



Report Number: ICRR0023177

## 1. Project Data

**Project ID**  
P074191

**Project Name**  
GH-Energy Dev & Access SIL (FY08)

**Country**  
Ghana

**Practice Area(Lead)**  
Energy & Extractives

**L/C/TF Number(s)**  
IDA-43560,IDA-47300,IDA-56290,TF-90450

**Closing Date (Original)**  
30-Nov-2012

**Total Project Cost (USD)**  
270,145,842.70

**Bank Approval Date**  
26-Jul-2007

**Closing Date (Actual)**  
31-Jan-2022

	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	90,000,000.00	50,000,000.00
Revised Commitment	266,285,458.53	49,822,093.98
Actual	264,695,555.46	49,822,093.98

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**Project ID**  
P070970

**Project Name**  
GH-GEF Rural Energy Access ( P070970 )

**L/C/TF Number(s)**

**Closing Date (Original)**

**Total Project Cost (USD)**  
5490927.09

**Bank Approval Date**

**Closing Date (Actual)**



26-Jul-2007

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	0.00	5,500,000.00
Revised Commitment	0.00	5,490,927.09
Actual	0.00	5,490,927.09

## 2. Project Objectives and Components

### a. Objectives

The project development objective (PDO), as stated in the 2007 Financing Agreement, was “to assist the Recipient in: (i) improving the operational efficiency of the electricity distribution system and increasing the population’s access to electricity; and (ii) transitioning Ghana to a low-carbon economy through the reduction of greenhouse gas emissions.” The 2010 Amended and Restated Financing Agreement replicated the 2007 PDO while breaking the sub-objective (i) into two parts, as reflected in the PDO1 and PDO2 below. The ICR quotes the 2010 PDO mistakenly dating it as a 2017 one and refers to Project PDOs in three different PADs, which creates confusion.

The PDO was not revised.

For the purposes of this ICR review, the objective will be assessed as follows:

PDO1: to improve the operational efficiency of the electricity distribution system.

PDO2: to increase the population’s access to electricity.

PDO3: to transition Ghana to a low-carbon economy through the reduction of greenhouse gas emissions.

### b. Were the project objectives/key associated outcome targets revised during implementation?

No

### c. Will a split evaluation be undertaken?

No

### d. Components

#### 1. Original components:

Note: total project costs by source are provided in section e: Comments on Project Cost, Financing, Borrower Contribution, and Dates. Total costs by component at closure were not available from the ICR or from the project team at the time when this review was prepared. The ICR provides component costs at



appraisal from all available sources and component costs at closure only from selected sources, which is confusing and not useful for the purposes of this review. Therefore, only component costs at appraisal are provided in this section.

**Component A:** Sector and Institutional Development (cost at appraisal: US\$14.0 million).

This component aimed to strengthen the capacity of the following Government of Ghana's (GOG's) agencies: (i) Public Utilities Regulatory Commission (PURC), including in relation to the design of electricity tariffs and of power purchase agreements (PPAs), as well as to renewable energy (RE) promotion; (ii) Ministry of Energy (MOE), in relation to donor coordination, managing the Project, and attracting Independent Power Producers (IPPs); (iii) Electricity Company of Ghana (ECG) (the main electricity distributor in the country) and Volta River Authority (VRA) (the main generator and supplier of electricity in Ghana; its subsidiary is the second electricity distributor in the country), in order to improve efficiency of operations; (iv) the Energy Commission, mainly to design and implement a new RE Law and promote RE; (v) relevant agencies responsible for environmental monitoring; and (vi) The Interim Access Secretariat and Rural Electrification Agency (REA), to support a program aimed at increased access to electricity.

**Component B:** Electricity Distribution Improvement (cost at appraisal: US\$94.0 million)

This component financed the following: (i) physical works to upgrade the ECG's electricity distribution networks and thus reduce system interruptions/outages and technical losses and (ii) ECG's commercial and technical capacity development. The physical works included: (i) upgrading and constructing the overhead lines, (ii) adding or replacing the distribution facilities, and (iii) providing shunt capacitor compensation. Capacity development involved establishing customer service centers and a trouble call center; developing a network and database management system; and extending the prepayment metering system.

**Component C:** Electricity Access and Renewable Energy (cost at appraisal - US\$101.2 million)

This component supported the following: (i) setting up a new institutional, regulatory, and financing framework for rural electricity access, including the creation of the REA and of the Rural Electrification Fund (REF) (the financing mechanism for access expansion beyond the project timeline); (ii) financing physical works, including new connections to the existing electricity distribution networks, extension of the distribution networks, building mini-grids, and providing solar photovoltaic (PV) systems; and (iii) establishing a financing mechanism for solar PV, to include consumer credits and capital subsidies, as well as agreements with dealers for installation and maintenance.

## **2. New and revised components:**

**2.1. Component D was added with the first Additional Financing (AF1) in June 2010** to expand activities under original Component B (Electricity Distribution Improvement):

**Component D:** Expanded Capacity for Electricity Distribution Improvement (cost at appraisal: US\$70.0 million)

This component supported upgrading and expanding the sub-transmission and distribution networks in the Ashanti region where ECG losses were the highest and demand growth the steepest; roll-out of prepaid metering to address commercial losses; and establishing additional customer service centers.



**2.2. New activities under Components A and C were added with level 2 restructuring in November 2012 (no additional financing was involved).** The following new activities were added to the GEF-financed parts of Components A and C: (i) establishing the solar testing and certification facility; (ii) expanding solar PV installation in public institutions; (iii) assessing the biomass resources for the design of feed-in tariffs for biomass-based generation; (iv) installing solar panels in schools; (v) installing PV-based streetlights; and (vi) completing a GIS-based electrification planning and management tool.

**2.3. Components E and F were added with the second AF (AF2) in April 2015:** Component E, to address the ECG's commercial losses; and Component F, to provide a technology application for managing outages and incidents in the supply network.

**Component E:** Revenue Collection Improvement (cost at appraisal: US\$55.0 million).

This component supported the installation of innovative metering infrastructure at low and medium voltage.

**Component F:** Management and Planning Enhancement (cost at appraisal: US\$5 million)

This component supported the following activities: (i) installing an information technology application for management and resolution of outages and incidents in the supply networks, focusing on low-voltage distribution and (ii) project management activities, including purchase of vehicles and office equipment and provision of technical assistance/consultancy services.

**2.4. New activities under Components E and F were added with level 2 restructuring in January 2020 (no additional financing was involved).** Activities adopted under AF2 (Components E and F) were expanded, and the timeline extended, to cover additional work to improve ECG's efficiency: (i) installing a corporate resource management system and of an Outage Management System (OMS); (ii) reengineering commercial processes and upgrading the commercial management system (CMS) incorporated under the project; and (iii) upgrading the data center.

