



Report Number: ICRR0024099

## 1. Project Data

**Project ID**  
P131084

**Project Name**  
ML-Rural Elec. Hybrid System

**Country**  
Mali

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

**L/C/TF Number(s)**  
IDA-53560,IDA-64720,TF-15897,TF-15961,TF-18873,TF-B0437

**Closing Date (Original)**  
30-Sep-2020

**Total Project Cost (USD)**  
60,788,729.74

**Bank Approval Date**  
11-Dec-2013

**Closing Date (Actual)**  
31-Mar-2023

	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	39,900,000.00	22,600,000.00
Revised Commitment	63,189,949.69	20,416,053.59
Actual	60,788,729.74	20,416,053.59

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**Project ID**  
P146287

**Project Name**  
ML-Rural Electrification Hybrid System ( P146287 )

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

**Closing Date (Original)**

**Total Project Cost (USD)**  
0

**Bank Approval Date**

**Closing Date (Actual)**



11-Dec-2013

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	0.00	0.00
Revised Commitment	0.00	0.00
Actual	0.00	0.00

## 2. Project Objectives and Components

### a. Objectives

The project’s development objectives were “to expand access to modern energy services in rural areas of the Recipient and to increase renewable energy generation in target areas”. This was as per the Financing Agreement, 2013, Schedule 1, p.6, as well as the Project Appraisal Document (PAD), p.8.

In the analysis that follows, the PDO can be parsed as follows: (i) “To expand access to modern energy services in rural areas of the Recipient; and (ii) to increase renewable energy generation in target areas”.

Because there was no change in the PDO, and changes in PDO outcome targets were relatively insignificant during the two restructurings, in 2019 and 2021, this review will not conduct a split evaluation.

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

No

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

No

### d. Components

**Component 1:** Service Improvement and Extension of Existing Mini-Grids (**Estimated cost at appraisal:** US\$39.4 million – of which IDA US\$19.5 million; **Actual cost at closing:** US\$43.93 million – of which IDA US\$25.91 million). This component, which had two sub-components, was intended: (1) to support – along with grant funding from SREP (Program for Scaling Up Renewable Energy in Low Income Countries) - the installation of an additional 4.8 MW of generation capacity in hybrid systems (including photovoltaic panels, inverters, batteries and control electronics); and (2) to support – along with grant funding from GPOBA (Global Partnership on Output-Based Aid) - increased access to electricity through extension and densification of rural mini-grids, including 2,400 Solar Home Systems (SHS). This sub-component partially supported the initial costs household connection to basic electricity service, including internal wiring in the newly connected houses, and provision of connection subsidies to poor households located in the service areas of existing mini grids.



**Component 2:** Development of Off-grid Lighting Markets and Energy Efficiency (**Estimated cost as appraisal:** US\$2.7 million (all IDA); **Actual cost at closing:** US\$2.36 million, of which US\$0.19 million from PHRD (Japan Policy and Human Resources Development). There were two sub-components: (1) intended to fund provision of Off-grid Lighting and Solar Lanterns, through (a) output-based subsidies to private distributors for the sale of certified portable solar lanterns, and (b) deployment and acquisition of portable solar lanterns in selected public schools and social facilities; and (2) aimed to fund promotion activities for energy efficiency, to reduce demands on existing mini-grids. The sub-component also supported the acquisition of energy-saving equipment by women's groups and rural production associations/communities for use in productive income-generating activities.

**Component 3:** Project Management Support and Capacity Building (**Estimated cost at appraisal:** US\$2.8 million (all IDA-financed); **Actual cost at closing:** US\$12.78 – of which US\$11.58 million from IDA and the balance from SREP, GBOPA and PHRD. This component financed (a) project management and supervision, including technical and procurement capacity for AMADER, project management support, the owner's engineer, studies and audit; (b) capacity building and technical assistance for rural electrification actors and stakeholders, AMADER and other relevant sector institutions, and for the Ministry of Energy and Water; (c) monitoring and evaluation activities, including financing of a baseline study of targeted mini grids pre-hybridization, and a follow-up study after investment completion; and (d) supporting information, education and communication, by financing information and promotional campaigns and communications between AMADER and local operators, central government and local government institutions.

