components with minor changes in activities, and with more emphasis on the improvement of commercial and distribution efficiency, given its critical importance for EDG's performance improvement. The restructuring narrowed down the

components to activities undertaken in the Kaloum district, which reflects the changes in the indicators. The components were redefined as:

- a. **Distribution Efficiency Improvement.** The component reengineers core business processes and deploys innovative technology solutions, such as pre-payment meters, in order to improve service delivery to reduce technical and commercial losses in the Kaloum area of Conakry; □
- b. **Rehabilitation of critical generation facilities.** Financing of critically required equipment and spare parts and technical assistance for operations, to improve the reliability and efficiency of the existing Garafiri hydroelectric plant and the Tombo thermal power plant. □
- c. **Institutional strengthening through Technical Assistance.** Technical assistance to help improve commercial management of the power utility and to implement an energy efficiency program for the utility's large customers. This component also supports a pilot program to introduce energy efficient lamps, as well as capacity building of the Ministry in charge of energy to process public-private partnership (PPP) projects. □

2. Key Factors Affecting Implementation and Outcomes

2.1 Project Preparation, Design and Quality at Entry

21. **Soundness of the background analysis.** The project was prepared with the following considerations:

- a. **Economic pertinence.** Electricity is an essential input in the transformation of a traditional economy into a modern model, both as a factor of production and as an essential household item. Guinea, with an electricity access rate of less than 20 percent, urgently requires strengthening the power sector to reach more consumers. The project was designed to support the distribution level of supply as well as the production level, albeit at a more modest degree.
- b. **Financial pertinence.** The project was designed to overcome the weakness in the commercial performance of EDG, as evidenced by the low CRI level for 2005, which did not allow expanding service, and, on the contrary, created a financial drain for the Government, thereby deflecting resources from social programs.
- c. **Lessons learned.** Rehabilitation of the commercial performance of an electric utility is a condition for service sustainability, particularly in poor countries where the Government can ill afford subsidizing the service. The project built upon a pilot initiative, the CREST, conceived with World Bank assistance, to improve commercial performance in the Kaloum district of Conakry, with positive results; for example, losses were reduced from 55 percent to 45 percent before and after the pilot. These results provided evidence that a more sustained and aggressive approach was justified.
- d. **Rationale for Bank support.** Project preparation clearly identified PRSP and CAS links, including the need for supporting infrastructure to overcome one of the major impediments to poverty reduction and growth. The CAS classified the energy sector as a high Country priority for Bank involvement, and the project responded to the need for its rehabilitation.

22. **Assessment of the Project’s initial design.** The design responded to the primary objective of seeking the commercial rehabilitation of EDG by assigning the major proportion of the budget to costs associated with distribution improvement in the Kaloum district of Conakry. However, the project design did not focus its efforts to improve billing collection among the highest consumers of electricity. This is now considered best practice during the implementation of revenue protection plans, i.e. by enabling increased revenues for utilities by focusing on the largest consumers first. The support for power generation was intended to improve the supply in the rehabilitated distribution network, thereby supporting necessary but unfamiliar initiatives in the Guinean context—hence unpopular—such as installing meters, billing and collecting from customers who were hitherto either connected illegally or not billed for their consumption, by offering in return improved continuity of supply. This explains the emphasis on the partial rehabilitation of the Tombo power station in Kaloum, which provided better supply at least during the distribution/commercial rehabilitation period. Finally, the technical assistance component was conceived as support for the GEF-financed energy efficiency elements, together with administrative improvements regarding the commercial operations of EDG. However, the project scope, as expressed in the PAD, would appear to be overly ambitious: it aimed to improve the governance of the utility, clarify its financial and regulatory relationship with the Government, and introduce a complete institutional change within the company to improve its management.¹⁰ Former staff of EDG when interviewed for the ICR expressed doubts regarding the scope at entry. Despite its ambitious scope, project design responded to the PDO.

23. **Assessment of the Project’s restructured design.** While the scope of the project was not revised—it maintained the three initial components—there were changes in specific activities, with more emphasis on the improvement of distribution and commercial efficiency, and some activities with other funding sources were cancelled from the World Bank project. The project restructuring paper provided a justification for the recommended changes by inserting the components and activities within the wider scope of the donor community that was financing different actions in the power sector. It also clarified specific activities, such as the distribution of energy efficient lamps, thereby bringing increased relevance to the project. The restructured project included a large amount of Additional Financing, which increased the financing (according to estimated costs) from US\$11.7 million to US\$30 million. The additional funds covered larger than expected component costs and some scale up of power sector physical infrastructure due to deterioration since project initiation.

24. **Adequacy of Government’s commitment.** At the time of project preparation, the Government of Guinea (GoG) was in the process of improving the capacity and viability of the electricity sector through a mix of interventions that included improving EDG’s operational performance, and the financial recovery of the sector while increasing generation capacity. Specific actions taken by the GoG included: (i) changing the management team at EDG; (ii) supporting EDG in reducing personnel and thereby improving the customer/employee ratio; (iii) resolving the dispute with the former private

¹⁰ PAD, p. 15.

operator; and (iv) increasing average tariff rates by 74 percent in September 2004 to GNF 260/kWh (USc 5.77/kWh), the first such increase since 1996.

25. **Assessment of risks.** The PAD focused on governance risks and risks associated with the weak institutional setup. Reducing commercial losses has proven to be a very difficult endeavor and has had limited success in many countries, particularly when the level of losses exceeds 30 percent or so. The obstacles include the unwillingness of governments to take unpopular measures such as disconnecting users, or corruption within the power company that induces staff to not cooperate with loss reduction initiatives. Also, given that the project contemplated equipment rehabilitation, the particular risks associated with such activities should have been recognized, e.g. the limited information on rehabilitating a power generation unit before it has been taken apart. These risks were not well addressed at preparation. The project paper at restructuring provided a much more comprehensive risk analysis: (a) stakeholder risks, including corrupt employees and disgruntled consumers, (b) implementing agency risks due to management changes, (c) governance risks associated with Ministry intervention in EDG's operations, (d) project design risks, including cost estimation risk, (e) social and environmental risks associated with interventions in a heavily populated area, and (f) delivery and monitoring risk, i.e. the risk that the proposed commercial interventions could prove ineffective. At restructuring it can be said that risks were thoroughly identified.

2.2 Implementation

26. **Political unrest stalled the project shortly after initiation.** The project, having reached effectiveness in August 2007, was progressing in a satisfactory manner, when a military coup that suspended the Constitution took place in December 2008, following the death of President Conte. As a result, the Bank suspended disbursements and only resumed them upon the return to civilian rule in 2010. A contract for the rehabilitation of the Tombo thermal generation unit had been signed prior to the coup; the procurement for a large contract to rehabilitate the Kaloum distribution network with anti-loss/anti-theft technical features had been tendered but the award was pending, and a comprehensive loss reduction strategy, comprising both technical and non-technical aspects, including pre-payment meters was agreed and about to be put into practice. Additional Financing was in preparation, which would also extend the project's closing date.

27. The country conditions following the coup, which led the Bank to stop operations in 2009 and 2010, halted this progress. The contracts for key investments could not be awarded and the only investment with a signed contract (Tombo rehabilitation) could not be completed, as EDG lacked funds to fully pay the contractor. The project in effect came to a stop. As a consequence, the GEF grant, which was approved on May 15 2008, was only signed three years later, after the operations resumed, on September 2, 2011, and became effective on February 6, 2012. Since then, the political environment has remained stable and favored project execution, which enjoyed wide Government support during the last three years.

28. **The Ebola crisis.** Despite having regained governance stability, the Ebola epidemic that occurred in early 2014 had a devastating economic effect that reduced investment countrywide, and hindered project implementation and consultants and contractors slowed down or abandoned project activities (the epidemic was officially declared over in

December 2015). The project was able to surmount these obstacles and normalized its execution, but required the closing date extension granted in December 2014.

29. **Unsustainable partial generation rehabilitation.** The signed contract for the rehabilitation of Tombo generation unit No. 33 (one of the 4 x 11.2 MW diesel units of Kaloum 3 thermal power plant, initially put into service in 1997) was partially executed during 2009 with the procurement of required parts. The full overhaul maintenance or partial rehabilitation was finalized in 2011, but it did not contemplate putting in place new instrumentation. As a consequence, the unit performed during two years and broke down in 2013. After being put into service again in July 2014, it generated during a brief period and broke down again; it is currently idle and must undergo further repairs. In the case of the Garafiri hydro plant, the project financed spare parts that were effectively used.

30. **Loss reduction infrastructure implemented successfully.** The project was successful in implementing the rehabilitation of the distribution network, including the rehabilitation of substations, replacing medium voltage (MV) conductors, and changing distribution low voltage (LV) cables to include theft-resistant cables. This included the rehabilitation of transformer enclosures, which had deteriorated to the point of being used as homeless shelters or ad-hoc storage. Implementation of the distribution infrastructure led to a reduction in total losses (technical loss reduction with new equipment and theft reduction), which was a major goal of the project.