#### **e. Comments on Project Cost, Financing, Borrower Contribution, and Dates**

**Project Cost:** The actual project cost was US\$446.1 million, compared to the appraisal estimate of US\$210.6 million. Note that the cost by component at appraisal amounts to US\$209.6 million because it does not include the GEF's Project Preparation Fund (PPF) in the amount of US\$1 million. The ICR does not provide financing at closure from all sources, it only contains financing from IDA, the GEF, ACGF, and GPOBA. Therefore, the total costs at closure in the ICR are not comparable with the total costs at appraisal from the Project's PAD. The team has provided costs at closure, by source, at IEG request. Total costs at closure by component were not available. Costs at appraisal quoted here have been obtained from the Project PAD.

**Project Financing:** The project was financed by an International Development Association (IDA) credit (US\$90.0 million at appraisal and US\$217 million at closure) and a GEF grant (US\$5.5 million at appraisal and US\$5.5 million at closure). Project financing also included co-financing from the following entities: GPOBA (US\$6.3 at appraisal and US\$4.4 million at closure; Africa Catalytic Growth Fund (ACGF) (US\$50.0 million at appraisal US\$50.0 million at closure); African Development Bank (AfDB) (US\$18.3 at appraisal



and US\$87.9 at closure) and the Switzerland Government's State Secretariat for Economic Affairs (SECO) (US\$11.0 at appraisal and US\$33.0 at closure).

**Borrower/Recipient contribution:** The actual Borrower contribution was U\$48.4 million, above the appraisal commitment of US\$29.65 million. This contribution included the financing from the GOG (US\$1.2 million at appraisal and US\$1.44 million at closure); from the ECG (US\$20.7 million at appraisal and US\$39.18 million at closure); and from private sources (US\$7.75 million at appraisal and US\$7.75 million at closure).

**Project Dates:** The project was approved on July 26, 2007 and became effective on December 6, 2007. The mid-term review was on February 19, 2010. The original closing date was November 30, 2012. The project was extended seven times:

- i. on June 3, 2010, for 12 months to November 30, 2013, through a level 1 restructuring, which supported IDA's AF1;
- ii. on November 22, 2012, for 10 months to September 30, 2014, through a level two restructuring, to reallocate the funds between the sub-components of the GEF project;
- iii. on December 12, 2013, for ten months to July 31, 2015, through a level two restructuring, to allow for completion of works in the Northern regions;
- iv. on April 9, 2015, for 24 months, to July 31, 2017, through a level two restructuring, which supported IDA's AF2;
- v. on June 15, 2017, for 18 months to January 31, 2019, through a level two restructuring, due to a late approval of the Financing Agreement by the Parliament;
- vi. on January 31, 2019, for 12 months to January 31, 2020, through a level two restructuring, to allow for completing two contracts key for the financial sustainability of the power sector;
- vii. on January 29, 2020, for 24 months to January 31, 2022, through a level two restructuring, to finance key investments to improve commercial and operational performance of ECG.

### 3. Relevance of Objectives

#### Rationale

**Country context:** At the time of project approval, deficiencies in the electricity sector amounted to a crisis due to a significant supply-demand gap (supply below demand) and poor quality and reliability of supply. Ghana was ranked 84th out of 104 countries in the Global Competitiveness Report in terms of energy service quality. At the same time, reliable access to energy was a major factor of economic growth, critical for reducing poverty and inequality, including among the country's regions and urban/rural population. The GOG's strategy in the energy sector covered several areas. First, regional integration through the West Africa Gas Pipeline (WAGP) and the West Africa Power Pool (WAPP), and a program to expand the country's own electricity generation capacity were pursued. Second, measures were developed to address financial inefficiency of the VRA and ECG caused by the below cost recovery tariffs, poor operational performance, and significant technical and commercial losses. Third, a demand-side management program was undertaken. Fourth, an electrification program was implemented since 1989, and at project approval it included objectives to connect customers located far from the main grid through mini-grids and off-grid solutions.



**Relevance to GOG's Strategies at approval:** The PDO was relevant to the country conditions and well-aligned with national priorities. The Ghana's Growth and Poverty Reduction Strategy II covering 2006 - 2009 (GPRS II) emphasized the energy sector objective of reliable supply of high-quality energy services across customer classes and urban-rural areas. Access was to be increased from 54 percent to 75 percent by 2015. Africa's Clean Energy Investment Framework, launched in 2006, aimed at increasing energy access while reducing emissions. The GOG focused power sector reform on: (i) a new institutional framework for rural access; (ii) a tariff review aimed at cost recovery; and (iii) a framework for public/private partnerships. The Project was to support these strategic objectives, including: reforming tariffs; improving sector operational performance; reducing system losses; improving quality of power supply; supporting private investment in RE; and increasing rural access through new institutional and financial frameworks and innovative technical solutions (mini-grid and off-grid).

**Relevance to the WBG's Assistance Strategies at approval:** The Bank's Ghana Country Assistance Strategy (CAS) 2004-2007 was aligned with the GPRS II. In particular, the CAS acknowledged that deficiencies in the supply and quality of energy services was preventing the achievement of Ghana's economic objectives, targeted reform of the energy sector, and included the Project as a key element of its program. Also, the Project was to contribute to the achievement of the MDGs by: (a) reducing inequality in the urban/rural access to electricity and (b) improving the financial health of the power sector and therefore the sector's fiscal burden.

**The PDO remained relevant at closing.** The project objectives were relevant to the January 2022 WBG's Country Partnership Framework (CPF) for FY2022-26, specifically to the CPF Objective 1.3 Enhanced Operational Efficiency in the Energy Sector. The CPF notes that the fiscal burden created by the energy sector is one of the main factors of the diminishing momentum of economic reforms. The government started the Energy Sector Recovery Program (ESRP) in 2019, aiming to restore sector financial and commercial viability, and the CPF supports the government plans, aiming to address financial viability of the electricity sector from two points: (i) tariff review and design; and (ii) assistance to the ECG to improve operational performance and attract private investments. In this context, the ongoing Energy Sector Transformation Initiative Project (GESTIP, P163984) supports the sustainability of the GEDAP's investments by providing capacity building in the areas of electricity sector planning and revenue management, gas sector management, regional power trading, and access to power in remote areas. ASA preparation is also underway, including the ESMAP's Clean Energy Transition and Operational Efficiency in the Power Sector and the Ghana Country Climate and Development Report (CCDR, P177261), where energy sector is key to finding solutions.