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

##### Project Cost and Financing

All of the project's financing was provided through two IDA credits, an initial credit of US\$25 million, followed by an additional financing (AF) amount of US\$22.7 million (US\$20 million IDA plus TF of US\$2.7 million). The project also received grant funding from three trust funds: SCF-SREP (Strategic Climate Fund Scale-Up Renewable Energy Program) – US\$14.9 million; GPOBA – US\$5 million; Japan PHRD (Policy and Human Resource Development) Fund – US\$2.7 million.

No borrower contribution was envisaged at appraisal, nor did any take place subsequently. However, it is noted that the Government contributed indirectly to the project by making AMADER available as project implementing agency, the personnel costs of which were covered by the Government.

##### Dates

The project was approved on December 11, 2013, becoming effective on June 18, 2014. The original closing date was September 30, 2020. However, this date was extended via three restructurings - to March 31, 2023. The first restructuring, on June 28, 2019, was to introduce the Additional Financing, triggered by an underestimation of investment and management costs, subsidies and unbudgeted tax expenditures, with an extension of closing date by 12 months; the second, on September 30, 2021 to further extend the closing date by six months, to March 31, 2022, on account of delays triggered by procurement challenges and two military coups; and the final one – triggered by ECOWAS sanctions on the transition government - to extend the project to a final closing date of March 31, 2023. The restructurings were not accompanied by any change in the project's development objectives and components.



### 3. Relevance of Objectives

#### Rationale

##### Country and Sector Context

Prior to 2012, Mali had been considered an example of democratic governance and political stability. In 2012, however, the country faced a multitude of crises on three fronts: conflict in the North, political turmoil in the South and humanitarian and food insecurity across the country due to a drought in 2011. These crises led the World Bank to trigger Operational Policy OP 7.30, suspending disbursements to Mali. The suspension was lifted following the preparation of an Interim Strategy Note (ISN) in June 2013 – which was a prelude to approval of the current operation. At the time of appraisal, Mali was one of the poorest countries in the world, ranking 182 out of 186 countries in the UNDP’s Human Development Index. Poverty increased as a consequence of the drought and political turmoil in 2012, from an estimated 43.6 percent in 2010 to 46.0 percent in 2012. The subsequent decade, which saw the implementation of the current project, was marked by further political and economic uncertainty. Despite elections taking place in 2013 and a peace agreement being signed with two rebel coalitions in 2015, insecurity and ethnic conflict spread into central Mali. The eruption of widespread protests in June 2020 was followed by a military coup in August 2020, and postponement of elections due in 2022, which led to sanctions by the Economic Community of West African States (ECOWAS), which were lifted only in July 2022, after the Government committed to holding elections in 2024.

Access to modern energy services remained low, despite the economic progress that had been made in the decade prior to 2012. Some 80 percent of household energy needs had to be satisfied by biomass resources (wood and charcoal), causing health problems among households and aggravating environmental problems, such as deforestation and land degradation. At the time of appraisal, access to electricity in Mali was estimated at around 30 percent (55 percent in urban areas and only 18 percent in rural areas). Electricity provision in urban areas was the responsibility of the State-owned *Energy du Mali* (EDM-SA), which had a client base at the time of 290,000 connections. The majority of the population however lived outside the EDM-SA concession area. To reach this population, the Government of Mali (GoM) launched an ambitious rural energy access program implemented under the responsibility of the newly created rural electrification agency, AMADER. From 2004 to 2012, an IDA-financed Household Energy and Universal Access project (HEURA), implemented by AMADER, played a key role in development of the country’s rural energy sector, with an estimated 1.2 million people gaining access to modern energy services through the project. Progress made in rural electrification access was quite significant, with a ten-fold increase – from about 1-2 percent of the population to 18 percent – taking place in under a decade; though it had still to reach the large majority of the rural population.

