Report Number: ICRR0024016

1. Project Data

Project ID	Project Name
P133312	Energy for Rural Transform III
Country	**Practice Area(Lead)**
Uganda	Energy & Extractives

L/C/TF Number(s)	Closing Date (Original)	Total Project Cost (USD)
IDA-56530	31-Dec-2020	142,917,875.48
Bank Approval Date	**Closing Date (Actual)**	
05-Jun-2015	30-Jun-2023	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	135,000,000.00	0.00
Revised Commitment	135,000,000.00	0.00
Actual	133,751,595.13	0.00

Prepared by	Reviewed by	ICR Review Coordinator	Group
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Project ID	Project Name
P146876	UG-GEF Egy for Rural Transform III (P146876)

L/C/TF Number(s)	Closing Date (Original)	Total Project Cost (USD)
		8196004.04
Bank Approval Date	**Closing Date (Actual)**	
05-Jun-2015		

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	0.00	8,200,000.00
Revised Commitment	0.00	8,196,004.04
Actual	0.00	8,196,004.04

2. Project Objectives and Components

a. Objectives

According to both the International Development Association (IDA) Financing Agreement (p.6) dated December 16, 2015, and the Project Appraisal Document (p.14), the project objective is "to increase access to electricity in rural areas of Uganda."

The formulation of the project objective in the Global Environment Facility (GEF) Grant Agreement (p.5) dated December 16, 2015 included the reduction of greenhouse gas emissions as an additional objective: "To increase access to electricity in rural areas of Uganda and reduce greenhouse gas emissions."

This review will assess the project's performance based on the achievement of the project objective as defined in the IDA Financing Agreement.

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

No

c. Will a split evaluation be undertaken?

No

d. Components

The Energy for Rural Transformation Project III (ERT-3) was the third phase of a project series and consisted of three components:

A. On-Grid Energy Access. *(Appraisal cost: US$144.60 million; actual cost: US$131.48 million excluding the cost incurred by the Government of Uganda because data was not available)*

This component was to finance on-grid investments to be implemented by the Rural Electrification Agency (REA). These investments were to consist of grid expansion (construction of 21 priority distribution lines totaling 1,800 kilometers (km) in accordance with the Indicative Rural Electrification Master Plan), grid intensification (short grid extensions to medium and low voltage networks), and electricity connections (last mile or no pole household connections). This component was to also support REA in strengthening its rural electrification oversight capacity through the provision of technical advisory services, non-consulting services, training, and acquisition of goods and in implementing the on-grid investments through planning,

coordination, and implementation support, supervision of constructions, and independent verification of connections.

B. Off-Grid Energy Access. *(Appraisal cost: US$25.00 million; actual cost: US$22.08 million)*

This component was to finance the following activities: (i) installation and maintenance of solar photo-voltaic (PV) systems in health centers, post-primary schools, and water pumping schemes and technical advisory services to the ministries responsible for these sectors; (ii) strengthening of business development services through the provision of training to wiremen, technicians, and contractors, the construction of pico-hydro and micro-hydropower generation facilities, and the organization and self-regulation of solar PV vendors; (iii) scaling up of the Credit Support Facility through the Uganda Electricity Capitalization Company (UECCC) to facilitate financing of solar sub-projects by financial intermediaries, and the strengthening of the capacity of the UECCC in product enhancement and pricing, appraisal and risk assessment of solar companies, risk management, process and procedures for its operations and information systems; and (iv) the carrying out of awareness campaigns on quality and effectives solar lighting procedures and strengthening of the capacity of the Uganda National Bureau of Standards (UNBS) in reviewing the national solar quality assurance framework with the goal of obtaining international accreditation.

C. Institutional Strengthening and Impacts Monitoring. *(Appraisal cost: US$5.60 million; actual cost: US$4.73 million)*

This component was to provide technical advisory services to the Ministry of Energy and Mineral Development (MEMD) and the REA for institutional strengthening, regulatory enhancement, conducting studies, and capacity development in rural electrification. These activities were to consist of undertaking a cost of service study for the sector, carrying out of consumer affordability studies, preparation of national guidelines for the design and construction of electricity distribution infrastructure, review of qualifications and licensing requirements for electrical technicians, systematic review of the new electrification model, carrying out of priority environmental and social impact assessment studies, and a comprehensive review of technical information on potential geothermal sites and improvement of the related legal framework. The component was also to support project implementation, coordination, and oversight by the MEMD, the REA, and the project coordination unit including monitoring and evaluation.

Revised Components

At the second project restructuring, the development of six pico and micro-hydropower generation projects by the Private Sector Foundation of Uganda was dropped because of significant delays in preparing the feasibility studies, and a 307 km distribution line section was excluded from the project's financing because of the government's request to prioritize funding for other activities.

Additionally, the financial intermediation activities under the second component were scaled down from US$8.5 million to US$4.7 million because of slow progress in lending to solar energy companies. The number of water pumps to be installed with solar PV systems was increased to use additional funds that became available because of an amendment of the Value-Added Tax Law. Under the third component, the geothermal development preparation, review of the electrification model, and the impact evaluation of Energy for Rural Transformation Project II (ERT-2) were dropped. Instead, the scaling up of the certification of wiremen and a baseline survey for ERT-3 were added to the project scope. The revisions to the project components reported in this paragraph were included in the Aide Memoirs but not documented in the project restructuring papers (ICR, footnote 6, p.14).