**Previous WB sector experience in Ghana.** In the recent past, the WB supported the West Africa gas pipeline by financing the Sankofa gas project (2015), which now provides 60 percent of the gas needs of the country. This project transformed the power sector by phasing out liquid fuels. The WBG also financed construction of the HV interconnection lines with Burkina Faso and Togo; reinforcement and extension of the distribution grid to peri-urban and rural communities; installation of mini-grids and solar PV systems in remote areas; and equipment and tools to improve commercial performance of ECG.

The relevance of objectives is rated high.

## Rating

High



## 4. Achievement of Objectives (Efficacy)

### **OBJECTIVE 1**

#### **Objective**

To improve the operational efficiency of the electricity distribution system.

#### **Rationale**

The theory of change (ToC), developed for the ICR, showed a direct, logical causal chain from inputs to outputs. The inputs were: (i) regulatory strengthening; ECG corporate strengthening; and environmental, social, and project management improvement; (ii) distribution network improvements and extension (physical works, network and database management); (iii) distribution companies' revenue collection improvements through the installation of metering and customer service centers; (iv) physical works providing RE solutions and capacity development for RE management; and (v) provision of the distribution network incidents management system. These inputs, if successfully implemented, were expected to result in the following outputs: (i) studies finalized and capacity building completed; (ii) distribution network physical works completed and network/database management systems operational; (iii) metering systems installed and customer service centers operational; (iv) rural mini-grids and solar PV systems installed, RE regulatory framework established; (v) the incident management system functional.

The inputs are logically linked to the outputs, but some of the inputs could be better defined. The point of the capacity development input (input (i), Component A) was more specific than just regulatory strengthening and ECG corporate strengthening; more specifically, it was to support tariff design, PPA design, and RE promotion, as well as to help improve efficiency of operations of the ECG and VRA. The electricity access and RE input could also be captured closer to project design: it went beyond capacity building and physical works to install mini-grids and PV systems. In fact, it involved setting up a new institutional, regulatory and financial framework (consumer credits, capital subsidies, agreements with dealers for installation and maintenance) for sustainable rural RE market.

The TOC's link from the outputs to outcomes has significant weaknesses. First, there is an inadequate link between output (ii) (distribution network improvements) and the outcomes: this output is only linked to the outcome of "increasing the population access to electricity" (PDO sub-objective 2), whereas it should be also linked to the outcome of "improving the operational efficiency of the electricity distribution system" (PDO sub-objective 1) because this output represents a supply-side efficiency improvement. Second, output (iv) (RE) should be linked to both PDO sub-objectives 2 and 3 (increased access and mitigation action). Third, from the presentational point of view, the list of PDO level outcomes in the TOC is confusing: it lists five outcomes instead of the logical three (as it would be per the PDO sub-objectives), repeating one of them twice and creating a fourth one with no need to do so. Instead, the TOC should have listed the three PDO sub-objectives as outcomes and use arrows to connect the outputs to them.

The long-term objectives in the TOC are substantively incorrect. They do not include actual long-term objectives but instead mix project outcomes, which are already stated in the "PDO outcomes" column using slightly different wording (namely, improved reliability of the distribution system, "increased performance of energy public entities and utilities", and "improved financial stance of institutions active in the electricity



sector”) and objectives outside of the Project scope (namely, “capable and efficient institutions to ensure the oversight of the electricity sector” and “expansion of connections to RE sources”). Instead, the relevant list of long-term objectives of the Project would be as follows: reduced fiscal burden from the electricity sector, reduced financial losses to customers due to such disturbances as blackouts and voltage variations; and welfare gains/inequality reduction/climate mitigation gains due to increased access and the scale-up of the rural RE-based access expansion, promoted by the Project.

## Outputs

**1. Electricity Distribution Improvements and Expansion.** The Project delivered all of the expected outputs as related to investment in physical assets and software to support distribution network improvements and expansion (Component B, Component D, and Component F). This included (within Components B and D) installed primary substations; upgraded substations (installed switchgear and transformers, expanded substations); installed interconnecting circuits from the new substations to the network; installed small capacity transformers for high-voltage distribution; and installed shunt capacitor banks. This also included the delivery of the planned 17 customer service centers and nine district offices. In addition, it included the establishment of a network and database management system and the delivery of prepayment metering systems. Under Component F, an information technology application for managing outages and incidents in the supply network was provided.

**2. Sector Development** (Component A). Multiple outputs in the area of sector development were completed under the project, including: electricity tariff design, RE law design, REA creation, and RE promotion. The Renewable Energy Act was developed under the Project and approved by the Parliament in 2011. The Renewable Energy Directorate (RED) within the MOP was established and is operational. Renewable resource assessments for biomass energy, wind, and mini/micro-hydro electricity generation have been completed. Tariff studies and utility benchmarking were also finalized, and the feed-in tariff methodology for RE was prepared. Oversight agency capacity building was implemented. A solar PV testing and certification center was established.

**3. ECG’s Operational Performance Improvements.** Significant efforts to improve ECG’s operational performance were made throughout project implementation (Component A, Component D, Component E, and Component F), and the outputs were delivered. Key outputs were: (a) the upgrading and modernization of the automatic meter testing and the development of the Secondary Automation and Supervisory Control and Data Acquisition (SCADA) system; (b) the deployment of the bulk meters for boundary metering; and (c) the completion of the Commercial Management System (CMS) and the Enterprise Resource Planning (ERP) system for ECG. Under Component E, smart pre-payment meters were installed, as well as bulk meters for distribution transformers. Staff was trained.

## Outcomes

**1. Electricity Distribution Improvements and Expansion** The network upgrades/extension under the Project allowed for better quality of supply and for the intensification of the existing network usage, as shown in the following outcomes:

- Annual unplanned outages amounted to 24.5 hours at closure, significantly exceeding the target of 100 hours and the baseline of 200 hours. Progress with this indicator was stable over the years of project implementation: it measured at 130 hours in 2015 (AF2 Restructuring Paper), at 90 hours in 2017 (2017





Restructuring Paper), and at 46.8 hours in 2019 (2019 Restructuring Paper). Improved supply quality benefits customers when their financial losses from unplanned blackouts and voltage variations diminish.

- Over 150,000 households were connected to the distribution networks and 127,983 customers have been added to ECG's customer base.

**2. Sector Development.** The Project made a significant contribution to creating the institutional and regulatory framework for the RE development and promoting rural RE by piloting mini-grids and starting PV-based rural electrification. Project's long-term value-added was expected to be in the scale-up of the established rural RE-based connections.

### 3. ECG's Operational Performance Improvements.

In the area of ECG's operational performance, none of the targeted outcomes were achieved, specifically:

- ECG's non-technical losses reached 20.16 percent at closure, significantly worse than both the target of 9.8 percent and the baseline of 13.9 percent.

- ECG's ratio of revenues to costs equaled 0.69 at closure, significantly below the targeted level of "above 1".