##### Alignment with Country Strategies

Because of the overwhelming security issues in Mali, the World Bank’s strategic focus was largely on pathways toward strengthening social contract, human capital accumulation and private sector development. As a result of the acute security and political instability during the period, there was a paucity of strategic documents underpinning the country’s partnership with the World Bank Group (WBG). The last WBG Country Partnership Framework (CPF) covered the period 2016-19, with one of the core objectives



being to “Improve infrastructure and Connectivity for all Malians”. The earlier Strategic Country Diagnostic (SCD) had identified connectivity as a critical constraint towards lifting most Malians out of poverty and building the foundations for economic transformation, while energy was considered critical to enabling transformation of the economy. The CPF program included support for initiatives to tackle connectivity bottlenecks through leveraging power transmission lines and through targeted investments in renewable energy to diversify the energy mix. In addition, it was intended to increase the capacity of the energy sector through both policy reforms and investments, including from the private sector. Following the country’s stabilization and resumption of the Bank’s activities a new CPF covering the period 2024-26 is currently under preparation.

The project was generally consistent with a draft national electricity access strategy (SNAE) intending to achieve universal access to energy in 2040. Under the Strategy, many of the actions establishing the foundations supporting sustainable frameworks would be carried out during the coming years, 2022-28 – including the existence of a commercially and financially viable sector, and an efficient institutional framework. Similarly, one objective of the Bank’s ISN in 2013 had been to increase access to increase access to electricity in rural areas.

Based on the above, the relevance of the project’s objectives is rated Substantial.

## Rating

Substantial

## 4. Achievement of Objectives (Efficacy)

### OBJECTIVE 1

#### Objective

“To expand access to modern energy services in rural areas of the Recipient”

#### Rationale

##### Theory of Change (TOC)

The project was designed to increase access to modern electricity services in rural areas. Project activities aimed to increase generation capacity in hybrid systems (by 4.8 MW), install new LV transformers, distribution lines and public lighting, and to expand and densify existing rural mini-grids and their connection to new localities, as well as to expand off-grid lighting markets, including solar lamps sold and solar home systems (SHS) installed. The activities also aimed at providing project management support and capacity building. These activities were expected to lead to outcomes such as increased access to electricity by household connections, and increased capacity and generation of renewable energy (RE), leading to reduced greenhouse gas (GHG) emissions. The technical capacity and performance of rural electrification institutions was also expected to improve.



While the activities were broadly appropriate to achieving the desired outcomes, the theory of change (TOC) discussion in the ICR does not specifically analyze whether they were of adequate scale to create a critical mass for change.

Key assumptions underlying the TOC included: (a) Enhanced RE policy coordination and modernization, (b) Mobilization of enough financial resources to ensure continued maintenance of the hybrid electricity generation infrastructure, and (c) An increased dialogue among the key stakeholders to manage and maintain the rural energy infrastructure.

Indicators used to measure the achievement of objectives were consistent with the above results chain. To measure increase in access to electricity under the project, the outcome indicator was the number of people with access to electricity by household connection. Increased generation capacity of non-hydro RE constructed under the project was measured by the amount of MW of RE generation capacity constructed under the project. Other indicators included annual electricity output in MW/h from RE (solar, biodiesel) under the project; the amount of GHG emissions reduced in CO<sub>2</sub>/ton; and the number of direct project beneficiaries, of which female.

### **Outputs**

- 9,320 domestic solar home systems (SHS) were installed by project closing against a target of 6,860.
- 9,272 additional connections to existing mini networks took place, against a target of 9,770, i.e. a 95 percent achievement rate.
- 227 Km of distribution lines were constructed or rehabilitated under the project against a target of 225 km.
- 94,876 CFL or LED bulbs were distributed by project closing, against a target of 58,700.

### **Outcomes**

The project was successful in increasing the number of people with access to electricity in rural areas of Mali. Though the target of 612,000 people was revised downwards to 550,800 under the restructuring of September 2021, actual achievement was much higher, of the order of 632,147 people provided access by household connection. The increase in connections came about on account of the enthusiasm created by the improvement in quality and duration of service, plus the reduction in price per kWh, arising from hybridization.