31. **Poor Government support for the implementation of commercial loss reduction investments.** For a full rehabilitation of the Kaloum district, it was necessary to install electricity meters, including both prepaid meters and postpaid meters. This was to be one of the main outputs of the project to facilitate the commercial recovery of the targeted zone. Despite the improvements in the network, users in the Kaloum area opposed the installation of meters, and the GoG suspended further efforts to roll out prepayment meters. The consequence has been a dismal performance regarding prepayment meter installation, which only achieved four percent of its target. At completion there were only 566 installed prepaid meters, and around 13,000 remained in storage, unused (together with a stock of meters acquired through other operations with different donors). It should be noted however that the project successfully installed 556 postpaid meters in the premises of larger customers, which contributed significantly on achieving the loss reduction target.

32. **In 2015 a private operator was hired to manage EDG.** In July 2015 Veolia, a private company was awarded a management contract, financed by the Bank under the Power Sector Recovery Project (P146696), which currently lasts until end 2019. The Project Implementation Unit (PIU) continued to operate normally under the new management team. In fact, implementation of the project was significantly improved under the new management during the last six months of execution, despite significant delays in the preparation of a business plan, which was a key deliverable of the management contract. The private operator also has an interest in assuring a successful operation of the project to fulfill management targets (as expressed by performance indicators) under its Management Service Contract.

33. **Supply conditions have improved during the last two years.** The project's operation has been favored by a much improved supply situation, with the commissioning of the Kaléta hydropower plant (240 MW) in August 2015, together with 175 MW from

thermal IPPs. This has improved service reliability and reduced power interruptions. The GoG has recently decided to privatize most thermal generation power plants, and to have EDG remain as the operator of existing hydropower facilities and some small regional thermal plants. These measures are expected to improve supply reliability, particularly by delegating the thermal supply responsibility to private operators.

2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

34. **Original M&E Design.** The PDO (to support the Recipient in its efforts to improve the technical, commercial and operational efficiency of its power sector through critical investment support and capacity building) was articulated in very general terms for a project that was focused primarily on highly specific areas of intervention, particularly given the modest original budget of US\$11.7 million, including the GEF contribution. The KPI chosen originally reflected the general terms of the PDO, and were inadequate to provide a full picture of the project's implementation. A Mid-Term Review was not conducted due to the relatively short time frame (three years) expected for implementation; instead, two annual reviews were conducted.¹¹

35. **M&E Design at Additional Financing/restructuring.** As part of the restructuring undertaken during the Additional Financing, many of the weaknesses in KPIs, both for monitoring the PDO and the project's progress, were revised; the restructuring introduced new indicators that were more appropriate and focused to the actual investments contemplated in the project, such as the geographical limits for distribution rehabilitation and the actual generating units being rehabilitated. The restructuring dropped a number of the original KPIs, which were either too vague to be monitored with any degree of precision, or were contemplated elsewhere, e.g., under project covenants.

36. **M&E implementation.** During the phase of the project prior to restructuring and suspension, i.e., August 2007 to October 2009 project indicators reflected, as noted above, general aspects of EDG and were collected through general company statistics. Their lack of relation to the project was evident; for example, baseline losses of 59 percent were allegedly reduced to 30 percent in 2010, before putting in place any of the project's components. With restructuring, the indicators reflected project achievements and were monitored more closely. The indicators associated with the restructuring were followed through data collected at EDG's Kaloum agency and through standard data obtained from the production directorate of EDG. Other data were readily collected following project implementation. As a result, the M&E information collected during implementation after restructuring was useful in better reflecting project achievements and provided a better basis for qualifying project progress in the ISRs.

37. **M&E utilization.** After restructuring the indicators were better linked to the project, but some of the final results will only be available after project closure; such is the case of commercial losses and bill collection, where implementing elements such as the prepaid

¹¹ As stated in the PAD (page 22, paragraph 62): "The Project will have a 3-year implementation period. There will be no Mid-Term Review (MTR) in view of the relatively short time frame for implementation. Instead there will be two annual reviews and an Implementation Completion Report (ICR) at the end of the Project, to be jointly prepared by IDA and EDG."

meters will be delayed until after closure. However, the intermediate indicators, that are closely associated with project execution provided a good measure of progress towards achieving the PDO. M&E arrangements are sustainable beyond the project.

2.4 Safeguard and Fiduciary Compliance

38. **Environment.** At preparation the project was rated Environmental Category C, thus it did not trigger any safeguard policies. The ‘C’ rating was justified because the project involved rehabilitation of existing distribution infrastructure and focused primarily on a pilot initiative, in the Kaloum district in Conakry, to improve commercial and operational efficiencies. The initial design foresaw the preparation of an environmental audit to address significant environmental issues in the context of a larger, follow-on project.

39. **Social.** At project preparation it was noted that expected improvements in electricity service delivery, efficiency, and billing would have a positive social impact. Evidence from the CREST pilot had shown that increased satisfaction through better management resulted in collection levels rising, customer connections increasing, and losses decreasing. A major effect of the project was expected to be to bring better service to consumers and hence acceptance of the effects associated with having to pay for the service. However, it was noted in the PAD that due to the extreme poverty prevailing among the population—with 50 percent living on less than US\$1 day—there could be widespread dissatisfaction among users and the poorest consumers could be priced out of the market if tariff hikes materialized. The project designed the delivery of energy efficient lamps to compensate for the effect of forcing users in the targeted area to pay for their consumption through lower electricity use. Eventually, protests by consumers against metering led the GoG to halt the installation of meters under the project, including the communications strategy that had been planned to accompany the implementation.

40. **Financial Management was rated Satisfactory at closing.** A full Financial Management (FM) assessment was carried out at preparation, and it was noted that the GoG procedures were not at a stage that could provide reassurance in funneling resources to donor-supported projects. However, EDG did have the institutional and knowledge background to provide reassurance that it would be capable of managing the funds of the project. The financial management risk was rated moderate at the at the evaluation stage and during project implementation. The performance of the FM system was rated satisfactory during project implementation. Quarterly financial reports were produced on time and their quality was satisfactory. Audit reports were submitted to the World Bank on time (except for the audit report of 2014, which was submitted with two months’ delay) and the auditors expressed an unqualified opinion for each.

41. **Procurement was rated Satisfactory at closing.** EDG’s staff that worked on the project was trained regarding Bank guidelines for contract preparation, bidding, and implementation. No major challenges were identified during project execution, and there were no major issues regarding compliance with Bank procurement policies during implementation. The main issues encountered in procurement concerned the multiple approvals required for most contracts; the organizations concerned were EDG, the Ministry, the State procurement agency, and the World Bank; in practice this meant a “double no objection” process that inevitably slowed down project implementation.

2.5 Post-completion Operation/Next Phase

42. The project has not been fully implemented, as it has been unable to install all of the supplied electricity meters, and the prepaid meters in particular. Sustainability of the project hinges on the possibility for improving revenues of the utility by improving billing collection for energy delivered. In hindsight, the component to improve commercial performance may have better performed if a number of enabling conditions would have been met namely: (i) the deployment of a targeted communication campaign (ii) improving service delivery prior to the installation of pre-paid meters, and (iii) a targeted campaign to ensure that billing collection rates are first increased for those that consume significant quantities of power, i.e. the rich and middle class (in Guinea, roughly 10 % of customers consume three quarters of electricity). Consequently, post-completion activities necessitate a persistent effort in implementing a revenue protection plan targeting the larger consumers, followed by an effort to install meters. EDG possesses around 186,000 prepayment meters in stock from different suppliers; the ongoing IDA operation (Power Sector Recovery Project-P146696) will finance the installation of 17,000 prepayment meters including the remaining 13,000 supplied by the project, but it will first ensure the installation of smart meters for large consumers.

43. From the maintenance and operations point of view, the equipment installed is standard and will only require normal operational procedures for assuring its good performance. But, EDG must implement a management information system to collect data from the smart and pre-paid meters. In the case of the power plants, an operations and maintenance contract would be necessary to ensure the sustainability of the assets.

44. However, the project's ultimate objective, which consists of demonstrating best practices that can subsequently be replicated in service areas of EDG other than Kaloum, must also include a persistent effort towards reducing commercial losses, including concentrating on billing and improving billing collection. So far other districts in Conakry have undergone rehabilitation of their distribution network with financing from different donors, including the African Development Bank and Islamic Development Bank following the example of the World Bank in Kaloum. One of the KPIs of the Management Service Contract of EDG includes the roll out of smart meters to all customers of EDG by 2019. EDG is rightly focused on reducing the cost of service, by implementing investment programs for least cost technology (hydropower), and continuing its efforts in reducing losses and improving efficiency. Once the cost of service is reduced to a manageable level, the Government of Guinea would be in a position to consider a review of its tariff schedule, which has not changed since 2008. A tariff increase of around 25 percent for industrial customers was adopted by cabinet in October 2016, but has not yet been applied. The recommendations of the tariff study financed by the project—which have yet to be implemented must be reconsidered for implementation with a view to adapting tariffs to the particular needs and situation of the Guinean population, once costs are better managed.

45. With a view to the project's sustainability, the KPIs used to monitor it during implementation should continue to be gathered and used to guide EDG's performance; these would include (a) commercial performance (energy billed, collections), (b) technical performance (technical loss estimates), and (c) generating station availability. Collecting these KPIs has been included in the Management Service Contract with Veolia.

