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Report No: ICR00004654

IMPLEMENTATION COMPLETION AND RESULTS REPORT

(IDA-49800, IDA-H7150)

ON A

GRANT

IN THE AMOUNT OF SDR 40.4 MILLION
(US\$65.4 MILLION EQUIVALENT)

AND A

CREDIT

IN THE AMOUNT OF SDR 12.0 MILLION
(US\$19.3 MILLION EQUIVALENT)

TO THE

REPUBLIC OF MALAWI

FOR AN

ENERGY SECTOR SUPPORT PROJECT

June 17, 2019

Energy and Extractives Global Practice
Africa Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective June 17, 2019)

Currency Unit = Malawian Kwacha (MWK)

MWK 761.80 = US\$1

US\$1.39 = SDR 1

FISCAL YEAR
July 1 - June 30

ABBREVIATIONS AND ACRONYMS

AMR	Automatic Meter Reading
CAS	Country Assistance Strategy
CPS	Country Partnership Strategy
DFID	United Kingdom Department for International Development
DSM	Demand-side Management
ESIA	Environmental and Social Impact Assessment
ESCOM	Energy Supply Corporation of Malawi
ESMF	Environmental and Social Management Framework
ESPS	Energy Support Project Secretariat
ESSP	Energy Sector Support Project
GoM	Government of Malawi
GRM	Grievance Redress Mechanism
HWG	Hot Water Geyser
ICR	Implementation Completion and Results Report
IFC	International Finance Corporation
IPP	Independent Power Producer
IRR	Internal Rate of Return
IRP	Integrated Resource Plan
ISR	Implementation Status and Results Report
LV	Low Voltage
MAREP	Malawi Rural Electrification Program
M&E	Monitoring and Evaluation
MCC	Millennium Challenge Corporation
MGDS	Malawi Growth and Development Strategy
MIS	Management Information System
MoNREM	Ministry of Natural Resources, Energy, and Mining
MV	Medium Voltage
NPV	Net Present Value
O&M	Operation and Maintenance
OPCS	Operations Policy and Country Services
ORAF	Operational Risk Assessment Framework
PAD	Project Appraisal Document
PAP	Project-affected Person

PCN	Project Concept Note
PDO	Project Development Objective
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PPP	Public-Private Partnership
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SAPP	Southern African Power Pool
TEC	Technical Electricity Committee
T&D	Transmission and Distribution
TITK	Total Interruption Time per kVA Installed
ToR	Terms of Reference

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P099626	Energy Sector Support Project
Country	Financing Instrument
Malawi	Investment Project Financing
Original EA Category	Revised EA Category
Partial Assessment (B)	Partial Assessment (B)

Organizations

Borrower	Implementing Agency
Department of Energy Affairs	ESCOM, Ministry of Natural Resources, Energy and Mining

Project Development Objective (PDO)

Original PDO

To increase the reliability and quality of electricity supply in the major load centers.

FINANCING

	Original Amount (US\$)	Revised Amount (US\$)	Actual Disbursed (US\$)
World Bank Financing			
IDA-49800	19,300,000	19,300,000	15,071,933
IDA-H7150	65,400,000	65,400,000	57,075,177
Total	84,700,000	84,700,000	72,147,110
Non-World Bank Financing			
Borrower/Recipient	0	0	0
Total	0	0	0
Total Project Cost	84,700,000	84,700,000	72,147,110

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
28-Jun-2011	30-Jan-2012	18-Mar-2015	30-Oct-2016	15-Oct-2018

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US\$M)	Key Revisions
13-Aug-2015	13.46	Change in Components and Cost Reallocation between Disbursement Categories Change in Disbursements Arrangements Change in Institutional Arrangements
18-Mar-2016	18.97	Change in Results Framework Change in Components and Cost Change in Loan Closing Date(s) Reallocation between Disbursement Categories Change in Disbursements Arrangements Change in Procurement Change in Implementation Schedule
20-Jul-2018	65.48	Change in Loan Closing Date(s)

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	High

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US\$M)
01	27-Dec-2011	Satisfactory	Satisfactory	0
02	11-Jul-2012	Satisfactory	Satisfactory	6.20
03	16-May-2013	Moderately Satisfactory	Moderately Satisfactory	6.20
04	21-Nov-2013	Moderately Unsatisfactory	Moderately Unsatisfactory	6.65
05	09-Jun-2014	Moderately Unsatisfactory	Moderately Unsatisfactory	7.23
06	12-Dec-2014	Moderately Unsatisfactory	Moderately Unsatisfactory	9.86
07	29-Jun-2015	Moderately Unsatisfactory	Moderately Unsatisfactory	12.98
08	11-Nov-2015	Moderately Unsatisfactory	Moderately Unsatisfactory	16.32
09	31-May-2016	Moderately Satisfactory	Moderately Satisfactory	21.65
10	09-Mar-2017	Moderately Satisfactory	Moderately Satisfactory	31.54
11	20-Jul-2017	Moderately Unsatisfactory	Moderately Unsatisfactory	39.95
12	05-Feb-2018	Moderately Unsatisfactory	Moderately Unsatisfactory	57.91
13	29-Jun-2018	Moderately Satisfactory	Moderately Satisfactory	65.48
14	08-May-2019	Moderately Satisfactory	Moderately Satisfactory	72.15

SECTORS AND THEMES

Sectors

Major Sector/Sector (%)

Energy and Extractives	100
Renewable Energy Hydro	19
Public Administration - Energy and Extractives	9
Energy Transmission and Distribution	64
Other Energy and Extractives	8

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3) (%)

Private Sector Development	42
Jobs	32
Job Creation	32
Public Private Partnerships	10
Urban and Rural Development	68
Urban Development	36
Urban Infrastructure and Service Delivery	32
Services and Housing for the Poor	4
Rural Development	32
Rural Infrastructure and service delivery	32

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I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. Malawi ranked at 153 out of 177 countries in the United Nations Human Development Index, with an estimated gross national income per capita of US\$280¹ and a headcount poverty incidence rate of 40 percent.² The youth comprised about 52 percent of the total population, which was still growing at a fast rate. The population was expected to reach 22.4 million by 2025.³ This landlocked country, 118,484 km² in area, was predominately agrarian with about 80 percent of the population living in rural areas.
2. In 2004, Malawi implemented a strong stabilization policy and obtained relief from its debt (of 25 percent of gross domestic product), from the Heavily Indebted Poor Countries Initiative, which helped it improve government finances, manage public spending, and create the fiscal setting for resuming growth. As a result, real gross domestic product growth averaged about 7 percent in the five years up to 2010. But, the country still faced significant barriers to sustainable long-term growth which included power shortages and unreliable power, water shortages, poor telecommunications infrastructure, and high costs of services.
3. Electricity Supply Corporation of Malawi (ESCOM), a vertically integrated, government-owned electric utility, was the main electricity service provider whose mandate was to generate, transmit, and distribute electric power. ESCOM owned and operated all the formal generation capacity in the country, which comprised 283 MW, 98 percent of which was run-of-river hydropower from the Shire river with all its related hydrological risks. ESCOM also operated the national electricity grid. The transmission network comprised 1,250 km of wood pole lines and 815 km of steel tower lines. These lines transmitted bulk power at 66 kV and 132 kV and fed power to over 70 transformers that were located at 39 substations in the country.
4. Electricity access rate was only about 8 percent of the population, mostly in urban centers. For the 80 percent of the people living in rural areas, access to electricity was less than 1 percent. ESCOM had connected about 203,000 customers to its grid network. ESCOM had a significant backlog of new connections, both from residential and industrial customers (including mining customers), resulting in significant suppressed demand in the system.
5. The electricity supply also could not meet the peak demand, estimated at about 330 MW, resulting in daily load shedding. An annual demand growth of 5 percent was projected for the next decade and frequently exceeded 35 MW, or over 10 percent of peak demand. The operating power stations were not only of insufficient capacity to meet this demand growth, but they also urgently needed rehabilitation because of aged equipment and poor maintenance practices. The transmission system was also characterized by heavily loaded lines and transformers which led to frequent power outages hence poor quality of supply in the country. Most of the medium voltage (MV) and low voltage (LV) distribution

¹ World Bank. 2010. *The Little Data Book 2010*.

² Welfare Monitoring Survey 2007.

³ World Bank. 2006. *Malawi - Poverty and Vulnerability Assessment: Investing in Our Future*.

networks supplying the main load centers were also heavily overloaded, operating beyond their design limits and extended beyond regulatory voltage requirements, thereby affecting quality and reliability of supply.

6. ESCOM's financial position was in a weak state and the utility's commercial performance had been very poor with negative operating cash flow generation over several years. This was also worsened by the high network losses (transmission and distribution [T&D]) that were well over 22 percent. Due to ESCOM's significant resource constraints, maintenance of the distribution system had been on an emergency repair basis, with limited systematic rehabilitation. These resource constraints could be attributed in part to ESCOM's tariffs, which at US\$0.04 per kWh had for several years been barely sufficient to meet ESCOM's operating costs for the existing power plants. Any major maintenance, repair, or rehabilitation works would thus put huge strains on ESCOM's financial situation. In addition, generation expansion was impossible for ESCOM without extensive external financing. Although the regulatory authority did increase tariffs by a cumulative 61 percent by 2011, this was still not likely to yield much relief.

7. These low electricity tariffs, together with the uncertainties associated with the implementation of the energy and electricity laws, presented limiting factors for new investment in Malawi's electricity sector as well as the participation of the private sector in the generation segment. These sector issues posed a major constraint on the economic development of the country, especially in the north where significant mineral deposits (including uranium ore) were available for exploitation. The unreliability of the T&D system had become a major concern to the existing industrial and commercial operators in addition to the already existing load shedding due to generation shortfall.

8. The T&D network needed urgent upgrading. A systematic strengthening of transmission capacity to the north was needed to ensure security of supply for mining and other new industrial loads. ESCOM was also an unconnected member of the Southern African Power Pool (SAPP) and was not able to trade electricity through the SAPP or bilaterally with neighboring countries.⁴ In July 2007, a Mozambique-Malawi Transmission Interconnection Project was approved by the World Bank's Board of Directors.

9. Given the structural capacity deficit, Malawi also urgently needed to accelerate the development of new generation capacity. The Government of Malawi (GoM), through system expansion studies, identified possible hydropower generation sites. Complete feasibility studies (including detailed environmental and social impact assessments [ESIAs]) for these sites were identified as an urgent first step in developing the sites and needed to be addressed in the proposed project. In addition, Malawi presented considerable opportunities for other renewable energy sources other than hydropower, although no thorough investigative work had been undertaken. These included good solar characteristics, wind energy potential, biomass potential, and geothermal resources. The ESSP supported this need by funding several feasibility and other studies for projects that would meet this capacity shortfall under its component 2, which is detailed in paragraph 26 below.

10. ESCOM's transmission network had suffered from many years of under-investment and the system was, as a result, mostly old and outdated with a lack of spare parts and skill sets of utility employees. The system was characterized by heavily loaded transmission lines and transformers, resulting

⁴ The Malawi transmission grid did supply some LV power to settlements just over the Malawi border in neighboring countries, where there is no coverage from the domestic grid.

in frequent failures especially during the rainy season, and generally poor quality and unreliable supply. The network configuration was inflexible and susceptible to outages. Demand for electricity had risen over the years without corresponding investments in systems causing the system to be greatly strained with overloading, bottlenecks and load shedding.

11. Most of the low-voltage distribution networks supplying the main load centers were also heavily overloaded, and operating beyond their design limits thereby affecting quality and reliability of supply. Transformers and LV lines were also oversaturated and over-extended, contributing to high technical losses and excessive voltage drops along with frequent and prolonged unplanned outages in customer service and power supply interruptions. Maintenance of the distribution system had often been on an emergency repair basis, with limited systematic rehabilitation, rendering the entire distribution system highly unreliable. Although ESCOM strived to maintain supplies to these priority MV customers, it was often unable to prevent outages due to equipment failures in the transmission and distribution systems. Furthermore, ESCOM had a significant backlog of new connections, both from residential and industrial customers (including mining customers), resulting in significant suppressed demand in the system.

12. The Energy Sector Support Project (ESSP) was designed to provide urgently needed rehabilitation, upgrading, and expansion of the existing electric T&D systems. The details of improvements it was to contribute and its component interventions are outlined in paragraphs 27 to 31 below. The project was also closely related to the Millennium Challenge Corporation (MCC) Compact.

13. The MCC signed a US\$350 million Compact with the GoM to provide support to the energy sector in Malawi. The Compact would provide financing for a program of grid rehabilitation and upgrade, focused on the generation and transmission subsectors, as well as investments in natural resource management. As part of Compact preparation, MCC financed detailed feasibility studies, which identified urgent energy sector investments in Malawi with estimated costs of approximately US\$475 million. These studies were drawn on in the preparation of some activities in the World Bank financed project. However, the IDA financing supported a stand-alone project and was not part of any joint co-financing. Achieving the project's Development Objective and the expected results did not in principle depend on implementation of, or progress in, the MCC Compact. In reality, as the projects were implemented, due to the evolution of the grid, there were in fact certain operational interdependencies.

14. In addition, the MCC Compact would support a program of policy reforms, including improvements in the financial management, operational management, and corporate governance of ESCOM, as well as improvements in the regulatory framework for private sector participation in the sector. The World Bank task team has coordinated closely with the MCC project team during the development of the Compact, and the program of policy reforms reflects the assessments of the WB task team on key sector and regulatory issues. Conversely, the ESSP relied on some of the financial and operational management policies and procedures instituted by MCC, for ESSP's M&E and implementation as described in more detail later in this document.

15. Efforts to reduce the peak demand through demand-side management (DSM) and energy efficiency initiatives were being explored by ESCOM. ESCOM had plans to have a program to replace 2 million traditional incandescent bulbs with low-power compact fluorescent lamps (1.3 million to households and 0.7 million to businesses and other customers through a voucher system), over a period of 18 months, with an aim of shaving off up to 20–30 MW of the evening peak load and deliver 100 GWh

per year of energy savings. The United Kingdom Department for International Development (DFID) provided funding of £2.6 million for the project. ESSP also included a DSM component (Component 3) to help ESCOM better manage the demand side. This component is described in Paragraph 30.

16. The proposed project was to contribute directly to the set of objectives set out in the Malawi Country Assistance Strategy (CAS) (FY07–FY10) (Report No. 38326-MW). The CAS is a program of country assistance in support of the overall Malawi Growth and Development Strategy (MGDS), which underscored the importance of putting in place a foundation for long-term economic growth through improved infrastructure and the investment climate. It specifically proposes that the World Bank continues to play a central role in infrastructure development, focusing its efforts on energy and water development.

17. A new CAS for FY12–FY15 that was under preparation, at the time of project preparation, had identified, in consultation with the GoM, the energy sector as a high priority as it would address critical growth constraints, to help Malawi achieve a more sustainable, diversified, and inclusive growth. In addition, the proposed project was in line with the economic growth and development objectives set out in the GoM’s five-year MGDS (2006–2011). Energy was identified as a crucial input for industrial processing. The objective of the MGDS with respect to energy was to reduce the number and duration of blackouts, increase access to reliable and affordable electricity in rural areas and other targeted areas, and improve coordination between the needs for energy for households and those of other high growth sectors such as tourism and mining.

18. The Technical assistance and capacity building component of ESSP (Component 4) was included in the project to support ESCOM and the Ministry of Natural Resources, Energy, and Mining (MoNREM), which were directly associated with the CAS outcome of putting in place a foundation for long-term economic growth through improved infrastructure and the investment climate, by helping close the supply-demand gap and improve the electricity distribution and transmission sector.

19. In addition, the project was aligned with the new Africa Strategy focus, that is, addressing the continent’s massive infrastructure deficit particularly in the energy sector as a means of enhancing Africa’s competitiveness and employment levels.

20. The implementation of the project, however, also had to take place in an environment of weak institutional capacity and of disruption due to the unbundling of an integrated power sector entity into a generation entity EGENCO, and a transmission and distribution utility ESCOM along with the simultaneous restructuring of ESCOM. The project was also a first of its kind in the country after a hiatus of significant duration over which most of the institutional memory regarding implementation of World Bank investment projects, in the power sector in particular, had been lost. In addition, the project’s implementation was beset by several issues unrelated to the project itself (and some beyond the control of the project management team) which had the potential to severely impact the implementation of the project. These are described in further detail in Section II of this report – “KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME”.