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

Project Cost: The project cost was originally estimated at US$176.4 million including a price contingency of US$1.2 million. The project closed on June 30, 2023, with an actual cost of US$158.29 million. The actual cost was lower than the estimated cost because of lower financing requirement for the acquisition of the wayleaves for the installation of the installation of solar PV systems at schools, health centers, and water pumping stations.

Financing: At appraisal, the IDA credit amount was estimated at US$135.0 million and the GEF grant amount at US$8.2 million. The project fully disbursed the GEF grant and US$133.8 million of the IDA credit by project closing.

Borrower's contribution: At appraisal, the borrower's contribution was estimated at US$33.2 million to finance the acquisition of wayleaves. At project closing, the actual borrower's contribution was estimated at US$18.0 million as confirmed by the World Bank project team.

Project Restructurings: The project was restructured three times.

- **First Project Restructuring (June 12, 2020 – Level 2):** The project closing date was extended by 12 months from December 31, 2020 to December 31, 2021 to allow time for the completion of the grid extension and intensification works under the first component that were delayed because of inadequate project implementation arrangements and management capacity, insufficient staffing to implement the project, protracted procurement processes, and inefficient internal processes. The non-compliance to World Bank's Involuntary Resettlement safeguard policy under the previous ERT-2 necessitated the preparation of a new framework under the ERT-3 to ensure compliance with the requirements of this safeguard policy. The time required to prepare the new framework delayed the implementation of the project activities. Lastly, the restrictions imposed by the onset of the COVID-19 pandemic in March 2020 delayed project implementation activities.
- **Second Project Restructuring (October 14, 2021 – Level 2):** The project closing date was extended by 11 months from December 31, 2021 to November 30, 2022 to allow time for the completion of the delayed project activities because of the continued adverse impact of COVID-19 pandemic-related restrictions (on site mobilization, importation of major electrical equipment, and compensation of project-affected persons), the reorganization of the REA (the project implementing agency of the first component) as a new department under the MEMD, and the general elections held in January 2021. The financing agreement was revised to replace the REA by the Department of Energy Resources Development (DoERD) of the MEMD as the implementing agency of the rural electrification activities under the first component. Additionally, the development of pico and micro-hydropower generation projects were dropped from the project scope because of significant delays to conduct feasibility studies, and the target for the "total length distribution lines constructed under the project (kilometers)" was reduced because of the government's decision to exclude 307 kilometers of a line section from financing under the project (see Revised Components above).
- **Third Project Restructuring (November 25, 2022 – Level 2):** The project closing date was extended by seven months from November 30, 2022 to June 30, 2023 to allow time for the completion of the project activities that were delayed because of the continued impact of the institutional changes in the status of the REA and non-compliance with the implementation of the Involuntary Resettlement and Forests safeguards policies. There were about 16,000 unpaid project-

affected persons at the time of the restructuring, and some project works were undertaken without mitigation measures to minimize the project's impact on forests. An action plan was prepared and implemented to address these safeguards' issues that continued beyond project closing.

Dates: The project was approved on June 5, 2015 and became effective ten months later on March 31, 2016 because of the delay in establishing a project implementing unit for the activities under the first component. The Mid-Term Review was conducted in February 2019. The original project closing date was December 31, 2020, but it was extended by 30 months (please see the project restructurings above for the reasons of project closing date extensions). The project closed on June 30, 2023.

3. Relevance of Objectives

Rationale

The project objective was substantially aligned with the World Bank's latest strategy as defined in the Country Partnership Framework (CPF) for the Republic of Uganda, FY2017-2021 (At the time of this review, there was no active country partnership framework for Uganda). The project sought to address the development problem of lack of access to electricity in the rural areas of Uganda—one of the major barriers to economic development and reduction of poverty. The project was to finance the expansion of the distribution network and the installation of solar PV systems at households, schools, public agencies, and water pumping stations to increase access to electricity that would have been expected to have a direct positive impact on the socio-economic welfare of the rural population. The project was also to support the development of private sector in solar PV systems and the development of pico and micro-hydropower generation plants. The project objective corresponded to "Strategic Focus Area B: Raising Incomes in Rural Areas" and the project supported the achievement of "Objective 4: Enhanced resilience of the poor and vulnerable" through increased access to electricity among others (CPF, p.37). The project indirectly supported the achievement of "Objective 2: Improved social service delivery" through improvements in education and health services because of increased access to electricity under "Strategic Focus Area A: Strengthening Governance, Accountability and Service Delivery" (CPF, 33). However, the focus of the latest bank strategy on increasing access to electricity was weaker compared to the focus in the previous Country Assistance Strategy (CAS), FY2011-2015. The CAS specifically included "increased access to electricity" as an objective under the "Strategic Objective 2: Enhancing Public Infrastructure." The achievement of this CAS objective was rated unsatisfactory; the World Bank's efforts to increase access to electricity during the CAS period were adversely affected by "unclear roles and responsibilities of agencies involved in expanding access to power" in Uganda (CPF, p49). Yet, the Strategic Country Diagnostic (SCD) Update of 2021 points out the importance of increased access to electricity for accelerating growth and identifies the lack of access to electricity as one of the dimensions of poverty in Uganda. Similar to the recent CPF's focus, the SCD Update included improved access to electricity along with internet connectivity and digital technology infrastructure and solutions under its priority area of "Governance and service delivery." Therefore, the project objective is aligned with the priorities and proposed key actions of the SCD Update.

