



## 1. Project Data

<b>Project ID</b> P151785	<b>Project Name</b> MG-ESOGIP	
<b>Country</b> Madagascar	<b>Practice Area(Lead)</b> Energy & Extractives	
<b>L/C/TF Number(s)</b> IDA-57730,IDA-62800	<b>Closing Date (Original)</b> 30-Jun-2020	<b>Total Project Cost (USD)</b> 71,699,945.11
<b>Bank Approval Date</b> 22-Mar-2016	<b>Closing Date (Actual)</b> 29-Dec-2023	
	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	65,000,000.00	0.00
Revised Commitment	74,452,523.00	0.00
Actual	72,605,365.45	0.00

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## 2. Project Objectives and Components

### a. Objectives

According to the International Development Association (IDA) Financing Agreement (p.5) dated April 8, 2016, and the Project Appraisal Document (p.10) the project development objective (PDO) was “to improve the operational performance of the National Electricity and Water Company (JIRAMA), improve the reliability of electricity supply in the project area, and in the event of an eligible crisis or emergency, to provide immediate and effective response to said eligible crisis or emergency”.



The Project Area was defined in the PAD (p.27) as “the geographical areas where project activities under Component 3 of the project will be implemented, namely the regions of Analamanga, Vakinankaratra, Alaotra Mangoro, Diana, Sava, Boeny, Sofia, Betsiboka, Androy, Atsimo Andrefana, Antsinanana, Analanjirofo, Menabe, Haute Matsiatra, Vatovavy Fito Vinany, Ihorombe, or any other areas on which the Bank may agree in writing with the Government”.

For assessing the project’s performance, the PDO is parsed as follows:

Objective 1: To improve the operational performance of the national electricity utility (JIRAMA),

Objective 2: To improve the reliability of electricity supply in the project area,

Objective 3: To provide immediate and effective response to said eligible crisis or emergency.

However, since no cost was allocated and no relevant activities were performed in relation to Objective 3, it was not taken into account when assessing the project’s performance.

On June 14, 2018, the project received an additional financing (AF) in the amount of US\$40 million. The PDO and the outcome indicators did not change.

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

Yes

**Did the Board approve the revised objectives/key associated outcome targets?**

Yes

**Date of Board Approval**

14-Jun-2018

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

No

**d. Components**

The Electricity Sector Operations & Governance Improvement Project (ESOGIP) consisted of five components:

- 1. Improving electricity sector planning and financial sustainability.** (Estimated Cost at Appraisal: US\$2.48 million; Revised cost with US\$3.50 million AF: US\$5.98 million; Actual Cost at Closing: US\$5.98 million) This component was to support sector planning and financial sustainability through provision of technical assistance, capacity building and consultancy services for: a) development of Least Cost Power Development Plan (LCPDP); b) strategy and action plan to increase electricity access; c) studies to address the sector financial viability. These studies were to cover assessing current average ability to pay for electricity services and determining the most adequate methodology for tariff setting to be applied in the short and medium term; and designing a socially and politically acceptable “glide path” for the effective application of the proposed methodology and related tariff charges.



2. **Strengthening operational performance and governance of the National Electricity and Water Company (JIRAMA).** (Estimated Cost at Appraisal: US\$12.56 million; Revised cost with US\$5 million AF: US\$17.56 million; Revised cost at the third restructuring: US\$13.56 million; Actual Cost at Closing: US\$13.56 million) This component was to aim at strengthening operational performance and governance of JIRAMA through provision of technical assistance, capacity building and consultancy support services and equipment. This was to be achieved by the preparation and effective implementation of a Management Improvement Plan (MIP) for JIRAMA for a three-year period, focused on improving efficiency, transparency, and accountability in the key operation areas of electricity supply, commercial functions, and management of corporate resources. In addition, this component was to support the incorporation of Management Information Systems (MIS) at JIRAMA as well as implementation of the Revenue Projection Program (RPP). The implementation of an RPP was to target sustainable reduction of non-technical losses in supply (unmetered consumption) through systematic remote recording and monitoring of consumption of large users as designed in the MIP. The initial phase of the RPP was to include all MW-supplied customers (around 1,000) and the largest low voltage-supplied customers (around 5,000). In total, the RPP was expected to cover approximately the 6,000 largest electricity customers in Madagascar, representing some 50 percent of total sales in 2014 (PAD, p. 18).
3. **Investing in enhanced reliability of electricity.** (Estimated Cost at Appraisal: US\$48.62 million; Revised cost with US\$29.50 million AF: US\$78.12 million; Revised cost at the third restructuring: US\$55.35 million; Revised cost at the fourth restructuring: US\$53.95 million; Revised cost at the fifth restructuring: US\$51.46 million; Actual Cost at Closing: US\$51.46 million) This component was to finance the reinforcement of an existing 138/63kV substation, the construction of new 63kV transmission line for the looping of the network. In addition, the rehabilitation and/or reinforcement of distribution networks in Antananarivo, and the upgrading of existing distribution systems in selected districts of the country were foreseen under this component. Lastly, this component was to finance rehabilitation of auxiliaries of generation plants and the design and supervision of works.
4. **Project management.** (Estimated Cost at Appraisal: US\$1.34 million; Revised cost with US\$2 million AF: US\$3.34 million; Actual Cost at Closing: US\$3.34 million) This component was to finance the recruitment of social and environmental safeguards experts to provide support to JIRAMA as necessary to prepare and monitor the project safeguards studies as well as the recruitment of a financial management specialist and a procurement specialist. In addition, through this component, the project audits, procurement of selected office equipment, and incremental operating costs were to be financed. Lastly, it was to finance trainings to be provided to Ministry of Energy and Hydrocarbons (MEH) and JIRAMA staff.
5. **Immediate response mechanism.** No funding was allocated to this component at appraisal and none disbursed at closing.