21. The project management and implementation teams seem to have performed remarkably well against the odds described in that section in bringing the project to a close. Disbursements at close were at 94%. All 10 of the substations have been completed, powered up and loaded. Of the nine distribution

lines, all but two were completed. The two remaining lines connect sensitive loads such as the Chileka airport and main water supply for Blantyre and the Blantyre city service for which outages have been impossible due the election period. These are expected to be completed as and when the required maintenance outages for these load centers can be obtained under an agreed outage management plan for testing and energizing. All of the RAP steps have been implemented including disbursing the compensation payment amounts to 99.6% of the project affected people (PAP). All the feasibility and other studies under Component 2 have been completed. The AMR system and 925 meters under the modified component 3 have been installed. The Capacity building and Technical Assistance activities under Component 4 have also been completed.

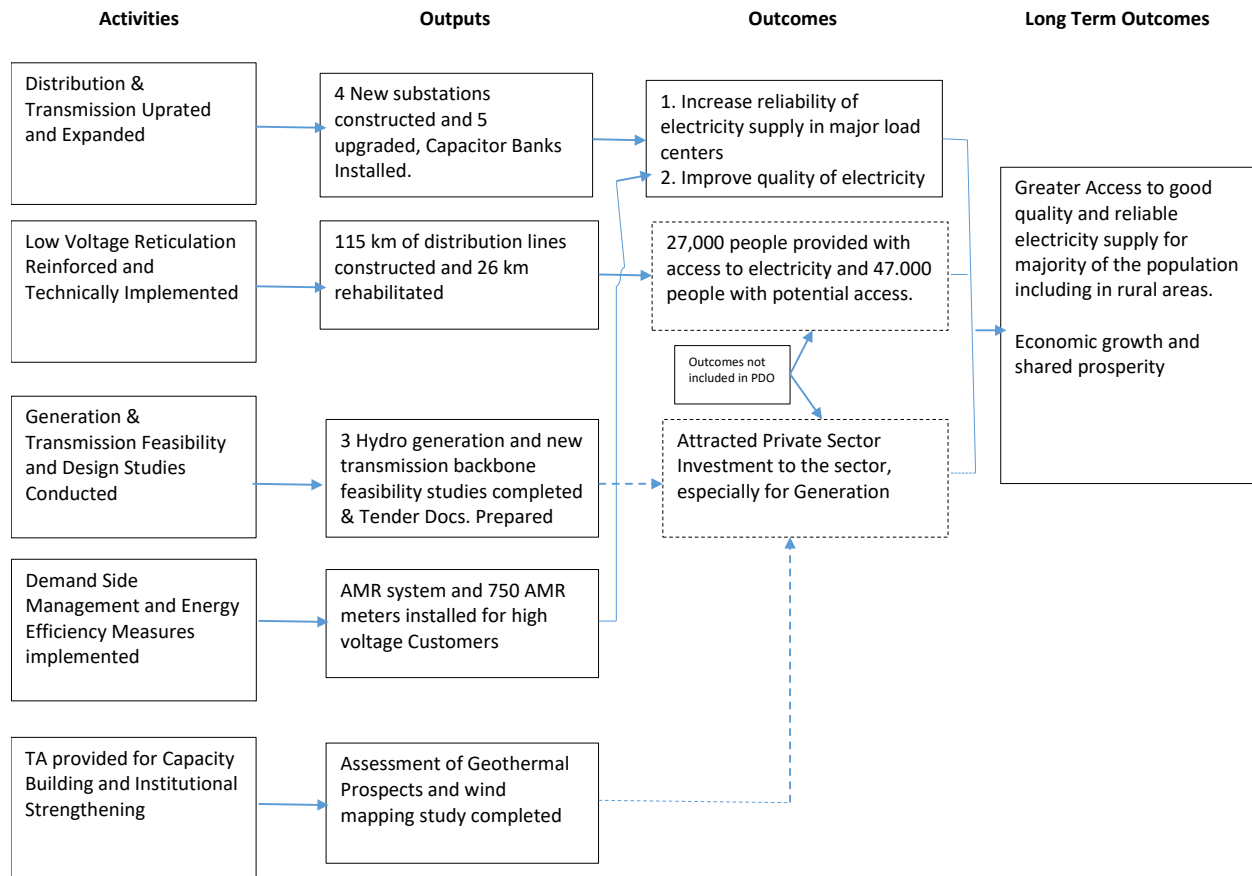
Theory of Change (Results Chain)

22. An intervention by itself cannot solve all the issues in a system. At best it can provide one or more needed steps, among perhaps many, to transition from the extant to the more desirable. In this case, as mentioned earlier, the power system in Malawi was characterized by severe T&D capacity constraints that impaired the quality and reliability of electricity supply, not to mention that only 9 percent of the 11 percent of the people who currently have electricity had access to even that electricity. The project, through its T&D upgrade and the front-end work for future generation investments, would provide some of the key steps needed to make the transition to better quality and more reliable electricity supply along with increased access.

23. Without the project, the quality and reliability of the system would continue to deteriorate even without the forecast demand growth. The performance would be further complicated as capacities in other parts of the system were augmented by other investments (for example, the MCC project with which the ESSP is closely coordinated), causing significant imbalances in the system, resulting in further deterioration in performance. In the event, as revealed by the updating of the baseline results indicators in the second restructuring discussed in paragraph 35 below, this was what actually occurred.

24. This theory of change is illustrated in figure 1.

Figure 1. Theory of Change: ESSP



Note: AMR = Automatic Meter Reading.

Project Development Objectives (PDOs)

25. The PDO was to increase the reliability and quality of electricity supply in the major load centers.

Key Expected Outcomes and Outcome Indicators

26. The original set of PDO outcome indicators were

- Reduction in electricity losses per year in the project areas (Core Indicator);
- Total Interruption Time per KVA Installed (TITK) per year in the project areas; and
- Direct project beneficiaries (number), of which female % (Core Indicator).

Components

27. The proposed project activities comprised four components.

Table 1. Project Components and Costs

Project Component	Estimate Cost (US\$, millions)	Actual Costs (US\$, millions) ⁵
Component 1: Electricity Network Strengthening and Expansion	51.10	49.03
1a: Distribution and Transmission Upgrading and Expansion	39.90	39.42
1b: Low Voltage Reticulation Reinforcement and Technical Implementation Support	9.51	7.09
1c: Design, Procurement, and Supervision	3.50	2.52
Component 2: Generation and Transmission Feasibility and Design Studies	13.98	10.46
Component 3: Demand Side Management and Energy Efficiency Measures (Memo: AMR Supply and Installation)	5.27	1.94
Component 4: Capacity Building and Technical Assistance	3.26	7.92
4a: Support for ESCOM	0.58	1.34
4b: Support for MoNREM	2.68	6.58
Total	73.03	69.35

28. Each of these components is briefly outlined in the following paragraphs.

Component 1: Electricity Network Strengthening and Expansion (estimated at US\$56.2 million, including contingencies)

- **Subcomponent 1a: Distribution and Transmission Upgrading and Expansion (estimated at US\$41.9 million, including contingencies).** Activities in this subcomponent included (a) construction of new substations and associated transmission lines; (b) upgrading of existing substations; (c) construction and rehabilitation of 33/11 kV distribution lines; (d) rehabilitation of underground cables; (e) extension of peri-urban networks; (f) purchase of spare parts for generation;⁶ and (g) compensation costs for project-affected persons (PAPs), as needed (such as compensation for crop damage).
- **Subcomponent 1b: Low Voltage Reticulation Reinforcement and Technical Implementation Support (estimated at US\$10.5 million, including contingencies).** Activities in this subcomponent included (a) reconfiguration and extension of MV overhead lines (i.e. 11 kV and below) supplying consumer substations/distribution transformers; (b) installation of approximately 200 new such consumer substations; (c) construction of new three-phase LV overhead lines and conversion of single-phase to three-phase LV overhead lines; (d) a limited intensification of the peri-urban network including the supply of operation and maintenance (O&M) tools; and (e) provision of technical hands-on training for the enhancement of ESCOM's training school in Blantyre.
- **Subcomponent 1c: Design, Procurement, and Supervision (estimated at US\$3.8 million, including contingencies).** Activities in this subcomponent included (a) preliminary survey

⁵ As of June 17, 2019

⁶ The parts for the T&D systems were dropped.

and design work for T&D lines investments in Subcomponents 1a and 1b, (b) support to ESCOM to supervise contractors during implementation of Subcomponents 1a and 1b, and (c) advising ESCOM on establishing a dedicated materials management system.

Component 2: Generation and Transmission Feasibility and Design Studies (estimated at US\$15.2 million, including contingencies)

29. This component would support financing of full feasibility studies needed for the eventual development of an additional 200–400 MW of new hydropower generation capacity, required to meet Malawi’s growing energy demand. Activities in this component included (a) full feasibility study at Lower Fufu on the South Rukuru River, (b) feasibility study at Mpatamanga on the Shire River, (c) feasibility study at Chimgonda on the Dwambazi River, and (d) feasibility study on a new ‘inland’ transmission backbone line from Lilongwe through Kasungu to Mzuzu. In addition, where the studies included dam design work, there would be support for a separate and independent expert (or group of experts) to review the quality of the studies and designs being undertaken by the main consultants, to guarantee that they reflect international best practices and standards with respect to dam safety and environmental and social aspects for the respective hydro sites. There would also be an Environmental and Social Advisory Panel, consisting of one environmental expert and one resettlement expert, to review the terms of reference (ToR), full ESIA, Resettlement Action Plan (RAP), and other safeguard documents and advice on safeguard aspects.

Component 3: Demand Side Management and Energy Efficiency Measures (estimated at US\$6.8 million, including contingencies)

30. This component would support several DSM and energy efficiency activities in industrial and urban residential areas. Activities supported in this component included (a) time-of-use meters and sensitization campaigns, (b) derating of hot water geyser (HWG) element ratings, (c) HWG management system with insulation, (d) installation of solar water heaters, (e) radio control to switch off water heaters to reduce demand at peak times, (f) SMS messages to manage peak load demand, and (g) media campaigns.

Component 4: Capacity Building and Technical Assistance (estimated at US\$3.5 million, including contingencies)

31. This component would provide institutional strengthening and technical assistance to both the MoNREM and ESCOM to support their efforts to further develop the country’s energy sector. Activities under this component included (a) a wind power resource study; (b) a preliminary assessment of geothermal prospects; (c) a technical assessment of the opportunities to expand bagasse-fueled cogeneration capacity from the sugar production operations in Malawi; (d) sectoral studies to underpin the evolving agenda; (e) support for specialist transaction advisers to provide financial, legal, and technical advice to the GoM and Malawi Energy Regulatory Authority (MERA) on private sector investment in the power sector; and (f) institutional strengthening of the project implementing agencies at the MoNREM and ESCOM, including for incremental operating costs, goods and equipment for office functioning and training, relevant consultancy services and training in World Bank procurement and financial management procedures, environmental and social safeguards issues, project management, energy planning, and monitoring and evaluation (M&E) systems.

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

32. The first four subsections provide a statement of the key changes and revisions with dates of the revisions as appropriate, for PDO, outcome targets, PDO indicators, project components, and other indicators. The last subsection explains the rationale for these changes and revisions and their implications for the theory of change.

Revised PDOs and Outcome Targets

33. There were three restructurings during the implementation of the project. All of them were level 2 restructurings and there was no change to the PDO or the PDO-level outcome indicators, although the target values were revised upward, and some intermediate output indicators were added or replaced, as discussed in more detail in the following paragraphs. The three restructurings were as follows:

- (a) **May 2015.** Component 2: Shifting the feasibility study of Backbone Transmission Line to ESCOM, with the balance of the studies remaining with the MoNREM. This was to address a systems issue in the WB Client Connection which did not permit ESCOM the contracting entity to document the expenditures since MONREE was the executing Agency in the System.
- (b) **April 2016.** (i) a 21-month extension of the project closing date to July 2018; (ii) cancellation of DSM activities (primarily due to exchange rate losses as explained further in paragraph 43 below) in Component 3 and the removal of related intermediate indicators and the inclusion of a new activity (i.e. AMR supply and installation) in Component 3 together with new intermediate indicators for this; (iii) reallocation of funds described in table 2; (iv) change to components and costs to reflect the cancellation and reallocation; (v) revisions of the Results Framework to better reflect the current sector situation at that time (explained in greater detail in the 'Rationale' section); (vi) inclusion of the 'force account' procurement method (normally used for undertaking works using the resources of a public agency or the government without competitive bidding or negotiated contracts), amendment of the operating cost definition to include the expenses to be financed under this method, and inclusion of a new disbursement category for the same purpose; (vii) change to the disbursement arrangements of category 6 so that ESCOM can make payments out of this category; and (viii) update of the implementation schedule.
- (c) **May 2018.** Extension of the closing date from July 31, 2018, to October 15, 2018.

Revised PDO Indicators

Summary of Revisions

34. The end-target values of PDO indicator and the intermediate results indicators were revised to be more consistent with the current actual values obtained from the field M&E team at the time of the second restructuring. The intermediate indicators were also revised to align with the revised project activities. Thus, some intermediate indicators were dropped (see annex 1), while a couple of new intermediate indicators were added. Selected end-target values for some of the intermediate indicators

were also changed as described in the 'Analyses of Changes' section. The original and the revised Results Framework for PDO-level indicators is presented in table 2.

Table 2. PDO-level Indicators

PDO-level Results Indicators	Core	Unit of Measure	At Approval		Post Restructuring (April 2016)		Actual Achieved by Project Closing December 2018 Actual
			Baseline	Target Value	Baseline	Target Value	
Indicator 1: Reduction in electricity losses per year in the project areas	Yes	%	17.4	13.4	17.4	20	17 ^a
Indicator 2: Interruption Time per KVA installed (TITK) per year in project areas	Yes	Number (changed to hours) ^b	2.6	2.2	32.1	25.8	19.71
Indicator 3: Average interruption frequency per year in the project area ^c	New	Number	2.6	2.2	11	9.4	6.57
Customers served in the project area ^d	Dropped	Number	0	27,000	0	294,940	1,728,635
Indicator 4: Direct Project Beneficiaries (number) - of which female %	Yes	Number (%)	0	47,000 (50%)	0 (50%)	294,940 (50%)	398,023 (51.49)

Note: a. While the indicator states 'Reduction' of losses, both the original baseline and target, as well as the post restructuring ones, are actually percentage loss figures and include both technical and nontechnical losses (Project Appraisal Document [PAD] annex 1). It needs to be noted that the reduced figure for losses shown in this table may not be attributable solely to reduction of technical losses because the AMR system and meters are likely to have also reduced some nontechnical losses.

b. Changed to the generally accepted unit of measure for TITK - hours.

c. This indicator was not in the original three PDO-level indicators and was added as part of the restructuring. While the indicator is a standard one for measuring reliability, in the opinion of the Implementation Completion and Results Report (ICR) team, the values for both the baseline and the target are most likely monthly values misstated as annual. This conclusion is based on the World Bank enterprise survey data (2011–2018) in which the monthly average outage frequency for Sub-Saharan Africa is 8.9 or an annual rate of 106.8. The equivalent baseline and target for this indicator as an annual figure would thus be 132 and 112.8, respectively.

d. This indicator was dropped during the second restructuring but may have crept in as an artifact in the system with an incorrect value (Annex 1). It should therefore be ignored until the system is updated to reflect the deletion.