The project objective was substantially relevant to the country context. The project directly supported the government's rural electrification efforts as defined under the Rural Electrification Strategy and Plan 2 (RESP-2) with the goal of increasing the electrification rate to 80 percent by 2040. Therefore, the project objective was appropriately pitched for the development status in the country but as explained in the previous paragraph, the unclear roles and responsibilities of agencies involved in expanding the electricity

coverage in Uganda still continues to be a bottleneck for a successful implementation of national plans. This was evidenced during the implementation of ERT-2 when REA was reorganized as a department under the MEMD; this adversely affected the project implementation and the achievement of the project results.

The World Bank has been a long-term development partner of Uganda in the electricity sector and rural electrification. The project constituted the third phase of a programmatic approach to rural electrification. While the project objective was clearly defined as to increase access to electricity in rural areas of Uganda, it was output-oriented, rather than outcome-oriented; a significant shortcoming of the project formulation of the third project in a programmatic approach is the lack of clarity around what outcomes would have been achieved as a result of increased access to electricity.

Overall, while there were minor misalignments of the project objective with the World Bank strategy and the country context, and the objective was output-oriented rather than outcome-oriented, its relevance was, nevertheless, substantial taking the extremely low electrification rate in Uganda into consideration.

Rating
Substantial

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1
Objective
To increase access to electricity in rural areas of Uganda.

Rationale
Theory of Change of the Project

The project's theory of change was typical for a rural electrification project with an objective formulated at the output level as only increasing access to electricity. The project inputs (IDA credit, GEF grant, and technical assistance) were to be used to finance the expansion of the distribution network to connect households to the grid and the supply and installation of solar PV systems to households, schools, health centers, and water pumping stations while developing pico and micro-hydropower generation projects to increase the supply of electricity. The project was also to extend credit and guarantees to financial institutions and beneficiaries for the financing of solar PV systems and develop standards for solar PV systems to be adopted in the country. To support the electrification efforts in the medium term the project was to finance a review of electrification model and prepare a study for geothermal development. The project's outputs would have been distribution lines expanded and 150,000 households connected to grid electricity, solar PV systems installed at 30,000 households, 100 schools, 276 health centers, and 15 water pumping stations, and six pico and micro-hydropower generation facilities developed. Additionally, the project would have been expected to have extended a total of US$17.0 million credit and guarantees for solar PV projects, developed national standards for solar PV systems, completed a review of the electrification model, and prepared a study for geothermal

development. The intermediate outcomes of these activities would be a total of around 1.02 million people gaining access to electricity, and capacity of the related entities strengthened in implementing electrification activities. One critical aspect of the project was that the government was to pre-finance the cost of households' connection to the grid, which would have been repaid by the customers in 60 months without interest (This did not include solar PV systems). It was also estimated that there would have been sufficient demand from enterprises and individuals for credit and guarantees to install solar PV systems. The global environment outcome of the project would have been an avoided emission of greenhouse gases because of the installation of solar PV systems.

Overall, although the causal links from project inputs and outputs to the expected intermediate outcomes were direct and valid, and the achievement of the increase in the number of people gaining access to electricity and avoided greenhouse gas emissions could be attributed to the project's intervention, the theory of change had significant shortcomings regarding what outcomes that should have been expected from households, schools, health centers, and pumping stations' gaining access to electricity. Furthermore, the theory of change did not address the availability, quality, reliability, and affordability aspects of electricity supply service through grid, or the sustainability of the solar PV systems installed under the project.

Outputs

- **Total length of distribution lines constructed under the project (Kilometers):** Originally, the project was to finance the construction of 1,850 km of distribution lines consisting of 21 sections. The target was revised down to 1,543 km at the second restructuring because of the government's decision to exclude a 307-km of distribution lines from the project's financing. The achievement of 514 km in four sections at project closing was significantly lower than the revised target. After closing, and thus outside the project's financing and scope, 166 km of distribution lines were completed in December 2023 financed by government funds. The project team reported by email dated May 30, 2024, that the total length of distribution lines constructed as of April 30, 2024 reached at 784 km.
- **Number of on-grid household connections made under the project (number):** The project financed the connection of 122,783 households to the grid against the target of 150,000. The achievement was lower than the target because of the shorter length of the distribution lines constructed under the project and the two-year delay of the adoption of the Electricity Connection policy. Furthermore, as the ICR (p.19) reports, because the project could only build 541 km of distribution lines (see the previous indicator), the project established household grid connections using the pre-existing distribution network. Therefore, the achievement of this output can partially be attributed to the project's intervention according to the theory of change.
- **Number of off-grid household solar system installations made under the project (number):** The project financed the supply and installation of 4,072 off-grid household solar systems. The achievement was significantly lower than the target of 30,000 because of the demand for these systems did not materialize as estimated at appraisal. Affordability (i.e., high interest rates to finance the initial capital cost) and technical constraints regarding solar component standards in the local market also adversely affected the installation of solar PV systems. The project did not provide any subsidy for this activity.
- **Number of rural schools with solar PV systems installed:** The project financed the installation of solar PV systems at 89 schools against the target of 100.
- **Total installed capacity of solar PV systems installed at rural schools:** The achievement was 114 kWp. The target was 169 kWp.