The number of direct project beneficiaries was 893,534 - falling slightly short of the (revised) target of 1,000,800 (hence, partially achieved). The target ratio of female to male beneficiaries, of 50.40, was however on track. This achievement number includes 632,147 people provided access via connection to mini grid and SHS, 98,853 beneficiaries of solar lanterns, and 162,060 hospital patients benefiting from the lighting and solar water heater service installed in 2021.

The increased access to modern energy services in rural areas reflected an increased densification of electricity mini grids, an expansion of distribution lines, together with an increase in connections. This included rehabilitation of existing networks, creation/extension of the 15 kV medium voltage network through installation of LV transformers, extension of the low voltage network and creation of a public lighting



network. Some 9,272 additional connections were made to existing mini grids, against a forecast of 9,770, or a performance rate of 95 percent. New MV/LV distribution lines installed reached 227 km, marginally exceeding the target of 225 km.

Based on the above, efficacy of PDO1 is rated Substantial.

### **Rating**

Substantial

## **OBJECTIVE 2**

### **Objective**

“To increase renewable energy generation in target areas”

### **Rationale**

The theory of change applicable to this objective is the same as for Objective 1. Relevant activities to meet this objective included a focus in off-grid lighting and solar lamps, the building of new solar home systems (SHS) and delivery of new domestic solar kits and solar lanterns, and the signing of lamp distribution agreements.

### **Outputs**

- Hybrid mini-grid (solar/diesel) systems installed: 45 hybrid mini-systems were installed by project closing, in excess of a target of 42 systems.
- 98,853 “Lighting Africa” solar lanterns were disseminated, against a target of 90,000 (revised from 110,800 in 2021)
- 11,000 solar lanterns were distributed in schools and socio-community infrastructure in non-electrified rural areas, against a target of 10,800.
- 58 items of Energy Efficient equipment for social infrastructure were distributed as part of the productive use of solar energy for the creation of income-generating activities for the benefit of women in rural areas (target was 50).

In addition,

- All 50 localities housing a solar plant were reached by information and communication campaigns (target was 50).
- 577 persons received training and capacity building in the fields of technical and solar engineering, management, environmental and social management under the project. The target was 420 persons, which was significantly exceeded.



- 9 studies related to rural electrification were completed by project closing, against a revised target of 6 (original target of 4).

- of the 9 project-related grievances received under the project grievance redress mechanism, all 9 (or 100 percent) were handled to the satisfaction of the complainants (target was 100 percent).

### **Outcomes**

Electricity infrastructure funded by the project substantially helped increase the volume of electricity generated from RE sources. Annual generation of renewable energies from various sources was 10,654 MWh at project closing, against a target of 13,000 MWh (revised marginally downwards from 14,000 MWh in 2021).

Generation capacity of renewable energy (other than hydro) constructed and installed was 7.21 MW at closing, against a target of 6.18 MW (slightly reduced at restructuring from the original target of 6.70 MW).

Greenhouse gas (GHG) emission reduction was of the order of 13,945 tons of CO<sub>2</sub> eq/year, in excess of the target of 10,678 tons of CO<sub>2</sub> eq (reduced in 2021 from the original target of 11,577 MW).

Based on the above, efficacy of PDO2 is rated Substantial.

### **Rating**

Substantial

## **OVERALL EFFICACY**

### **Rationale**

As seen from the above, the project substantially achieved its two objectives. Considerable progress was achieved in terms of increasing access to electricity, especially in terms of household connections. Substantial achievements were also recorded in increasing renewable energy generation in target areas. On balance, project efficacy is rated Substantial.

### **Overall Efficacy Rating**

Substantial

## **5. Efficiency**

The economic internal rate of return (EIRR) for the project at closing was estimated at 25.7 percent, with a Net Present Value (NPV) of US\$22.1 million (at a 6 percent discount rate), compared to the estimated rate at appraisal of 11 percent and NPV of US\$2.03 million at the same discount rate. The EIRR at closing was





estimated taking into account returns for the solar lanterns, CFL/LED distribution and SHS systems, which were not included in the estimates made at appraisal. Using the same parameters as at appraisal – i.e. without taking into account these items – the ERR works out to 13.7 percent, with an estimated NPV of US\$14.7 million. These estimates can be considered to be relatively conservative as they did not include the benefits of solar libraries, energy saving equipment, and the 11,000 solar lanterns supplied to the socio-community infrastructure, nor of the vastly improved lighting quality of solar systems compared to the kerosene lighting quantified in the analysis.