**Revised components:** The AF (first restructuring) revised the first component and added a new activity which was to provide technical assistance, capacity building, and consultancy services for the development of small hydro. The activity was to cover preparation of tenders for high-priority small hydropower plants. Accordingly, the AF increased the cost of this component from US\$2.48 million to US\$5.98 million. As for Component 2, the AF added new activities of development and implementation of human resources development plan and communication strategy for JIRAMA. With the increase of the component budget from US\$12.56 million to US\$17.56, the second component was to cover costs for the installation of auxiliary IT infrastructure and equipment necessary for operating the MIS as well. The AF facilitated financing of additional activities under Component 4 also. These additional activities included construction of a modern dispatching center equipped with supervisory control and data acquisition (SCADA), procurement of network infrastructure equipment and its related works, procurement of mobile substations,



and equipment for network maintenance, including mobile units. To finance these new activities the cost for Component 3 increased from US\$48.62 million to US\$78.12 million (Please see Section 2.e. below for details of the AF and the restructurings).

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

**Project cost:** The project cost was originally estimated at US\$65 million. An additional financing of US\$40 million was granted increasing the total project cost to US\$105 million. With loan cancellations implemented at the third, fourth and fifth restructurings the revised cost was US\$74,45 million. The actual cost at project closing was US\$74.34 million. The difference between the revised cost and the actual cost was undisbursed and cancelled.

**Financing:** The IDA loan amount estimated at appraisal was SDR 47.1 million (US\$ 65 million equivalent). This amount included an advance from the World Bank's Project Preparation Facility (PPF) of US\$1.33 million. By project closing, the project had disbursed US\$74.34 million.

**Borrower contribution:** At appraisal, no borrower contribution was foreseen, and none had materialized at closing.

**Dates:** The primary loan for the project was approved on March 22, 2016, and became effective on August 24, 2016. The project's original closing was on June 30, 2020. However, the implementation period was extended to match with closing date of the AF (first restructuring) to December 31, 2021. The AF was approved on June 14, 2018 and became effective on April 29, 2019 (Please see section on Restructurings below for reasons for delay in effectiveness). The implementation period of the of the project was extended twice, first from December 31, 2021 to June 6, 2023 (second restructuring) and then to December 29, 2023 (fourth restructuring). The mid-term review took place on November 13, 2023. The project closed on December 29, 2023.

**Restructurings:** The project had five restructurings including one AF.

- **First restructuring (additional financing) (June 14, 2018):** The AF was introduced to finance mainly the following needs: i) additional technical assistance needs of JIRAMA to ensure successful implementation of its organizational restructuring; ii) capacity building for MEH to create a pipeline of investment-ready small hydro power plants; iii) creation of a new dispatching center and network automation systems. Accordingly, as mentioned in section 2d (Revised components) the AF introduced some new activities under Components 1, 2, 3 (preparation of tenders for high-priority small hydropower plants, development and implementation of human resources development plan and communication strategy for JIRAMA, construction of a modern dispatching center equipped with supervisory control and data acquisition (SCADA), procurement of network infrastructure equipment and its related works, procurement of mobile substations, and equipment for network maintenance, including mobile units). In line with these additions, the project team revised the results framework and introduced five new intermediate results indicators. In addition, the targets for three out of four PDO indicators (percentage of electricity losses, number of electricity interruptions, and the number of direct beneficiaries) were increased and made more ambitious. Although the funding for AF was approved in May 2018, it became effective only on April 29, 2019. The delay in effectiveness was mainly due to late ratification of the legal agreement by the Parliament. Delays in revising and updating the project implementation manual and formalizing a subsidiary agreement between the



Government and JIRAMA also negatively affected timely effectiveness of the AF. The AF extended the implementation period of the project by 18 months to December 31, 2021.

- **Second restructuring (December 23, 2021- Level 2):** This restructuring extended the implementation period of the primary loan (US\$65 million) from June 30, 2020 to December 31, 2021. Also extended the implementation period of the AF from December 31, 2021 to June 30, 2023. The extensions were to enable completion of some of the delayed activities, particularly the reinforcement of the existing 138/63 kV substation, construction and rehabilitation of 63 kV transmission lines (looping of the interconnected network of Antananarivo RIA).
- **Third restructuring (May 5, 2023- Level 2):** This restructuring cancelled SDR 19.8 million of non-used credit. The unused credit emerged as a result of cancellation of three groups of activities: i) dispatching and control center: Although the construction of the building progressed well and was to be completed by project closing, the project experienced issues regarding the procurement of the SCADA system (delays in finalization of bidding documents and finalization of procurement process). Considering the uncertainties regarding the date of signature of the contract and the remaining time of the project, the borrower decided to cancel this activity ii) transmission lines: Supply and installation for the reinforcement of existing transmission RIA loop was to be implemented through four lots. At the time of restructuring although the tenders for all four lots were completed, only the contract for lot 4 was signed. The three other lots were still in the procurement phase due to organizational changes in JIRAMA leading to the lack of the persons in charge of signatures. Also, the project experienced delays in implementing the Resettlement of Affected Persons (RAP). Based on these, the project team and the borrower decided to cancel lots 1, 2 and 3 relating to work on construction of transmission lines. iii) implementation of Performance-Based Compensation programs by JIRAMA: Based on the conclusion of the evaluation of JIRAMA's performance-based compensation system conducted by the external auditor, it was concluded that the system to be implemented by JIRAMA needed much improvement. This led to the non-continuation of this activity given the timeframe of the project. In line with these cancellations, two of the intermediate results indicators introduced through AF (1-Dispatching Center and Distribution Control Center constructed and commissioned; 2-Transmission lines constructed under the project) were deleted from the results framework.
- **Fourth restructuring (June 30, 2023- Level 2):** The restructuring extended the closing date of the AF from June 30, 2023 to December 29, 2023. This extension was mainly to enable completion of the implementation of the RAP. Also, additional unutilized funds in the amount of SDR 1 million, was cancelled.
- **Fifth restructuring (December 29, 2023- Level 2):** The last restructuring cancelled an additional undisbursed amount of SDR 1.9 million in relation to uncompleted works.