46. The Tombo rehabilitation did not succeed, and unit 33G is currently idle and awaiting repairs. Currently EDG plans to privatize the thermal generation facilities, which would include the Tombo power station units. As for the Garafiri hydro plant, conventional maintenance is expected to provide continued service, as partially facilitated by the project's spare parts.

47. Several issues remain to be analyzed, such as the poverty consequences of the project. On one hand, service conditions have improved, but on the other poor consumers may have been negatively impacted by higher electricity bills; this is an opportunity to analyze the welfare consequences of commercial loss reduction (e.g., by comparing pre-and post-rehabilitation consumption when shifting from lump sum bills to metered consumption) for taking them into account in future projects. A continued effort to gather data on this subject should continue as EDG rolls out electrical smart meters to all its customers.

48. Finally, a follow-on project, the Power Sector Recovery Project (*Projet de Redressement du Secteur de l'Électricité, PRSE, P146696*), with a US\$50 million commitment, is internalizing lessons learned with the project and applying them to (i) improving sector governance, including private sector participation through the current management contract, (ii) reducing technical and commercial losses, and (iii) enforcing efficient sector maintenance and investment. This project should continue to gather data on consumer behavior as new meters are installed, including smart meters for larger consumers.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation

Relevance of objectives

PDO Rating: High. At preparation the project was consistent with the 2003 CAS, which assigned the energy sector a high priority for achieving its development objectives. At ICR, the current 2014-2017 CPS¹² endorses focusing on ensuring the sustainability of energy services, and prioritizing energy as part of the diversified and inclusive growth strategy. In the CPS client survey, stakeholders identified energy sector development as the key development priority in the country. The GoG strategy in particular emphasizes establishing electricity supply in urban, densely populated areas, which is a key concern of Government. It also endorses the approach to energy efficiency, including the EDG lighting component to distribute 5 million energy-saving lamps. The GoG Energy Sector Policy Letter consisted of, among others, achieving sector financial autonomy through a suitable tariff structure and commercial management. All of these elements are supported through the project, which therefore maintains its relevance both with respect to the targeted rehabilitation area but also as a pilot that points out the way to go for extending the approach to other areas.

GEO: Rating: High. The GEO was stated as: The Project will be instrumental in containing CO2 emissions by improving the efficiency of the electricity distribution system, and by

¹² Country Partnership Strategy for Guinea for the Period FY14-17, September 4, 2013, International Development Association, Report No. 76230-GN

introducing end-use energy management practices. The GEO rating is based upon GoG's policy under the Paris Accord pursuant to the United Nations Framework Convention on Climate Change (UNFCCC) formulated in September 2015¹³. The mitigation commitments include improving the energy performance of the Guinean economy through, inter alia, "disseminating solar streetlamps and low-energy lamps and electrical appliances"; the project's GEF component responds directly to this commitment, hence the continued relevance of the component and the GEO.

49. **Relevance of design; Rating: Substantial.** The project's approach to supporting the financial rehabilitation and sustainability of the company through loss reduction continues to be relevant by focusing on technical loss reduction through distribution infrastructure improvement—there being no practical alternative—and by focusing on commercial loss reduction by installing theft-prevention devices and metered consumption. The latter approach has been tried successfully in different African countries, taking advantage of technological improvements in prepaid metering. The focus on a limited area was designed to extract implementation lessons that could be extended to EDG's other service areas. It was also designed using the experience gained with the CREST initiative, which improved its chances of success. However, if the project were prepared at ICR it would have emphasized the reduction of losses for large customers and would have oriented the project towards ensuring that all large users in the Kaloum district were metered using state of the art equipment, and practically eliminating any possibility for electricity theft.

50. **Relevance of implementation; Rating: Substantial.** The project's relevance of objectives required implementation responses to changing circumstances; challenges that arose during implementation included the unexpected cost increases for infrastructure equipment and the need to extend the rehabilitation to additional items in order to achieve the project's objectives. These circumstances were taken into account through the Additional Financing made available in 2012 to cover these findings. The project also had to face the World Bank's suspension of disbursements during the period of political instability; when the project's activities were reinitiated, both the World Bank and EDG teams successfully re-engaged within a short period to continue with project implementation. The same was true when facing the Ebola crisis of 2014, which delayed the project for a very limited time thanks to the rapid re-initiation of activities by the implementation team. Although the rehabilitation of the Tombo plant was short lived, its consequences were minimized through the implementation of the Kaléta hydro power plant, thereby facilitating the supply to the Kaloum area and the implementation of commercial activities such as billing and collections.

3.2 Achievement of Project Development Objectives and Global Environment Objectives

Rating: Substantial

¹³ Republic of Guinea—Intended Nationally Determined Contribution (INDC) under the United Nations Framework Convention on Climate Change, Republic of Guinea, September 2015

51. **Project Development Objectives.** The objective of the Project as stated in the Financing Agreement¹⁴ (FA) was to support the Recipient in its efforts to improve the technical, commercial and operational efficiency of its power sector through critical investment support and capacity building. After restructuring, the achievement of the KPIs is summarized in Table 2.

Table 2. Achievement of Project Indicators

Key Indicator	Baseline 2006	Target ¹	Achieved	% of Target	Comments
Outcome Indicators					
Number of low voltage customers in Kaloum.	11,300	13,693	14,963	109%	
Total distribution losses in Kaloum (percent)	21.5	16%	14.7%	109%	Lower losses = achievement
Bill collection rate in Kaloum (percent)	66%	95%	81.5%	86%	
Beneficiaries (number)	71,258	86,348	94,566	110%	
of which female (number)	35,629	43,174	62,017	110%	
Reduction of CO ₂ emissions (tons)	0	36,448	35,510	97%	
Intermediate indicators					
Number of Sub-stations rehabilitated/installed	0	42	35	83.3%	PAD targets overestimated
Replaced underground cables (km)	0	55.5	25.5	46%	
Meters installed (number)	0	13693	566	4%	
Garafiri Availability rate (percent)	95.8	98.5%	85.3%	86.6%	
Generation of Unit 33 G at Tombo (MWh)	0	211,779	83,132	39.2%	

¹Restructuring Project Paper, May 1, 2012, Annex 1.

52. The project focused on the specific area of Kaloum as a step towards learning how to address the issues associated with technical and commercial losses, which were at the core of the financial and operational underperformance of EDG. The increase in low voltage customers in Kaloum is a measure of the reduction of commercial losses by incorporating as customers many users who were hitherto connected illegally; to assess the significance of the achieved target, the increase in low voltage customers from 2012, when the actual investments were initiated, represents a growth of 2.8 percent per year, which is high for an already dense district; this confirms the effectiveness of the project in reducing commercial losses.

53. The critical measure of total losses and its reduction by 31 percent, surpassing the target level, together with the increase in bill collection, indicates that the approach implemented in the project can contribute to the financial rehabilitation of EDG by replicating it in other service areas. However, despite the loss reduction, the bill collection rate, which increased by 23 percent, also fell short of the target. To estimate whether the project actually yielded a sustainable commercial result in the Kaloum district, the loss reduction achievement and the bill collection rate can be combined in the CRI; the target CRI for the project was 0.80 (a typical level for an acceptably managed utility), but the project only achieved a CRI of 0.70. This indicates that the effort to improve collections should be sustained before the ultimate objective of achieving commercial sustainability

¹⁴ Financing Agreement, November 7, 2006.

can be reached; it should be noted that the low achievement of the prepayment meter installation (an intermediate indicator) had a consequence on the bill collection rate, as prepayment meters have, by definition, a 100% collection rate.

54. Regarding the low accomplishment of intermediate indicators (i.e. the number of substations, the length of distribution cables, and the number of meters installed), (a) if the PAD targets were effectively overestimated, there should have been a restructuring once this error became evident, and (b) the very low meter installation rate responded to customer resistance, which was partly outside the project’s control. During implementation MEH and EDG had rushed to start meter installation before the project-financed communication contract became effective, which could have made a difference regarding the number of meters installed. Ultimately, there had been very little experience in increasing billing collection in Guinea, and the project implemented an approach that had been successfully piloted. Therefore, allowing for these factors, it can be concluded that (i) given that four out of six outcome indicators surpassed their targets, and (ii) that the bill collection target can be addressed in the future through the PRSE project by implementing better governance practices and enhanced commercial performance methods, the project effectively pointed out a path towards commercial rehabilitation, hence the rating.

55. Despite the low rate of prepaid meter installation, losses were reduced beyond the target, from 21.6% in 2006 to 14.7% in 2016 as a result of the installation of postpaid meters in non-residential customers’ premises. The project installed a total 1,022 meters, of which 556 were postpaid and 566 were prepaid; the loss reduction obtained validates the strategy whereby commercial rehabilitation should concentrate, initially at least, on effective metering of larger customers.

56. **Final Rating of Achievement of PDO.** Because the Results Framework changed significantly with the AF and its associated restructuring, the project outcome is assessed against both the original indicators prior to the restructuring and against the revised indicators at closure.