If the benefits of GHG emission-reductions are included, economic returns increase further to between 27.2 percent and 28.9 percent, depending on the social value of carbon (SVC) assumed.

**Operational/Administrative Efficiency**

The project was implemented in a challenging environment, with insecurity affecting some of the localities selected for implementation, and in the wake of two military coups and the global pandemic. As such, there were delays in disbursement and in the delivery of planned infrastructure and services, leading to a delay in project closing of 30 months. Nevertheless, the actual cost of implementing the operation remained within the earmarked budget. The project’s results were achieved at a total cost of US\$60.79 million, which was slightly lower than the estimated cost of US\$67.60 million.

Taking into account the relatively high economic returns relative to estimates at appraisal, combined with relatively moderate operational performance and administrative efficiency, the project’s overall efficiency is rated Substantial.

**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	✓	11.00	0 <input checked="" type="checkbox"/> Not Applicable
ICR Estimate	✓	13.70	0 <input checked="" type="checkbox"/> Not Applicable

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

**6. Outcome**

The project’s development objectives remain substantially relevant to the objectives of Mali’s energy sector and the energy needs of the rural population. Its overall efficacy is rated Substantial, the project having achieved many of its key development objectives. Its efficiency is similarly rated Substantial, taking into account both



economic analysis and Operational/Administrative efficiency considerations. As such, its overall outcome is rated Satisfactory.

**a. Outcome Rating**  
Satisfactory

## 7. Risk to Development Outcome

Key risks to development outcome were likely to arise from:

- (a) Continued insecurity and unclear Government policies for the energy sector and rural electrification. Mali's political situation continues to be uncertain, arising from developments within the country and within ECOWAS. The lack of policy clarity might well stall the impact of the achieved outcomes.
- (b) Lack of appropriate expertise to repair and maintain the hybrid mini plants installed; along with an absence of clear arrangements in the oversight of the rural electrification practice. AMADER reported that most of the 45 hybrid power plants had no qualified technicians to oversee the proper functioning of the plants. Existing arrangements among the key stakeholders (Directorate of Energy, AMADER, OSER and the independent operators) moreover appeared unclear as regards the allocation of responsibilities for addressing the operational inefficiencies in these plants.
- (c) Disincentives in the energy sector arising from high tariffs and the potential transfer of the mini hybrid plants to the State Utility. Mitigation policy should address the issue by promoting grater dialogue between the key stakeholders

## 8. Assessment of Bank Performance

**a. Quality-at-Entry**

The design of the project drew from the lessons of prior operations, including the Household Energy and Universal Access Project (P075558), which played an important role in structuring the rural electrification sector in Mali, and the Energy Support Project (P108440), which supported the expansion of access in urban and peri-urban areas. The project was strategically relevant at appraisal, being not only consistent with WBG's energy strategy but also with the higher-level objectives of the Program for Scaling Up Renewable Energy in Low Income Countries (SREP), and remained so during implementation.

The implementation arrangements put in place for the project were generally adequate, with the Malian Rural Energy Service Agency (AMADER) being identified as the implementing agency. AMADER had experience in implementing a Bank project, as well as national programs and its procurement procedures and contract management practices were considered reliable, efficient and transparent. In practice, however, implementation readiness turned out to have been less than optimal, as the PIU did not have a Procurement specialist. Many feasibility and other studies at the core of project implementation were



moreover not ready at approval, which also affected implementation readiness. But overall, design is rated Satisfactory.

**Quality-at-Entry Rating**  
Satisfactory

**b. Quality of supervision**

The project appears to have been adequately supervised. The Bank team conducted 18 supervision missions over a nine-year period which included the military coups that took place in 2020 and 2021, which triggered OP 7.30 which halted Bank operations in the country, the Covid-19 pandemic, which impacted project implementation, a severe deterioration of security conditions in localities in the interior of the country, and economic sanctions imposed by ECOWAS, which resulted in closure of borders and halted financial flows. The Bank team was able to keep the project alive and broadly on track despite these major implementation challenges.