- **Number of rural health centers with solar PV systems installed:** The project financed the installation of solar PV systems at 329 health centers. The target was 276 health centers. The achievement was higher than the target.
- **Total installed capacity of solar PV systems installed at rural health centers:** Although the project installed higher number of solar PV systems at rural health centers than the target, the installed capacity of these solar PV systems was 250 kWp. The target was also 250 kWp.
- **Number of rural water pumping stations with solar PV systems installed:** The project financed the installation of solar PV systems at 27 water pumping stations. The original target was 15 pumping stations. The achievement was higher than the target because of the reallocation of funds from other components to the implementation of this activity and the cheaper price due to the VAT relief on equipment.
- **Total installed capacity of solar PV systems installed at rural water pumping stations:** The achievement was 458 kWp against the target of 200 kWp because of the installation of a higher number of solar PV systems than the target.
- **Amount of credit and guarantee extended to Participating Financial Institutions (cumulative):** The achievement at US$3.8 million was lower than the target of US$8.5 million because of insufficient demand.
- **Amount of credit and guarantee extended to project beneficiaries by Participating Financial Institutions (cumulative US$ million equivalent):** The achievement at US$0.8 million was significantly lower than the target of US$8.5 million because of lack of demand.
- **National standards for Pico PV Systems adopted by UNBS:** The project financed the preparation of these national standards as planned.
- **National standards for Solar Home Systems adopted by UNBS (Yes/No):** The project supported the preparation of the national standards for solar home systems. These standards are now implemented.
- **Completion of the baseline survey report for ERT-3 (Yes/No):** The project financed the implementation of a baseline survey report for ERT-3 as planned.
- **Increase in certified wiremen for household connections:** The project financed the training and certification of 1,850 wiremen against the target of 2,300 wiremen.
- The project did not develop any pico or micro-hydropower generation facility, because this activity was dropped at the second restructuring. The geothermal development preparation, review of the electrification model, and the impact evaluation of ERT-2 were also dropped (see Revised Components in section 2.d. Components above).
- Expansion of low voltage (LV) lines: 32 percent (941 kms out of 2,970 kms) of LV lines were completed at project closure. There was no indicator to measure the achievement of this output.

Outcomes

- **People provided with access to electricity by household connections (Number):** At project closing, 714,901 people gained access to electricity through on-grid and off-grid household connections. The achievement was substantially lower than the target of 1,021,000 people mostly because of the lower than expected demand for solar household systems as explained in the following two indicators below and lower grid connections. As explained in the Outputs section, this achievement can only be partially attributed to the project's intervention because the project connected households to the grid using existing distribution network, not the distribution lines expanded under the project.

- **People provided with access to electricity by household connections –Grid (Number – Sub-Type: Breakdown):** Through on-grid household connections, 695,770 people gained access to electricity against the target of 850,000 people (Please see the previous indicator above for a discussion of attribution).
- **People provided with electricity by household connections – Off-grid/mini-grid – Only renewable sources (Number – Sub-Type: Breakdown):** The project's achievement in providing access to 19,131 people through off-grid solar home systems was significantly lower than the target of 171,000 people. The main reason was insufficient demand because of higher costs including interest rates.
- **Direct project beneficiaries:** This indicator includes the number of people who gained access to electricity through grid and off-grid connections under the project and those who benefit from electricity at schools, health centers, and water pumping stations. The achievement is reported at 8,595,298 people against the target of 7,600,000 people. Although the number of people who gained access to electricity through household connections was lower than the target (as given in the previous three indicators above), the number of project direct beneficiaries was higher than the target because more health centers and water pumping stations gained access to electricity from which higher numbers of people are estimated to benefit.
- **Tons of CO2 emission reduced/avoided as a result of the project (tCO2):** The avoided carbon dioxide emission amount because of project activities is estimated at 96,337 tons. This is lower than the target of 120,000 tons.

The project's achievement in connecting households to electricity through grid and solar PV systems fell short of the targets. The achievements of the on-grid connections can be partially attributed to the project's intervention because the households were connected to the existing distribution lines rather than the ones constructed under the project. The ICR (p.21) reports some anecdotal information gathered from the beneficiaries regarding the impact of access to electricity on social and economic activities, but these do not constitute a robust evidence base to validate the achievement of the project outcomes. The evidence is insufficient to assess the availability, reliability and affordability of the electricity supply service. There is a high risk that the ongoing construction of the distribution lines could not be completed because of insufficient government funds. Overall, the project, the third in a three-project series, fell significantly short of achieving the project outputs and outcomes. Therefore, the project's efficacy in achieving the project objective is rated Modest.

Rating
Modest

OVERALL EFFICACY
Rationale
Although the project was partially successful in connecting households to the grid using the existing distribution lines, it substantially fell short of achieving the project outputs of distribution lines constructed and

solar home systems installed. This resulted in fewer households gaining access to electricity than targeted. The overall efficacy of the project in achieving the project objective is rated Modest.