- ECG's bill collection efficiency (% of sales) was 84.4 percent at closure, below the target of 90 percent and the baseline of 85 percent. This indicator showed no improvement over the years, as indicated by the data in the 2015 and 2017 restructuring papers.

- ECG's accounts receivable were 184 days at closure, significantly worse (i.e., more than double) than the target of 90 days and worse than the baseline of 150 days. However, the level of this indicator was 104 days in December 2019, and the subsequent deterioration of this result can be explained by the impact of the COVID-19 restrictions (as discussed in the Outcomes section).

- PDO indicator 1 - the ECG's Performance Verification Index (PVI) (ratio of revenue recovered to GWh delivered to the distribution system, adjusted to the average end user tariff) – was not achieved. The actual level at closure was worse at 66.3 percent, below the original target of 75 percent, the revised target of 90 percent, and the baseline of 68.9 percent. The ICR states that the low level of PVI at closure was due to the covid-related demand decline, reduced payments by customers, and restrictions on bill collection and power theft control. However, while this is a valid factor, it is certainly not the only one, as the decline in this indicator started prior to the COVID-19 outbreak: the AF2 restructuring paper (2015) registered the PVI of 87 percent, the 2017 restructuring paper reported it at 74 percent, and the ICR quotes its level at 80.6 percent in June 2020.

It is important to note that PDO indicator 1 is, in fact, not very useful for Project evaluation because it blends together technical, operational, and regulatory dimensions of the sector and ECG performance, while Project outcomes in these three areas were very different: successful network improvements (resulting in reduced technical losses), unsuccessful operational performance improvements (low revenue collection results), and insufficient tariff reform (below-cost recovery tariffs). Measuring these three dimensions (that have distinct determining factors) by using one formula makes the resulting numbers hard to interpret.

IEG disagrees with the ICR's conclusion that "there was good improvement in the operational efficiency of the Ghana's electricity distribution system, but the achieved progress was reversed by the destabilizing effect of



the COVID-19 pandemic on the revenue collection” (ICR, page 20). While Project investments supporting operational and financial sustainability were delivered, the Project achieved limited outcome level results in this area, as indicated in project documents (restructuring papers of 2015, 2017, 2019, and the ICR itself). The Project team has shared the information that non-technical losses had been increasing over the years, and Project interventions did not lead to positive results due to negative external factors. First, tariff increases were necessary to achieve cost recovery, but they were not fully implemented for political reasons. Electricity tariffs in Ghana are still significantly below cost recovery. Second, the country has excess generation capacity, a result of the ECG’s entering into more than 30 (uncompetitively procured and thus expensive) power purchase agreements (PPAs) during the 2012-2016 power crisis. This excess capacity creates a financial liability for the sector and pushes the cost of electricity up. Third, poor revenue collection is persistent despite the efforts made by the Project. The latter has been exacerbated (but not created) by the restrictions caused by COVID-19.

The Project made significant efforts to improve ECG’s operational and financial performance, starting with the original project, which emphasized this task. In 2015, AF2 targeted mainly ECG’s operational efficiency, dedicating more than 90 percent of its total funding to it. Many of the project’s extensions can be explained by the need to produce outputs that supported improved efficiency of the ECG operations. Namely, Project’s extension of 2017 was mainly caused by a delay in the implementation of a new metering system (part of the revenue collection improvement program); and the 2019 extension was due to a delay with the installation of the pre-payment meters. Project closure extension of 2020 was due to an additional effort to improve operational and commercial performance of ECG as well: to deliver systems for resource management, outage management, commercial management, and data management. Despite these efforts, the task of sector operational improvement is still outstanding, and the Bank’s Energy Sector Recovery Program (ESRP), approved in May 2019, is aimed at providing an action plan for the Government to bring the sector back into financial balance (which is critical for the country’s fiscal balance) over the next five years.

To summarize the discussion of efficacy under Objective 1:

**1. Electricity Distribution Improvements and Expansion.** The Project delivered all of the expected outputs. The outcomes were also achieved: network upgrades/extension under the Project allowed for better quality of supply (significantly reduced outages) and for the intensification of the existing network usage, leading to 150,000 new residential connections.

**2. Sector Development.** Multiple outputs were completed including electricity tariff design, RE law design, REA creation, and RE promotion. The Project value-added in this area was in creating institutional and regulatory basis for RE development and piloting/demonstrating rural RE electrification solutions for a scale-up.

**3. ECG’s Operational performance improvements.** While the outputs in this area were delivered, they did not amount to improved operational performance, as shown by the results framework (RF) indicators. In particular, non-technical losses have been increasing over the years. Project interventions in this area did not lead to positive results due to factors outside of the Bank’s control, including: the below-cost-recovery tariffs; excess generation capacity which created an upward pressure on electricity cost; and poor revenue collection, exacerbated by the restrictions imposed during COVID-19. The task of sector operational improvement is still outstanding, and the Bank’s Energy Sector Recovery Program (ESRP), approved in May 2019, is currently addressing it focusing on sector financial sustainability, which is critical for the country’s fiscal balance.



The efficacy rating for Objective 1 is substantial, but with major shortcomings related to the critically important outcome of improving ECG's operational and financial performance. This is aligned with a modest outcome, as clarified by the Bank team in their response to IEG dated January 20, 2023, which explained the underlying rationale for the ICR's overall project outcome rating of Moderately Satisfactory.

### Rating

Substantial

## OBJECTIVE 2

### Objective

To increase the population's access to electricity.

### Rationale

Please see the discussion of the TOC under objective 1.

### Outputs:

**Access expansion.** Outputs under this objective were two-fold: (i) intensification of the existing distribution network (transformers were added and conductors upgraded to increase voltage, and distribution lines were extended) and (ii) RE promotion (five mini-grids were installed; PV solar equipment was supplied to households, health facilities, and schools; and PV solar street lighting was delivered). Outputs included creation of energy service companies (ESCs) and a credit scheme for home solar systems.

### Outcomes:

**1. Grid intensification.** The need for grid intensification was critical, exacerbated by rapid urbanization in the country, which significantly increased demand for electricity in the area served by the existing network and created the need for network extension.

Under objective 1 (Component B), the Project created technical capacity for network intensification, which was a pre-requisite for the provision of new connections. Under the Project, more than 2.1 million people received new connections to the grid, exceeding the target.

**2. Rural RE-based electrification** under the project led to increased rural access to electricity: new connections that were provided to approximately 100,000 people through individual PV systems and to 10,000 people through mini- and micro-grids. Outcomes also included improved street lighting from PV-powered systems. The long-term expected outcome was a scale-up of the Project investments in rural electrification, based on the institutional and regulatory basis for RE development created by the Project and piloting/demonstrating rural RE electrification solutions by the Project.