The ICR notes (para 76) that while procurement delays were taking place at the outset on account of low capacity of AMADER to manage Bank procedures, the Bank team addressed this problem by: a) fast-tracking recruitment of a procurement specialist, and b) putting in place a short-term technical assistance to manage fiduciary issues for the project until the procurement specialist was on board in November 2015.

Overall, while delays in disbursement and project implementation did take place on account of the above-mentioned challenges, the Bank team displayed resilience and commitment to results implementation (ICR, para 78). The team worked closely with the Borrower and other stakeholders to complete all procurement and safeguards transactions despite extreme internal and external constraints.

**Quality of Supervision Rating**  
Satisfactory

**Overall Bank Performance Rating**  
Satisfactory

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

**a. M&E Design**

M&E design and arrangements were generally adequate. The PDOs were clearly stated and appropriately reflected in the results framework. Most indicators to measure outputs and outcomes of individual objectives were realistic and measurable, as were the intermediate indicators. Most indicators could be monitored on a regular basis – except for annual GHG reduction estimates and project-related grievances registered under the grievance redress mechanism (GRM), which were planned to be addressed at project closing or during an impact evaluation at a later stage of project implementation.



M&E arrangements were embedded in the appropriate institutions – namely the Project Management Unit (PMU) located in AMADER, the implementing agency. Indicators, targets and mechanisms for monitoring were all discussed and agreed with the implementing agency.

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

According to the ICR (para 58), close monitoring of the key performance indicators (KPIs) was at the core of the results achieved by the project. In addition, during the Mid-Term Review (MTR) in April 2018, the Bank team and the Borrower assessed the performance of the project's implementation progress. The review conformed that the PDO continued to be relevant and was on the critical path to be achieved if additional financing (AF) were to be provided to supplement financing shortfalls.

The results framework was revised during the 2019 and 2021 restructurings to factor in changes to the scope of the operation arising from the AF, and changes to targets arising from implementation delays resulting in extensions of closing dates.

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

Data reporting by the PIU, Aide Memoires and Implementation Status and Results Reports (ISRs) all played a role in establishing dialogue among key stakeholders. These data also informed key implementation decisions, including the restructurings/additional financing.

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

Substantial

## **10. Other Issues**

### **a. Safeguards**

The project was classified as Category B, triggering the following policies: (a) Environmental Assessment (OP 4.01), (b) Physical Cultural Resources (4.11), and (c) Involuntary Resettlement (OP4.12). An Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) were prepared by the Borrower and cleared by the World Bank, with specific chapters on issues related to Natural Habitats, Physical Cultural Resources and Involuntary Resettlement. The ESMF outlined an environmental and social screening process with monitoring and mitigation measures for future investments. All E&S instruments were reviewed, cleared and disclosed as per the Bank's requirements.

The Resettlement Action Plan (RAP) validated by AMADER in November 2017 was a key instrument bringing into focus the social dimension in the project's execution. The RAP enabled (a) the identification of Project Affected Persons (PAPs), to pay them compensation linked to losses suffered related to project activities, (b) identification of the most vulnerable persons in the population, to provide them with assistance in the form of a solar lamp and food kit, (c) the land security process to commence in order to guarantee the project plots equipped with land titles, and (d) develop the terms of reference for the RAP audit. The audit identified 430 vulnerable PAPs who were eligible for the social package of 12.36 million FCFA entirely



covered by AMADER. All PAPs who opted for the package were fully paid in cash, after which AMADER secured the land for project sites.

By closing, safeguards compliance with the triggered policies in handling environmental and social development on the ground had significantly improved (ICR, para 67) and was assessed as Moderately Satisfactory.

### **b. Fiduciary Compliance**

By mid-2015, procurement performance - as well project management - was rated Moderately Satisfactory in the ISRs, on account of the systematic delays associated with AMADER's slow procurement processing. A Memorandum of Understanding was formulated – by way of mitigation measure - between AMADER and the Project Coordination Unit to review procurement packages prior to the Bank's review. This new arrangement succeeded in substantially improving the quality – though not the speed - of the procurement packages submitted to the Bank.