Table 3. Split Level Evaluation for Efficacy

		Against Original KPIs (2007–2011) ^a	Against Revised KPIs (2012–2016) ^b	Overall
1	Rating	Moderately Satisfactory	Moderately Satisfactory	—
2	Rating Value	4	4	—
3	Disbursed before restructuring	US\$3.45 million of US\$21.4 million	US\$17.95 million of US\$21.4 million	—
4	Weight (% Disbursed)	3.45/21.4 = 16%	17.95/21.4= 84%	—
5	Weighted value (2*4)	4 * 16% = 0.64	4 * 84% = 3.36	0.64+3.36 = 4
6	Final rating	—	—	Moderately Satisfactory

Notes: a. December, 2011 ISR (seq. 11) b. Jan 13, 2016 ISR (seq. 18).

The project was rated MS before restructuring and MS at closure; as noted in ISR of December 2011 prior to restructuring, “the project requires additional financing and light restructuring as it is facing a cost overrun, financing gap and some small scale up of existing activities that have become necessary due to infrastructure degradation during the suspension of Bank operations (2009-10)” and the split evaluation is not strictly necessary.

57. **Global Environment Objectives.** The GEO was to contain CO₂ emissions by improving the efficiency of the electricity distribution system, and by introducing end-use energy management practices. The corresponding indicators are shown in Table 4.

Table 4. Achievement of GEO Indicators

Key Indicator	Baseline 2006	Target	Achieved	% of Target	Comments
Reduction CO ₂ emissions (tons)	0	36,448	35,510	97%	Based upon efficient lamps
High efficiency lamps distributed (number)	0	600,000	584,465	97.5%	
Energy audits executed (number)	0	30	71	237%	

The GEO objective was reached to a very high degree by containing emissions through the distribution of efficient lamps; an estimate of the reductions accomplished through the consequences of energy audits was not available, but it should have moved the CO₂ indicator further towards full achievement. Additionally, a reduction in CO₂ emissions can be associated with the reduction in technical losses that would decrease the amount of thermal generation. This would further justify the PDO/GEO rating.

3.3 Efficiency

Rating: High

58. The economic and financial evaluations were broken down for the investments in distribution rehabilitation and the Demand Side Management (DSM) investment in efficient lamps. The results are shown in Table 5.

Table 5. Summary of Economic and Financial Evaluation

	Economic Evaluation				Financial Evaluation			
	EIRR	NPV Costs ¹	NPV Benefits ¹	B/C Ratio	FIRR	NPV Costs ¹	NPV Benefits ¹	B/C Ratio
Distribution Rehabilitation	16%	9.78	11.63	1.2	21%	9.78	14.51	1.5
DSM	>100%	0.72	15.4	21	>100%	0.72	14.25	20

¹Values in Millions of US\$, discounted at 12%

The rate of return indicators exceeds the threshold levels of 12 percent for Bank projects. The economic and financial evaluation results warrant the following comments:

- a. The lengthy implementation period (nine years from effectiveness) should have had a negative impact on the economic and financial indicators; however, most of the investment was concentrated during the 2012-2016 period after restructuring, which minimized the effect of project delay;
- b. Economic benefits of distribution rehabilitation are limited to the reduction of technical losses and the efficiency gains in reduced power generation induced from the reduction of commercial losses;
- c. Financial benefits of distribution rehabilitation are higher than the economic benefits because they include the increase in billed energy from customers who pay their bills with the project;
- d. Economic benefits of DSM include the production savings associated with the efficient lamps distributed through the project and the benefits from GHG

reduction; the financial benefits are lower because they do not include the reduction in GHG as a benefit to EDG;

- e. The efficient lamps pay for themselves in less than a year, hence the very high EIRR and FIRR.

59. A comparison of the rates of return at restructuring with those at completion yields:

- a. The EIRRs at restructuring and at completion for the distribution component yield roughly similar values: 15.2 percent and 16 percent, respectively;
- b. The FIRR of 30 percent at restructuring was higher than the FIRR of 21 percent at completion;
- c. At restructuring there was no economic or financial estimate for the DSM component to provide a comparison between ex-ante and ex-post values.

3.4 Justification of Overall Outcome and Global Environment Outcome Rating

Rating: Moderately Satisfactory

60. The rating is based upon the combination of the previous ratings, namely: (a) high relevance of objectives, (b) High relevance of design, (c) Substantial relevance of implementation, (d) Substantial efficacy of PDO, and (e) High efficiency. The GEO largely achieved its objectives, and the PDO accomplished its targets within the margins allowed by the political environment.

3.5 Overarching Themes, Other Outcomes and Impacts

(a) Poverty Impacts, Gender Aspects, and Social Development

61. As noted beforehand, poverty impacts were not identified during project implementation. However, this remains a subject for future research, as the provision of affordable electricity for all remains an important objective, and a plan for monitoring the effects of metered supply on consumers' behavior could provide valuable information for future commercial improvement initiatives.

(b) Institutional Change/Strengthening

62. This is an area where the project could have had a major impact: corrupt officials that collude with consumers willing to pay bribes in exchange for a lower fixed price contract should become fewer as opportunities for such behavior are eliminated by prepaid meters. This did not occur because the meter installation program was interrupted; it is important to conclude the installation of meters acquired through the project, together with the new smart meters to be installed under the PRSP (P146696). The project should also create a culture of customer service; the involvement of Veolia, the private management contractor, should help in achieving this goal.

(c) Other Unintended Outcomes and Impacts (positive or negative)

None were identified.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

Not applicable

4. Assessment of Risk to Development Outcome and Global Environment Outcome

Rating: High

63. **Risk to Development Outcome.** Maintaining commercial standards in an electricity utility requires constant vigilance in order to avoid slippage. Some of the risks that can materialize include:

- The inability of government to implement a revenue protection program to ensure that the large consumers (10 % of users consume three quarters of the electricity) pay their full share; this would require that large consumers are cut off if they fall in arrears;
- Inability of the power company to preserve the commercial infrastructure, both human and physical, necessary to preserve the loss-reduction and collection achievements of the project; this is also a high probability risk that could materialize for a variety of reasons, starting with lack of upper management support within EDG resulting from management changes due to Government changes.
- Any tolerance for corruption among utility staff, which often happens when there is a lack of management continuity, could lead to slippage that can be extremely difficult to overcome, or inability to detect and reduce corruption.

Maintaining and extending the private management contract for a prudent amount of time could contribute partially to mitigating this risk, which mainly requires vigilance and standard maintenance procedures.

64. **Risk to GEO.** The GEO objective of reducing GHG emissions could be jeopardized (a) because of deterioration in the rehabilitated infrastructure, thereby leading to higher technical and commercial losses, increased power generation, and higher emissions, and (b) the lack of replacement of efficient equipment—in this case the Compact Fluorescent Lighting distributed during the project—leading to the adoption of lower cost but less efficient equipment. The former risk can be addressed through the measures indicated above in mitigating the development outcome objective. The risk of replacement with less efficient lighting options can be mitigated by providing longer-lived lighting alternatives, such as LED-based lamps whose useful lifespan (on the order of 30,000 hours) can extend their benefits for more than ten years, and whose cost has been decreasing significantly since 2012.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance

(a) Bank Performance in Ensuring Quality at Entry

Rating: Moderately Unsatisfactory

The project was prepared with a good appreciation of possible effects of the project, and it was designed to respond to the primary objective of contributing both to more efficient management as well as the GEO objective of reducing emissions. The design of the main distribution and supply component was adequate and did not require any adjustments during

execution, but it could have anticipated a better targeting of large consumers. The support for generation, although justified for the Tombo partial rehabilitation, lacked sufficient scope to provide a longer-term substantial contribution in the Kaloum area, particularly before the Kaléta hydropower plant came on line. The reduced operational time of Unit 33 can be ascribed to having visualized a minimal intervention, whereas rehabilitation of large equipment that cannot easily be diagnosed externally may lead to substantial deviations from the initial requirements. Project preparation lacked a better understanding of the implementation challenges, and lacked a feasibility study—which would have been possible based on the CREST precedent; as a result, the project went ahead with an insufficient budget and an unrealistic implementation timeline of only three years.

(b) Quality of Supervision

Rating: Moderately Satisfactory

65. The World Bank was diligent throughout project implementation by conducting regular missions, responding to the need for additional funds in order to conclude the project, and providing timely reports on project progress. The Bank was effective at the restructuring stage in order to restart the project, to assess the needs for its completion, and to concentrate on effective implementation. The question of incorrect design targets (the overestimation of Medium Voltage substations and lines) was not addressed in time by modifying the project indicators, and the underperforming generation component, namely the Tombo rehabilitation, should have been flagged earlier. The team failed to file an ISR at or near the completion of the project; the last ISR is dated over five months before the closing date.

(c) Justification of Rating for Overall Bank Performance

Rating: Moderately Satisfactory

The rating reflects the ratings for project preparation and supervision, with the MS outcome rating as the deciding factor.

5.2 Borrower Performance

(a) Government Performance

Rating: Moderately Unsatisfactory

66. Political-related events had important consequences on project implementation; the 2008 coup delayed the project for about two years, and the Government's decision to halt the installation of prepaid meters was a rejection of one of the pillars towards the rehabilitation of commercial performance in EDG. However, once the project resumed operations, it was implemented in three years and almost fully disbursed, including additional financing. The installation of prepayment meters, which was halted following Government intervention, severely impacted achieving the project's objectives, despite being rolled out along with an improved Government-backed communication campaign.