### Rating

Substantial



## **OBJECTIVE 3**

### **Objective**

To transition Ghana to a low-carbon economy through the reduction of greenhouse gas emissions.

### **Rationale**

Please see the discussion of the TOC under objective 1.

### **Outputs:**

The Project contributed to the country's climate change mitigation efforts through the following actions: (i) support to RE institutional and regulatory strengthening and to rural RE-based electrification (Component A and Component C); (ii) supply-side energy efficiency investments through distribution network upgrades leading to improved quality of supply and therefore a reduced need in back-up generators (which are typically powered by high-emission diesel) (Component Band Component F); and (iii) demand-side energy efficiency improvements, namely smart meters' installation, resulting in reduced theft (and therefore reduced over-usage) of network electricity (Component E). The ICR failed to acknowledge the supply-side and demand-side measures.

As discussed under Objective 1, Project RE outputs included electricity tariff design, RE law design, REA creation, and PV systems' installations in rural areas. Supply-side outputs were the delivered physical assets and software to support distribution network improvements and expansion. Main demand-side outputs were: the provided modern automatic meter testing system and data management systems for metering, as well as the deployment of bulk and individual pre-payment meters.

### **Outcomes:**

The outcome level results in the area of climate mitigation were:

- Ghana's institutional and regulatory framework for RE was developed;
- RE-based mini-grids had an aggregated installed capacity of 1.7 MW; and individual PV solutions were provided to 16,822 households, replacing kerosene lamps. In addition, 752 solar PV systems were delivered to rural health facilities and schools, also replacing alternative fossil fuel-based lighting solutions.
- By Project closure, 458 Ktons of CO<sub>2</sub> were avoided, against the target of 250 Ktons, due to the implemented RE-based electrification solutions only. Total avoided CO<sub>2</sub> emissions during the life of the physical RE assets delivered by the Project were estimated at 2,220 Ktons.
- Supply-side energy efficiency investment resulted in decreased outages: the achieved level was 24.5 hours of annual unplanned outages at closure, against the target of 100 hours and the baseline of 200 hours.
- Demand side interventions (the installation of the smart metering systems) were not measured at the outcome level.
- Long-term expected outcome: climate mitigation gains due to the creation of RE institutional and regulatory framework and a scale-up of the rural RE-based solutions promoted by the Project.



**Rating**  
Substantial

## **OVERALL EFFICACY**

### **Rationale**

For all three objectives, the efficacy is Substantial, except that for Objective 1, the rating is qualified as Substantial with major shortcomings, hence a modest performance with respect to the critically important outcome of improving ECG's operational performance. The Project achieved the key outcomes of electricity distribution improvements and expansion, leading to a better quality of supply (significantly reduced outages) and allowing for network intensification, which in turn led to more than 2.1 million people being connected to the grid, exceeding the target. The Project created institutional and regulatory basis for RE development, piloted rural RE electrification solutions, and created potential for a scale-up. The CO2 emissions avoided due to the RE-base electrification under the Project amounted to 458 Ktons by Project closure, almost twice the target of 250 Ktons.

ECG's operational performance did not improve by Project closure, although the Project delivered the intended outputs. The reasons for this shortcoming were outside of the Bank's control. The issue of sector operational performance is still outstanding, and the Bank's Energy Sector Recovery Program (ESRP) is addressing it. Since the task to improve operational performance constituted a small share of financing under Objective 1, and other tasks under the same objective achieved their expected outcomes, the overall rating for Objective 1 is Substantial.

The overall efficacy is substantial.

### **Overall Efficacy Rating**

Substantial

## **5. Efficiency**

Economic analysis was conducted both at appraisal (ex-ante) and at closure (ex-post), using cost-benefit methodology in both cases. The outcomes are only partially comparable because the analysis at appraisal was conducted at the level of specific Project interventions and one Project component, while the analysis at closure involved calculations at the component level, as well as for the Project overall. The following components/subcomponents were not covered in both ex-ante and ex-post calculations: Component A (Sector and Institutional Development); Subcomponent C5 (Capacity Building for Off-grid Renewable Energy Solutions); Component E (Revenue Collection Improvement); and Component F (Management and Planning Enhancement). The ICR reports that the ex-ante and ex-post analyses covered respectively 95 percent and 90



percent of the total Project costs. However, using the Project costs data by component from the ICR (ICR, page 63), the correct ex-post number is 78 percent, while the ex-ante number is indeed 95 percent.

**The ex-ante analysis presented in the Project PAD contained the following outcomes:**

The analysis was done for Components B and C (except Sub-component C5 on RE capacity building).

Component B: Electricity Distribution Improvement. The EIRR is 202 percent, while the NPV is USD\$682.7 million (at 8 percent discount rate);

Component C: Electricity Access:

- Grid access: The outcomes of the economic analysis are presented by sub project. The EIRR for four sub-projects ranges from 10.8 percent to 74.6 percent, while the NPV ranges from US\$5.6 to US\$147.0 million (at 10 percent discount rate).
- Solar PV: The EIRR equals to 21 percent. The NPV was not calculated.

**The ex-post analysis presented in the ICR had the following outcomes:**

The analysis was done for Components B, C (except Sub-component C5 on RE capacity building), and D.

Project overall: The EIRR is 20.7 percent (or 21.9 percent when climate change mitigation benefits are included); while the NPV is US\$175.7 million (or US\$198.7 when climate change mitigation benefits are accounted for), at 10 percent discount rate.

Component B (Electricity Distribution Improvement) and Component D (Expanded Capacity for Electricity Distribution Improvement). The main economic benefits estimated were: (i) reduction in unserved power and (ii) additional electricity delivered using new connections. The EIRR is 23.8 percent (or 24.8 percent when climate change mitigation benefits are included); while the NPV is US\$154 million (or US\$167.6 when climate change mitigation benefits are accounted for), at 10 percent discount rate.

Component C: Electricity Access. The main economic benefits were derived from additional electricity delivered using new connections. The analysis included both grid intensification/extension and off-grid RE solutions. For the component C overall, the EIRR is 10.3 percent (or 12.2 percent when climate change mitigation benefits are included); while the NPV is US\$1.1 million (or US\$8.5 million when climate change mitigation benefits are included), at 10 percent discount rate. Calculations separately for the grid and off-grid sub-components were as follows:

- Grid intensification/extension: the EIRR is 12.7 percent (or 14.6 percent when climate change mitigation benefits are included); and the NPV is US\$10 million (or US\$17.6 million when climate change mitigation benefits are included), at 10 percent discount rate.
- Off-grid RE solutions: the EIRR is -6.1 percent (or -5.7 percent when climate change mitigation benefits are included); and the NPV is (US\$6.5 million) (or (US\$6.3) million when climate change mitigation benefits are included (at 10 percent discount rate).