Procurement risk remained Substantial throughout the period, as risk mitigation measures related to procurement identified at appraisal were not fully implemented. However, recruitment of the procurement specialist led to an improvement in AMADER's capacity. By project closing, procurement performance had improved sufficiently to be rated Satisfactory.

Financial management (FM) performance was adequate overall during the implementation period in terms of staffing, budgeting, reporting, accounting and external audit. The project financial management team had been in place at project effectiveness and became functional, and the project procedures manual laying out the roles and responsibilities of the key actors had been developed. By closing the FM system in place was moderately satisfactory, with an overall rating of the Project in terms of financial risk of moderate. The project's accounting was up-to-date, financial monitoring reports were submitted on timely basis and were of acceptable quality, plus the Board of Directors of AMADER was functional. There were some weak spots however, including some delayed bank reconciliations and errors in accounting entries, and an internal control system without an internal auditor.

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

According to the ICR (para 48), there was an improvement in the quality and duration of electricity service provision in comparison to generation based on thermal sources. The duration of service supply increased from 8 hours a day to 19 hours a day, thanks to the solar production source. There was also a corresponding reduction in electricity costs (including maintenance) and prices, the tariff being reduced from 250 FCFA/kWh average to 190 FCFA/kWh – i.e. by around 25 percent. There was also an increase in economic activities for productive uses in the project's beneficiary localities (metal welding, agricultural product processing units, schools, etc.).

### **d. Other**



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## 11. Ratings

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

## 12. Lessons

IEG derives the following lessons drawn from the ICR:

- 1. The Bank Group’s re-engagement in the energy sector in FCV countries calls for sustained and resilient commitment to the client.** This project lasted more than ten years in a politically unstable environment, ravaged by insecurity, compounded by the impact of a global pandemic. What helped was that the Bank and Government maintained a dialogue throughout the period of implementation, so as to be able to devise arrangements to keep the project alive, despite a growing insecurity, in localities where project activities were being implemented. The Bank’s willingness to remain engaged during a challenging period enabled the operation to commission a renewable energy infrastructure throughout the country, connect new households and communities to electricity, or improve energy service for close to a million beneficiaries.
- 2. Public-private participation is a key ingredient to achieving efficiency and sustainability in the provision of energy services in rural areas.** The project aimed to introduce market incentives for distributors of lamps and economic undertakings by women associations, through the provision of subsidies and promotion policies from Government entities to prime the pump. While hybrid plants were owned by the State, they were managed by private operators via a contractual arrangement with AMADER and the operator. The latter oversaw electricity distribution, payments and collection of revenues, while AMADER ensured tariff regulation and monitoring of the operations of the mini networks. The project also trained women in cooperative management, entrepreneurship, accounting and handling of gas-powered equipment, marketing and labeling techniques for local products. These two initiatives were key to bringing in greater efficiency in the sector using private operators and launching economic units managed by women.
- 3. For countries with a dispersed rural population off-grid mini plants and SHS are a recipe for provision of affordable energy services.** Off-grid mini plants and SHS are cost-effective approaches to expansion of energy services to dispersed populations, being tailored to rural conditions in terms of cost and maintenance. In countries in the Sahel, with abundant sunshine, the use of solar technology is an efficient way of bringing about rapid expansion of electricity access to relatively remote areas, until such time as the grid infrastructure can eventually be extended there.



### **13. Assessment Recommended?**

No

### **14. Comments on Quality of ICR**

The ICR is well written, candid review and internally consistent, and provides a fair amount of detail on background and implementation issues. The achievement of objectives is adequately analyzed, though a clearer description of outputs achieved would have been useful. The Bank's performance is adequately assessed, as is the M&E system. Overall, the narrative appears to support the ratings and available evidence. One area where more details might have been useful is compliance with environmental and safeguards issues. Also, key lessons from the project could usefully have framed to have a broader application to potential future operations and interventions.

#### **a. Quality of ICR Rating** Substantial