35. The final Results Framework table with updated values is provided in detail in annex 1.

Analysis of Changes

36. Although the funding for the project was reduced due to exchange rate losses (SDR-USD), except for Component 3, there was no change in the scope of the project although the PDO results indicators were changed during the second restructuring. Under certain circumstances, the ICR guidelines require a split rating if either the PDO or the results indicators are changed for some reason. In the present case, however, a split rating was not warranted for the following reasons:

- (a) There was no change in the PDO.
- (b) The units were changed from a 'number' to 'hours'. The scope of the components (other than Component 3) did not change, in that the number of substations and kilometers and scope of LV reticulation for distribution lines, which were to be installed and upgraded, remained the same. In this sense, the project became more ambitious and efficient, in that the same results were to be generated with fewer funds.
- (c) Changes in the values of PDO Indicators also did not warrant a split rating because of the following:
 - (i) The changes in the PDO indicators were, in part, to clarify the indicators and make them more compliant with the then generally accepted standards for the measurement of the parameters being measured, for example, the generally accepted unit of measurement for the TTIK is hours. Part of the changes in the baselines were to reflect the deterioration of the system performance during the project implementation period while the project components were still to be completed. These required the baselines to be adjusted to the then current actuals to reflect this deterioration.
 - (ii) The target values for results indicators therefore also had to be adjusted to reflect both the changed units of measurement and the deterioration. The percentage improvements between the baselines and the targets in the original, the revised, and the actual cases are provided in table 3.

Table 3. Percentage Improvements between the Baselines and the Targets in the Original, the Revised, and Actual Cases

	Original (%)	Revised (%)	Actual (%)
Reduction in electricity losses per year in the project areas	22.9	20.0	32.0
Total Interruption Time per KVA Installed (TITK) per year in the project areas	15.4	19.4	38.6

- (iii) In the case of the loss reduction indicator, the actual improvement was greater than the original improvement envisaged, even though the revised target improvement had been set slightly lower as a round figure. This obviated the need for a split rating in this case. In the case of the TITK indicator, the revised targets required a greater

improvement than the original did and so there was no need for a split rating as this was more ambitious.

(d) Component 3

- (i) **DSM.** Because the original economic and financial analyses in the PAD had excluded benefits accruing from DSM and energy efficiency measures, it is likely that the PAD did not attribute any of the improvements in the results indicators to DSM. Conservatively, if this component contributed to the achievement of some portion of the improvements in the PDO results indicators, this would have been achieved by load shifting of about 8 MW (DSM result target - indicator four in the PAD annex 1) from peak to off peak through the DSM activities that were dropped. The capacity added by the 10 substations was about 117 MVA. Conservatively, if the contribution to the improvements in the indicator attributable to the LV reticulation (or Component 4) had been zero, this would imply that Component 3 would have contributed to about 7 percent of the improvement. Had the revised and/or actual results indicator values after the restructuring reflected a reduction in improvement by 7 percent or more, there would have been a case for a split rating. However, in each case the revised and/or actual improvements were greater than the improvement targets at approval.
- (ii) **AMR.** The AMR-related meters, which were originally to be funded elsewhere, were added to Component 3 and an additional intermediate indicator was also added because of this. Because this was an expansion of the scope of Component 3, a split rating was not required in this case.

Revised Components

37. An analysis of the amendments to the components under the first two restructurings is provided in table 4 in SDR. The first restructuring was to reallocate a portion of Component 2 to ESCOM from the MoNREM and the second amendment was to reflect the restructuring due to the exchange rate losses.



Other Changes

Table 4. Revised Component

Original Financing Agreement			Amendment No.1			Amendment No.2		
Category	Credit (SDR)	Grant (SDR)	Category	Credit (SDR)	Grant (SDR)	Category	Credit (SDR)	Grant (SDR)
(1) Goods, works, non-consulting services, consultants' services, and training for Part A of the project	12,000,000	20,478,000	(1) Goods, works, non-consulting services, consultants' services, and training for Part A of the project	12,000,000	20,478,000	(1) Goods, works, non-consulting services, consultants' services and, training for Part A of the project	12,000,000	23,100,000
						(10) Operating Costs for Part A.2 (b) of the project	—	1,100,000
(2) Consultants' services for Part B of the project	—	8,636,000	(2) Consultants' services for Part B.1 of the project (MoNREM)	—	6,228,970	(2) Consultants' services for Part B.1 of the project (MoNREM)	—	5,860,000
			(9) Consultants' services for Part B.2 of the project (ESCOM)	—	2,407,030	(9) Consultants' services for Part B.2 of the project (ESCOM)	—	1,944,000
(3) Goods, works, non-consulting services, consultants' services for Part C of the project	—	3,810,000	(3) Goods, works, non-consulting services, consultants' services for Part C of the project	—	3,810,000	(3) Goods, works, non-consulting services, consultants' services for Part C of the project - (AMR Supply and Installation)	—	1,409,000
(4) Consulting services, goods,	—	360,000	(4) Consulting services, goods,	—	360,000	(4) Consulting services, goods,	—	1,031,000



Original Financing Agreement			Amendment No.1			Amendment No.2		
Category	Credit (SDR)	Grant (SDR)	Category	Credit (SDR)	Grant (SDR)	Category	Credit (SDR)	Grant (SDR)
Training and Operating Costs for Part D.1 of the project			Training and Operating Costs for Part D.1 of the project			Training and Operating Costs for Part D.1 of the project		
(5) Consulting services, goods, training, and operating costs for Part D.2 of the project	—	1,655,000	(5) Consulting services, goods, Training and Operating Costs for Part D.2 of the project	—	1,655,000	(5) Consulting services, goods, Training and Operating Costs for Part D.2 of the project	—	5,233,000
(6) Compensation Payments payable under each respective RAP	—	309,000	(6) Compensation Payments payable under each respective RAP	—	309,000	(6) Compensation Payments payable under each respective RAP	—	723,000
(7) Refinancing of the Preparation Advance	—	1,854,000	(7) Refinancing of the Preparation Advance	—	1,854,000	(7) Refinancing of the Preparation Advance	—	—
(8) Unallocated	—	3,298,000	(8) Unallocated	—	3,298,000	(8) Unallocated	—	—
Total Amount	12,000,000	40,400,000		12,000,000	40,400,000		12,000,000	40,400,000

38. Some of these changes were, in part, because of exchange rate changes between the SDR vs. USD. As a result, the total amount of available funds in U.S. dollars at restructuring was reduced to US\$73.8 million from the original amount of US\$84.7million, and based on current the exchange rate (as of June 17, 2019) it is US\$72.4 million. This is illustrated in table 5.

Table 5. Revised Components

Component	Allocated (US\$)	Disbursed (US\$)	Undisbursed (US\$)
Component 1: Electricity Network Strengthening and Expansion - Categories (1), (10), and (6)	50,985,124.55	49,027,120.69	1,958,003.86
Component 2: Generation and Transmission Feasibility Studies - Categories (2) and (9)	10,776,153.40	10,462,614.57	313,538.83
Component 3: Demand Side Management and Energy Efficiency Measures - Category (3)	1,945,617.65	1,943,312.31	2,305.34
Component 4: Capacity Building and Technical Assistance - Categories (4) and (5)	8,649,644.40	7,924,471.37	725,173.03
Totals	72,356,540.00	69,357,518.94	2,999,021.06

39. The final disbursement figure of US\$69.4 million reflects this change in exchange rates and also the consequent restructuring. All contracts have been satisfactorily completed and settled (including for Component 3, as restructured), for goods, works, and services, and acceptance certificates have been issued where applicable. The undisbursed amount of US\$2.99 million is thus a saving for the operation.

40. Component 3: Specifically, for Component 3, at the Second restructuring, all the subcomponents were dropped, and the AMR system and the supply and installation of the AMR meters were included as the only activity. This was done to accommodate the exchange rate losses incurred at that point.

41. There were two tariff increases during the implementation phase of the project. Although the project itself did not contain any conditions or requirements for tariff increases, the project was closely coordinated with the MCC project and benefited from many of its policy and regulatory reforms as part of the division of labor aligned to the Paris Accord and contributing to the theory of change.

Rationale for Changes and Their Implication on the Original Theory of Change

First Restructuring

42. The feasibility studies for a Transmission Backbone Project, to be funded under Component 2, was transferred by the MoNREM to ESCOM. This was to address a systems issue in WB Client Connection which did not permit ESCOM the contracting entity to document the expenditures since MONREE was the executing Agency in the System.

Second Restructuring

43. The second restructuring included the following:
- (a) **21-month extension of the project closing date to July 2018.** Implementation had taken longer than anticipated due to initial implementation delays caused by the political situation in the country and weak implementation capacity. Implementation had since improved significantly, and the project was completed by the new closing date of October 15, 2018, set as part of the third restructuring.
 - (b) **Cancellation of DSM activities in Component 3.** At the time of restructuring, appreciation of the U.S. dollar against the SDR had reduced the available project amount by US\$10.92⁷ million equivalent (around 15 percent of the current total credit and grant amount). To complete priority activities, the Government and ESCOM elected to cancel the activities (not yet started) related to (i) DSM under Component 3 and (b) rehabilitation of underground cables related to the extension of the peri-urban network under Component 1. ESCOM would finance the latter two activities out of its own funds. As mentioned earlier, a new activity was added to Component 3, namely, the AMR supply and installation, which also led to a downward revision of the costs hence the reallocation as mentioned in point (c).
 - (c) **Reallocation of funds.** The reallocation of funds was because of the reduction of project funds due to exchange rate changes and the changes in Component 3. The reallocation is summarized in tables 4 and 5.
 - (d) **Revision of Results Framework.** As no new activities had been undertaken in the country to lower energy losses and/or reduce the average interruption frequency per year, since the project was approved, at the point of the second restructuring, the original baseline values no longer reflected the current baseline situation before project activities actually started. Accordingly, the end-target values were revised to be consistent with the then actual values. Intermediate indicators were also revised to align with revised project activities. Thus, some intermediate indicators were dropped while a couple of new intermediate indicators were added and the selected end-target values for some of the intermediate indicators were also updated (as illustrated in table 2).
 - (e) The 'force account' procurement method (that is, undertaking works using the resources of a public agency or the Government without competitive bidding or negotiated contracts) was added to the Financing Agreement, because ESCOM staff would now be responsible for executing the LV reticulation works under the project. The project had procured the materials for this work and would be financing the operating expenses for ESCOM to complete this work (at an estimated cost of US\$1.5 million). While this was foreseen in the PAD, the 'force account' procurement method had not been included in the Financing Agreement. The definition of operating costs was also amended to include the expenses to be financed under this method.

⁷ At closing the net loss was US\$12.1 million equivalent.

Third and Final Restructuring

44. Extension of the closing date from July 2018 to October 15, 2018. The original request was for a five-month extension but only three months were granted, given that there had already been a 21-month extension granted before.

Implications for the Theory of Change

45. The two changes most likely to have an impact on the project outcomes were the changes to Component 3 and the implementation delays. DSM in Component 3 would have alleviated system peak load and also contributed to the improvements in the quality and reliability of electricity supply. The capacity increase from the substations and the rest of the T&D upgrade may have obviated the immediate need for DSM to realize the theory of change, but DSM would have eventually benefited the system integrity when the system load (as well as generation capacity) caught up with the increased T&D capacity. The implementation delays postponed the realization of the theory of change by the period of the delay. However, even if project implementation had been completed on the original schedule, the full benefits would still have been postponed because of certain technical indivisibilities with respect to the MCC project, which only reached completion along with the ESSP. Thus, the changes had relatively limited immediate implications for the original theory of change.

I. OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating

46. The project straddled both the FY07–FY10 CAS and the subsequent FY13–FY16 Country Partnership Strategy (CPS) (Report No: 74159-MW) providing an opportunity to consistently assess the relevance of the PDOs both at entry and implementation completion. The PDO was clearly relevant at the close of the FY07–FY10 CAS and remained so through the duration of the FY13–FY17 CPS. Specifically:

- **Relevance at entry.** As mentioned in section 1, the FY07–FY10 CAS specifically proposed that the World Bank continue to play a central role in infrastructure development, focusing its efforts on energy and water development. The PDOs and the project components were thus directly associated with the FY07–FY10 CAS outcome of putting in place a foundation for long-term economic growth through improved infrastructure and the investment climate for which the quality and reliability of electricity supply were key.
- **Continued relevance.** The World Bank Group Malawi CAS (FY13–FY16) was to support both analysis and direct project interventions and encourage private investment through public private partnerships (PPPs). Under that strategy, the World Bank and International Finance Corporation (IFC) would continue to work closely with other development partners supporting the energy sector, in particular the MCC, whose program had a complimentary T&D project with which the project was to be (and has been) closely coordinated, as well as with the African Development Bank and other development partners active in the sector. It would also coordinate closely with the Government's own investments to build capacity for

power generation and T&D. The ESSP dovetails almost completely with all these elements of the FY13–FY16 CAS. Thus, the PDO and project remained very relevant during its implementation phase through 2016.

- **Relevance at closing.** Although the next CPS is not due to be made public until 2019, extensive stakeholder consultations are being conducted and the Government’s Third Malawi Growth and Development Strategy 2017–2021 (MGDS-III), which the CPS will support, has energy as one of its key priorities. Specifically, these priorities include access to reliable and sustainable energy supply, improved access to affordable alternative sources of energy, and enhanced use of renewable and clean energy in the underserved communities. The PDO, the outcome indicators, and constituent Components 1, 2, and 3 of the project are directly relevant to these desired outcomes of the Government’s MGDS-III. The increased substation capacity and the new and rehabilitated distribution lines would also enable greater access. This integrally addresses the World Bank Group’s goal of shared prosperity and thus substantially preserves its high relevance to the CPS, the MGDS-III, and also the World Bank Group’s ‘twin goals’⁸ after they were formally adopted in 2013.

47. Thus, the PDO is accorded a rating of High Relevance.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

48. The PDO ‘to increase the reliability and quality of electricity supply in the major load centers’ includes both reliability and quality of electricity supply to be increased. Both the reliability and quality of electricity supply are measured by frequency and duration of interruptions as well as the fluctuations in voltage, frequency, and power factor. Electricity losses are a consequence of poor reliability and quality of electricity although they can, in some cases, also be caused by these. Interruptions and losses are easier to measure and track than fluctuation in voltage, frequency, or power factor. For this reason, interruptions and losses have been chosen as measures of reliability and quality for the PDO indicator jointly and severally.

49. Efficacy, or the extent to which the project’s objectives were achieved or are expected to be achieved, is generally assessed once the project is closed, even though sometimes, as in this case, interim results indicators are also used as the project progresses through implementation. Since the reduction of losses and TITK, two core PDO-level results indicators, need to be measured over time and can be attributed to the project only after the substations and lines have been completed and commissioned, these have to be, of necessity, assessed after project completion.

50. The substations, capacitor banks, and power lines funded by the project are all operational and the load levels relative to capacity at the substations have fallen (although partly because of seasonality, lack of generation could also have contributed to limiting the actual system load) well below what they would have been, absent the new substation capacity. This will clearly increase the reliability of the system

⁸ The twin goals, while implicit in most World Bank interventions at the time, were formally articulated and adopted, after project approval in 2013.

by reducing outages because of overloading and weak distribution lines. The quality of electricity supply is also improved through the enhanced ability to regulate voltages and frequency and improve power factor. In addition, the quality of service is also improved through the introduction of new substations and uprating of existing substations in the major load centers, LV reticulation, and introduction of new consumer substations. The capacitor banks will improve the voltage profile along the MV lines. Thus, while only experience accrued over time will provide further verification, the project already is, after four months of completion, effectively meeting its stated development objective and is likely to continue to do so.

51. In more concrete terms, data available four months after project completion, clearly indicate that all the core PDO-level results indicators have been met or are expected to be met and, in some cases, exceeded, a clear indication that the objective of increasing quality and reliability of electricity supply has been met. Table 6 shows the PDO-level results indicators four months after project completion.

Table 6. PDO-level Indicators

PDO Level Results Indicators	Core	Unit of Measure	At Approval		Post Restructure		December 2018 Actual
			Baseline	Target Value	Baseline	Target Value	
Indicator 1: Reduction of electricity losses per year in the project areas	Yes	%	17.4	13.4	25	20	17
Indicator 2: Interruption Time per KVA installed (TITK) per year in project areas	Yes	hours	2.6	2.2	32.1	25.8	19.71
Indicator 3: Average interruption frequency per year in the project area	New	Number	—	—	11	9.4	6.55
Indicator 4: Direct Project Beneficiaries (number) - of which female %	Yes	Number (%)	0	47,000 (50%)	0 (50%)	294,940 (50%)	398,023 (51.49)

52. The goal of new access specified in the revised third PDO-level results indicator has also been met. However, access does not necessarily mean that people have been connected. For this reason, the project had an additional intermediate outcome indicator specific to the number of households connected. The target for the project was 27,000.⁹ This indicator was (during the second restructuring) folded into PDO-level indicator 4 and increased to 294,000. This revised indicator has also been met and exceeded. Thus, the PDO-level indicators and the first core intermediate indicator were appropriate for measuring the achievement of the expected outcomes of the project. The apparent shortfall in the intermediate indicator “Number of centers serviced by LV reticulation” shown in Annex 1, is in fact not really a shortfall, as the remaining trading centers were electrified by MAREP.