**Administrative efficiency.** Operationally, the Project was able to implement its activities without a significant adjustment of its design. The Project's scope considerably expanded with AF1 and AF2. This increase was justified considering the amount of additional financing. Project inefficiency was mainly in its prolonged time



frame: the Project was extended seven times for the total extension of ten years, from the original planned closing date of November 30, 2012 to the actual closure on January 31, 2022. However, this should be viewed in the context of the AF1 in 2010 and of the AF2 in 2015, both of which involved additional activities. Most of the original activities (Components A, B, and C) were completed by the end of 2015, when the AF2 was approved. This indicates a delay of approximately two years with the delivery of the original components. While the activities under AF1 were completed on time, the implementation of tasks under AF2 was not proceeding according to the schedule. At the same time, the AF2 activities were critically important to complete because they were mainly addressing ECG’s financial sustainability, essential for the overall country’s fiscal balance. The focus was on the provision of advanced metering systems. There were multiple delays with the implementation of this task, caused by various external factors, including the COVID-19 related restrictions. As a result, while the original planned closing date for these activities was July 31, 2017, there were three extensions for the total of four years and six months.

The project efficiency is rated substantial. Despite the significant delays with Project closing, IEG took into account (i) the completion of the original activities by 2015 and the timely completion of AF1 activities; and (ii) the persistent difficulty of implementing activities related to the ECG operational and financial sustainability, as well as the importance of these efforts.

**Efficiency Rating**

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	21.90	78.00 <input type="checkbox"/> Not Applicable

\* Refers to percent of total project cost for which ERR/FRR was calculated.

**6. Outcome**

Based on the high relevance of objectives, substantial efficacy (with major shortcomings, hence modest performance in the critically important outcome of improving ECG’s financial and operational performance, under Objective 1), and substantial efficiency, the overall outcome rating is Moderately Satisfactory.

**a. Outcome Rating**

Moderately Satisfactory



## 7. Risk to Development Outcome

**Financial Risk.** The main project risk is financial sustainability of the ECG, which is critical for the overall country fiscal balance. The project's substantial efforts to support ECG's financial health were unsuccessful. The Bank's Energy Sector Recovery Program (ESRP) is currently addressing this issue.

**Political.** One of the reasons for the poor financial performance of the electricity sector is an inadequate tariff level (tariffs are well below costs). The reluctance of the authorities to increase the tariffs, as well as to address the drivers of the high cost of electricity, has political reasons and is expected to continue to be a risk to Project outcomes.

**Government ownership/commitment.** Rural electrification has high costs – both financial and operational - because of the low density of rural population and the need in off-grid, location-specific solutions. This might push it down the list of Government priorities, creating a risk to the expected scale-up from the Project's investment in rural RE-based solutions.

**Technical.** The assets delivered by the Project are mostly based on advanced technology, and there is a risk of asset dilapidation due to insufficient capacity to use them and technical capacity to maintain them. However, the Project invested in creating such capacity by providing training.

## 8. Assessment of Bank Performance

### a. Quality-at-Entry

The Project was fully aligned with the government's strategy for improving electricity sector performance through addressing power distribution quality, improving operational performance of distribution companies, addressing sector financial gap, increasing rural access, and promoting RE-based electricity supply. The project was well-informed by financial and sector studies, including those conducted by other Bank projects. The team worked closely with the stakeholders to design a project that would be consistent with the country needs in the energy sector and address the sector's financial insolvency, which was putting increasing pressure on the country's budget.

The Project design reflected multiple critical sector issues and was based on a comprehensive approach: the Sector and Institutional Development component, as well as the regulatory and institutional sub-components of the Electricity Access and RE component, were supportive of the long-term sustainability of the project-financed physical investments. To respond to the need to supply electricity to rural areas, the Project used innovative technological RE solutions and tested and demonstrated various approaches, applying those that were suitable for local conditions, thus setting the basis for eventually promoting a scale-up.

Combining two very different and complex tasks – distribution network improvements and setting up a system of rural RE-based electrification – in one project could be seen as a factor of potential low project performance (as the ICR states, "the key weakness at entry was the complexity of the project activities and scope"). In fact, however, it was a beneficial design approach to combine a component with expected





high financial (distribution network improvements) and a component with, vice versa, low financial return, considering that the latter one was bringing high social benefits, both at project closure and long-term.

The ICR states that while main risks were identified, some mitigation measures were unsuitable. However, there is no further discussion of the stated unsuitable measures, and it is unclear which risks could be mitigated better. The ICR correctly states that some of the risks stated at appraisal were not possible to mitigate. Indeed, the Project took on a very ambitious task of improving sector operational and financial performance, which depended on Government's actions in the areas of tariff reform, competitive selection of power producers, and billing and collection reform, and therefore are outside of the Bank control. The Project's RF is heavily focused on the sector operational performance, reflecting those ambitions.

While the project was over-ambitious in its targets related to sector operational performance, most of the financing at appraisal was allocated to the lower-risk tasks of improving the distribution network and establishing RE-based rural electrification. The high-risk task of improved operational performance was justifiable considering its importance for the country's fiscal balance. The rating for quality at entry is therefore Satisfactory.

### **Quality-at-Entry Rating**

Satisfactory

#### **b. Quality of supervision**

Project implementation took 15 years, compared to the five years envisioned at appraisal. However, this should be viewed in the context of the AF2, which added new tasks (focused on improving the ECG's billing and metering system) at the time when almost all of the original activities, as well as the AF1 additional activities, were concluded. It should also be viewed in the context of negative external factors.

- Prior to AF2, the Project closure was delayed for two years. The implementation of the original activities was finalized 2015, with a two-year delay, as compared with the appraisal date of completion. The related extensions were needed to complete the tasks under both distribution network and rural access components, which took longer than expected. The activities under AF1 were completed on time.

- AF2 delays amounted to four years and six months, requiring three extensions of Project closure. The factors were technical (complexity of the task), bureaucratic, and contextually challenging in relation to the adjustment to the evolving country needs. The first extension (from July 2017 to January 2019) was mainly due to a late approval of the AF2 Financing Agreement by the Parliament, resulting in the gap of one year and eight months between AF2's Bank approval and its effectiveness. The second extension (from January 2019 to January 2020) was caused by the technical issues with a newly installed by the Project metering system, requiring the contractors to do additional work. The third extension (from January 2020 to January 2022) was triggered by the Bank decision to step in to provide support in place of a cancelled project, which was supposed to be financed by the Millennium Challenge Corporation (MCC).