Overall Efficacy Rating	Primary Reason
Modest	Low achievement

5. Efficiency

Economic Analysis

At appraisal, a cost-benefit analysis was conducted for the on-grid infrastructure investments and the installation of solar PV systems at households, schools, health centers, and water pumping stations. The benefit included in the analysis was the consumer surplus derived from a comparison of average consumption basket before and after grid connection and the installation of solar home systems—the difference between the cost of paraffin and phone charging and the cost of using electricity from grid or solar home systems along with increased consumption. The analysis included the environmental benefit from a reduction in greenhouse gas emissions because of the use of solar PV systems. The costs associated with the extension of the distribution lines, grid intensification (low voltage lines), solar system installations, operation and maintenance costs of the assets, and the cost of additional power generation were included in the analysis as costs. The assumptions used in the analysis were appropriate for a project with the objective to increase access to electricity. The calculations resulted in an overall Economic Internal Rate of Return (EIRR) of 38 percent and a Net Present Value (NPV) of US$231 million at a discount rate of 10 percent. The EIRR and NPV estimated for on-grid connections were 39 percent and US$277 million, respectively, and those for the off-grid solar system installations were 20 percent and US$3.3 million.

At project closing, the same methodology with actual project benefits and costs was used to conduct a post-project economic analysis. The calculations resulted in an overall EIRR of 30.0 percent and an NPV of US$123.1 million. The EIRR and NPV for on-grid connections estimated at project closing were 33 percent and US$127 million, respectively. Although these calculations were lower than the those estimated at appraisal, they, nevertheless, were sufficiently high to confirm the economic viability of the on-grid connections and overall project. However, the EIRR and NPV for off-grid connections at 3 percent and negative US$3.2 million were significantly lower than those estimated at appraisal failing to confirm the economic viability of the off-grid connections. The main reason for a lower EIRR and an NPV for off-grid connections was the significantly fewer solar PV systems installed at households.

Operational and Administrative Efficiency

Through to project closing, the project was faced with significant operational and administrative inefficiencies. The project effectiveness was delayed by nine months because of lack of institutional capacity to establish the project implementing unit (PIU), which was a condition for effectiveness. The PIU staff were not solely assigned to the project but covered other activities. The PIU staff lacked capacity in procurement, safeguards implementation, and financial management. The project activities were non-compliant with Involuntary Resettlement and Forests safeguard policies. These significantly contributed to delays in project implementation that resulted in a total of 30 months of project closing extension. Despite these project closing day extensions, the extension of distribution lines could not be completed before project closing. Except two distribution line segments, the remaining 19 line segments and the pico and micro-hydropower project were not ready for

implementation at project start. Additionally, the change in the project implementation unit for the on-grid component because of the merging of the REA as a department under the MEMD resulted in a halt in project implementation for about six months. The delay in the government's issuance of the electricity connection policy in January 2018 (which was expected in March 2016) adversely affected the number of household connections. Poor documentation, insufficient capacity of the technical and procurement staff, and long-time required in receiving approvals from the contracts committees resulted in lengthy and delayed procurement of MEMD sub-projects. Weaknesses in contract management adversely affected project implementation such as withdrawal of the main supervision consultant for distribution line expansion because of delays in amending their contract that resulted in the implementation of some project works without supervision.

Overall, the project's efficiency in achieving the project objective is rated Modest because of major shortcomings in operational and administrative efficiency and low EIRR and negative NPV for the off-grid connections.

Efficiency Rating

Modest

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	✓	38.00	100.00 ☐ Not Applicable
ICR Estimate	✓	30.00	100.00 ☐ Not Applicable

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

6. Outcome

While the project objective was substantially aligned with the World Bank strategy and was output-oriented rather than outcome-oriented (for a project that is third in a three-project series), it was nevertheless highly relevant to the country context where the electrification rate is significantly low. Therefore, the relevance of the project objective is rated Substantial. The efficacy of the project in achieving the project objective is rated Modest because of the lower achievement of most targets. Similarly, the efficiency of the project is also rated Modest because of significant shortcomings in the operational and administrative efficiency of the project and low EIRR and negative NPV for the off-grid connections.

Although not directly a criterion for rating outcome, it is important, in terms of understanding project results comprehensively, to take into account the unsatisfactory performance and non-compliance of the project with Environmental Assessment, Involuntary Resettlement, and Forests safeguard policies, as well as health and safety requirements (see Section 10 below on Safeguards). The project team monitors the progress in the completion of the actions defined in the Post Closure Safeguards Corrective Action Plan the Government of Uganda developed because of non-compliance determined during project implementation.

Overall, the project's outcome is rated Moderately Unsatisfactory.

a. Outcome Rating
Moderately Unsatisfactory

7. Risk to Development Outcome

Financial risk for Solar PV Systems: Inadequate funds pose a high risk to maintain the solar PV systems installed at schools and health centers and protect them against vandalism. The maintenance of these assets by service providers for five years following their installation were included in the contracts financed by the project. These assets were also secured in lockable or welded cabinets. However, insufficient government funds beyond the initial five-year maintenance contract could adversely affect the maintenance and protection of these systems, and, hence, their operation. This is to be addressed by funds to be made available for maintenance under the follow-on World Bank-financed Electricity Access Scale-up Project (EASP – P166685) and by other donors (ICR, p.35).

Completion of the ongoing project activities: The government has been financing the ongoing construction of the distribution lines that were to be built under the project. The completion of those distribution line is delayed because of insufficient government funds. The government shares the implementation status reports with the World Bank on a monthly basis. Once completed, the expanded distribution network is expected to facilitate the connection of more households to the grid.

Financial Viability of the Service Providers: Service providers are faced with financial constraints. Although the current pricing policy allows the service providers to charge the customers a fee for the distribution service high enough to recover operating costs, if the collection rate dropped, the service providers' financial viability could worsen. This would have an adverse effect on the operation and maintenance of the distribution grids.