### 3. Relevance of Objectives

#### Rationale

**Country context:** The PDO was well aligned with the strategic priorities of government of Madagascar. In Madagascar, unreliable and insufficient supply of electricity constrained social and economic development.





It is the most severe constraint on business climate. The country has limited resources and vulnerable to natural disasters. The infrastructure for electricity transmission and distribution is insufficient and the existing ones require upgrades and modernization. The electricity system losses (technical and non-technical) are high. Madagascar's utility in charge of electricity generation, transmission and distribution (JIRAMA) has financial difficulties and lack of technical tools to manage and monitor the sector. The PDO targeted addressing technical insufficiencies in electricity transmission and distribution by establishing and control and dispatching center, supporting rehabilitation of existing distribution and transmission lines and building new ones. On the other hand, PDO also targeted addressing management and operational issues of JIRAMA by providing managerial and operational tools. The PDO was rightly pitched for the development status and capacities in the country since it first addressed transmission and distribution capacity bottlenecks due to the poor state of the grid and targeted rehabilitation and upgrade of the national distribution system to alleviate distribution capacity constraints and reduce losses, rather than first targeting increasing the electricity generation capacity. The PDO was consistent with the Government of Madagascar's policies and strategies, reflected in several documents. The General State Policy of the Government of Madagascar highlights energy, transport and telecommunications sectors as the key sectors for economic growth and development. The Energy Sector Policy Letter (2015-2030) involved scaling up RE sources and increasing household access to modern and affordable electricity.

**Bank strategy:** By project closing, the project development objectives were highly aligned with the World Bank strategy defined in the Country Partnership Framework (CPF) FY23-27 (High level objective 1: Improved job opportunities; Objective 1.3: Improved access to basic infrastructure services). The CPF highlights access to electricity and digital services as critical to support economic opportunities and human development. Furthermore, the document mentions implementation of a three-level approach to energy sector reforms which involves supporting JIRAMA, expansion of grids and scaling-up renewable energy investments. The PDO was also aligned with the Bank's twin goals of poverty reduction and shared prosperity. In Madagascar, efforts to increase access are hindered by the financial position of JIRAMA, the lack of generation capacity, and the poor state of the grid. The PDO addressed these aspects as critical first steps to improve the expansion of electricity supply and access, in line with the goals of reducing poverty and promoting shared prosperity.

**Previous sector experience:** The Project Preparation Advance granted in 2014, enabled financing of critical studies for sector development and attracting additional support to the sector. The studies included development of the MIP, development of a Least Cost Power Development Plan (LCPDP), elaboration of a tariff study, and development of an Electrification Strategy. The technical assistance, financed by the Energy Sector Management Assistance Program (ESMAP), which mapped the potential of small hydropower projects (less than 20 MW) revealing opportunities to lower the cost of generation, green the energy mix, and foster private sector participation in hydro generation. In parallel to ESGIP, the Bank provided short-term assistance to MEH in identifying the most promising Independent Power Producers (IPPs) to be developed immediately, and supported the review of associated documentation and development of an adequate regulatory framework. This support aimed to support MEH in increasing installed generation capacity in an efficient, transparent, and accountable manner. The project benefited from the Bank's experience in designing and implementing projects for utility reforms across Sub-Saharan Africa (including Liberia, Kenya, Rwanda, and Tanzania) and emerging countries in other regions. More specifically, the lessons learnt indicated that the successful design and implementation of MIPs made it possible for the utilities to achieve and sustain significant improvements in their operational performance, as well as they contribute to the financial sustainability of the companies and of the power sectors in which



they operate. In the case of the ESOGIP, in line with the lessons learned, the implementation of JIRAMA's reforms was anchored in the MIP.

Overall, the PDO was well aligned with the Bank strategy and the country priorities. The PDO statement was clear, focused, and pitched at an adequate level of ambition. The PDO could have better captured the outcomes generated by the project, such as the impact of the new tariff regime on JIRAMA under the first objective or the impact of the increased reliability of electricity on beneficiary individuals, businesses and on provided services under the second objective. Overall, the Relevance of objectives is rated as Substantial.

## Rating

Substantial

## 4. Achievement of Objectives (Efficacy)

### OBJECTIVE 1

#### Objective

To improve the operational performance of the national electricity utility (JIRAMA)

#### Rationale

**Theory of change (ToC):** To achieve the stated objective, the project provided technical assistance, capacity building and equipment to JIRAMA including: development of an Management Improvement Plan (MIP), installation of an Management Information Plan (MIS) and acquisition of necessary equipment, implementation of revenue protection program, and preparing tenders for high-priority small hydropower plants, development of LCPDP, development of a Revenue Protection Program (RPP), and development of tariff study for the electricity sector. These activities aimed to increase JIRAMA's operational performance and governance. The expected outputs included; fully functioning MIS with sales, customer service, maintenance, purchasing/inventory, fixed assets, finance, human resources, and business intelligence modules, adoption of MIP by JIRAMA, implementation of RPP, implementation of new tariff structure. The expected outcomes included: improved service quality by JIRAMA, reduction in non-technical losses as a result of improved monitoring and planning capabilities of JIRAMA, improved financial sustainability, better-informed decision-making and streamlined operational processes and increased revenues as a result of implementation of new tariff scheme. The anticipated long-term outcomes included the expansion of electricity supply and access, provision of affordable reliable sustainable electricity services contributing to reduction of poverty and shared prosperity.