⁹ This was subsequently updated to 423,455 (see table 2) and this has also been met.

53. Components 2 and 4 have also yielded significant positive outcomes:

54. The hydropower studies that included draft feasibility studies and ESIA for the Lower Fufu hydropower project (estimated 260 MW), Phase I (prefeasibility) for Mpatamanga (308 MW), draft Phase II (feasibility study), Phase III (detailed topographic survey and tender documents), ESIA, and the geotechnical investigations for Mpatamanga have all been completed. These sites were previously identified and studied at a preliminary level through the 1998 Power System Development Study ('Master Plan') and confirmed by the 2017 Integrated Resource Plan (IRP), which provided a least-cost generation and transmission plan and enabled the Mpatamanga hydropower project and the Mozambique-Malawi Regional Interconnector to be identified as high priority projects. This together with the independent power producer (IPP) advice provided to the Government for the Mpatamanga, Lower Fufu, and Kholombizo hydropower projects has led to discussions between the Government, the World Bank, and IFC (the proposed joint developers with the Government for Mpatamanga) toward concrete steps being taken to implement the Mpatamanga hydropower project. This contributes to the MGDS-III's goals of sustainable renewable energy supply for the country.

55. The Pre-feasibility studies on geothermal prospects (US\$1.5 million) and the reconnaissance study were presented to the various stakeholders on September 8, 2016. Upon completion of Phase II (geochemical investigation), Phase III geophysical investigations, and prefeasibility studies at two sites, that is, Chiweta in Rumphu district and Kasitu in Nkhotakota, the reports were submitted to the Embassy of Iceland for review and consideration for funding geothermal exploration drilling.

56. The feasibility study for Bagasse-fueled cogeneration capacity was completed identifying short- and longer-term potential for producing power from Malawi's two major sugar estates. Subsequently, the project was taken up by Illovo Sugar, the company that owns the named estate. The concept was done by end November 2017, the prefeasibility was completed in April 2018, the feasibility study is expected to be completed by end 2019, construction and commissioning is expected to be completed by end 2020. Total production is expected to be 33 GWh of which 8 GWh is needed for own use the plant while the balance 25 GWh is to be sold into the grid either through a PPA with ESCOM or a buyback option.

57. These have been significant positive outcomes for the project. Even though these outcomes are not part of the PDO statement, these studies were explicitly included in Component 2 and were also supported by Component 4. These were also included in the intermediate results indicators as outputs. While under the ICR guidelines, outcomes which are not part of the PDO statement are not given credit in the outcome ratings, these outcomes were in fact part of the results indicators to be used for measuring the efficacy of the project and thus could be considered implicit objectives implemented with planned interventions, the outcomes of which now need to be taken into account in an assessment of the outcome rating.

58. As noted in section I B earlier, due to a reduction of available project funds because of exchange rate fluctuations, Component 3, 'Demand Side Management and Energy Efficiency', was removed and the installation of the AMR for large customers was added. This would allow large commercial customers to better monitor and manage their energy consumption, as well as allow ESCOM to improve its revenue collection by enabling real-time (remote) monitoring of meter performance on customer sites and thereby reducing losses from power theft. As of project closing, all 925 meters were installed (more than the 750 as originally envisaged). The AMR center went live in April 2017 and any remaining test blocks and Current

Transformers were changed. In addition, communications systems at substations requiring functioning antennas were addressed to resolve communications issues at the substations. In this, the AMRs also contributed to the achievement of the PDO by improving the reliability of electricity supply and for this reason, among others, an additional output indicator was included in the intermediate results indicators as part of the second restructuring.

59. The project, while not dependent on the MCC project for implementation, had nonetheless, built in certain complementarities with the MCC transmission project both in terms of timing of the two projects and integration in the grid structure. This has yielded significant synergies for the Malawi electricity sector, further enhancing the quality and reliability of the system by ensuring that the upstream and downstream grid infrastructure are ready for energy delivery to new and old load centers, because of increased household connections.

60. Thus not only have all the core PDO-level indicators been met, development objectives implicit in the remaining core and intermediate indicators have also been met or exceeded, at four months after project closing.

Justification of Overall Efficacy Rating

61. Taking into account the relative importance of the different objectives of quality, reliability, and access as reflected in the PDO and the PDO-level results indicators, the operation exceeded and fully achieved its objectives and is expected to continue to do so even as generation and system load increases. The objectives implicit in Components 2 and 4 were also substantially achieved and strengthen the case for an efficacy rating of High for the project.

C. EFFICIENCY

62. Project efficiency in the ICR is a measure of how economically resources and inputs are converted to results both in economic and financial terms. The ICR measures efficiency or changes, if any, to the efficiency of the project itself upon completion including the impact on efficiency because of factors relating to the implementation and completion of the project. Project efficiency typically entails calculating a net present value (NPV) and/or an internal rate of return (IRR) for the project both in economic and financial terms and is usually established at the project approval stage. Efficiency upon completion, on the other hand, would also take into account, for example, delays in implementation of key activities, procurement issues and delays, cost overruns, and planned versus actual project time frame (recognizing that delays are not always inefficient and can, in some instances, result in net efficiency gains).¹⁰

63. Private participation in the upgrade and rehabilitation of the T&D systems is often difficult without private participation in the entire T&D entity, as ring fencing is complicated because of technical and financial indivisibilities extant in the configuration of ESCOM before its restructuring, which took place

¹⁰ The present (OP/BP 10.00) guidance on economic analyses also includes an analysis of the counterfactual and an evaluation of the appropriateness of public sector financing and the World Bank's staff value added. Because this guidance was introduced in 2013, that is, after the effectiveness of the project, the PAD addressed these issues only indirectly. A discussion of the counterfactual is included in the Theory of Change section of this ICR and the appropriateness of public investment is included briefly in the discussion on efficiency.

after project approval. The complexity of private participation further increases if other parts of the T&D system are also being developed or upgraded with grant funds. While unbundling the system was a step in the right direction, at the time of the Project Concept Note and appraisal, private participation might also not have been a realistic option both in terms of the political economy and the capacity of ESCOM, both organizationally and financially (low tariffs), to attract, absorb, and manage private participation at the time. As such, public sector financing was therefore the appropriate option for the ESSP.

64. At appraisal, the project's economic analysis predicted an NPV of US\$142.9 million based on a nominal opportunity cost of capital (hurdle rate) of 10 percent and an economic rate of return of 26.0 percent. This was accompanied by a financial analysis predicting an NPV of US\$62.1 million at the same hurdle rate and an IRR of 16.9 percent. The project cost assumptions, including borrower's implementation costs and the timing of the related cash outflows for the project, including grant and credit proceeds as well as borrower expenditures, were assumed to be the same in both cases. The economic analyses calculated economic benefits, attributable to the project, accruing to the borrower while the financial analysis purely calculated the incremental financial flows accruing to the project. Sensitivity analyses, carried out during appraisal, demonstrated that the project remains economically and financially viable against a simultaneous 15 percent increase in investment cost and a 15 percent drop in the stream of economic benefits or financial revenues.

65. Because of the complementarity and interconnections between the ESSP and the MCC T&D project, there is some likelihood that some of the economic benefits and or revenue streams assumed in the calculation of these NPVs and IRRs could be partly attributable to the MCC project. For simplicity, the ICR assumes that any of the project's economic benefits or revenue streams attributable to the MCC project, remain unchanged at levels assumed in the original analysis at appraisal and that any changes in the project economic benefit and/or revenue streams because of implementation issues or changes in the project's circumstances (for example, components) are solely attributable to the project itself.

66. There have also been two tariff increases during the period between appraisal and project completion. These would improve the economic and financial returns to the project. In evaluating any changes in project efficiency at completion, compared to those assumed at entry, the effect of the tariff increases on project efficiency can only be attributed to the project, if the project had some role in instituting these tariff increases. While the project did not have any direct role in the tariff increases, it benefited from the policy and regulatory reforms included in the MCC Compact many of which were derived from the dialogue process with the donor community including the World Bank Group. Also, the project, relied on the MCC reforms for many of its fiduciary and regulatory aspects (PAD paragraph 31). For this reason, among others, the effects of the tariff increases have been taken into account in estimating the efficiency of the project at completion. However the project remains viable even without the tariff increases, although the risk to sustainability is then higher, as discussed further in the risk section.

67. Upon completion, all the technical objectives of the project in terms of the planned substations and power lines were fully completed and are operational. There is no reason to expect the economic benefit and the revenue streams of the project would be any different than that which were calculated at appraisal, except for two issues that have affected implementation and the operational start point of the project.

68. **Implementation delays.** There were some implementation delays caused by poor performance of the implementation consultancy firm; and later its debarment by the World Bank for reasons unrelated to the project. Due to these delays in implementation, there were some changes in the economic and financial NPV and IRR of the project. (a) cash outflows have occurred later than planned and this has contributed to an increase in the NPV and possible changes in the IRR; (b) because of the later operational start, the previously assumed benefit and revenue streams also were postponed, contributing to a reduction of the NPV but actually a net increase in the IRR due to the relative timing changes of the cash flows; (c) the implementation delays have also increased implementation costs both in terms of fixed costs and out-of-pocket (for example, consultant fees)¹¹ costs of the project. These have also adversely affected the NPV resulting in a small net reduction in the NPV; however, with the increase in the IRRs of the project still remaining. It also needs to be noted, that in view of the complementarity, interconnections and interdependence between the MCC project and the ESSP and the completion schedule of the MCC project, many of the benefit and revenue streams of the ESSP would not have been realized even if the ESSP was completed earlier than the original schedule, because in the event the MCC project was also not completed before the completion of the ESSP. Therefore, the previous assumption regarding the benefits attributable to the MCC project remains robust.

69. **Modification of Component 3.** The changes concerning DSM will not have any impact on the original economic analysis of the project because the original economic and financial analyses had excluded benefits accruing from DSM and energy efficiency measures, as well as from new and rehabilitated overhead lines (Restructuring Note RES 21490). The resultant reduction in project expenditures were offset partially by the increased expenditure due to the AMR. The net increase in benefits from improved collections and MV user efficiencies, generated by the AMR system, were originally included by attribution to the related technical assistance and capacity building in Component 4, even though funded elsewhere. Therefore, inclusion of the AMR in the restructured Component 3 has no incremental increase in benefits. For details see annex 4.

70. Taking these factors into account, the ICR estimates the economic NPV and IRR of the project at completion to be US\$128.63 million and 36 percent, respectively and the financial NPV and IRR to be US\$61.84 million and 25 percent, respectively. As mentioned earlier, the timing of the cash flows results in a decrease in the NPVs but an increase in the IRRs. Sensitivity analyses, similar to those conducted at appraisal, carried out at completion, also demonstrates that the project continues to remain economically and financially viable against a simultaneous 15 percent increase in investment cost and 15 percent drop in the stream of economic benefits or financial revenues (for details see annex 4).

Assessment of Efficiency and Rating

71. The predicted project efficiency at entry measured by IRRs of 26 percent (economic) and 16.9 percent (financial) were well in excess of the World Bank opportunity cost of capital guidelines¹² for the project's economic analyses (which states that the discount rate may be taken as twice the expected long-term average growth rate in per capita income), as well as the generally used typical discount rate in World Bank projects of 10–12 percent for financial analyses. The IRRs of 36 percent (economic) and 25

¹¹ The implementation consultant, upon being unable to complete the work within the contract period, would then only complete the work for cost.

¹² Not to be confused with the International Monetary Fund/World Bank guidelines for the Debt Sustainability Analysis (DSA) which was provisionally set at 5 percent in 2013.

percent (financial) estimated at project completion remain soundly viable and well above these sector benchmarks. Given that the changes attributable to Component 3 were not needed to establish viability, that even without the implementation delays the project benefits and revenue streams, dependent on the completion of the MCC project, would not have been realized earlier in any case, and that the tariff increases, albeit indirectly attributable to the project, substantially enhance the project efficiency at completion, the overall efficiency of the project needs to be rated Substantial.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

72. As indicated in the discussion of the theory of change underpinning the project, the ESSP has brought significant benefits to Malawi and Malawi's power sector. The project will not only improve the quality and reliability of electricity supply in the country, but also significantly increase the system's absorptive capacity, for new access and connections through distribution, as well as for new electricity generation. For the latter, the project has also prepared the foundation, by funding feasibility studies for renewable energy such as hydro, wind, and biomass. It has also enhanced the capability within the country and the beneficiary utility to attract private participation in these new generation initiatives through PPPs. All this has been done at an efficiency level that meets or exceeds sector expectations. For a country where only 12 percent of the population has electricity, this is a very significant and Satisfactory overall outcome.

73. Based on a rating of High for relevance of the PDO and a rating of High for efficacy, and with a rating of substantial for Efficiency, the overall outcome rating based on the current ICR rating guidelines is Satisfactory.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

74. Ample evidence has been documented to show that electrification has greater positive impacts on women. A number of studies have found that electricity is associated with reduced use of fuelwood, whether measured as time collecting fuelwood or choice of cooking technology. Supplying electricity to community facilities has also been shown to have positive effects on women and girls, for example through improving school quality, health care, security and streetlighting, social capital from lighting community spaces, and improved economic options for small women-owned enterprises ('Energy, Gender and Development' World Development Report 2012). Improved access from expansion of LV distribution enabled by the project is likely to offer these same gender-specific benefits.

75. In Malawi an additional benefit would accrue to women, whose sole link to the outside world and wider horizons is often now the mobile phone, the ubiquitous use of which by women and specially the younger cohorts, is noticeable, albeit anecdotal. In Malawi, these women often seem to have to walk several miles every day to a local charging station to charge their mobile phones. The new distribution lines and the potential for power at home, or more proximate access that this provides, would also free up several hours of women's time for other productive activities.

76. A sampling (although not scientific) of PAP during the preparation of this ICR, included several female heads of households. The compensation has been very beneficial for them. In one case, the compensation was used to improve the roofing of the household dwelling yielding a significant improvement in the quality of life.

77. Finally, there were several women employed by the project contractors. This provision of employment opportunities for women directly affected women's incomes and assets. A number of women employees were also added to the implementation teams at the implementing agencies, that is, MoNREM and ESCOM, as a direct result of the project.

Institutional Strengthening

78. Component 4 of the project provided significant amounts of capacity building and technical assistance both to ESCOM and to the MoNREM. Under this component, ESCOM procured and received training in system planning tools (DigSilent), as well as in software for generation system planning (PLEXOS). Selected ESCOM officers in Blantyre as well as the MoNREM and EGENCO were subsequently provided additional training on PLEXOS in 2017. Under this component, ESCOM also received training in various other fields, such as project management, DSM (even though this part of Component 3, was subsequently dropped), procurement, and financial management.

79. The component has also provided capacity-building support to the Energy Support Project Secretariat (ESPS) in the MoNREM with training in various fields, including, procurement, financial management, project and contract management, and hydropower project preparation. In addition to experience gained in the supervision of the contracts for the feasibility studies (hydroelectric, bagasse, wind resource mapping, geothermal, and IRP), the project also provided training in various solar technologies.

80. The component also provided the MoNREM with an IPP adviser, originally to provide financial, legal, and technical advice to the MoNREM on IPP projects. But, given the appointment of transaction advisers funded by Power Africa for the Mpatamanga hydropower project, it was decided that the consultants would mainly provide capacity-building support to key stakeholders in Malawi on PPPs for energy projects.

81. That all the studies were completed and attested by the panel of experts (also provided under the project) is evidence of the capacity that has been built in the MoNREM and ESCOM to procure and supervise such studies and the technical aspects of these studies.

82. In addition to Component 4, Component 1 also supported equipping a training school where operational staff of ESCOM and other parts of the sector would be trained. Linesmen and technician alumni of the program are now staffing several of the project-related activities such as the LV reticulation work now being funded by ESCOM.