(b) Implementing Agency or Agencies Performance

Rating: Moderately Satisfactory

67. EDG performed well during project implementation and maintained staff continuity, particularly during the World Bank's suspended activity period. The Project Implementation Unit team was responsive to project demands and was diligent in finding solutions to issues that arose during implementation. Veolia staff acknowledged the quality

of the project team during interviews conducted during ICR preparation. EDG complied with the fiduciary and safeguard responsibilities, and conducted procurement activities diligently, following Bank procedures. Its major failing lies in not having conducted a promotional campaign preceding prepaid meter installation, which resulted in consumer protests (as well as within EDG), and ultimately led to the Government decision to suspend their implementation.

(c) Justification of Rating for Overall Borrower Performance

Rating: Moderately Unsatisfactory

Despite the MS performance of the PIU team, the GoG performance brings down the overall Borrower performance rating.

6. Lessons Learned

68. **Government support should be assured before project initiation.** In sensitive matters requiring interaction with customer's similar projects should ensure that there is full Government support for implementation. Government support should extend not only to allowing sensitive installations, such as meters, but also to backing the promotional campaigns that raise public awareness and improve communication between the utility and its customers.

69. **Public awareness campaigns are essential to the implementation of loss recovery and sector reform projects.** Meter installations and distribution investments inevitably require interactions with customers and interventions within their premises; careful management of such actions is essential to avoid antagonizing consumers, and preceding them by a well-designed communication campaign can be a determining factor for the success of the project.

70. **Investments in training human resources prior to field intervention are required.** To avoid clashes with the population, operators should be trained in procedures for gaining the confidence of users; a public relations unit, depending on the size of the communities, should be organized to accompany those in charge of technical work. Capacity building in communications should be included in similar projects.

71. **Assuring the sustainability of rehabilitated infrastructure.** The support for spare parts is symptomatic of required O&M resources due to insufficient revenues; breaking the vicious circle of poor revenues, absence of maintenance resources, and poor service is a challenge that should be addressed with full Government support for strengthening institutional measures rather than relying on short term allocations to overcome specific problems.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners

(a) Borrower/implementing agencies

TBD

(b) Cofinanciers

Not applicable

(c) Other partners and stakeholders

Not applicable

Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

Component/ Activity		Amount in original PAD	Cost at Restructuring	Final Cost 2016	Percent of Revised	Comment/ Contract
1. Improving Distribution Efficiency						
1.1	a) Reduction of technical losses	3.65	7	6.87	98	#1 RMT
	b) Compensation reactive power, improvement of S/S and transmission	0.6	0.08	0	0	Dropped
	c) Outage Management	0.05	0.08	0	0	Dropped
	d) Commercial management improvement: metering	2	6.04	6.22	103	#3,4,5 Togo Assist
	e) Customer support center	0	0.4	0.23	58	#8, 9 2HK, 10 SGI Automobiles, #11 EJC, #26 EJC
1.2	Engineering supervision, implementation support, auditing and training (incl. for other components)	0.78	2.6	2.49	96	#14, 15, 16, 17, 41 AECOM #18, 19 20 IRAF #42 AG Partners #40 Lancinet
1.3	System Protection and Coordination	0.2	1.05	0	0	Dropped
1.4	Kaloum underground cables	0	4.6	3.53	77	#2 RMT, #7 ABB
1.5	Contingencies/ unallocated	0.1	0.5	0	0	
Component 1 Distribution Efficiency		7.38	22.35	19.35	87	
2. Generation efficiency enhancement						
2.1	Garafiri Investment Support	0.86	2	2.56	128	#23 ERAI
2.2	Tombo Investment Support	0.86	1.45	1.45	100	#22 TSI
2.3	Technical Studies	0.18	0	0.13		#24 Van Thich #38 Burgeap
2.4	Contingencies and Unallocated	0.1	0.1	0	0	
Component 2: Generation Efficiency		2.00	3.55	4.14	117	
3. Technical Assistance						
3.1	Energy Efficiency/ Conservation/ DSM	0.5	0.6	1.15	191	#37 STUDI

Component/ Activity		Amount in original PAD	Cost at Restructuring	Final Cost 2016	Percent of Revised	Comment/ Contract
3.2	Policy Preparation Support	0.3	0.15	0.20	133	#32 Ideaconsult
3.3	Finance and Accounting Support	0.6	0	0		
3.4	MIS and IT Support	1.29	0	0		
3.5	Purchase of High Efficiency Lamps	1	1.48	1.35	91	#6 MMETS
3.6	Tariff Study	0	0.1	0.08	79	#33 Ideaconsult
3.7	TA for Commercial Management	0	1	0.06	6	#12 DBC
3.8	Institutional Support	0	0.34	1.47	433	#27 CFAO #28 SETA #29 EGI #30 M-C #31, 9 SGI #11, 26 EJC #46 ERAI #47 Formation #48 Fonctionnement #49 Banque
3.9	EDG Audit	0	0.25	0.34	137	#13 Cabinet La Foret #20 Deloitte, #21 E&Y, #43 COFIMA, #44 Yzas, #34 Fiduciaire de Guinée, #35 MORRE, #36 Diarra,
3.1	Contingencies / Unallocated	0.1	0.1	0.02	22	#39 Kourouma
Component 3 Technical Assistance		3.79	4.02	4.68	116	
TOTAL Financing Required		13.17	29.92	28.17	94	

(b) Financing

IDA-H2400 (P077317), IDA-H7730 (P129148), TF-93404 (P098742)					
Source of Funds	Type of Financing	Appraisal Estimate (USD millions)	Estimate at Additional Finance (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Additional Finance Estimate
Borrower		0.00	0.00	0.00	
International Development Association (IDA)	Grant	7.20	25.50	23.76	93%
Global Environment Facility (GEF)	Grant	4.50	4.50	4.50	100%
Total		11.70	30.00	28.26	94%

Annex 2. Outputs by Component

Component/activity		Final Cost (M\$)	Output
1. Improving Distribution Efficiency			
1.1	Reduction of technical losses	6.87	Substation MV and LV distribution equipment
	Commercial management improvement: metering	6.22	Prepaid meters and installation
	Customer support center	0.23	Furniture, equipment, vehicles
1.2	Engineering supervision, implementation support, auditing and training (incl. for other components)	2.49	Engineering, supervision, for substation equipment, cables, and meters
1.4	Kaloum underground cables	3.53	Cables and substation equipment of Kaloum
2. Generation efficiency enhancement			
2.1	Garafiri Investment Support	2.56	Spare parts
2.2	Tombo Investment Support	1.45	Rehabilitated 33G unit at Tombo power station
2.3	Technical Studies	0.13	Reactive compensation study for EDG transmission network
3. Technical Assistance			
3.1	Energy Efficiency/ Conservation/ DSM	1.15	Implementation of energy efficiency and DSM
3.2	Policy Preparation Support	0.20	Energy policy document
3.5	Purchase of High Efficiency Lamps	1.35	600,000 energy efficient lamps
3.6	Tariff Study	0.08	Report
3.7	TA for Commercial Management	0.06	Software
3.8	Institutional Support	1.47	Vehicles, Office furnishings, computers, DSM equipment and metering, training, PIU functional expenses
3.9	EDG Audits	0.34	Project audits, EDG audits for 2012-2014, financial diagnostic of EDG, environmental audit of Garafiri,
3.1	Contingencies / Unallocated	0.02	Environmental and social audit

Annex 3. Economic and Financial Analysis

The project was evaluated on the basis of the benefits associated with its major component, namely the rehabilitation of distribution infrastructure and commercial operations in the Kaloum district of Conakry, together with the distribution of around 584,000 efficient lamps. The evaluation comprises the economic benefits of the project and the financial benefits.

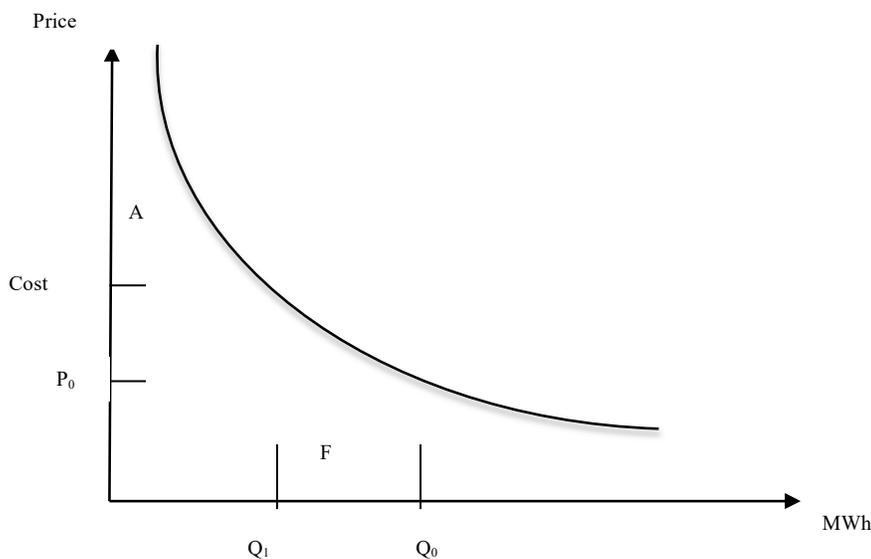
Economic Evaluation

Benefits. Economic benefits comprise:

- The reduction of technical losses in the distribution network, which are valued directly through the energy savings and the avoided generation cost; and
- The benefits associated with a reduced consumption of users as a result of monitoring consumption through the newly installed meters.