Replacement of the Solar Home System Batteries: The project connected 4,000 households to electricity through the installation of solar home systems. The households financed the installation of these solar home systems through their own funds or borrowing from the project, because the project did not provide any subsidy for their installation. Therefore, it should be expected that the households would have funds to replace the batteries at the end of their service lifetime. However, if the replacement of the batteries becomes unaffordable, the outcomes achieved from the installation of solar home systems could be lost as has been the case in other countries at the similar income level with Uganda.

8. Assessment of Bank Performance

a. Quality-at-Entry
Increasing the electrification rate in the country has been of a high strategic importance for the Government of Uganda. The project design to increase access to electricity was straightforward consisting of infrastructure investments for on-grid connections and installation of solar home systems to

provide off-grid electricity to households and public institutions. However, the overall design of the project was complex because each component consisted of numerous sub-components and various project activities ranging from development of geothermal power (preparation study) and pico and micro-hydropower projects to training of wiremen, technicians and contractors to be implemented by a total of eight implementing agencies. Economic analysis was adequately conducted showing the economic viability of the project's intervention in increasing access to electricity, but the assumptions related to the demand for solar home systems were overly optimistic. Monitoring and evaluation (M&E) arrangements were adequate to capture the project outputs and the increase in access to electricity but had shortcomings in encompassing the project outcomes related to electricity supply service quality.

Although similar issues were experienced during the implementation of the previous projects in this three-project series, the safeguards arrangements, both environmental and social, had shortcomings that led to project implementation delays. The insufficient institutional capacity of the REA, which was responsible for 85 percent of the project, was identified at appraisal, but the mitigation measures fell short of addressing this issue. The project was not ready for implementation except two distribution line segments out of 21. The demand for working capital and guarantee facilities, and the solar home systems was overestimated because of insufficient preparation at appraisal. The World Bank's strategy to prepare and implement subprojects within the project's implementation period was not realistic, which resulted in a significant downsizing of the working capital and guarantee facilities and deletion of the pico and micro-hydro power projects from the project scope along with some studies.

Overall, given the experience gained during the implementation of ERT-1 and ERT-2, the project should have been expected to be at a higher readiness status for implementation. However, the project readiness was weak, and insufficient support to the implementation capacity during appraisal led to significant delays that resulted in uncompleted project activities. Because of significant shortcomings in identification, preparation and appraisal of the project, the quality at entry is rated Moderately Unsatisfactory.

Quality-at-Entry Rating
Moderately Unsatisfactory

b. Quality of supervision
In-person supervision missions were held twice a year, except the COVID-19 period during which virtual missions were held. A brief review of the Implementation Status and Results Reports (ISRs) and Aide Memoirs showed that the performance reporting was candid and detailed. The project team's focus was more on addressing various project implementation issues, such as non-compliance with safeguards policies, delays in procurement, and strengthening REA's capacity in project implementation, which took for about three years (ICR, p.34). Despite these efforts, the project closed with significant shortcomings in the implementation of the Involuntary Resettlement and Forests safeguard policies; a Post Closure Action Plan had to be prepared to ensure the project activities compliance with these safeguard policies after project closing.

While there were moderate shortcomings in quality of supervision, the project team acted proactively to address the implementation issues most of which stemmed from insufficient preparation at appraisal. The onset of COVID-19 and the various other reasons beyond the control of the project team adversely affected

project implementation such as the merging of REA as a department under the MEMD. Overall, the quality of supervision is rated Moderately Satisfactory.

Quality of Supervision Rating
Moderately Satisfactory

Overall Bank Performance Rating
Moderately Unsatisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design
The project objective to increase access to electricity was output-oriented. The indicators in the results framework were sufficient to capture the achievement of the project outputs (such as the construction of distribution lines and number of solar PV systems installed) and the increase in the number households with access to electricity. These indicators were specific, measurable, relevant and timebound, but some were not achievable, such as the number of household solar systems and the amount of credit and guarantee extended to financial institutions, because the demand for these project activities was not adequately assessed at appraisal. The results framework did not include any indicator capturing the quality, reliability and availability of electricity supply through grid. The M&E arrangements were complex; five ministries and three agencies were responsible for collecting M&E data, and a Project Steering Committee chaired by the MEMD and consisting of the representatives of other ministries and agencies was to convene regularly to provide guidance to project implementation based on the M&E data.

b. M&E Implementation
The agencies responsible from collecting M&E data, and the project coordination unit prepared the quarterly progress reports (QPRs), but these were in the form of simple Excel-based spreadsheets. The QPRs “were not comprehensive enough and lacked adequate narrative to explain issues and remedial actions” (ICR, p32). The weaknesses in the results framework to measure the outcomes achieved because of increased access to electricity or those related to service delivery were not addressed during implementation. Some indicators were revised or deleted depending on the change in the project scope without being formally processed through project restructurings. The Project Steering Committee could only meet three times during project implementation adversely affecting the effective implementation of M&E.

c. M&E Utilization
The M&E findings were effectively used to prepare project implementation plans, but these plans were not implemented according to the schedule to complete the project activities before project closing. The M&E findings led to some revisions in the project scope such as the dropping of the pico and micro-hydropower projects and narrowing of the credit and guarantee mechanism, but these revisions were

mostly because of inadequate preparation at appraisal. The M&E data were used to provide evidence of application of inputs and achievement of outputs but not outcomes. The output-orientation of the project objective restricted the use of M&E data to show what happened as a result of increased access to electricity. The M&E findings led to the follow-on project of EASP. However, a project third in a three-project series should have provided more robust M&E data for the achievement of the project results beyond simple counting of the household connections or number of solar PV systems installed.