83. While the learning curve associated with the project has been somewhat fraught with difficulties and delays, especially for Component 1 and related consulting contracts, the experience and training gained by ESCOM and the MoNREM staff in the implementation of the project has clearly strengthened ESCOM's capacity to undertake future projects of size and complexity, on its own.

Mobilizing Private Sector Financing

84. The project has yielded rich dividends toward the mobilization of private sector financing. Almost all the feasibility and other studies in Component 2 have generated private sector interest and investment and potential investment projects.

- (a) The prefeasibility, feasibility studies, the ESIA, geotechnical investigations, and the preparation of tender documents for the Mpatamanga hydropower project have led to a possible joint development of the hydropower project with IFC with the IPP adviser now funded under the Power Africa facility.
- (b) The bagasse studies have led to an agreement with a local sugar company to convert an existing plant at Dwangwa to a bagasse-fueled cogeneration facility for generating 9 MW.
- (c) As mentioned earlier, reports from the geothermal studies have been submitted to the Embassy of Iceland for review and consideration for funding geothermal exploration drilling, most likely by a private Icelandic company.

85. The IPP advisory work yielded the first ever competitive solar tender in Malawi for 70 MW out of which three successful bidders were selected.

Poverty Reduction and Shared Prosperity

86. The increased access to electricity that the project enabled by increasing substation capacity and expanding the LV lines to the peri-urban and some rural areas, will contribute directly to alleviating poverty and contribute to shared prosperity. Although some of the new connections were being provided to some of the more affluent neighborhoods and developments, for example, in Mzuzu, this in fact can be seen to be contributing to the goal of shared prosperity, because ESCOM also needs the higher (that is, beyond lifeline levels) tariff customers to help support its rollout of connections in the less affluent and rural areas. This also mitigates the financial risk noted in the Operational Risk Assessment Framework (ORAF).¹³

Other Unintended Outcomes and Impacts

87. The introduction of new substations and expansion of LV lines into some peri-urban areas, for example, Mzuzu, has spurred real estate investment and development accompanied with the buildout of roads and sewers, and so on, some of which might not have otherwise occurred. This will not only augment ESCOM's revenues but will also create jobs and additional economic activity.

¹³ "Financial constraints at ESCOM may hamper proper maintenance of the new and upgraded T&D network components and hence sustainability of the project results."

II. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

88. The project was relatively well designed with clear and realistic objectives, discrete components logically grouped, and well-defined results indicators clearly attributable to the component activities. The primary focus for quantitative and qualitative M&E of the project's results was to be on Components 1 and 3 of the project, given that Component 2 was composed solely of feasibility studies. ESCOM was to have the responsibility to supply up-to-date data on the set of agreed performance indicators set out in the project's Results Framework. More details are provided in the M&E discussion in section IV (a).

89. The PDO in the PAD was supplemented with additional clarification in the Results Framework to include not only the presently served, as beneficiaries, but also those with new access to electricity as a result of the project. Some of the mitigation measures proposed for one of the main project risks noted in the PAD,¹⁴ proved in the event to become unavailable, because of reasons unrelated to the project, and the risk in fact materialized in the form of the delays experienced by the project, as discussed in more detail in the next section.

90. It also needs to be noted, that during the Quality Enhancement Review, a five-year project duration was 'agreed'. In retrospect, it remains unclear whether the project preparation team had better understood the institutional weaknesses in Malawi and had rightly asked for more time initially.

B. KEY FACTORS DURING IMPLEMENTATION

91. Several factors influenced the implementation of the project. Some were under Client control and some attributable to the Bank. But there were also factors which were unrelated to the project which had a significant impact on project implementation.

Client Factors

92. The client prepared a Project Implementation Manual (PIM), as a condition of effectiveness. The PIM identified the methods, processes, and reporting to be used during project implementation. It was to be used as a reference document for different technical issues that staff and managers would face when executing their duties. The PIM clarified the respective roles and responsibilities of the various implementing groups, including in the MoNREM and ESCOM. The project became effective on January 30, 2012, more than six months after Board approval in June 28, 2011.

93. Although all the positions in the PIM may not have been immediately filled, the document itself provided a clearer blueprint for implementation to the management and staff of both the MoNREM and ESCOM, instilling a sense of ownership for the project, which was strengthened much further in the later stages of project implementation.

¹⁴ "ESCOM and MoNREE's limited experience of World Bank-financed projects may lead to implementation delays."

94. As mentioned earlier, the limited capacity and a complex and lengthy decision-making process, especially for procurement (PAD paragraph 56), both within the MoNREM and ESCOM, were both identified during project preparation. This capacity issue was addressed by the project in two ways: (a) including a capacity-building component and other training activities in the project and (b) the provision of implementation consultancy services for the project and training for staff and management at the same time. However, many of the weaknesses¹⁵ identified in a 2006 Capacity Assessment that the World Bank had undertaken under a different interconnector project, seems likely to have still remained. As a likely consequence, the award of the very consultancy designed to address these issues was itself delayed to June 2014,¹⁶ a full two and a half years after effectiveness. While some of this delay can be partly attributed to the lack of experience with World Bank policies and procedures, the second Restructuring Data Sheet (RES 21490) attributes these delays to the ‘political situation’ in the country at the time.

95. The duration of the implementation consultancy (contract) was four years, with Phase I (preparation) being for one year and Phase II (Implementation) being for three years. Phase I was completed in November 2016 instead of June 2015, the original completion date.¹⁷ Even though the contract end date was December 2018, the consultant stopped work on Phase II on December 6, 2017, because of the depletion of resources caused by implementation delays by the project contractor. The implementation consultant (contractor) could not be held responsible for the delays and would only complete the work for cost.¹⁸ As a result, the work of the implementation consultant was not completed. Due to these and the other factors (discussed in the next section), the implementing agency ESCOM, was essentially left to its own devices to complete the remaining work, which it did successfully.

96. These delays notwithstanding, from a fiduciary standpoint, procurement has remained in compliance with the World Bank Guidelines and were adjudged satisfactory during the World Bank’s April 2018 supervisory mission. Overall, the implementation of the major contracts under ESCOM which include contracts for construction of substations, distribution lines, and LV material supply as well as those under the ministry, were completed and no issues were identified by the World Bank’s procurement staff. Two of these distribution lines were not completed because ESCOM has not been able to acquire maintenance outages for the lines as both lines are sensitive; one supplies the Chileka airport and main water supply for Blantyre; and the other line supplies Blantyre city for which outages have been impossible due the election period. These are pending agreement on an outage management plan for testing and energizing. While, a review of ESCOM’s revised financial statements, post unbundling, released in May 2018, indicates compliance with the project’s financial covenants, financial management was still noted as a risk in the latest Aide Memoire because of delays in filing the audit reports.

97. The World Bank task team has coordinated closely with the MCC project team on a program of policy reforms, including improvements in the financial management, operational management, and corporate governance of ESCOM, as well as on improvements in the regulatory framework for private

¹⁵ Lack of exposure to World Bank procedures, procurement planning, and monitoring; proper bid processing, and vendor rating, among others.

¹⁶ The Request for Proposal was issued around July 2012 with a submission deadline of September 2012. Most of the delay seems to have occurred between submission and contract award.

¹⁷ In February 2016, as part of the level 2 restructuring the Government requested an 18- to 21-month extension

¹⁸ The Request for Proposals, ToRs, and contract documents do not seem to adequately address this issue.

sector participation in the sector. These reforms are consistent with the energy sector reforms set out in the 'Letter of Intent' prepared by the GoM.

98. To support the logistics and information management needs of the ESSP, the project components included a total of 23 vehicles and 35 cellphones for the various contracts for the effective management of the various components under the project. At project completion these assets will be under the custody of the borrower.

99. Environmental and social issues and compliance are covered under section III (B).

Bank Factors

100. From Concept Note to project completion, there have been a total of five task team leaders assigned to the project, with four of them being assigned during supervision.¹⁹ According to the MoNREM, in the early period of project implementation, access to the World Bank was perceived to be difficult. Also, the inexperience of the borrower and beneficiary implementation teams, with respect to the World Bank policies and procedures, may have led to some of the initial delays experienced in the project, as stated by the MoNREM. The restructuring paper, as mentioned earlier, attributes most of this delay to the 'political situation' in the country. The situation was stated (by both ESCOM and the MoNREM) to have been much improved in the later stages of the project not only because of the experience gained by the implementation team but also in view of closer coordination with the World Bank staff on implementation issues.

101. This is reflected in the Implementation Status and Results Reports (ISRs) as well as the Aide memoires and evidenced in the acceleration of disbursements, in spite of the implementation consultant having been absent during the later stages of the project.

Other Factors

102. The project also seems to have been beset by several issues unrelated to the project itself (and some beyond the control of the project management team) which appear to have affected the implementation of the project.

- Fluctuations in the exchange rate between the U.S. dollar and SDR, in which the project funding is allocated, have had the effect of reducing the U.S. dollar available for project spending by around US\$13 million at one point during implementation. As described earlier, this forced the cancellation of certain components and reallocation between components and unallocated funds in the project.
- Although originally envisaged under the Power Sector Reform Strategy, approved by the GoM in 2003, the actual unbundling of the sector took place after the enactment of the revisions to the electricity laws in 2016. This coincided squarely with the implementation

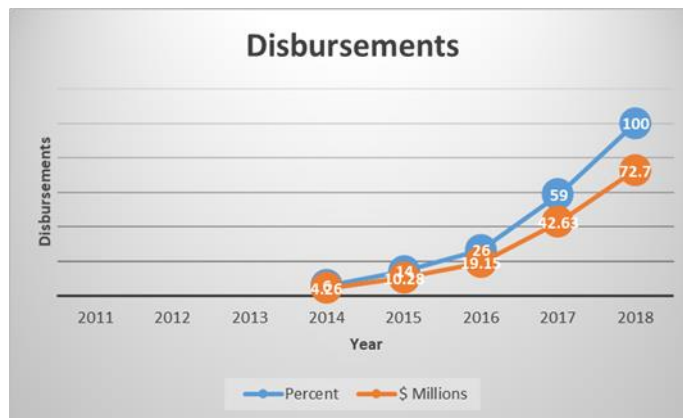
¹⁹ While attribution of project performance to frequency of team changes cannot in this case be substantiated, Independent Evaluation Group studies elsewhere, have shown that "a higher number or frequency of team changes predict below-average performance ratings, holding constant other project and country-level characteristics." Findings on PSM Project Performance June 6, 2011.



period of the project. This unbundling of generation from T&D contributed to severe staffing and organizational disruptions at a critical time in the project's implementation. ESCOM lost many of its administrative staff, including accounting and safeguards staff, to the generation entity and elsewhere. This impaired the ability of ESCOM's Project Implementation Unit (PIU) to implement the project in several areas, including disbursements, M&E, and most importantly safeguards, where only one person was responsible for all of ESCOM's projects. This is likely to have also contributed to some of the compliance issues discussed in section III (B).

- A corporate restructuring of ESCOM itself, also took place at the same time. This caused further disruptions in staffing and also organizational uncertainty. The resulting delays in approvals and implementation for organization structures and related recruitment and staffing challenges also impaired the implementation of the project. For example, as of project closing, many of the PIU positions, including for safeguards policy and implementation had either not been filled or the recruited staff had not commenced work. This further strained the already limited capacity within the implementation teams.
- As mentioned earlier, the implementation consultant had not completed the required work before demobilizing in December 2017. This was due, among others, to the unavailability of the consultant's project manager for extended periods during the contract period. This protracted the implementation delays by impeding decision making and approvals from the consultant's side. These delays were further complicated when, due to events completely unrelated to the project, the implementation consultant was also debarred by the World Bank from September 2017 to 2018, and thus became completely unavailable to assist ESCOM with project implementation, during the critical last 13 months of the project implementation period. Issues and delays in obtaining a waiver from this debarment further caused the contractor to remain unavailable to assist until project closure in October 2018. This in turn exacerbated the already strained capacity of ESCOM to smoothly complete the project before the project closing date.

Figure 2. Disbursements (2011–2018)



Source: Nov 2018 Aide Memoire

103. The project management and implementation teams, with close day-to-day support from the World Bank team, have been able to overcome these odds and bring the project to a close. Disbursements went from 26 percent in 2016 to 93 percent in September/October 2018. All 10 of the substations have been completed as have seven of the nine distribution lines. The substations have been energized, and loaded. All the feasibility and other studies under Component 2 have been completed. The AMR system and 925 meters under the modified Component 3 have been installed. The capacity-building and technical assistance activities under Component 4 have also been completed, all by the closing date of October 15, 2019. For safeguard and compliance issues see section III (B).

III. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

104. The theory of change discussed in an earlier section seems to have been well reflected in the Results framework with adequate clarity on the objectives and the attributability of the outcomes to the project outputs and the components that produced them. The indicators were relevant and realistic. The original M&E arrangements in the PAD had, as a primary focus, Components 1 and 3, because Component 2 was mainly concerned with studies. Under this arrangement, ESCOM would be responsible for supplying up-to-date data on key performance indicators in the Results Framework, annually for the three PDO indicators and semiannually for the intermediate indicators using both technical surveys and administrative data sources. A project report was to be furnished every semester (later made quarterly), consolidating both ESCOM and MoNREM activities, by the Technical Electricity Committee (TEC) with input from the ESPs. The Malawi energy sector and its electricity subsector were acknowledged in the PAD as having weak M&E capabilities and without an integrated and functioning management information system (MIS). Though the MIS was not made a prerequisite, ESCOM would implement the MIS supported by the MCC project, while also being provided with general institutional strengthening, including for M&E systems and staff, through Component 4 (capacity building and technical assistance). A midterm review was to be conducted after two years of effectiveness to determine if any midcourse adjustments, reallocation of funds, modification of objectives, or introduction of new activities, were needed. A minor shortcoming, in this respect, might have been the reliance on an external project (MCC) for MIS implementation. This is a minor concern because of the close coordination planned with MCC as part of the ESSP design and the substantial assistance and support that was also to be provided for M&E under Component 4. Therefore, the quality of M&E design should be rated High.

M&E Implementation

105. The PIM, submitted as a condition of effectiveness, contained the actual implementation arrangements for M&E. While the PIM included provisions for a performance management officer (M&E) in the PIU, the M&E provisions in the manual stated that M&E officers from the two secretariats will be responsible for coordinating data collection and preparing relevant sections of the annual project monitoring and procurement reports (co-mingling M&E with procurement issues). In addition, the M&E, under the PIM, would focus primarily on the MGDS' goals, while also covering the M&E aspects of the

ESSP and the MCC Compact. Given the M&E and MIS weaknesses identified during preparation, the practicality of these arrangements needed to be tested.

106. The implementation delays discussed elsewhere led in the event to the requirement of the semiannual reports being made quarterly. The borrower and the beneficiary agency have both complied with this. However, because the three main development objectives of the project, quality and reliability of electricity supply (PDO) and access (results indicator), can only be attributable to the project once it is fully implemented and commissioned, actual implementation of the M&E had to wait for this. The baseline and current indicators in the ISRs up to the end of 2015 reflected this. However, in February 2016, the project underwent a level 2 restructuring that included, among others, an update of the baseline indicators as of that date and a revision accordingly of the target values²⁰ of these indicators. The revision of the baseline indicators had to rely on the M&E process and teams, as well as databases in the power (for example, SCADA) systems, set up according to the PIM, thus indicating the efficacy of the M&E arrangements. The subsequent ISRs also reflected the revised baseline with no further change in the current indicators. In effect, monitoring of the results indicators could not begin before project closing. However, this cannot be attributed to any M&E weakness.

107. The project closed on October 15, 2018, and the values of the target indicators have been received indicating that all the indicators have been either met or exceeded or are expected to be met or exceeded. Given that the project closing took place during the dry season, it is likely that the results would improve further once the rainy season commences and hydropower (which is the country's primary generation source) generation would be at full capacity.

108. The expedient updating of the baseline values for the restructuring in 2016 and also monitoring of the results indicators at project closing are indicative of the M&E arrangements, implemented according to the PIM, working well in spite of the initial concerns regarding M&E and MIS weaknesses at entry. Accordingly, the quality of M&E implementation is rated High.