The Bank team was based in the country and was able to monitor project implementation closely. Efficiency of supervision was supported by the division of responsibilities between the two Project TTLs. One oversaw the implementation of the distribution network improvements and the other managed the rural



RE-based electrification component. The ICR reports that the team “had a flexible and proactive role in addressing the barriers that hindered project implementation”, finding solutions, and ensuring that “the reporting on progress toward project’s outcome was regular and comprehensive”.

The project experienced significant delays, in some cases caused by the inability to accomplish tasks within the established time frame. However, the implementation was also a difficult task due to the technical complexity of the Project and external factors. Therefore, the rating for quality of supervision is Moderately Satisfactory.

### **Quality of Supervision Rating**

Moderately Satisfactory

### **Overall Bank Performance Rating**

Moderately Satisfactory

## **9. M&E Design, Implementation, & Utilization**

### **a. M&E Design**

The strength of the Project RF at appraisal was as follows. The RF included several intermediate outcome indicators and included higher level outcome indicators, such as access to electricity and CO2 emissions avoided. All indicators in the original RF were quantitative, and all of them were time-bound and had baselines and targets. A gender-disaggregated indicator was applied with a consequent revision.

However, the project's RF had significant weaknesses, specifically:

(i) The appraisal level RF reads like an electricity performance benchmarking manual because it mainly consists of key electric utility performance indicators and has no indicators measuring actual Project outputs. It had an emphasis on ambitious outcome indicators, whose achievement was outside of the Bank control. Most of them were linked to operational performance of ECG and, considering the extent of the lingering issues with ECG operations, it was hard to expect that one project can possibly accomplish so much. At the same time, the RF did not include any output indicators, which would be very useful to monitor project performance under both the distribution network improvements component and sector development component.

(ii) All three PDO indicators were inadequate for the following reasons:

- PDO indicator 1 – the ECG’s PVI - mixed technical, operational, and regulatory dimensions of the sector and ECG performance and therefore was hard to interpret. It proved to have limited utility for monitoring because outcomes in these three areas turned out to be very different: successful network improvements by the Project (resulting in reduced technical losses); unsuccessful operational performance improvements, which were only partially under the Bank control; and insufficient tariff reform, which was outside of the Bank control.



- PDO indicator 2 – Household electrification rate in the ECG service area – was not adequate for measuring Project achievements because of the impact of various demographic factors and the steep urbanization in the country before and during Project implementation. This indicator was later replaced by the indicator of “Direct project beneficiaries, number of people”.

- PDO indicator 3 – CO2 emissions avoided due to the Project – is not very useful as a PDO indicator because the point of the RE-based electrification task under the Project was in creating an institutional and regulatory basis for RE adoption and in piloting RE applications in rural areas, thus promoting a scale-up. As such, the RE-based electrification under the Project was implemented on a small scale, and this indicator did not reflect main Project outcomes in this area. This indicator would be appropriate to use as a PDO-level one for a task that would scale up Project RE investments.

(iii) The indicator of system losses combined technical and commercial losses, while measuring them separately would be necessary in order to monitor project performance in two separate areas: distribution network improvements and operational efficiency. This deficiency was later corrected, and two new, separate indicators were included in the RF: for technical losses and commercial losses.

## **b. M&E Implementation**

The ICR states that the PIU performed M&E. Some issues were created by the modifications for the RF during the 2010 AF1 restructuring, when indicators specific to the northern Ashanti region were added. Specifically, the PIU was unable to monitor the indicators specific to the Ashanti region because making the data public for one region was perceived as singling it out, unless the same data were collected for other regions.

Very few improvements were made to the RF in respect to the deficiencies described in the section “M&E Design” above, despite the opportunity to do so presented by many project restructurings. Much more could be done. However, the RF at closure still had most of its appraisal-level weaknesses.

## **c. M&E Utilization**

The ICR reports that M&E played a central role in the oversight of the Project and that M&E data and information from the Aide Memoires and ISRs were used to sustain the dialogue with the borrower on the sector reforms associated with the project. The ICR further states that “the collaboration between the PIU and World Bank could have been improved toward streamlining the number and appropriateness of the PDO intermediate indicators”. While it is recognized that the RF data were useful for the discussions with the borrower, it is important to mention in this context that because of the deficiencies of the RF described above, the RF was not very useful for monitoring Project implementation.

### **M&E Quality Rating**

Modest

## **10. Other Issues**



## a. Safeguards

The ICR reports that the World Bank and AfDB piloted the ‘use of country safeguard systems’ in the Project. At appraisal, it was concluded that the Ghanaian social and environmental safeguards system was equivalent to that of the WBG, with minor gaps with regard to environmental assessment and physical cultural property. As a result, the project was not classified in a specific category, but because of the identified gaps, the project approval triggered the following World Bank safeguards policies: (a) Natural Habitats (OP/BP 4.04), (b) Involuntary Resettlement (OP/BP 4.12), and (c) Safety of Dams (OP/BP 4.37). During supervision and at project closure, these triggered policies were not assessed for compliance with World Bank standards or against the country safeguards standards. (ICR, paragraph 86)

The following environmental issues were identified during distribution network works: (i) in some cases, poles were placed in gutters, blocking the flow of water, against the environmental guidelines; (ii) in other cases, the power lines were built without clearing the vegetation, against the condition of permit from the Environmental Protection Agency (EPA). On some occasions, construction works were delayed due to difficulty in obtaining permits from the Forestry Department. This could have been avoided if negotiations with the Forestry Department had started prior to the commencement of the construction works. (ICR, paragraphs 87-88)

The following social issues were registered: (i) it was observed that mistakes were made during revenue collection, and some ECG’s customers were overbilled; (ii) some power lines were built too close to people’s houses, posing a safety hazard; and (iii) one site was supposed to be built in a location used for recreation, the site was relocated after the local population expressed dissatisfaction. (ICR, paragraphs 87-88)

## b. Fiduciary Compliance

**Financial Management** was overall satisfactory throughout project implementation, with the following exceptions (derived from the ICR, paragraph 89):

- Budget utilization was slow due to delayed procurement processes, pointing to capacity issues that needed to be addressed.
- Implementing agencies had difficulties in accessing funding from other donors (co-financing) due to delays in complying with legal requirements or inadequate institutional set-ups. As a result, the Project could not fully use the allocated funds prior to its closure.
- There were long delays for implementing agencies, especially for VRA and ECG, to comply with the covenants provided in the Financing Agreement.