Critical assumptions were: that (a) the Government of Madagascar remains committed to the reform process in the electricity sector and supports implementation of required actions, and (b) JIRAMA demonstrates ownership and commitment for implementing changes in governance and operational procedures. Overall, the stated activities in the ToC were directly connected to the outputs, intermediate outcomes and outcomes in a plausible causal chain. However, the ToC was not fully reflected in the results framework. The key outcome indicators were the total electricity losses per year and the interruptions in electricity service per year in the project area. Although it was part of the PDO, the results framework did not involve any outcome



indicator which capture the impact of the project on JIRAMA. The results framework could have benefitted from additional indicators which could assess the impact of the implementation of new tariff regime and the implementation of RPP (reduction of non-technical losses) on JIRAMA.

### Outputs:

Achievements as reported in the Results Framework:

- The ESOGIP supported preparation of the MIP for JIRAMA. The MIP was adopted in January 2018 and foresaw recruitment of key positions in the organization through competitive and transparent processes. In October 2018, a new organizational chart was also adopted. However, the MIP was not implemented, since the new JIRAMA management decided not to continue the implementation of the full MIP following the change of presidential regime in 2019. The new management implemented their own human resources development plan not the one developed by the project which foresaw a competitive and transparent selection process for key management positions at JIRAMA. At the time the ICR was prepared, the recruitment of a new CEO was ongoing. However, the recruitment of a new CEO and CFO for JIRAMA is now complete and both are onboard, though those were not done under EGOSIP but under Least-Cost Electricity Access Development Project (LEAD): extension and densification of the electricity network (implemented in part by JIRAMA and Digital and Energy Connectivity for Inclusion in Madagascar (DECIM) Project (P178701) (Project team's written response to the IEG questions, December 4, 2024). Target was partially achieved.
- By project closing, the percentage of technical positions held by females that reported directly to Directors in JIRAMA was 14%. The baseline value was 5% and the target was to increase this value by 15%. Target was achieved and exceeded.
- By project closing, installation of the MIS was complete in Antananarivo and the system was fully functional at JIRAMA. The MIS was deployed in secondary cities and involved several functional modules including sales and customer service, maintenance, purchasing/inventory, fixed assets, finance, HR, and business intelligence and enterprise resource development (ERP). The MIS is the main tool for JIRAMA for monitoring and managing the electricity sector. The ICR (p.18) reports that JIRAMA received additional funding to sustain subsequent operations and maintenance (O&M) tasks, including system maintenance, license renewal, and staff training. Target was achieved.
- The project supported development and implementation of the RPP (Matselaka). By project closing, 40% of total sales (kWh) were covered under the RPP (Target was 40%). The RPP targeted improved financial sustainability of JIRAMA in the short-term. The program aimed to protect JIRAMA's revenues from sales to its large customers, ensuring that all users in that segment were permanently billed according to their accurately metered full consumption, directly contributing to the reduction of non-technical losses. It consisted of the installation of telemetry at JIRAMA's major customers with smart and remote metering systems. By the end of the project, its implementation was successfully completed and the RPP is still in use (Project team's written response to the IEG questions, December 4, 2024). The Program covers 8,500 out of 34,351 commercial and industrial customers (25 percent) and is expected to cover a larger number in the coming years. Target was achieved.
- The project supported development of LCPDP. The plan contributed and provided input to the selection of two big hydro powerplants: Volobe, Sahofika. Concessions and power purchase agreement contracts were signed with the private sector. With the input of LCPDP, a master plan for electricity networks was developed in Madagascar. Also, various components of the World Bank-financed LEAD Project benefited from the LCDP at appraisal stage. In addition, it was used in





preparation of the African Development Bank (AfDB)-financed Power Transmission Network Reinforcement and Interconnection Project in Madagascar. The target was achieved.

- The project supported development of a Tariff Study. As result of this study, a new tariff structure (JIRAMA: OPTIMA residential- 2021 and OPTIMA business -2022) was implemented by JIRAMA. The ICR (p.19) reports that since the implementation of the new tariff structure which revised the tariff structure for households and businesses across all distribution segments, an estimated US\$3.4 million monthly additional revenue has been noted. Target was achieved.
- A Competitive Bidding Process for the development of a priority small hydro site was launched. This activity was included through the AF. Madagascar possesses enormous potential in renewable energy resources, particularly hydro. The country's hydropower potential has been estimated at 8.4 GW. However, the economic exploitable potential had not been established (PAD, p.5). The ICR reports that discussions with the German and French development agencies are ongoing for the development of the selected sites in the country.
- JIRAMA's customer satisfaction baseline survey was completed in the project area in 2017 and 2019. This indicator measured whether JIRAMA designed and administered a customer satisfaction survey and took into account feedback received. The two satisfaction surveys were conducted in seven regional capitals with 2,389 participants each. The surveys assessed the level of satisfaction with key JIRAMA services. The overall rating was 4.1 and 4.36 over 8 in 2017 and 2019 respectively. Although the overall rating did not improve significantly, some notable improvements could be reported in the areas of satisfaction in obtaining service (which increased from 31.44% in 2018 to 58.20% in 2020) and in satisfaction with downstream services (which increased from 55.50% in 2018 to 64.77% in 2020). Target was achieved. The results of the customer satisfaction survey were made publicly available.