M&E Utilization

109. The project restructuring that took place in February 2016 used input from M&E to revise the baseline results indicators using the current status of these indicators. This put the project on a more realistic footing and made the target values, some of which were also revised, more meaningful. This report fully uses the input from M&E to rate the efficacy of the project. Thus, the M&E results were used during implementation to review and update the project indicators and values and also to generate the values at completion. The rating for utilization is also accordingly High.

Justification of Overall Rating of Quality of M&E

110. There were only minor shortcomings identified in the design, implementation, and utilization of the M&E framework and process for the project. Consequently, the overall rating for the quality of M&E for the project is High.

²⁰ As mentioned in a previous section, there was a small error in one of the indicators where a monthly figure was shown as an annual one. The ICR has taken this possible typographical error into account in conducting its evaluation of project efficacy.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

111. The project triggered several of the World Bank's safeguard requirements:

Table 7. Safeguard Requirements

Safeguard Policies Triggered	Yes	No
Environmental Assessment (OP/BP 4.01)	X	
Natural Habitats (OP/BP 4.04)		X
Forests (OP/BP 4.36)		X
Pest Management (OP 4.09)		X
Physical Cultural Resources (OP/BP 4.11)	X	
Indigenous Peoples (OP/BP 4.10)		X
Involuntary Resettlement (OP/BP 4.12)	X	
Safety of Dams (OP/BP 4.37)		X
Projects on International Waterways (OP/BP 7.50)	X	
Projects in Disputed Areas (OP/BP 7.60)		X

112. An Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) were prepared as part of the project preparation process and disclosed in-country and in the World Bank InfoShop by project appraisal. The project was carried out in accordance with the provisions of the ESMF and RPF and a RAP was prepared in accordance with the requirements of the RPF, furnished to the Association for approval as part of the proposed annual work plan, and disclosed locally. The riparian notification process, for Projects on International Waterways (OP/BP. 7.50), was timely undertaken and the notification period concluded on May 1, 2011. There were no historical and archaeological or ancestral worship sites identified for the proposed distribution line routes, in the RAP. Although some graveyards were identified, the proposed distribution line routes were diverted from these churches. The borrower and the implementation agency diligently executed the required provisions of the RAP²¹ according to the work plan. The PAPs were all identified, the compensation and the process for it were disclosed, and consultations were duly held.

113. An ESMP was prepared for the most of the Overhead lines in June of 2015. The contracts for the OVH (Overhead) lines²² (all of the PAPs²³ were in these rights-of-way) were issued and effective by November/December 2017, a full year after completion of Phase I by the preparation and implementation consultant. This left only about nine months to project completion. The project supervision expressed its concern at this point (November 2017 Aide Memoire) that the implementation consultant, for some reason, had depleted its staff presence in Malawi and was thus ill equipped to fully execute its responsibilities under the contract. These concerns were communicated both to the consultant and the client. However, when the implementation consultant also actually became unavailable at this point

²¹ Finally approved by the Ministry of Lands, Housing, and Urban Development in November 2017.

²² The LV reticulation work was to be done by ESCOM. Even though the required materials arrived by February 2017, the works could not commence before December 2017 when the needed training could be completed.

²³ In addition to the original 1,197 PAPs identified under the RAP an additional 837 claimants were subsequently also identified in non-RAP areas.

(September 2017), because of debarment as described earlier and given the previous delays and the already strained capacity and the accompanying unbundling and restructuring activities, the implementing agency was by then stretched to the limit. Due to the resulting confusion or the lack of safeguards and accounting staff (as a result of the unbundling and concurrent restructuring) or due to the apprehension that the works for OVH and LV reticulation could not be completed by the closing date if all PAP payments had to be made first or all three, the construction began before or simultaneously with the PAP disbursements.

114. When the requested (in early 2018), one-year extension of the project was approved only for three months, the logistics in retrospect become clear that unless the PAP payments had been implemented simultaneously with the construction, project funds could not have been used to pay the contractors for works, as the works could then only have been completed after the closing date and consequently the contractors could not then, under the World Bank policy, have been paid out of project funds. This created compliance issues with respect to the World Bank safeguards policy which requires PAP compensation payments to be completed before commencement of construction.

115. The compliance issue was flagged to the World Bank management and the World Bank team worked diligently with the borrower to bring the project back into compliance. Most of the RAP steps have now been completed including disbursing all compensation payment amounts for PAPs to the district councils who have in turn disbursed funds to all of the original 1,197 PAPs in the RAP areas. Of the 837 subsequently identified non-RAP PAPs, all but a handful²⁴ have received due compensations.

116. Although ESCOM had put in place a grievance redress mechanism (GRM) that used the existing governance structures in Malawi, the GRM was reviewed by World Bank Group specialists and deemed to be 'inadequate and ineffective'. Based on this, improved GRM structures and channels were proposed for the future Malawi Electricity Access Project.

117. Some key lessons to take away from this include the following: (a) the borrower needs to be made aware early on that safeguards compliance is critical for continued country programming, (b) no payments can be made from project funds for any work done or completed after the closing date, and (c) the contracts under the project need to more clearly specify deliverables and cover the contingency of the contractor being debarred during the contract or the project period.

118. To address the fiduciary aspects of the project, the implementation plan in the PAD and PIM included (a) a financial management officer/project accountant; (b) a project procurement officer supervised by the project coordinator, and (c) a project M&E officer responsible for overseeing the M&E framework of the overall project implementation. Although these personnel were located in Blantyre, there was close coordination with the financial management and procurement staff at the World Bank office in Lilongwe.

²⁴ About five to eight who could not be traced and one who was reportedly out of the territory (Mzuzu) and could not be reached. Efforts are being made to find and contact these PAPs.

119. Except for the remaining 0.4 percent of the disbursements to PAPs by the district councils (which are democratically elected independent organs), there is now full compliance with all social, environmental, and fiduciary requirements of the World Bank.

C. BANK PERFORMANCE

Quality at Entry

120. The project was prepared with a PDO and outcome indicators that were highly relevant for the country at approval and remain so at closing. The technical, financial, and economic aspects were well analyzed (although the annex for the detailed economic and financial analysis was not included in the PAD) given the guidelines at the time. The economic and financial viability of the project, including the appropriateness of public finance and the World Bank's value added, when reviewed according to the present guidelines (OP/BP 10.00), remain high at closing. The required environmental and social reviews and plans were prepared and duly disclosed. The procurement and financial management safeguards and processes were specified. The project coordinated with the MCC Compact on policy and regulatory aspects and a PIM, outlining processes and institutional arrangements for implementation and M&E, was made a condition of effectiveness. The risk assessment was thoughtful and realistic, although some of the mitigation measures incorporated in the design were nullified during implementation by circumstances unrelated to the project.

121. Three issues were not anticipated in the project design: (a) SDR exchange rate losses, (b) debarment of project contractors because of factors unrelated to the project, and (c) impact of simultaneous sector and utility restructuring on already weak implementation capacity as identified during project implementation. In hindsight, it is unclear if the project preparation team could have anticipated the enactment of the revisions to the electricity laws in 2016 and its organizational and capacity consequences because of the restructuring and unbundling process that it triggered. It is also unclear if there is any Operations Policy and Country Services (OPCS) guidance for anticipating SDR exchange risk and unrelated debarments, for inclusion in the PAD. Therefore, these can only be considered to be minor preparation shortcomings. The rating for quality at entry should thus clearly be at least Satisfactory.

Quality of Supervision

122. The project faced several challenges to the achievement of the development objectives during the course of project implementation. As elaborated in the preceding sections, these included (a) the depletion of project funds because of exchange losses, which were addressed by restructuring the project and reallocating certain funds; (b) the disruptions because of sector and utility restructuring and loss of the implementation consultant, which were quickly contained by more intense and granular supervision and closer and more frequent coordination with the World Bank resources; and (c) the misguided, albeit unavoidable,²⁵ parallel initiation of construction and PAP compensation, which the supervision team addressed immediately by agreeing an accelerated and time-bound completion of PAP compensation

²⁵ Mostly because of the two-and-a-half-year delay in procuring the preparation and implementation consultant between January 2012 and July 2014 and the consultant's subsequent delay in delivering Phase I, as noted earlier in the preceding sections.

along with intense day-to-day local supervision. In spite of these fairly significant challenges, the project achieved all its development objectives and has met or exceeded all its outcome indicators at the time of writing this ICR. In spite of the extraordinary efforts made by the supervision team, as further explained in paragraph 115, this occurrence of noncompliance with safeguards requirements led to the project closing with pending safeguards requirements.

123. Supervision has been diligent in that ISRs have been published every six months during implementation (except in 2016 the year of the restructuring when the restructuring paper was issued instead). The implementation delays were noted in the early issues and the actions taken to expedite implementation are evident in the later issues. The Aide Memoires, especially in the later years of the project, are detailed and frank, indicating a strong command and grip on the implementation process.

124. The supervision at the closing stage, notably reflected initiative and diligence on ensuring that adequate training and supervision of O&M personnel was taking place and that operations manuals and technical support for operations across the network would be available. Although the project closed on October 15, 2018, subsequent World Bank projects in the sector would enable sector and utility personnel to access World Bank staff for assistance if needed. These would all contribute to a smooth transition to regular operations after closing.

125. Focusing on the development objectives and outcome indicators having been achieved and met and also recognizing that even if the project had been completed earlier, these objectives could not have been met earlier because of certain technical indivisibilities with the MCC project, which also completed at about the same time, the early delays in the project would have had only a minor impact on the overall effectiveness. For this and the factors listed in the previous paragraphs, the quality of supervision would have been considered Satisfactory. However, there was a brief period during implementation when the project went out of safeguard compliance as noted above in paragraph 115. It was picked up immediately, and followed through with intense local supervision, by the Bank's safeguards team which brought the project expeditiously and duly back into compliance. This brief period of non-compliance nevertheless has led to the Quality of Supervision being rated as Moderately Satisfactory.

Justification of Overall Rating of Bank Performance

126. The World Bank performance for preparation and quality at entry is rated Satisfactory. However, the quality of supervision, which had otherwise been exemplary, needed to be rated Moderately Satisfactory, because of circumstances described in paragraph 115. Because the overall outcome rating has been Satisfactory, the overall rating for World Bank performance can therefore, according to the World Bank Guidance, be rated Moderately Satisfactory.

D. RISK TO DEVELOPMENT OUTCOME

127. Risks to the sustainable achievement of the PDOs, identified in the ORAF, that might persist beyond project closing included (a) financial constraints at ESCOM that may hamper proper O&M of the new and upgraded T&D network components and hence sustainability of the project results; (b) project analytical outputs (for example, feasibility studies in Component 2) may not have full impact because of a lack of GoM commitment to moving forward; and (c) hydrologic risk in Component 2 (feasibility studies): utility of studies may be reduced by increased risk of unavailability of water for power generation at full

capacity as a result of hydrologic and climate variability, rendering the site(s) unsuitable for hydropower generation. The mitigating factors are discussed below:

- Although there were two tariff reviews during the implementation of the project, one in 2014 and one more recently in 2018, and these would have improved the forecast cost recovery ratios of ESCOM from the near breakeven forecasts at the time of project appraisal (PAD paragraph 88), the continuing financial health of ESCOM would depend on how revenues are allocated between the unbundled generation and T&D and what, if any, has been the increase in fixed costs as a share of revenues because of the unbundling. The likelihood and impact of this risk might not be trivial.
- The Government and the donor community, as well as the private sector, have continued to show interest and commitment to the projects, for which the feasibility studies have been undertaken under the project. There is thus a high likelihood that many, if not most, of these projects will move forward. However, the risk of delays, for reasons other than commitment, still remain and the opportunity cost of such delays is likely to be high.
- Hydrological risks, including climate-related risks, still remain. However, the Government is actively pursuing other renewable generation sources such as solar, geothermal, wind, bagasse, and so on, and these would clearly help mitigate the hydrological risk.

128. One additional risk that seems to be emerging at closing and might need attention, lies in the Government's approach to private participation in generation and other sector activities. Lack of advisory support, including legal advisory support, might lead to significant asymmetries in the negotiation process. This could result in higher costs and loss of flexibility and further aggravate any financial weaknesses for ESCOM as well as impact the Government's fiscal headroom. Some advisory services were provided under the project, and ESCOM has, of late, sought assistance in this regard. Nevertheless, this risk needs to be carefully monitored going forward.

IV. LESSONS AND RECOMMENDATIONS

129. In terms of relevance, efficacy, and efficiency the project has performed very well. Performance of the World Bank team has been superior both in preparing the project and in supervising it, particularly in the later years. This project experience offers some valuable lessons which are not only worth remembering for future projects in the country but are also worthy of emulation elsewhere, notably for countries with similar low capacity project environments.

Strategic

- (a) The Project was a first of its kind in the sector after a hiatus of some duration over which much of the institutional memory and capacity in the country, for implementing Bank investment projects, had been lost. This, in an institutional environment at an early stage of maturity and of limited depth, posed significant challenges for the project and its implementation as has been described in some detail earlier in the body of this report. That an effective and efficient project, would be delivered in this environment with over 94%

disbursed at closing, in spite of the initial operational delays, is somewhat exemplary. Some important lessons can be noted from what was done: (i) Intensive deployment of presence and responsiveness are key in such limited capacity settings – otherwise trivial issues can quickly escalate. (ii) Capacity building in such low capacity environments needs to address not only technical and institutional weaknesses but also the significant information asymmetry between the client, vendors and other parties. (iii) Scarcity of committed or expected counterpart resources, both administrative and monetary and often unacknowledged, remain a reality and need to be provisioned for, if needed on a contingency basis.

- (b) The project design included several large feasibility studies for projects that were in the identification or early concept stage. While appearing somewhat speculative at entry, these have yielded rich dividends in the form of several new and major projects entering or due to enter the portfolio. Many of these are likely to be public private partnerships and will help address the limited fiscal headroom which tend to prevent the realization of the much needed infrastructure assets in low income and indebted countries. Including such studies in investment operations could be a forward looking strategic approach worth considering for accelerating the building of much needed infrastructure assets in such resource constrained low capacity countries.
- (c) The project suffered a certain amount of impairment because of (SDR:USD) exchange rate losses. During this period it is likely that all Bank projects denominated in SDR but disbursed in USD, suffered similar losses. Management may wish to seek OPCS or other corporate-level guidance on this matter or explore if there are any provisions for providing hedging assistance to the borrower. This issue might merit further corporate review.
- (d) Implementation delays affect not only the project but also the quality of the World Bank's portfolio. One option for addressing this might be to seek the guidance of OPCS and LEG on whether certain key milestones in the implementation critical path might be further 'hardened' by also being included in the Financing Agreement.

Operational

- (e) Two of the consultants supporting the implementation of the project were debarred by the World Bank, during project implementation, for reasons unrelated to the project. In one case the consultant was critical to the implementation of the project. In addition to streamlining the approval process for waivers, in cases such as this, the General Form of Contract used by the borrower for World Bank-funded projects might also be reviewed to determine if these could include any provisions to address situations such as these.
- (f) While safeguards policies and GRMs in the project were found to have been otherwise adequately implemented, in one case, the project was found to be out of compliance. It is important for the country dialogue to clearly establish the significance of compliance for continuing World Bank programs in the country. GRMs are also an important part of the safeguards process. Best practices in this respect might need to be communicated to the



client and adequate training provided early in the project so that there are no residual issues at project completion.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

A. RESULTS INDICATORS

A.1 PDO Indicators

Objective/Outcome: To increase the reliability and quality of electricity supply in the major load centers.