The project complied fully with the requirement of the timely submission of the interim financial reports (IFRs) and the project financial audits. At the same time, the Project had challenges in fully complying with the submission dates for the entity (ECG) audits. (ICR, paragraph 90)



**Procurement management** was overall satisfactory throughout the project implementation period, and procurement operations were correctly initiated and concluded. The following challenges were encountered (ICR, paragraph 91-93):

- delays in getting approval from ECG’s Board of Directors for tender evaluation reports, leading to frequent requests to bidders to extend the validity of their bids;
- delays caused by land acquisition problems for some of the customer service centers and district offices for ECG;
- frequent requests from civil works contractors for revision of contract price due to fluctuation of prices of building materials;
- VRA’s delays in submitting applications for replenishment to the World Bank for the commitment letters; and
- delays by the VRA in the delivery of materials for installation works by contractors.

**c. Unintended impacts (Positive or Negative)**

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**d. Other**

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**11. Ratings**

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Satisfactory	
Bank Performance	Moderately Satisfactory	Moderately Satisfactory	
Quality of M&E	Modest	Modest	
Quality of ICR	---	Modest	

**12. Lessons**

- The Borrower’s commitment is critically important for project success. The commitment of the Government to three tasks under the Project – the improvements of the distribution network, the increase in the rural access, and the creation of the framework of the RE development – were essential to the successful implementation of these tasks. At the same time, the lack of Government commitment to making progress in achieving the operational and financial sustainability of the sector led to the Project’s inability to achieve the planned results in this area. This was also the reason of



the significant delays in the implementation of the AF2 activities. (this lesson is based on the ICR, paragraph 108)

- Close coordination with the counterparts, adaptive project management, flexible implementation, and careful stakeholder coordination during implementation are important conditions for achieving project objectives in cases of complex projects like GEDAP. GEDAP was implemented in close coordination with the counterparts, including the ECG, and was responding to the most important needs of the electricity sector, as recognized by the Government. The Project was implemented using a flexible and sequenced approach in the project design and implementation, allowing for adapting the project to the evolving priorities and needs of the counterparts. The Project benefited from stakeholder coordination by both the Project team and the counterparts. The stakeholders included several government entities, several donors, and government implementation agencies; and (iii) the provision of own budget and public resources. (this lesson is based on the ICR, paragraph 108)

- Modern and efficient transmission and distribution networks that guarantee sufficient consumer coverage, reliable access, and acceptably low technical losses, are a critical condition for achieving Sustainable Development Goal (SDG) 7.1 (universal access to affordable, reliable and modern energy services) and for the overall economic development of client countries. Importantly, transmission and distribution sector modernization and expansion require significant and long-term investment, and the World Bank is one of a few donors with sufficient resources to support client countries in this area of development. GEDAP's experience shows that a recognition of such comparative advantage by the Bank and its commitment to delivering expected results in this area is the right approach. In Ghana, while the supply-demand gap in electricity sector (power generation insufficient to cover demand) was reversed during the years of Project implementation and the share of population with electricity access soared from 54.0 percent in 2007 to 85.3 percent in 2020, the inefficient transmission and distribution sector was causing limited availability and low supply quality of electricity. Over the years of project implementation, through several restructurings and two AFs, adapting the project to new circumstances, GEDAP's team demonstrated commitment to resolving this problem. Largely as a result of network modernization and intensification under GEDAP, annual unplanned outages considerably dropped, and the bottlenecks in connecting additional customers diminished. (this lesson is a modification of ICR's lesson in paragraph 110)

The following lessons were formulated by IEG:

- The task of supporting off-grid rural electrification is challenging, and the scale-up requires significant additional investments. The Project's experience has shown that while the social benefits are significant, the economic benefits (without accounting for the social ones) are likely to be negative. The cost of connecting remote communities is very high, and often the amount of electricity produced by the household level PV systems or through mini-grids is low (and therefore economic benefits are low). While the Project's investment in this market segment was large and the targets were achieved, it is still unclear if the innovative approaches to RE-based rural electrification promoted by the Project will be scaled up, considering negative net benefits demonstrated by the Project in this area.

- Setting ambitious tasks that depend on factors outside of the Bank control often leads to the non-performance of the Bank projects. Instead, it would make more sense to support parts of those tasks that are within the Bank's control and exclude the parts that are high-risk because they depend on



political economy and politically motivated decisions. In the Project, it was a mistake to aim at achieving a significant progress in improving financial and operational performance of the electricity sector, while such progress depended on the sector's complicated political economy. Instead, it would have been more reasonable to aim at a less ambitious but more realistic task of supporting the ECG's commercial performance by investing in its capacity to measure consumption (through pre-payment metering and the supporting IT systems), manage outages (through IT solutions), manage resources (using state-of-the art technologies), and collect and analyze sector performance data.

- While designing the M&E framework, it is important to consider both intermediate (and possibly long-term) indicators and those that measure direct project outputs and immediate outcomes. The Project's RF was focused on ambitious intermediate outcome indicators, which were hard to achieve, while many outputs and immediate outcomes were not measured (e.g., outputs in the distribution network improvements component) were not included. It would be beneficial for adequate measurement and monitoring of project performance to include output and immediate outcome indicators in the RF while including intermediate outcome indicators only when their achievement was realistic.

### 13. Assessment Recommended?

No

### 14. Comments on Quality of ICR

The ICR provides a detailed history of the project and quantitative evidence related to the determining the efficacy ratings. The justification and transitions from the original project to the two Additional Financing stages were clearly delineated, as were the reasons for the ensuing delays. Although too long at 44 pages just for the main text, it is clear that much background research and reconciliation of fragmented sources went into the preparation of the ICR.

However, the ICR had significant shortcomings, when set in reference to IEG criteria for assessing ICR quality. In more than one case, the basis for ratings is unclear. The usage and presentation of data (most notably, Project cost data) are inconsistent and/or not comparable; this has hampered the comparison of costs at appraisal and closing, since the figures provided contain mistakes and lack references and explanatory notes. There are cases where the analysis and evidence leading to conclusions are either missing, or not supportive of conclusions, or confusing, or incorrect. Some lessons lacked logical coherence. For example, para 110 asserts as a lesson that expanding transmission and distribution would be justified even if efficiency and reliability had not yet been achieved, yet the accompanying paragraph does not mention the serious macro-fiscal implications of that approach, and the dire yet long-unmet need to increase tariffs. On the latter, para 112 cites as a finding and recommendation that "more research" is required, yet it is well known from decades of Bank support that the lack of political will to raise tariffs and address ECG's poor financial performance are key factors to the unreliable energy supply. Important lessons were missed. The theory of change does not adequately describe the logical, causal chain of project interventions. Some parts of the long ICR are unclear and repetitive.



These weaknesses have complicated the validation of the ICR, for which it became necessary to conduct a wider review of documents to understand what was happening with the Project, which factors were important, what the cost data are, what conclusions can be made, and what lessons should be derived. In light of the foregoing assessment, the ICR quality is rated as modest.

**a. Quality of ICR Rating**

Modest