#### **Additional outputs reported in the ICR:**

- Feasibility studies for 9 hydro sites were conducted which were identified within the scope of Government of Madagascar's Rural Electrification Development Project. In addition, training was provided to MEH on preparation of feasibility studies for mini-hydropower sites. Ministry of Energy staff was able to carry out mini-hydroelectricity studies following training. These constituted steps towards promoting renewable energy and attracting private sector investments in Madagascar.

#### **Outcomes:**

- Total electricity losses (system losses) gradually but continuously decreased during the implementation of the project between 2015 and 2023. The system losses were 35% (18% technical losses, 17% non-technical losses during 2015-2016 period. By project closing, system losses were 25.8% (17% technical and 8.8% non-technical). The decrease in technical losses was modest whereas the change in non-technical losses were significant. The decrease in non-technical losses can be attributable to establishment of new meters and successful implementation of RPP by JIRAMA. The ERP module developed within the new MIS system enabled connectivity between the new meters and RPP. The clients connected through these new meters now have operational billing statuses resulting in reduction of produced but not billed electricity (non-technical losses).

Overall, the project almost achieved its outcome target and most of its output targets. Although it was not part of the results framework, the ICR reports the positive impact of the implementation of tariff reform and RPP on operational performance of JIRAMA. The results framework could have benefitted from additional



outcome indicators which could have captured the impact of the project on operational and financial performance of JIRAMA. Based on these achievements, the project's efficacy in achieving its objective is rated Substantial.

### Rating

Substantial

## OBJECTIVE 2

### Objective

To improve the reliability of electricity supply in the project area

### Rationale

**Theory of change:** To achieve this objective, the project provided support for supply and installation of equipment, relevant services for works and technical assistance for acquisition of two transformers, construction of new 63kV transmission lines, replacement of overloaded transformers and replacement of wooden poles, installation of mobile automatic screening machine at the 96 MW Andekaleka Hydroelectric Plant (HPP). The expected outputs included; existing 138/63kV substation reinforced with the replacement of transformers, distribution networks extended with additional lines and existing lines are rehabilitated, transmission networks rehabilitated and new lines constructed in the project area. In addition, Andekaleka HPP rehabilitated. The expected outcomes included: increased connectivity, increased supply of electricity and reduction in disruption of electricity supply. The anticipated long-term outcomes included the expansion of electricity supply and access, provision of affordable reliable sustainable electricity services contributing to reduction of poverty and shared prosperity.

The areas selected for improved reliability were those where equipment was overloaded so that service quality and reliability could improve in a more significant manner (PAD, p.9).

Critical assumptions were that the ability of the relevant authorities to obtain land on time and adhere to the required safeguards for project activities related to transmission and distribution lines and the capacities in JIRAMA to procure relevant goods and services would be in place. Overall, the stated activities in the ToC were directly connected to the outputs, intermediate outcomes and outcomes in a plausible causal chain. However, ToC was not fully reflected in the results framework. The results framework could have benefited from additional indicators which could capture the impact of increased reliability of electricity supply on the project area.

### Outputs:

Achievements as reported in the Results Framework:

- By December 2023, within the scope of the project 297 km distribution lines were constructed and rehabilitated in the project area, achieving 99.3 percent of the target of 300km. The project rehabilitated 133.5 km and constructed 166.5 km of distribution lines. While these investments increased the country's connectivity it also facilitated integration of renewable energy sources into the electricity system of Madagascar. This supports Madagascar's strategic priority of increasing generation of electricity from renewable energy sources.



- The project targeted rehabilitation of a total of 100 km of transmission lines. By project closing, 67 km of transmission lines were rehabilitated. The activity for construction of 34 km of transmission lines was cancelled at the third restructuring, as a result of implementation delays. These were mainly due to delays in preparation of Resettlement Action Plans and the design change in the route of the transmission lines. The ICR (p.20) also reports that this activity required cutting off the power supply for the Antsirabe region, an industrial zone, resulting in delays in its implementation. The rehabilitated transmission lines enhanced connectivity and facilitated energy supply from the new renewable energy plant (40 MW photovoltaic power plant of Ambatolampy).
- Andekaleka HPP was rehabilitated through addressing the problem of grid-clogging and disrupted generation. In 2018, Andekaleka HPP was the largest hydroelectric power station operated by JIRAMA. With 3 generating units, it provides a total power of 91.2MW, which currently represents 45% of the peak power of the Antananarivo Interconnected (RIA) loop. Plant debris carried by the current was clogging the water discharge gates to the power plant and the water intake had to be cleaned manually, with the power plant shut down during these operations. This entailed accident risks for the workers, as well as reduced energy production for the RIA, and consequently significant losses for JIRAMA (Project team's written response to the IEG questions, December 4, 2024). The screening machine installed at the Andekaleka dam, (component 3.4 of ESOGIP) PAGOSE, enabled the cleaning operations to be carried out without stopping the power plant; thereby resulted in cutting down the losses (minimum losses of US\$600,000 for each occurrence of clogging) incurred by JIRAMA.

#### Outcomes:

- With improvements in transmission and distribution networks the number of interruptions in electricity service per year in the project area dropped to 445 (target 450) from the baseline number of 870 at appraisal while increasing systems reliability. The operational efficiency and strengthened monitoring and management capacity of JIRAMA also contributed to this improvement.
- By project closing, the project reached 340,000 direct beneficiaries as result of activities implemented under component 3, constituting 97.14 percent of the target (350,000). Female beneficiaries accounted 50% of this value.

The AF introduced a new activity of construction and commissioning of dispatching center and distribution control center. Although the necessary construction works were successfully completed, the SCADA system could not be procured due to delays in procurement and the uncertainties as to the date of signature of the contract and the remaining time of the project. However, this activity and other cancelled activities under this objective (lots 1, 2, 3 of RIA) were added to the new Digital and Energy Connectivity for Inclusion in Madagascar (DECIM) Project (P178701) which was approved in March 2023. They are being procured under the new project (Project team's written response to the IEG questions, December 4, 2024). In this regard, it is likely that the expected outputs and outcomes which would lead to centralized management of generation, transmission and distribution networks reduction of energy production costs and intervention times on the electricity networks, would be achieved with the implementation of DECIM project. This would contribute to reliable electricity supply and increased access.