The latter benefits can be explained through the demand curve shown in Figure 1

Figure 1—Effects of improved metering and billing



In the absence of meters, consumption is determined at point (Q_0, P_0) ; at this point, price is below cost, total consumer surplus is equal to $A+B+C$, and EDG incurs a total supply cost of $B+C+D+E+F$. In the presence of meters, consumption is reduced to Q_1 and consumer surplus reduces to A , and EDG's cost reduces to $B+E$, with a corresponding economic saving of $C+D+F$. The net gains and losses are:

- Consumers lose area B , which is transferred to EDG, with no net economic loss;
- Consumers lose area C , but it is recovered by EDG as lower production costs, with no net economic loss;

- Consumers no longer pay area F to EDG, and EDG no longer incurs the production cost associated with area F, with no net economic loss.

Consequently, the only economic benefit associated with the installation of improved metering and billing, i.e. with the reduction of commercial losses, is area D, which translates into lower production costs for EDG.

Financial benefits. The benefits to the producer include: (a) the savings in reduced production from Q_0 to Q_1 , i.e. area C+D+F, and (b) the increased billing from consumers who are being metered, i.e. area B. Total financial benefits are therefore area B+C+D+F. The financial benefits of commercial loss reduction exceed the economic benefits by area B+C+D; consequently, it is often the case that even if a commercial loss reduction project cannot be justified from an economic point of view, it is normally justifiable from a financial viewpoint.

Benefits from Demand Side Management (DSM).

The energy efficient lamps distributed by EDG provide a benefit because of the energy saved as compared to conventional incandescent lamps of similar illumination. The lamps distributed are rated at 15W each, with a light output approximately equivalent to a 75W incandescent bulb, thereby providing a capacity saving of 60W per bulb. Assuming a utilization of 5h/day yields an annual saving of 110kWh per bulb.

The efficient lamps also have an economic benefit from reduced CO2 emissions which were estimated at 0.59 kg/kWh and valued at \$11 per metric ton.

Cost Benefit Analysis results

The economic analysis is broken down into (a) an economic evaluation of the distribution investments where benefits are associated to the economic benefit of technical loss reduction and the economic benefit of commercial loss reduction, (b) a financial evaluation where benefits are associated with the financial benefits of technical loss reduction (which are equal to the economic benefits) and the financial benefits of commercial loss reduction, as explained above, (c) the economic evaluation of DSM investments, including the energy savings benefits and the reduced emissions benefits, and (d) a financial evaluation of eff.

Economic evaluation of distribution investments. The economic analysis and breakdown of benefits yields the results shown in Table 1.

Table 1 — Economic Evaluation of Distribution Investments

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021-2035
Benefits															
Technical Loss Reduction	0	0	0	0	0	0	0	3.18	2.72	2.77	2.81	2.85	2.89	2.93	2.93
Commercial Loss Reduction	0	0	0	0	0	0	0	0.00	0.23	0.30	0.47	0.48	0.61	0.62	0.63
Gross Benefits	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18	2.95	3.07	3.28	3.33	3.50	3.55	3.56
Investment Cost															
Cumulative	0.00	0.26	0.26	0.26	1.05	3.97	8.18	12.62	15.66	18.79	0.00	0.00	0.00	0.00	0.00
O&M	0	0	0	0	0	0	0	0.38	0.47	0.56	0.56	0.56	0.56	0.56	0.56
Total Costs	0.00	0.26	0.00	0.00	0.80	2.92	4.21	4.82	3.51	3.70	0.56	0.56	0.56	0.56	0.56
Net Cash Flow															
	0.00	-0.26	0.00	0.00	-0.80	-2.92	-4.21	-1.64	-0.55	-0.63	2.72	2.77	2.94	2.99	3.00
Discount Rate	12.00%														
EIRR	16%														
NPV Costs	\$9.78 Million														
NPV Benefits	\$11.63 Million														

The resulting EIRR of 16 percent is above the reference discount rate of 12%, thereby providing an economic justification for the distribution investments. It is worth noting that the bulk of the economic benefits is concentrated in the reduction of technical losses, whereas the economic commercial loss reduction benefits are very modest, thereby validating the initial graphic analysis.

Financial evaluation of distribution investments. The financial analysis yields the results shown in Table 2

Table 2 - Financial Evaluation Results

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021-2035
Benefits															
Technical Loss Reduction	0	0	0	0	0	0	0	3.18	2.72	2.77	2.81	2.85	2.89	2.93	2.93
Commercial Loss Reduction	0	0	0	0	0	0	0	0.58	0.76	1.19	1.21	1.54	1.56	1.58	1.58
Gross Benefits	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.76	3.49	3.96	4.02	4.38	4.45	4.52	4.52
Costs															
Investment Cost	0.00	0.26	0.00	0.00	0.80	2.92	4.21	4.44	3.04	3.14	0.00	0.00	0.00	0.00	0.00
O&M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.47	0.56	0.56	0.56	0.56	0.56	0.56
Total Costs	0.00	0.26	0.00	0.00	0.80	2.92	4.21	4.82	3.51	3.70	0.56	0.56	0.56	0.56	0.56
Net Cash Flow	0.00	-0.26	0.00	0.00	-0.80	-2.92	-4.21	-1.06	-0.02	0.26	3.45	3.82	3.89	3.95	3.95
EIRR	21%														
NPV Costs	\$9.78 Million														
NPV Benefits	\$14.51 Million														

The financial benefits are significantly higher, thus confirming the industry dictum that there is no better investment than reducing theft.

Economic and financial evaluation of DSM investments. The corresponding analysis is shown in Table 3 and Table 8.

Table 3-Economic Analysis of DSM investments

Economic Benefits (M\$)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy Savings	0	0	0	0	0	2.6	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Avoided emissions	0	0	0	0	0	0.21	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Total DSM benefits	0	0	0	0	0	2.8	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Investment Cost	0.0	0.0	0.0	0.0	0.0	1.35	0.00	0.07	0.01	0.03	0.00	0.00	0.00	0.00
Net Cash Flow	0.0	0.0	0.0	0.0	0.0	1.4	5.6	5.5	5.6	5.5	5.6	5.6	5.6	5.6
EIRR														
NPV Costs	\$0.72 Million													
NPV Benefits	\$15.40 Million													

Table 4-Financial Analysis of DSM Investments

Financial Benefits	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Energy Savings	0.00	0.00	0.00	0.00	0.00	2.57	5.14	5.14	5.14	5.14	5.14	5.14	5.14	5.14
Investment Cost	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Net Cash Flow	0.0	0.0	0.0	0.0	0.0	1.2	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
NPV Costs	\$0.72 Million													
NPV Benefits	\$14.25 Million													

The investments in efficient lamps pay for themselves in less than a year, either from an economic or financial viewpoint, thereby yielding very high returns and Benefit/Cost ratios on the order of 20.

Annex 4. Bank Lending and Implementation Support/Supervision Processes

(a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
Lending			
Prasad Tallapragada	Lead Energy Specialist	AFTEG	Team Leader
Rebecca Sekse	Senior Financial Analyst	AFTEG	Financial Analyst
Fanny Missfeldt-Ringius	Energy Economist	AFTEG	Economist
Chandrasekhar Govindarajalu	Senior Environment Specialist	CASEE	Environment
Gnoleba Matheiu Meguhe	Procurement Specialist	GGO23	Procurement
Nuru Lama	Financial Specialist	GG021	Financial
Bella Lelouma Diallo	Financial Management Specialist	GSU19	Financial Manag.
Zié Coulibaly	Infrastructure Specialist	INFRA	Infrastructure
Hiranya H. Fernando	Carbon Finance Specialist	CCCF	Carbon Finance
Racky Dia Camara	Team Assistant	AFMGN	Assistant
Supervision/ICR			
Dana Rysankova	Senior Energy Specialist	GEEES	Team Leader
Issa Diaw	Senior Energy Specialist	GEE06	Team Leader
Moez Cherif	Lead Energy Specialist	GEE05	Team Leader
Enagnon Ernst Eric Adda	Senior Financial Management	GCO25	Financial Manag.
Alpha Mamadou Bah	Senior procurement Specialist	GCO07	Procurement
Yussuf Uwamahoro	Energy Specialist	GEE07	Team Leader
Augustine Kudawoo Wright	Team Assistant	AFMGN	Assistant
Manuel Jose Millan Sanchez	Power Engineer	GEE08	Team member
Stephan Claude F. Garnier	Lead Energy Specialist	GEE08	Team member
Robert Schlotterer	Lead Infrs. Finance Specialist	GEEFS	Team member
Hocine Chalal	Lead Environment Specialist	GEN07	Team member
Racky Dia Camara	Program Assistant	AFMGN	Assistant
Thierno Hamidou Diallo	Operational officer	AFMGN	Disbur. Assistant
Amadou Mamadou Watt	Energy Specialist	GEE07	Team Leader
Racky Dia Camara	Program Assistant	AFMGN	Assistant

Annex 5. Beneficiary Survey Results *(if any)*

Not Applicable

Annex 6. Stakeholder Workshop Report and Results *(if any)*

Not Applicable

Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

EXECUTIVE SUMMARY

FUNDING, FRAMEWORK OF RESULTS AND OBJECTIVES

The Electricity Sector Efficiency Improvement Project (ESEIP) financed by IDA and GEF implemented on August 3, 2007 was initially to expire in December 2009; but Guinea entered a tumultuous period with the death of President Lansana Conté and the advent of a military regime led by Moussa Dadis Camara.