Overall, although the M&E utilization was partially effective in changing course when obstacles to project implementation occurred, there were significant shortcomings in the M&E system's design and implementation. Therefore, the quality of M&E is rated Modest.

M&E Quality Rating
Modest

10. Other Issues

a. Safeguards
The project was classified as Category B under Environmental Assessment (OP/BP 4.01) and triggered the Natural Habitats (OP/BP 4.04), Physical and Cultural Resources (OP/BP 4.10), Involuntary Resettlement (OP/BP 4.12), and Forests (OP/BP 4.36) safeguard policies.

Environmental Assessment (OP/BP 4.01): The project was classified as Category B because of site specific, temporary, and low impacts on environment such as solid and hazardous waste disposal, dust, noise, air and water pollution, vegetation clearance, and excavation and earthworks. Because the exact location and alignment of the distribution lines to be constructed under the project were unknown at appraisal, an Environmental and Social Management Framework (ESMF) was prepared and disclosed in country on July 29, 2014, and at the World Bank's InfoShop on September 8, 2014. The Environmental and Social Impact Assessment (ESIAs) for the first two distribution lines were prepared and disclosed in country on March 23, 2015, and the World Bank's InfoShop on March 27, 2015. The implementation of the safeguards policies suffered from inadequate implementation capacity of the REA. There were significant shortcomings in reporting issues related to environmental and social (E&S) issues. The monitoring and supervision of the implementation of safeguard policies was inadequate. The ISRs note issues with environmental management such as excavated pits posing safety risks to communities, murram heaps left in wetland and roadsides, and uncleared wayleaves that could potentially result in power outages through contact with three branches (ISR No:16, p.6). During project implementation, there were nine work related injuries and one case of gender-based violence that were not reported adequately but subsequently identified and addressed in accordance with the World Bank policies.

Natural Habitats (OP/BP 4.04): The project triggered this safeguard policy because of its likely impacts on wetlands and forests that could be natural habitats for some animals. The project team identified cases of excess murrum not removed but deposited on wetlands that are habitats to aquatic mammals, amphibians and birds.

Physical and Cultural Resources (OP/BP 4.10): The project triggered this safeguard policy because of the potential impact of the project activities on known and unknown physical cultural resources in the project areas. The project team confirmed that the project did not have an impact on any physical or cultural resources during project implementation.

Involuntary Resettlement (OP/BP 4.12): The project triggered this safeguard policy because it was expected that the construction of the distribution lines would have required some land acquisition along the distribution corridors. Because the exact location of and routing of most of the distribution lines were not identified at appraisal, a Resettlement Policy Framework (RPF) was prepared and disclosed in the country on July 29, 2014 and at the World Bank's InfoShop on September 8, 2014. The Resettlement Action Plans (RAPs) for the first two distribution lines were prepared and disclosed in country on March 23,2015, and at the World Bank's InfoShop on March 27, 2015. The RAPs for the remaining 19 distribution lines to be constructed under the project were to be prepared upon the identification of their location and alignment.

The project had significant non-compliance issues with this safeguard policy during project implementation that led to project implementation delays. The project activities started without payment of compensations to project-affected persons (PAPs), which was also a significant issue during the implementation of the previous ERT-2. In the final stages of project implementation in September 2022, it was identified that half of the grid extension and intensification works were non-compliant with the Involuntary Resettlement safeguard policy (ICR, p.33). The quarterly progress reports did not include any information related to the non-payment of compensations to PAPs. As a result, the project activities were put on hold. In addition to the inadequate supervision capacity of the owner's engineers and the contractors, the insufficient safeguards implementation capacity of the REA was the main reason for inadequate implementation of this safeguard policy. The World Bank and the government agreed on a Post Closure Action Plan to address all outstanding safeguard issues following the project closing. The World Bank project team continues to monitor the implementation of the Action Plan.

Forests (OP/BP 4.36): The project triggered this safeguard policy because of the possibility of power lines passing through forest areas. The ESMP provided guidance how the impact of the project on forests would have been assessed and addressed. The project constructed four distribution lines that affected six forests reserves, four of which are under the oversight of the National Forests Authority (NFA), and the remaining two under district local governments of Kole and Mubende. The civil works were completed without paying compensations to the NFA and the district local governments, which was against the requirements of this safeguard policy. The reasons were the lengthy time for the finalization of the memorandum of understanding with the NFA, the disagreements between the Chief Government Valuer (CGV) and the NFA in aligning the separate valuations, and the delays in obtaining the CGV's approvals. The World Bank project team continues to monitor the implementation of the Action Plan that includes actions to address the issues related to the implementation of this safeguard policy.