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Reduction in electricity losses per year in the project areas	Percentage	17.40	13.40	20.00	17.00
		01-Jan-2011	30-Oct-2016	31-Jul-2018	15-Oct-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Total Interruption Time per KVA Installed (TITK) per year in the project areas	Number	2.60	2.20	25.80	19.71
		01-Jan-2011	30-Oct-2016	31-Jul-2018	15-Oct-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Average interruption frequency per year in the project area	Number	11.00 30-Nov-2015	9.40 31-Jul-2018	9.40 31-Jul-2018	6.55 15-Oct-2018
Customers served in the project area	Number	0.00	47000.00	294940.00	1728625.00
Comments (achievements against targets):					

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Direct project beneficiaries	Number	0.00 28-Jun-2011	47000.00 30-Oct-2016	294940.00 31-Jul-2018	398023.00 15-Oct-2018
Female beneficiaries	Percentage	0.00	50.00	50.00	51.49
Comments (achievements against targets):					

A.2 Intermediate Results Indicators

Component: Component 1: Electricity Network Strengthening and Expansion

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised	Actual Achieved at
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				Target	Completion
Number of new substations constructed	Number	0.00 28-Jun-2011	4.00 30-Oct-2016	5.00 31-Jul-2018	5.00 15-Oct-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of substations upgraded	Number	0.00 28-Jun-2011	5.00 30-Oct-2016	5.00 31-Jul-2018	5.00 15-Oct-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Distribution lines constructed or rehabilitated under the project	Kilometers	0.00 28-Jun-2011	141.00 30-Oct-2016	168.10 31-Jul-2018	314.49 15-Oct-2018
Distribution lines constructed under the project	Kilometers	0.00 28-Jun-2011	26.00 30-Oct-2016	130.10 31-Jul-2018	265.69 15-Oct-2018
Distribution lines	Kilometers	0.00	115.00	38.00	48.80



rehabilitated under the project		28-Jun-2011	30-Oct-2016	31-Jul-2018	15-Oct-2018
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Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of centers serviced by LV reticulation	Number	0.00	172.00	172.00	145.00
		19-Nov-2015	31-Jul-2018	31-Jul-2018	15-Oct-2018

Comments (achievements against targets):

Component: Component 2: Generation & Transmission Feasibility Studies

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of hydroelectric power generation feasibility studies completed	Number	0.00	3.00	3.00	3.00
		28-Jun-2011	30-Oct-2016	31-Jul-2018	15-Oct-2018

Comments (achievements against targets):

Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
New transmission backbone	Yes/No	N	Y	Y	Y

feasibility study completed		28-Jun-2011	30-Oct-2016	31-Jul-2018	15-Oct-2018
Comments (achievements against targets):					
Component: Component 3: AMR Supply and Installation					
Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Number of meters in the ESCOM System covered by the AMR System	Number	0.00 19-Nov-2015	750.00 31-Jul-2018	750.00 31-Jul-2018	925.00 15-Oct-2018
Comments (achievements against targets):					
Component: Component 4: Capacity Building & Technical Assistance					
Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion
Preliminary assessment of geothermal prospects completed	Yes/No	N 28-Jun-2011	Y 30-Oct-2016	Y 31-Jul-2018	Y 15-Oct-2018
Comments (achievements against targets):					
Indicator Name	Unit of Measure	Baseline	Original Target	Formally Revised Target	Actual Achieved at Completion



Wind-mapping study completed	Yes/No	N 28-Jun-2011	Y 30-Oct-2016	Y 31-Jul-2018	Y 15-Oct-2018
Comments (achievements against targets):					

A. KEY OUTPUTS BY COMPONENT

Objective/Outcome 1: To increase the reliability and quality of electricity supply in the major load centers	
Outcome Indicators	<ol style="list-style-type: none"> 1. Reduction in electricity losses per year 2. Total Interruption Time per KVA Installed (TITK) per year in the project areas (Number, Custom) 3. Average interruption frequency per year in the project areas <ol style="list-style-type: none"> (i) Customers served in the project area (dropped at second restructuring) 4. Direct project beneficiaries <ol style="list-style-type: none"> (ii) Female Project Beneficiaries
Intermediate Results Indicators	<ol style="list-style-type: none"> 5. Number of new substations constructed 6. Number of substations upgraded 7. Distribution lines constructed under the project 8. Distribution lines rehabilitated under the project 9. Number of centers serviced by LV reticulation 10. Number of hydroelectric power generation feasibility studies completed 11. New transmission backbone feasibility study completed 12. Wind mapping study completed 13. Preliminary assessment of geothermal prospects completed 14. Number of meters in the ESCOM system covered by the AMR system
Key Outputs by Component (linked to the achievement of the Objective/Outcome 1)	<ol style="list-style-type: none"> 1. Reduction in electricity losses per year (17%) 2. Total Interruption Time per KVA Installed (TITK) per year in the project areas (19.71) 3. Average interruption frequency per year (6.55) 4. Customers served in the project area (1,728,635) 5. Direct project beneficiaries (398,023)



- (iii) Female Project Beneficiaries (51.49 %)
- 6. Number of new substations constructed (5)
- 7. Number of substations upgraded (5)
- 8. Distribution lines constructed under the project (266 km)
- 9. Distribution lines rehabilitated under the project (49 km)
- 10. Number of centers serviced by LV reticulation (145)
- 11. Number of hydroelectric power generation feasibility studies completed (3)
- 12. New transmission backbone feasibility study completed (Yes)
- 13. Wind mapping study completed (Yes)
- 14. Preliminary assessment of geothermal prospects completed (Yes)
- 15. Number of meters in the ESCOM system covered by the AMR system (925)



ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Supervision/ICR	
Dhruva Sahai	Task Team Leader(s)
Steven Maclean Mhone, Anthony Aggrey Msendema	Procurement Specialist(s)
Saidu Dani Goje	Financial Management Specialist
Trust Chamukuwa Chimaliro	Financial Management Specialist
Gulgoren A. Cansiz	Team Member
Rahmoune Essalhi	Team Member
Shri Vasantt Kumar Jogoo	Environmental Specialist
Sameena Dost	Counsel
Collins S. Umunah	Team Member
Francesca Fusaro	Team Member
Zione Edith Kansinde	Team Member
Herbert Oule	Safeguards Advisor/ESSA
Mercy Chimpokosera-Mseu	Environmental Specialist
Violette Mwikali Wambua	Social Specialist
Kagaba Paul Mukiibi	Team Member
Miriam Sangallo Kalembo	Team Member

A. STAFF TIME AND COST

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US\$ (including travel and consultant costs)
Preparation		
FY06	0	0.00
FY07	3.563	18,568.24
FY08	21.176	73,700.75
FY09	21.682	80,770.07
FY10	2.250	14,908.56
FY11	44.325	315,726.52
FY12	0	0.00
FY18	5.360	39,952.92
FY19	1.150	9,637.60
Total	99.51	553,264.66
Supervision/ICR		
FY12	20.774	133,868.29
FY13	16.493	126,056.51
FY14	20.409	125,159.75
FY15	35.102	123,845.59
FY16	24.901	121,620.30
FY17	45.469	165,840.52
FY18	47.237	272,469.69
FY19	25.670	149,284.05
Total	236.06	1,218,144.70



ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US\$, Millions)	Amounts allocated at 2 nd restructuring (US\$, Millions)	Actual at Project Closing (US\$, Millions) ²⁶	Percentage of Allocated
Component 1: Electricity Network Strengthening and Expansion	56.2	51.68	49.03	95
Component 2: Generation and Transmission Feasibility Studies (Subcomponent 2.1: Generation Feasibility Studies; Subcomponent 2.2: Transmission Feasibility Studies)	15.2	11.23	10.46	93
Component 3: AMR Supply and Installation	6.8	1.99	1.94	98
Component 4: Capacity Building and Technical Assistance	3.5	8.88	7.92	89
Total	81.7	73.78	69.35	94

²⁶ As of June 17, 2019

ANNEX 4. EFFICIENCY ANALYSIS

1. This annex supplements the discussion on project efficiency provided in section III (C) of the ICR. To reiterate the World Bank guidance on which these analyses are based.

“Project efficiency in the ICR is a measure of how economically resources and inputs are converted to results both in economic and financial terms. The ICR measures efficiency or changes, if any, to the efficiency of the project itself upon completion including the impact on efficiency due to factors relating to the implementation and completion of the project. Project efficiency typically entails calculating a Net Present Value (NPV) and/or an Internal Rate of Return (IRR) for the project both in economic and financial terms and is usually established at the project approval stage. Efficiency upon completion, on the other hand, would also take into account, for example, delays in implementation of key activities, procurement issues and delays, cost overruns, and planned vs. actual project time frame (recognizing that delays are not always inefficient, and can in some instances result in net efficiency gains).”—World Bank ICR Guidance Note.

2. This assessment of efficiency at closing accordingly considers both the economic and the financial viability of the project at closing. However, because the project funds are already expended, the analyses are more evaluative than decision oriented, although they may also offer lessons and guidance for future projects. It would be moot to check if the project is viable now that the funds are expended. Rather it would be important to see if the design of the project was robust enough to sustain the original estimates of viability at completion and also if implementation of the project itself had any impact on the realization of the original estimates of viability. This requires an ‘apples to apples’ comparison from the datum of the Financing Agreement date.

Economic Benefits

3. The stabilization of voltage and frequency enabled by the project can help ensure system security and avoid unnecessary loading of expensive liquid fuel generation to maintain stable voltage and frequency levels. The benefits of keeping the voltage and frequency stable within rated levels are well documented in the World Bank projects including

- Reduction in the risk of partial/full grid failure;
- Avoided damages to generator/customer equipment;
- Avoided out-of-merit dispatch with liquid fuel generation;
- Ability to interconnect with other power systems (very relevant for Malawi) in a synchronous mode, which in turn renders the system frequency more stable; and
- Ability to integrate higher volume of variable renewable energy resources.

4. The economic benefits of stabilizing voltage and frequency can be quantified in several ways. For Malawi and the project the more relevant include (a) reduction of unserved energy, (b) loss reduction, and (c) fuel savings.

Unserved Energy Reduction

5. Using post restructuring revised baselines, the reduction of unserved energy, because of the project, would have been from a baseline of 32.1 hours per KVA to 25.8 hours per KVA or 6.3 hours per KVA installed. With an installed capacity of 283 MW, this would come to 1.782 million kWh. At the current average tariff of US\$0.135 per kWh, this comes to US\$241,000 per year.

Loss Reduction

6. Again, using post restructuring baselines the loss reduction is from 25 percent to 20 percent,²⁷ including both technical and nontechnical losses. This is a reduction of about 14 MW per year. At the current tariff, this amounts to a saving of US\$16.7 million per year using a tariff of US\$0.135 per kWh.

Fuel Savings

7. Because 98 percent of formal electricity generation in Malawi is hydro based, the fuel savings are calculated on the basis of avoided cost of diesel generation. Assuming for simplicity, that a nominal 50 percent of the losses are nontechnical, the combined increase in availability from reduction in unserved energy and losses is 63.7 million kWh. At 35 percent efficiency, a diesel generator is likely to generate 3.5 kWh of electricity per liter. At the MERA price of MWK 983 per liter (US\$1.29 per liter), this would yield a diesel generation cost of about US\$0.36 per kWh which can be assumed to be the net avoided cost of diesel generation²⁸ assuming the incremental hydrogeneration costs of ESCOM to be negligible and that O&M is a fixed cost. This yields net fuel savings of about US\$23 million per year.

8. This is summarized in table 4.1.

Table 4.1. Economic Benefits

Savings	kWh	Avoided Cost US\$ per kWh	Savings Amount (US\$)
Unserved energy reduction	1,782,000	0.135	240,570
Loss reduction	123,954,000	0.135	16,733,790
Fuel savings	63,759,000	0.36	22,953,240
Total			39,927,600

9. Improvement in the quality and reliability of electricity supply can also yield substantial additional economic benefits in increased industrial output and efficiency, uninterrupted commercial activity, and

²⁷ Because the loss figures from ESCOM included both technical and nontechnical losses, it is unclear as to how much of the loss reduction at closing, that is, from 25 percent to 17 percent, can be attributed to the project, including the AMR. So to be conservative, it is assumed that the restructured target of 20 percent would capture the reduction attributable to the project.

²⁸ According to the PAD, at the tariff levels at approval, ESCOM's cost recovery ratio is roughly at breakeven in 2017 (PAD paragraph 88) and the return on sales is a negligible 3 percent.

the related increase in economic output, not to mention increases in employment and productivity overall. These benefits are significant but often difficult to quantify when available statistics and data systems are not evolved to a point where resources required to quantify the information are commensurate with the need for it, in decision making. Thus, if the project can be shown to be viable even without these additional benefits, the need for their quantification is obviated.

10. There are a range of other important benefits that result from increased and improved access to electricity including increased returns on education and wage income; improved access to modern communication and information devices; social benefits to the community (streetlighting, increased safety, allowing women to participate in the community life and go out at night); health benefits (reduced burn injuries from kerosene lamps); and time savings (for example, avoiding trips to charge batteries). Even though these represent a significant part of the social benefits of rural and peri-urban electrification, as these are somewhat difficult to quantify and were not included in the original analysis as well as for conservativeness, they have also been excluded from the present economic analysis.

Financial Benefits

11. The financial analysis considers ESCOM's increase in income contribution due to both revenue increases and cost reductions resulting from the project. At approval this pertained to both generation and T&D. However, at project completion the issue arises as to whether to consider the original ESCOM entity or, with the unbundling, only ESCOM the T&D entity, by appropriately prorating the benefits between the generation entity, EGENCO, and T&D entity, ESCOM, and counting only the benefits to ESCOM.

12. However, this would entail a more detailed disaggregation of the assets and liabilities of the two entities and this would also reflect a proration of the original expenditures for both the T&D and Component 2 outlays between the two entities. The financial costs and benefits accruing to the two entities would need to be re-aggregated to determine overall financial efficiency of the project, because the financial efficiency of the project and ESCOM is being measured per se. A very similar result is also likely to be arrived at by considering the total financial benefits based on the assumption of a combined entity. This would also better allow an easier 'apples to apples' comparison with the original financial analysis at approval as well as vastly reduce the resources and time that would otherwise be required.

13. For the financial analysis, just the three categories of benefits listed above can be considered to see if the project remains financially viable with just these benefits, that is, not considering the commercial and industrial and the consumer welfare benefits accruing from additional access. Because the original ESCOM—now EGENCO—also has some of its own liquid fuel generation capacity, it is assumed that around 50 percent of the fuel savings would accrue to EGENCO or to the original ESCOM. Also because most of the loss reduction takes place in T&D, but not all, a third of the benefits are assigned from loss reduction to generators outside of the original ESCOM, that is, to private generators. On this basis, the financial benefits to ESCOM would be around US\$23.5 million per year.

Project Costs

14. The project costs are assumed to be the same for both the economic analyses and the financial analysis. However, in terms of the present value, these costs at completion would differ from those at approval, because of the delayed timing of the actual expenditures. There would also be an increase in interest costs for Malawi because of the two-year loss of the grace period for the credit portion of the IDA funds. This analysis ignores this difference, as the present value of this increase would be relatively small.

Changes to Component 3

15. **Modification of Component 3.** Because of losses in project funding caused by exchange rate fluctuations, some of the DSM activities of Component 3 had to be dropped. Originally, Component 4 of the project included technical assistance and capacity-building activities that would allow ESCOM staff to better undertake the activities pertaining to the adoption of the AMR for large customers, which would allow them to better monitor and manage their energy consumption, hence allowing ESCOM to improve load control and reduce costs. The restructuring added the installation of the AMR system and 750 meters for the AMR, and only the AMR component was implemented. These changes concerning DSM will not have any impact on the original economic analysis of the project because the original economic and financial analyses had excluded benefits accruing from DSM and energy efficiency measures, as well as from new and rehabilitated overhead lines. The resultant reduction in project expenditures were offset partially by the increased expenditure because of the AMR. The net increase in benefits from improved collections and MV user efficiencies, generated by the AMR, was included by attribution to the technical assistance and capacity building in Component 4, even though funded elsewhere. Therefore, inclusion of the AMR in the restructured Component 3 is assumed to have no incremental increase in benefits for the purposes of this analysis.²⁹

16. Taking these factors into account, the ICR estimates the economic NPV and IRR of the project at completion to be US\$128.63 million and 36 percent, respectively, and the financial NPV and IRR to be US\$61.84 million and 29 percent, respectively. The timing of the cash flows resulted in a decrease in the NPVs but an increase in the IRRs. Sensitivity analyses carried out at completion also demonstrate, similar to those conducted at appraisal, that the project continues to remain economically and financially viable against a simultaneous 15 percent increase in investment cost and 15 percent drop in the stream of economic benefits or financial revenues.

17. The worksheet for the financial calculations is appended as table 5.

²⁹ Restructuring Data Sheet - Report No: RES21490.