The initial contribution of IDA was 7.2 million US\$ to which was added the GEF funding on June 6, 2007, for an amount of US\$ 4.5 million. Bringing the fund to 11.7 million US\$. The contribution of the AID has grown to reach US \$ 30 million and The PPIAF had to contribute for 0,3 million US\$.

Project Financing Plan	
Origin	Total Amount (US \$m)
Total Project Cost:	30,3
Co-financing: (GEF):	4,5
PPIAF	0,3
Borrower:	0
Total Bank Financing:	25,5
IBRD	0
IDA	25,5
New	18,3
Recommitted	-

The contribution of the PPIAF (Public-Private Infrastructure Advisory Facility) for the project was redirected towards funding a consultant as part of capacity building of IPP executives in the Electricity and Hydraulic Ministry. Instead of 0.3 m USD 0.2 was spent. This evaluation is a requirement of the project agreement, with the aim of assessing the activities and investments to the objectives set in the prior assessment of the PAD, and the effects and impacts of actions taken. In addition, it will assess its performance against the following criteria:

- Relevance,
- Consistency and complementarity,
- Effectiveness and efficiency,
- Effects and impacts,
- Sustainability.

PERFORMANCE ANALYSIS

1. RELEVANCE

This concept is based on the project design and puts into perspective the project objectives and the identified problems and real needs.

The project is consistent qualitatively with the identified problems at the Kaloum Municipality through:

- Improving the operational and commercial efficiency of the sector and ensure its sustainability and reduction of greenhouse gas (CO₂) through:
- Reducing technical losses,
- Reducing non-technical and commercial losses in the metering, billing and collection
- Improving customer satisfaction
- Improvement of production efficiency
- Strengthening the utilization capacity of hydropower plants (Garafiri) and thermal plants (Tombo)
- Institutional strengthening through technical assistance: Promoting efficiency and energy conservation; Development of private sector capacity; Strengthening the financial accounting system; and Operational support to information technology (IT) and use of prepaid meters. All these provisions are relevant to address the needs of Guinea in the scope of Kaloum.

2. CONSISTENCY AND COMPLEMENTARITY □

These two concepts allow seeing the compatibility between objectives, resources, activities and finally the expected results.

The results framework sitting on the Republic of Guinea planning documents ensures qualitative coherence between development goals and intermediate target; it is not the case in quantitative terms; problem lies in the reliability of the figures that set quantitative targets. We note that in the initial PAD some indicators impossible to bring under control were worn; therefore, in the review in 2012, the objectives related to these indicators have been abandoned.

3. EFFECTIVENESS AND EFFICIENCY

1. Effectiveness

	Réalisé	Objectif	Taux réalisation
PDO Level Results Indicators			
1. Number of low voltage customers in Kaloum	14 963	13 693	109%
2. Total distribution losses in Kaloum	14,7%	16	92%
3. Bill collection rate in Kaloum	81,5%	95%	86%
4. Reduction CO2 emissions	35 503	36 448	97%
Bénéficiaires			
Project beneficiaries,	94 566	86 348	110%
Of which female (beneficiaries)	62 017	43 174	110%
Intermediate Results Indicators			
Intermediate Result 1: Number of low voltage customers in Kaloum			
1. Availability rate of Garafiri hydropower plant	85,3%	98,5%	86,6%
2. Generation of unit 33 G at Tombo thermal plant	83 132	211 779	39,2%
Intermediate Result 2: Total Distribution losses in Kaloum			
3. Number of sub-stations rehabilitated/installed	35	42	83,3%
4. Replaced underground cables	25,48	42	60,6%
Intermediate Result 3: Collection rate in Kaloum			
5. Meters installed	566	13 495	4%
Intermediate Result 4: Reduction CO2 emissions			
7. High efficiency lamps distributed	584 465	600 000	97,5%
8. Energy audits executed	71	20	282%

In a glance we see among the 13 indicators to assess the achieved results and those which are not.

1.1 Objectives overvalued by bad study

We note that bad studies have set goals that are not in relation with the reality; those are:

1.1.1 Number of MV / LV rehabilitated / constructed

The results of rehabilitation of MV / LV distribution substations are not considered to have reached their goals because of a poorly done study totally which overvalued the needs and influenced the PAD objective.

1.1.2 MV underground cable length replaced

The results of rehabilitation of underground networks are not considered to have reached their goals because of a poorly done study totally which overvalued the needs and influenced

the PAD objective.

1.2 The objectives achieved

- Number of Low Voltage customers in Kaloum
- Distribution losses in Kaloum rate
- Reduction of CO2 emissions (tons)
- Projects Beneficiaries
- Women Beneficiaries
- Lamp Low Consumption distributed
- Energy audit

1.2.1 Number of Low Voltage customers Kaloum

According to statistics available for 2014 the number of low voltage customers in Kaloum grew steadily;

1.2.2 Distribution losses in Kaloum rate

The decrease in the loss rate is truly remarkable, although we cannot determine the level that the performed rehabilitations reduced technical losses; the inclusion of illegal consumers and upgrading of the package bills were conclusive.

1.2.3 Reduction of CO2 emissions (tonnes)

Maintaining the same ratio of energy-saving lamps and the emission gain used in the PAD, the result is satisfactory neglecting 2.5% of not provided bulbs.

1.2.4 Projects Beneficiaries

Same comment as the 1.2.1 because the data are mutually proportional.

1.2.5 Women Beneficiaries

Same comment as the 1.2.1 because the data are mutually proportional.

1.2.6 Lamp Low Consumption distributed

The bulbs are delivered lower than those that were reported in the PAD of about 2.5%, but this cannot be considered a disability. We consider the goal achieved.

1.2.7 Energy audit

Having started with a delay due to the Ebola epidemic, the consultant has successfully achieved and exceeded its target of 20 with 71 reports.

1.3 The unmet goals

- Bill collection rates in Kaloum
- Availability rate of Garafiri hydroelectric plant
- Meters installed

1.3.1 Bill collection rates in Kaloum

The bill collection rate is not at all mastered; improving the results of this indicator involves the empowerment of responsible of agency managers and meter readers, with financial incentives for good performance and penalties for bad results. □

1.3.2 Availability rate of Garafiri hydroelectric plant

□The project has not been well inspired to order spare parts without imposing the deadlines of both procurement and replacement of worn parts, as the availability rate of the plant would be an indicator of the project appraisal document PAD). Indeed, the Spare parts were delivered in small batches until 2015 and no replacement was made. On the other hand, expressed needs were partial and did not allow to have a significant effect since the hydro electrical plant had other issues such as the penetration of mud in refrigerants.

1.3.3 Production of 33G unit of Tombo

This failure is from all the more bitter we had, so that 4 years after the rehabilitation of the power unit, it does not work anymore, not because of the poor quality of the rehabilitation conducted by ESEIP, but due to poor maintenance by low skilled provider committed by EDG.

1.3.4 Meters installed

The Failure is most obvious in the way that so far we are approximately 4 % of realization. Moreover, the reasons are widely known and beyond the capacity of the project implementation unit (PIU). The involvement of the Government itself was required to lead the peoples to accept the installation of meters; the operation should not seem like an issue of EDG only.

2. Efficiency

We can say that the PIU of ESEIP has constantly sought efficiency and rigor in the purchase and use of consumables, fuel and other materials useful for the smooth running of the unit.

On the other hand, the principles of procurement were respected and no budgetary slippages have been recorded.