Overall, the project almost achieved its outcome target and most of its output targets. The under achievements with respect to transmission lines are likely to be achieved under the World Bank's DECIM project. Based on these achievements project's efficacy in achieving its objective is rated Substantial.



**Rating**  
Substantial

**OBJECTIVE 3**

**Objective**

To provide immediate and effective response to said eligible crisis or emergency.

**Rationale**

Since the emergency was not triggered, this objective has not been assessed.

**Rating**  
Not Rated/Not Applicable

**OVERALL EFFICACY**

**Rationale**

The efficacy of the project achieving the first and the second objective is rated Substantial.

**Overall Efficacy Rating**

Substantial

**5. Efficiency**

**Economic and financial analysis:**

Cost-benefit analysis was used to evaluate the economic viability of Components 2 and 3. Since components 1 and 4 funded technical assistance activities, the economic benefits could not be quantified. Component 5 was an emergency response window with zero funding allocation. For consistency, the methodology used for the economic analysis followed the same approach used at appraisal. The main economic benefits of the project were assessed using the avoided cost approach. Two types of benefits were considered: (a) under Component 2, the gain in nontechnical losses (avoided costs related to electricity not generated) achieved through consumers' reduced electricity consumption as response to the implementation of RPP and (b) under Component 3, the gain in technical losses (avoided costs related to electricity not generated) achieved through the grid reinforcement and rehabilitation. At appraisal the first economic analysis (Components 2 and 3) was conducted in 2015. This analysis was updated in 2018 when the AF was introduced. At appraisal, the overall expected project economic internal rate of return (EIRR) was estimated at 28.7%. With the AF it was estimated



at 26.3%. The EIRR of the components 2 and 3 were estimated at 53.5% and 16.4%, respectively. The NPV analysis conducted including AF resulted in an NPV of US\$169 million.

At project closing the ICR estimated the overall project EIRR at 29.8 % compared to 28.7 % at appraisal and 26.3% (with AF) and the NPV at US\$73 million (Component 2: US\$77 million, Component 3: US\$ -4 million). The ICR attributes the negative NPV for Component 3 to the deferral of crucial activities, which has affected the anticipated economic benefits. The financial analysis conducted at project closing resulted in financial internal rate of return (FIRR) of 75 percent and an NPV of US\$132 million, compared to a FIRR of 21.7% and an NPV of US\$94.6 million. However, the NPV calculated for the component 3 was negative (US\$-13 million). The ICR reports that this result in parallel with the economic analysis, explained by the marginal reduction in technical losses—approximately 1 percent—which is not substantial enough to offset the extensive investments that Component 3 demands. The activities completed within the scope of the project led to the reduction of 72,800 MWh (per year) electricity generation. Also contributed to decreasing carbon intensity of electricity generation in Madagascar in 2023 by 436 grams of CO2 equivalents per kWh.

**Administrative and operational efficiency:**

The ESOGIP was implemented over a period of seven years. The project disbursed 69.16% of total allocated funds of US\$105 million. The funds which were not to be disbursed were cancelled at the third, fourth and the fifth restructurings. By project closing, the project disbursed US\$72.62 million (99.56% of the remaining funds). The project experienced significant delays which lead to cancellation of activities and accordingly cancellation of project funds. The delays were due to several factors which included delays in finalization of project reports due to disagreement between the parties, delay in effectiveness of the AF, and high staff turnover in JIRAMA and the PIU, delays in procurement activities. The high staff turnover in the PIU particularly resulted in vacancy of the critical positions such as the procurement specialist and the financial management specialist. Absence of the specialists in the PIU delayed procurements which resulted in cancellation of the relevant activities. The project also experienced cost overruns which were as a result of actual expenses exceeding initial estimates, presenting obstacles to the project's financial viability. These cost overruns led to three reallocations of funds between categories. The ICR (p.21) lists the factors contributing to this situation as unforeseen circumstances such as the COVID-19 pandemic, government procedures regarding contractor compensation, and implications of local taxes (custom taxes which constitute 20-30% of equipment were not included in the cost estimates made by JIRAMA).

Overall, efficiency is rated Modest. Although the ex post economic returns were higher than the expectations at appraisal under the two components of the project and the strong financial analysis results, the project experienced significant operational and managerial inefficiencies. Based on these assessments the overall efficiency is rated Modest.

**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 (%)
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Appraisal	✓	26.30	0 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	29.80	0 <input type="checkbox"/> Not Applicable

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

## 6. Outcome

Relevance of objectives was rated Substantial. Overall Efficacy was rated Substantial for both objectives. The project achieved all PDO outcome targets (slightly below two of the outcome targets). Efficiency was rated Modest due to significant administrative and operational inefficiencies. Based on these sub-ratings the Outcome is rated Moderately Satisfactory.

### a. Outcome Rating

Moderately Satisfactory

## 7. Risk to Development Outcome

**Financial risk:** Financial risk is high. In order to avoid reliability of supply challenges, it is crucial to implement construction of 63kV transmission lines and ensure establishment of the SCADA system. Implementation of these activities is now under the World Bank’s DECIM project and funds have been secured for these activities. However, further resources will be needed for the maintenance of these systems. Furthermore, upgrading and/or maintenance of the MIS system established for the JIRAMA under the ESOGIP and the continuation of RPP with procurement of new meters will also require additional resources.