Table 5

Fiscal Year	cash outflow	NPV	financial inflows	NPV	economic inflows	PV	actual Fin. out Flows		financial inflows	NPV	economic inflows	NPV
IRR			19%		27%				25%		36%	
Present Value @10%	\$58.38	\$ 62.10	\$120.48	\$ 142.90	\$201.28		PV 37.73		NPV 99.57	61.84	166.36	128.63
2012	3		-3		-3				0		0	
2013	5		-5		-5				0		0	
2014	20		-20		-20				0		0	
2015	25		-25		-25		4.26	\$50.22	-4.26		-4.26	
2016	27		-27		-27		6.02		-6.02		-6.02	
2017	4.7		-4.7		-4.7		8.87		-8.87		-8.87	
2018			\$23.51	\$213.44(a)	\$39.28	\$356.58(a)	23.48		-23.48		-23.48	
2019			\$23.51		\$39.28		30.07		-30.07	\$213.44(a)	-30.07	\$356.58(a)
2020			\$23.51		\$39.28				\$23.51		\$39.28	
2021			\$23.51		\$39.28				\$23.51		\$39.28	
2022			\$23.51		\$39.28				\$23.51		\$39.28	
2023			\$23.51		\$39.28				\$23.51		\$39.28	
2024			\$23.51		\$39.28				\$23.51		\$39.28	
2025			\$23.51		\$39.28				\$23.51		\$39.28	
2026			\$23.51		\$39.28				\$23.51		\$39.28	
2027			\$23.51		\$39.28				\$23.51		\$39.28	
2028			\$23.51		\$39.28				\$23.51		\$39.28	
2029			\$23.51		\$39.28				\$23.51		\$39.28	
2030			\$23.51		\$39.28				\$23.51		\$39.28	
2031			\$23.51		\$39.28				\$23.51		\$39.28	
2032			\$23.51		\$39.28				\$23.51		\$39.28	
2033			\$23.51		\$39.28				\$23.51		\$39.28	
2034			\$23.51		\$39.28				\$23.51		\$39.28	
2035			\$23.51		\$39.28				\$23.51		\$39.28	
2036			\$23.51		\$39.28				\$23.51		\$39.28	
2037			\$23.51		\$39.28				\$23.51		\$39.28	
2038			\$23.51		\$39.28				\$23.51		\$39.28	
2039			\$23.51		\$39.28				\$23.51		\$39.28	
2040			\$23.51		\$39.28				\$23.51		\$39.28	
2041			\$23.51		\$39.28				\$23.51		\$39.28	
2042			\$23.51		\$39.28				\$23.51		\$39.28	
2043									\$23.51		\$39.28	
2044									\$23.51		\$39.28	
(a): Memo PV of Inflows												



ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS



**DEPARTMENT OF ENERGY
AFFAIRS**



ELECTRICITY SUPPLY CORPORATION OF MALAWI LIMITED

**ENERGY SECTOR SUPPORT PROJECT (ESSP)
PROJECT IMPLEMENTATION COMPLETION REPORT (ICR)**

Project ID: P099626

**CREDIT NO. 4980 - MW
GRANT NO. H7150 - MW**

WORLD BANK

DECEMBER, 2018

ORGANIZATION OF PROJECT IMPLEMENTATION

The Project was implemented by two Project Management Units (PMUs) at the Ministry of Natural Resources, Energy and Mining, and at ESCOM. The two PMUs received overall supervisory oversight and guidance from two high level Committees namely; Technical Electricity Committee and Project Steering Committee.

IMPLEMENTATION CHALLENGES

Component 1 – Electricity Network Strengthening

Under component 1, there were a number of contracts that included the construction of five new substations, rehabilitation of five existing substations, and construction of overhead lines and underground cables.

During implementation of this Component the following **challenges** were encountered:

(i) The biggest implementation challenge was the debarment of the Supervising Consultant; (ii) Another Contractor delayed mobilizing and commencing work; (iii) Yet another Contractor delayed finishing outstanding works; (iv) Challenges with Contractor inter-dependencies led to delays to energize some transformers because the supply to the substations depended on other contractors over which ESSP had no control; (v) One Contractor had payment issues with their sub-contractor such that works slowed down which resulted in delays; (vi) There was no properly coordinated outage mitigation plan to facilitate timely granting of outages; (vii) Delays for ESCOM Team to mobilize commissioning of the line; (viii) Theft of conductor conductors [cables and earth mat] at the transformer installation sites; (ix) Occurrence of accident, near misses; (x) ESCOM was struggling to pay the works invoices due to system limitation challenges.

Delayed preparation of training venue which was not ready at the time when training was supposed to commence: (i) Training materials and equipment took a long time to procure hence delaying the start of the training; (ii) Training materials and equipment specifications were not clear hence delaying the procurement process; (iii) The training materials and equipment quantities were too small such that competitive bidders rejected to bid for the lots resulting in delayed acquisition of the materials and equipment which affected not only the start of the training but also progress was hindered. (iv) Some materials and equipment specifications provided by the consultant were either not common in ESCOM or were actually not usable in ESCOM and this took time to reconcile hence training delayed. (v) Some key staff mobilized failed to meet client expectations resulting in poor delivery of the training thereby affecting quality of service in the process.

Component 2 - Generation and Transmission Feasibility and Design Studies

This component includes financing for feasibility studies needed for eventual development of an additional 200–380 MW of new hydropower generation capacity in Malawi.

The implementation of the Component met with some serious **challenges**: (i) The assignment was dependent on implementation of another contract (ESIA Contract) that took longer than anticipated to be completed. (ii) As the assignment was nearing completion and need for time extension was required, extension became difficult to obtain as the consultant preparing some of the project documents, was

debarred by the World Bank.

Component 3 - DSM and Energy Efficient Measures

Given the severe capacity constraints in Malawi's power system, it was proposed to finance several demand-side management (DSM) and energy efficiency activities, focusing on reducing the coincident peak load and therefore reducing load shedding. In the event of funds being not available due to exchange losses, ESCOM replaced these packages with AMR System Design, and Supply and Installation of AMR Meters.

During implementation of this package, the following **challenges** were encountered:

Development of meter drivers delayed because the main contractor had to sign disclosure agreements with another contractor, and the issue took time to be resolved. (ii) AMR Center had no full time operator nor data analyst. (iii) There were coordination challenges between contractors such that development of data concentrators could not be finalized as the main contractor could not get information in good time. (iv) Development of meter drivers by the main contractor had delayed the supply of meters; (v) Some Meter sites had no or poor signals for remote communication. (vi) Meter with data concentrators are not accessible for remote meter reading. (vii) It was difficult to source skilled personnel in HV metering in Malawi. (viii) There were some communication breakdown challenges between the Contractor and the Client for a certain period of time and this led to delayed completion of the works.

5.2 Component 4 - Capacity Building and Technical Assistance

Under the project a number of activities were conducted to build capacity including training and provision of consultancy services and supply of equipment. No major challenges were encountered in this component.

FINANCING AND DISBURSEMENTS

There were some **challenges** related to funds disbursements during project implementation.

(i) Exchange Rate movement between SDR and USD reduced project funds hence capital was affected resulting in some components being financed by ESCOM; (ii) The float was fixed regardless of level of activities/ project stages - as a result there were limitations in the amount of funds that could be accessed when the project activities were at their peak. (iii) The minimum ceiling for direct payment was set too high at USD 1,000,000.00. However, most of contractors' invoices submitted were below this ceiling - as a result the project could not utilize the advantage of making direct payment in the Client Connection System. (iv) Implementation of funds re-structuring changes took too long to be effected in the Client Connection System hence affecting categories' disbursement transactions.

ENVIRONMENTAL AND SOCIAL SAFEGUARDS IMPLEMENTATION

ESMF for ESSP was conducted by the Ministry of Natural Resources, Energy and Mining. Environmental and Social Management Plan document was prepared by the Project's Consulting Engineer. However, the

Consulting Engineer only supervised the works in substations but never supervised works during construction of the lines as they got debarred by the World Bank and could not extend their services to cover the construction period. About 8,000 trees were destroyed during construction of substations and power lines. These trees will be restored between December 2018 to February end 2019.

The ESIA

ESIA was not prepared for this project since the scope did not qualify for a full ESIA. An ESMP was developed and implemented instead. The ESMP for the project was comprehensive and a significant number of inspections on Environmental, Social, and Safety were conducted during the construction of the substations.

The RAP

Development of Resettlement Action Plan (RAP) for ESSP lines was done by an environmental consultant. The RAP was initially planned to be executed by another, yet to be procured consultant. However, due to the limited time available to procure another consultant, ESCOM went ahead with implementing the RAP by using its own internal resources.

Implementation of The Resettlement Action Plan (RAP) had some challenges.

Payment to PAPs

Payment commenced in the month of October 2018. Only those PAPs whose compensation was K50,000 or less received cash. The rest received their compensation through banks. This was done to avoid theft and also to let PAPs make a concrete decision on how to spend their money. The project had spent more than what was budgeted for. Another factor that had led to spending more than the budgeted amount was due to the RAP Preparation consultant not having accounted for PAPs properly. A number of PAPs were missing at the sites and some sections of the lines were completely missed out. This was discovered when ESCOM went to do verification before payment. There were about 1093 households who were affected by the project during RAP implementation. However, the affected project people figure went up to about 2000 because of other lines that were built under the ESSP but were not under the RAP. All PAPS who have lost trees will receive 5 tree seedlings to replace every tree lost. The budget for restoration of trees is MWK 43,000, 000.

PROJECT RELEVANCE AND IMPACT

Project Relevance

The relevance of the ESSP was assessed considering Malawi's energy issues and priorities in the national policy to resolve challenges in the sector.

The project was highly relevant since the country and the beneficiary areas had real issues that the project has managed to address. These include:

- Expression of interest by IPPs in developing some sites for generation of power to augment the huge power deficit in the country.
- Improvement in system stability and reliability.

Project Impact

The project has made significant impact on the network and end users (Customers). Resultant impact has been experienced from Electricity network and studies as follows:

Electricity Network:

- The electricity network in the project areas is now reliable.
- The supply stability is assured where voltages have been improved
- There is more capacity to connect more customers
- There is flexibility in managing system maintenance in the system with minimal power interruptions.
- There is flexibility in operating the system due to remote operations that have come with Substation Automation System (SAS) in the new substations.
- Reduced forced outages resulting from system faults.

Capacity Building:

- The project has enhanced capacity of PIU members and some users through training and project work experience.

Studies:

- Confirmation of the electricity generation sites that have potential to add capacity to the grid
- Generation of interest to finance some generation and transmission infrastructure
- Development of IRP that has a catalogue of projects for future development
- Enhancement of participation of Independent Power Producers.

PROJECT SUSTAINABILITY

In every project management it is imperative that consideration for sustainability of the facilities and infrastructure that have been put in place takes priority in order that the operation of the facilities and the positive impacts attained are sustained. Under the ESSP, the project sustainability was highly considered and ensured. Among other mechanisms, the project had the following:

- a. Ensure that key staff that were managing the project in ESCOM and MONREM are available and will continue to be available post completion
- b. Equipment acquired under the project such as motor vehicles, trucks, buses, circuit breaker analyzers, cable fault locators and oil regeneration equipment are in place for maintenance and operation management of the infrastructure.
- c. Training of the key staff was conducted to ensure sustainability of the infrastructure installed.



- d. Special training for linesmen and technicians was successfully conducted under the project that ensured capacity for sustainability of the project
- e. Adequate spares were supplied under the project to facilitate adequate maintenance and system sustainability.
- f. For substations, adequate staff have been trained and deployed to man the station on permanent basis.

CHALLENGES AND LESSONS LEARNED

Challenges.

During project implementation there were challenges, some of which are listed as follows:-

1. The project had capacity challenges at the early stages particularly in management of the procurement cycle.
2. Some Contractors had delayed to mobilize and commence the works hence affecting the completion time for the works and Energy and the entire project
3. Some contractors had delayed finishing the outstanding works due to their inability to mobilize key staff in a timely manner.
4. Coordination challenges with contractors that had inter-dependent projects in situations where one contractor had delayed thereby affecting commissioning of the other contractor's works. These included but were not limited to
 - Development of meter drivers being delayed because the AMR System developer had to sign non-disclosure agreements with the meter supply contractor which took long and as a result the meter supply contractor was also delayed.
 - There was no proper coordination between the main contractor and the meter supply contractor to develop data concentrators during the project period.
5. There was no properly coordinated outage mitigation plan to facilitate timely granting of outages.
6. PMU did not have dedicated commissioning engineers to be mobilized during commissioning of lines which led to some of the delays in commissioning and completion of the works.
7. Theft of copper conductors (cables and earth mat) at the transformer installation sites.
8. The project kept losing funds due to appreciation of USD leading to some components being financed by ESCOM and to some extent being dropped from the project.
9. Design shortfalls in certain components of the project particularly lines.
10. Storage and warehousing challenges for special tools and equipment and as a result the materials were vulnerable to theft.
11. Some Meter sites have no or poor signal for remote communication.

Lessons Learned

1. There is need for early and active involvement of key technical stakeholders to ensure full incorporation of all planning, design, and training aspects of the project for successful implementation.

2. Debarment of firms with ongoing activities in the project negatively affects implementation and completion of ongoing projects and there is need for the Bank to have speedy special consideration for such cases to avoid disruption and delay of ongoing work.
3. There is need to award the Design, Preparation of bid documents and Support During Procurement package to a separate firm from that of Supervision and DLP support package to mitigate against overlaps and effects of time overruns. If awarded to the same firm, at least the two packages should be distinct and independent Contracts.
4. Design Engineers and other related projects experts should be recruited early enough in order to have adequate time for designs, reviews, approvals and bid document preparations and procurement processing.
5. There is need for attachment of counterpart engineers (and all other experts) to consultants in order to cover procurement and supervision services in the event the consultant has demobilized. PMU to be adequately staffed.
6. Given adequate training and resources, internal experts are better to manage supervision services and ensure sustainability of the facilities.
7. Funds for co-financed project components have to be secured and ring fenced so that funds will be available for smooth and successful implementation of projects.
8. Outage mitigation plans to be developed and incorporated as part of the contract packages during the planning stages of the packages.

CONCLUSION & RECOMMENDATIONS

With reference to the Project Development Objectives, the implementation of the project has been a success since it has achieved the objectives. It is also worth noting that the challenges encountered during implementation have been taken as learning points for improvement in the implementation of future projects.

- a) All key stakeholders have to be identified early enough and be involved throughout the project period.
- b) For future projects the implementation Agencies should take advantage of the PPF to adequately capacitate the PMU in the early stages of the project.
- c) For proper take off and successful implementation of future related projects, it is recommended that the implementation Agencies should utilize experts that have had relevant and similar experience to avoid delays.
- d) At implementation, there should be reporting structure that is agreed upon by both client and consultants/contractors and is sustained throughout the implementation period.
- e) There is need to award the Design, Preparation of bid documents and Support During Procurement package to a separate firm from that of Supervision and DLP support package to mitigate against overlaps and effects of time over runs. If awarded to the same firm, at least the two packages should be distinct and independent Contracts.
- f) Progress rating of a project should not only be based on overall disbursements but project phases' progress and other agreed parameters for each phase of a project.



- g) There is need to adopt ant-theft designs for distribution lines including types of materials to be used.
- h) Specialized teams for specialized tasks, i.e. commissioning, have to be prearranged and capacitated for smooth implementation of the project components.
- i) It is recommended that packaging of contracts should be done in such a way that system supply and associated equipment should be under one contract for ease of integration and management.
- j) There should be improved communication between the donors/ lenders and client including review feedback and granting of No Objections.



ANNEX 6. SUPPORTING DOCUMENTS (IF ANY)

1. Minutes of Quality Enhancement Review, March 30, 2011
2. Integrated Safeguards Data Sheet
3. Resettlement Action Plan
4. Project Implementation Manual
5. Implementation Status Reports
6. Environmental and Social Management Framework
7. Environmental and Social Management Plan
8. Letter to World Bank (First restructuring)
9. Restructuring Paper (First restructuring)
10. Restructuring Paper (Second restructuring)
11. Government 'Letter of Intent' on Sector Reform