Overall, the project was noncompliant with the World Bank safeguards policies of Environmental Assessment, Involuntary Resettlement, and Forests. Inadequate implementation of these safeguards policies adversely affected project implementation, as a result of which some project activities could not be completed before project closing.

b. Fiduciary Compliance

Financial Management

The unaudited interim financial reports and semi-annual internal audit review reports were submitted with significant delays. The suggestions in the independent audit reports were followed by the internal audits but they were conducted irregularly. Although the Inspector General of Government conducted a corruption investigation on some projects implemented by REA, which led to the reorganization of REA as a department under MEMD, the investigation did not find any issues of corruption or misuse of funds associated with the project. The restructuring of REA disrupted some payment processes (such as payments to PIU staff, consultants, contractors, and PAPs) until the transfer of the project to the new project implementing agency under the MEMD was complete. The project team confirmed that all project funds were accounted for at project closing.

Procurement

The procurement followed the World Bank procurement guidelines and policies, but procurement was significantly delayed. Main issues were insufficient capacity of the staff responsible for procurement, inadequate documentation, and delays in receiving approvals from the contracts committees of the project agencies. Bids were mostly incomplete, which required revisions and clarifications further delaying the procurement process. Although the assessment of the REA highlighted insufficient procurement capacity, necessary measures were not taken to address this issue at appraisal. After lengthy discussions with REA, the project supported the establishment of a project implementing agency within REA, which included procurement specialists, but this could only be achieved in 2019, one year before the original project closing date. The procurement capacity further weakened when two procurement specialists left the project when REA was merged under the MEMD as a department. Overall, the shortcomings in procurement adversely affected project implementation and the operational and administrative efficiency of the project.

c. Unintended impacts (Positive or Negative)

None.

d. Other

None.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Satisfactory	Moderately Unsatisfactory	The number of household connections achieved under the project, especially through solar homes systems, was significantly lower than targets. The efficacy of the project in

			achieving the project objective is rated Modest. Although not a direct criterion to rate outcome, it is also important to note (for lesson-learning purposes) the project's non-compliance with the Bank's safeguards policies on Environmental Assessment, Involuntary Resettlement, and Forests.
Bank Performance	Moderately Satisfactory	Moderately Unsatisfactory	There were significant shortcomings at quality at entry regarding the preparedness of the project and the support to REA in increasing its project implementation capacity.
Quality of M&E	Substantial	Modest	There were significant shortcomings in the M&E system's design and implementation.
Quality of ICR	---	Substantial	

12. Lessons

This review has drawn three lessons based on the information in the ICR.

Insufficient capacity, implementation, and supervision of the safeguards policies can adversely affect the achievement of project results and objectives. Project implementation significantly suffered from issues related to the implementation of the Involuntary Resettlement and Forests safeguards policies. These issues were not appropriately reported in the progress reports. About one year before project closing, the project team identified that 50 percent of the distribution line works were completed or started without the compensation payments to the project-affected people and the agencies that are in charge of forests. The project's non-compliance with the safeguards policies continued during and after project implementation. The low readiness of the project at the start of project implementation was a one of the main reasons because the distribution line extensions to be constructed under the project were not identified (except two line segments); therefore, Resettlement Action Plans could not be prepared. The weak capacity of the project implementing agencies was another reason for the insufficient implementation of the safeguards policies.

Strengthening of the project implementing agency's institutional capacity during project preparation and setting up of a dedicated project implementation unit can be critical in successfully implementing complex projects. Although the project was the third in a three-project series, the main project implementation agency, i.e., REA, had insufficient project implementation capacity. The project did not finance any upfront capacity strengthening activities during project preparation. As the ICR (p.35) reports "project preparation did not include establishment of an ERT-3 dedicated team at REA and staffing levels and composition were inadequate for a much larger

project size than the previous ERT phases." It took three years after the start of the project for a PIU to be formed but it still had insufficient capacity. The merger of REA under the DEMD was another setback in project implementation because some specialists left the project, and the institutional memory was lost. Procurement, safeguards policies implementation, and contract management suffered from insufficient implementation capacity.

Insufficient assessment of the capacity of financial markets can result in low achievement of the project results expected from credit and guarantee facilities offered under a project. The financial intermediaries that were to benefit from the project's credit and guarantee facilities found these products risky and marked up the interest rates. These products that were to be used for the financing of solar PV systems were new to the financial market, and because of the risks involved in financing solar PV systems, the financial intermediaries offered higher interest rates to hedge their risks. The absence of subsidies to end users for the installation of the solar PV systems was another shortcoming of the project design. The insufficient assessment of the marker resulted in lower demand for these financial products and fewer number of solar PV systems installed by households.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is concise and candid. It is a tightly written and complete critique of the project. It is narrative is highly evaluative. The report including its annexes provides a robust base to adequately assess the project's performance and the achievement of the project objective not limited to achievements of the indicators. The quality of analysis is high. The interrogation of the evidence is sufficient; the salient points are summarized concisely; and the linking of evidence to findings are clear. The report is internally consistent and broadly responds to the Bank guidance, except the section on fiduciary compliance, which is missing, and the information on safeguards implementation is insufficient. The lessons are based on the specific experiences and findings of the project and are sufficiently linked to the narrative. However, although the report clearly provides strong evidence for the significant shortcomings in project implementation that led to the under achievement of the project results, it still attempts to justify the outcome and bank performance ratings in the satisfactory range, which are not supported by evidence. Similarly, the discussion of the M&E quality justifies a modest rating, but the ICR attempts to justify a substantial rating, which is also not supported by evidence.

Overall, the quality of the ICR is rated Substantial.

a. Quality of ICR Rating
Substantial