**Institutional risk:** The project provided support to improve operational capacity of JIRAMA through development of MIP, MIS and HR framework. These activities contributed to better monitoring and management of the electricity system. However, the financial sustainability of JIRAMA remains to be a problem and further efforts are needed. The ICR (p.33) reports that the ongoing decline in JIRAMA’s profitability risks will only persist if there is a commitment to implementing the measures outlined in the performance improvement manual, specifically concerning human resources. The decision of JIRAMA to not to continue the implementation of the full MIP under the project could be considered as a sign of backsliding.

**Government ownership:** The Government's strong commitment to reform electricity sector is likely to continue and does not pose a high risk to development outcome. The Government’s investment in enhancing the capacities of some key actors of the sector, engagement in further World Bank projects and projects with other donors signals its determination to pursue reforms in the sector.

## 8. Assessment of Bank Performance



### **a. Quality-at-Entry**

The project was strategically relevant to the Government of Madagascar's policies. The PDO was in line with the government's priorities and the Bank strategies. The PDO addressed issues related to the operational inefficiencies of the national utility as well as supported improvement and modernization of transmission and distribution networks. Both targeted reliable and increased supply of electricity to individuals and businesses in the project area where the system was overloaded and reliability of electricity supply and where the quality of services needed significant improvement. The technical design of the project followed a sequential approach. The original ESOGIP focused on the improvement of sector governance, restructuring of JIRAMA to improve its management, and the rehabilitation, reinforcement of electricity transmission and distribution infrastructure to reduce technical and commercial losses and providing support to the MEH on sector planning. The AF sustained the restructuring of JIRAMA by preparing and implementing a Human Resource Development Plan to increase the efficiency of the workforce; and financed additional key transmission and distribution investments to facilitate the development of the power sector in the medium and long term. The project experienced numerous adjustments in the distribution of funds among different categories as a result of cost overruns. These issues arose in relation to contract amounts. The costs of taxes and custom duties associated with the contracts were not assessed adequately at appraisal.

The project had two PIUs established in MEH and JIRAMA. Each PIU team involved a procurement and financial management specialist. However, the project did not establish necessary rules and boundaries which would ensure efficient decision-making by the PIUs. This resulted in delays in decision-making and difficulties in overcoming bureaucratic challenges. Gender-disaggregated indicators were included in the results framework to assess the extent to which women equally benefitted from extended services. In addition, women taking increased number of managerial positions in JIRAMA is another intermediate results indicator of the project. Six main risks were identified at the appraisal stage relating to three main areas: political and governance risk, policy risk and institutional capacity for implementation and sustainability risks, financial management and procurement risks. The PAD included specific measures to mitigate financial management and procurement risks. The overall risk was rated high. In relation to M&E, overall, it was simple, clear, but had some shortcomings related to indicators. The results framework could have benefitted from additional indicators which could assess the impact of the implementation of new tariff regime and the implementation of RPP (reduction of non-technical losses) on JIRAMA. Additional indicators which could capture the impact of increased reliability of electricity supply on the project area could have been beneficial for assessing the impact of the project. The PIUs in the MEH and JIRAMA did not include dedicated M&E specialists.

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

Moderately Satisfactory

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

The Bank conducted 15 supervision missions over the duration of the project and these were crucial to identifying challenges and obstacles that could negatively impact the progress. This approach and frequent and open dialogue with stakeholders allowed for the thorough examination of the issues (ICR, p.32). Despite the delayed mid-term review (November 2023), which was influenced by various factors, the project team maintained regular monitoring and evaluation of activities through supervision missions and



informal meetings held by the different TTLs with the PIUs to address emerging issues effectively (Project team's written response to the IEG questions, December 4, 2024). During the project's implementation three TTLs took the leadership of the project. However, this did not negatively affect the stability of the implementation support. Online meetings were arranged to preserve momentum during the COVID-19 pandemic. The Bank worked proactively with the Borrower to grant additional financing and to restructure the project in order to ensure that implementation was progressing towards the achievement of the PDO. The ICR (p. 32) reports that the project encountered difficulties in consistently evaluating the implementation status of activities. One particular issue was regarding the management of fixed assets. The mismanagement was identified by the project team and asset management audits were conducted which devised action plans for remedial measures; all of which resulted in implementation delays (Meeting with the project team, December 4, 2024). The ICR reports the potential for improvement through closer and more systematic monitoring of activities. The issues in relation to M&E arrangements mentioned in the Quality at Entry Section above were not addressed during the implementation.

### **Quality of Supervision Rating**

Moderately Satisfactory

### **Overall Bank Performance Rating**

Moderately Satisfactory

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

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

The PDO was composed of two objectives (see Section 2), which were assessed based on four PDO outcome indicators two of which were core indicators (number of direct beneficiaries and female beneficiaries). The PDO outcome indicators were measurable, relevant, and had baseline measurements with targets. However, with respect to targets at the time of the project's preparation, the available data lacked the necessary quality to establish accurate target values for some indicators (Project team's written response to the IEG questions, December 4, 2024). The project team addressed these issues during the implementation. On the other hand, the results framework could have benefited from integrating more specific outcome indicators related to improvement of operational performance of JIRAMA. In addition, a survey for assessing the reduction of electricity interruptions on businesses and individuals in the project area could have provided further evidence on the positive impact of the achieved results regarding reliability of electricity supply. The results framework included 12 intermediate results indicators (IRIs) to track the progress of the different project activities. The IRIs were measurable and connected to the project activities. The two project implementing agencies, MEH and JIRAMA, were to collect and verify data, and MEH was to consolidate the information and submit progress reports to the Bank on an annual basis for PDO indicators and on a semi-annual basis for the IRIs at component level. The PIUs did not have dedicated M&E specialists.