3. SOME SIGNIFICANT ACHIEVEMENTS AND ACQUISITIONS □

Networks, distribution substations and meters

- 35 MV / LV rehabilitated or constructed in Kaloum
- 25.48 km MV cable replaced in Kaloum
- 6,708 connections resumed in Kaloum
- 43 primary 20 kV cells installed and put into service in the Kaloum MV substation
- 14000 meters provided with 1022 installed and put into service of which 566 prepaid
- A server room with SMART Vendor software for energy recorded by the meters
- 1 calibration bench installed in the laboratory based in the area of Kaloum power plant□
- 592,250 CFL supplied and distributed

Kaloum agency

- 6 generators, 6 computers + software, 6 printers, 6 sets stabilizers and inverters
- Radio communication, motorcycle, set of tools for the agency Kaloum□- 2 DC pick up 4x4 vehicles
- 11 office settings 18 single offices, 10 armchairs for executives ,12 low backrest armchairs, 5 benches for visitors, 2 tables for the fund, 10 work tables, 21 metal cabinets, 80 visitor's chairs, 6 computer tables, 6 safety boxes N° 140,

DSM cells (EDG and MEH)

- 2 DC 4x4 pick up vehicles for 2 DSM cells (EDG and MEH)

- 7 single offices, 7 armchairs for executives, 7 wooden cabinets, 7 visitors' chairs, 7 laptops, 2 tooling batches and data loggers

Deliverables of Consultants

- 1 tariff study provided by IDEACONSULT
- 1 letter of detailed policy in the electricity sector by IDEACONSULT
- 1 business plan by Tecsum / AECOM
- 1 assessment tracking software by Tecsum / AECOM
- 1 study of reactive compensation and strengthening the EDG's transmission network by Nguyen Van Thich, consultant
- 71 energy audit reports
- Various supervision reports consulting engineers and accounting and financial audits of EDG and ESEIP.

4. RECOMMENDATIONS

From the lessons learned in the project and its environment, we are, for better conduct future projects, the following recommendations:

R1 Technical studies

To avoid budget revisions or technical specifications of the investments that have consequences in terms of time and work quality, we recommend that EDG puts in place a well-equipped study cell with well-trained staff to ensure all the project studies or to make use of well-experienced and credible consultant firms

R2 Operation maintenance and security

Given the lack of professionalism of the engineers and technicians (general operation, maintenance, security, incident analysis, logging, etc.) we recommend a general upgrading for them; that unofficial personnel are banned from networks or integrated they are competent and honest; they should not continue working informally and have contacts with people in the name of EDG.

R3 Commercial management

We suggest that commercial management is decentralized effectively into the regional delegations and agencies and that the different levels are actually empowered with clear objectives with the possibility of profit related to the results; the sales department will handle the implementation of the marketing policy, training.

It may itself be assessed on the consolidated results of the delegations and regional farms.

R4 Human resources

The project recommends the organization of training for company managers from all levels on management tools so that they are able to mobilize their employees towards achieving the goals. □ That the employees have customized management contracts and are evaluated with an incentive or penalty depending on the results.

EDG has to ensure that staffs to be trained are able to assimilate the training and multiply and especially apply daily □ We always require a report and a presentation to employees participating in training, a factory recipe or an important meeting.

A structure is dedicated to receive all the documentation gathered during receiving training for sound management □EDG creates a corporate culture by sharing with the staff of the vision, rationale, policy and basic objectives of the company.

R5 Financial management and cash

We recommend the project for financial management prioritization of payments according to their impact on the financial and operational viability of the company; and provide possible targets.

R6 Procurement logistics and inventory management

The project recommends the establishment of material storage magazine (central and regional agency or minimum), the training of officers in management or stock acquisition in addition to a commitment in terms of time to deal with preliminary work needs the achievement of project sites funded by donors.

R7 documentation standardization and reliability of data and statistics

The project recommends the implementation of a document management system and a standard cell for EDG.

5. CONCLUSION

In addition to the impact of socio political and military crises and the threat of Ebola epidemic, we must recognize that the ESEIP suffered from malfunctions whose responsibilities fall on:

The EDG for

- Transmitting unreliable statistics and studies to the Bank when it was writing and revising the PAD, thus skewing some objectives,
- Writing tender specifications not taking into account all the problems that reduce the availability of the Garafiri power plant,
- Select an unreliable provider to maintain the 33G resulting final shutdown in such little time,
- Set up a policy and ineffective commercial organization for bill collection...

The State of Guinea for not having involved

- Sufficiently and early in the awareness and communication towards the people on the need for the installation of meters
- In reducing procurement time and signing of contracts

Both EDG and PIU of ESEIP for not having

- Ordered a comprehensive study to determine all the investment needed to improve the availability of Garafiri
- Sufficiently put pressure on the ERAI Company for quick delivery of spare parts Garafiri
- Ordered a deadline for the replacement of damaged parts and leave the initiative to the EDG the replacement, while the project would be judged on the availability of the power plant,

The World Bank for not

- Being firm in the requirement of a good quality in studies and statistics provided by the EDG when identifying investment to fund and to realize, and writing the PAD.
- Put more speed in giving the agreements of no objection.

Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders
None

Annex 9. List of Supporting Documents

EDG, Projet d'Amélioration du Secteur de l'Électricité, Rapport d'Achèvement, 30 juin 2016

EDG, Rapport Annuel, Exercice 2015

The World Bank, GEF Project Document, May 31 2007

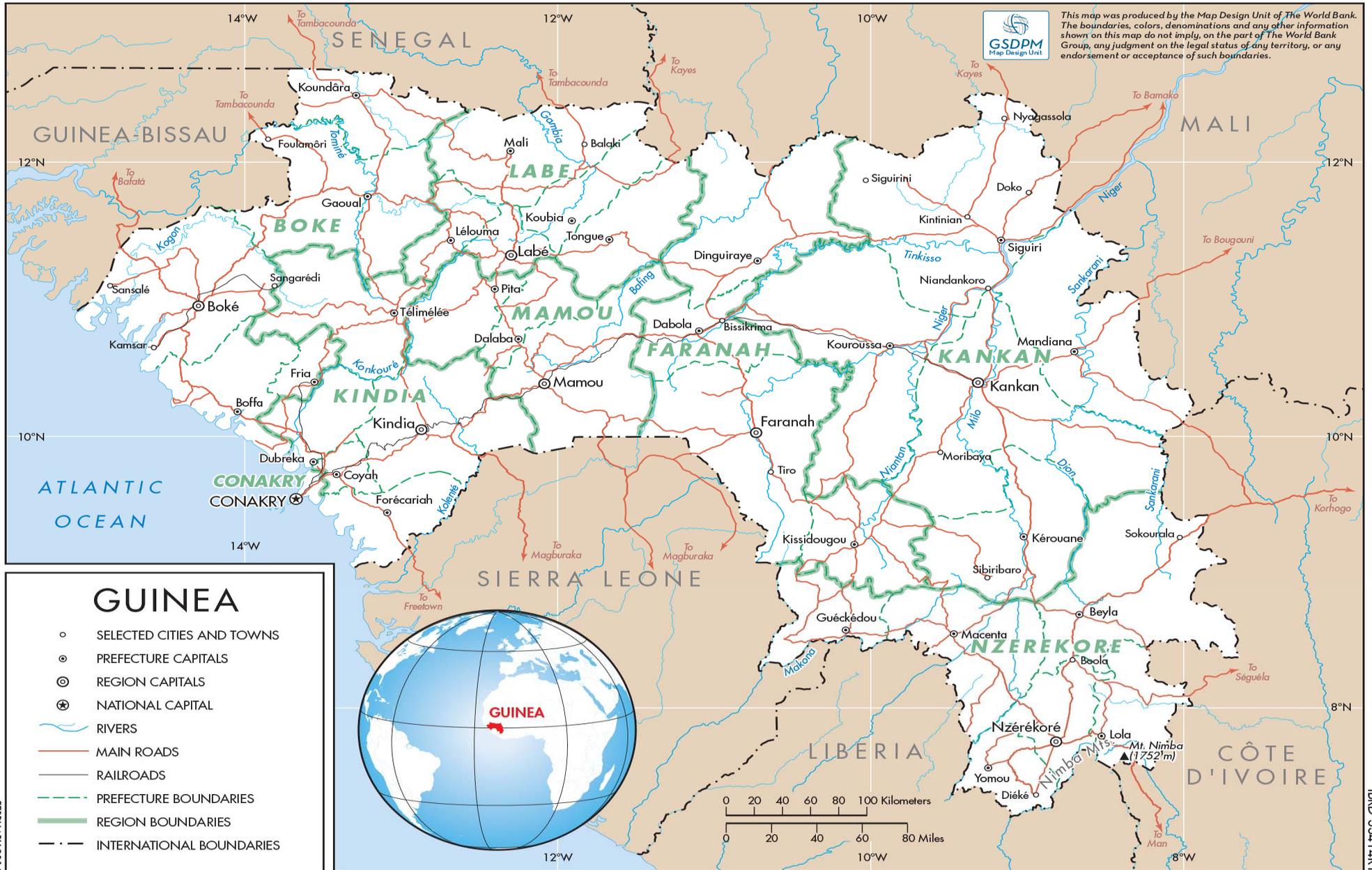
The World Bank, Project Paper on a Proposed Additional Grant, Report No. 68084-GN, May 1 2012

The World Bank, Project Appraisal Document for an Electricity Sector Efficiency Improvement Project, Report No. 36362-GN

Project Agreement between Électricité de Guinée and International Development Association, 7 November 2006

Financing Agreement between Republic of Guinea and International Development Association, November 7, 2006

MAP



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GUINEA

- SELECTED CITIES AND TOWNS
- ⊙ PREFECTURE CAPITALS
- ⊕ REGION CAPITALS
- ⊗ NATIONAL CAPITAL
- RIVERS
- MAIN ROADS
- RAILROADS
- - - PREFECTURE BOUNDARIES
- REGION BOUNDARIES
- - - INTERNATIONAL BOUNDARIES