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

The data quality issues encountered at the M&E design stage necessitated adjustments in the target values of the two PDO indicators (Project team's written response to the IEG questions, December 4, 2024) through restructurings. A number of additional indicators were included in the results framework to assess achievements of the newly introduced activities. The changes could be made due to the reports and activity summaries that the implementation units provided. The PIUs monitored the project's progress and shared important indicators with the World Bank team even though there were some delays (ICR, p.29). The shortcomings mentioned in the M&E Design section were not addressed during the implementation.

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

The M&E findings were regularly reviewed by the project team and the implementing agencies. The M&E framework enabled the project team to make appropriate adjustments to the implementation plan, depending on the status of physical progress. Accordingly, the project was restructured five times (including one AF). During the implementation, the M&E system was used as a tool to facilitate decision making and achieving the PDO by the implementing partners.

Overall M&E design was simple and clear. However, it lacked some additional indicators which could contribute to better assessment of the impact of some of the activities implemented within the scope of the project. Based on this assessment M&E quality is rated Substantial with moderate shortcomings.

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

Substantial

## **10. Other Issues**

### **a. Safeguards**

The project was assigned an environmental Category B, since any social and environmental impacts were expected to be small to moderate, temporary and site-specific and mitigation measures were expected to be readily designed. The project triggered the Bank's safeguard policy on Involuntary Resettlement (OP/BP 4.12) because it involved the construction, rehabilitation, and operation of MV substations and overhead transmission lines, requiring acquisition of lands, removal of valued trees (Component 3). At appraisal a Resettlement Policy Framework was prepared to ensure that activities to be financed under the project that required involuntary resettlement in local communities were properly managed. The Resettlement Action Plans (RAPs) were prepared and implemented in compliance with the World Bank's OP 4.12. During the implementation, 452 project-affected persons (PAPs) were identified in relation to construction/rehabilitation of distribution and interconnected networks. Among these PAPs, 132 in relation to distribution activities (out of 161 in total) were compensated. However, the ICR reports that compensation in relation to interconnected networks were pending at the time the ICR was prepared. This was mainly due to the decision by JIRAMA to change the initially agreed route of the transmission line. This decision complicated the process of identifying and compensating the PAPs. This activity has been transferred to the DECIM project. Within the scope of the project with the support of the consultancy work, 14 Environmental and



Social Management Frameworks were disclosed in compliance with local laws and World Bank policies during the implementation.

**b. Fiduciary Compliance**

**Financial management:** The project experienced some challenges in meeting the standards of the World Bank’s financial management requirements. These resulted in implementation delays and, on some occasions, suspension of payments. The audits conducted during implementation revealed some irregularities particularly in relation to asset management by JIRAMA. Management Audits were organized, and action plans were prepared with measures. By project closing the project’s financial management was assessed as Moderately Unsatisfactory.

**Procurement:** The project had two procurement units - one at JIRAMA and the other at MEH. Both units had established internal procedures consistent with the World Bank’s procurement rules and standards. However, the assignment of the project’s procurement expert to other projects by JIRAMA caused delays. The ICR also reports high turnover at the PIU at JIRAMA and long vacancy periods at the positions of procurement and financial management specialists. These conditions resulted in delays in procurement activities and then caused cancellation of some project activities (cancellation of procurement of SCADA system). Despite such developments project had Satisfactory rating for procurement in the implementation assessment.

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

None.

**d. Other**

None.

**11. Ratings**

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





## 12. Lessons

The following three lessons are from the ICR with some adaptation of language:

- **While implementing projects that support strategic sector reforms, preparing detailed analysis and phasing the implementation can help avoiding bottlenecks and lead to better achievement of results.** In the case of Madagascar, the ESOGIP project supported tariff reform for which the preparation of a detailed analysis on tariffs was crucial to guide discussions and the strategies to be put in place. This reform was divided into several phases: the first involving tariff optimization, notably simplifying tariff structures, adjusting the targeting of subsidies to focus on vulnerable households and SMEs, and the second involving indexation and automatic adjustment.
- **Established jointly by an external auditing firm and utility, and assessed periodically, Asset Management Plans can ensure that the allocated project resources are used effectively and efficiently.** In the case of ESOGIP, the issues encountered during the implementation in relation to fixed asset management caused delays in project implementation. Asset management audits had to be conducted while diagnosing irregularities. Systematic and closer monitoring with a robust M&E implementation with dedicated specialized personnel could have helped avoid emergence of some of these issues. An asset management plan which involves the procedures for managing fixed assets, clarifying the responsibilities of staff/direction within the utility for each stage of the plan can be of significant help to implementing agencies.
- **Clarifying decision-making powers of the PIUs at appraisal stage is essential to ensure effective coordination and management across the levels of project implementation.** The PIUs of the project did not in fact have substantial decision-making authorities particularly the one in JIRAMA. This resulted in inefficient project execution. The decisions in relation to the project had to undergo several layers of approval in the organizational structure. In practice, this multi-layered approval process delayed approval of procurement files, payments to contractors, and approval of invoices. Establishing clear boundaries regarding the authority of all PIUs at appraisal can help prevent encountering such bureaucratic challenges during implementation.

## 13. Assessment Recommended?

No

## 14. Comments on Quality of ICR

The ICR was well written and provided adequate coverage of project activities and reported candidly on most shortcomings, in concise form. The ICR used the available data to justify most of the assigned ratings and is consistent with the guidelines. The report is internally consistent, and it included a relevant discussion on the achievement of the PDO. Lessons reflected the project experience and were based on evidence and analysis.



The ICR could have been further enriched with details in the M&E quality section. Also, reporting on safeguards and fiduciary aspects lacked details.

**a. Quality of ICR Rating**  
Substantial