Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

Appraisal Stage | Date Prepared/Updated: 23-Apr-2019 | Report No: PIDISDSA25274

BASIC INFORMATION

A. Basic Project Data

Country	Project ID	Project Name	Parent Project ID (if any)
Malawi	P164331	Malawi - Electricity Access Project	
Region	**Estimated Appraisal Date**	**Estimated Board Date**	**Practice Area (Lead)**
AFRICA	06-May-2019	30-May-2019	Energy & Extractives
Financing Instrument	**Borrower(s)**	**Implementing Agency**	
Investment Project Financing	Ministry of Finance, Economic Planning and Development	Ministry of Natural Resources Energy & Mining, Electricity Supply Corporation of Malawi, Ltd.	

Proposed Development Objective(s)

The development objective of the project is to increase access to electricity in Malawi.

Components

Grid electrification
Off-grid market development
Technical Assistance

PROJECT FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	150.00
Total Financing	150.00
of which IBRD/IDA	150.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Development Association (IDA)	150.00

IDA Credit	150.00

Environmental Assessment Category

B-Partial Assessment

Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

B. Introduction and Context

Country Context

1. **Malawi is a landlocked country in southeastern Africa, bordered by Zambia, Tanzania and Mozambique, with a population of about 18 million people.** The population growth rate is estimated at 2.8 percent per annum and is expected to reach 23 million by 2025. Malawi remains an overwhelmingly rural economy, however, the country is urbanizing at an annual rate of about 3.5 percent, higher than the average for Sub-Saharan Africa. Malawi has had a stable democratic political system since 2014 and has initiated economic and political reforms in public financial management, business regulations and the foreign exchange regime. The country has a very young population with 56 percent of Malawians being younger than 20 years old[1]. 14.2 percent of people aged 15 years and above have never attended school and 70 percent have not completed primary school.

2. **The economy is largely agrarian and extreme poverty is widespread.** Agriculture represents about 30 percent of GDP, over 80 percent of total export earnings, and 85 percent of employment. The agriculture sector is dominated by two crops, maize for food security, and tobacco for export revenues. This sector is heavily dependent on rainfall and, in recent years, climate variability has led to a recurrence of floods and droughts in various parts of Malawi. Malawi remains one of the world's poorest countries, with over half of its population living in poverty. In 2016, the proportion of poor households living below the poverty line of US$1.9 /day (2011 PPP) stood at 70 percent of the population[2]. The Gross National Income (GNI) per capita[3] was estimated at US$340 in 2015. Malawi is ranked 173 out of 188 countries on the United Nations Human Development Index (UNDP, 2015).

3. **Malawi's development perspective is spelled out in Malawi's vision 2020.** The vision was launched in 1998 with the aim to move Malawi to a "[…] *secure, democratically mature, environmentally sustainable, self-reliant with equal opportunities for and active participation by all, having social services, vibrant cultural and religious values and a technologically driven middle-income economy*" by 2020. The implementation of Vision 2020 has progressed in five-year medium-term strategies. To date, three

[1] Fourth Integrated Household Survey (IHS4) 2016-2017
[2] World Bank (2017). Malawi Economic Monitor – Unleashing the Urban Economy, Macroeconomics and Fiscal Management Global Practice, Washington, DC: The World Bank.
[3] GNI *per capita* - atlas method (current US$)

medium term national development strategies have been implemented including Malawi Poverty Reduction Strategy (MPRS) 2002 - 2005, Malawi Growth and Development Strategy (MGDS I) 2006 - 2011 and MGDS II 2012 - 2016. The Government has launched the MGDS III 2017 – 2022 which has five main pillars, namely: (i) Agriculture and Climate Change Management; (ii) Education and Skills Development; (iii) Transport and ICT Infrastructure; (iv) Energy, Industry and Tourism Development; and (v) Health and Population Management.

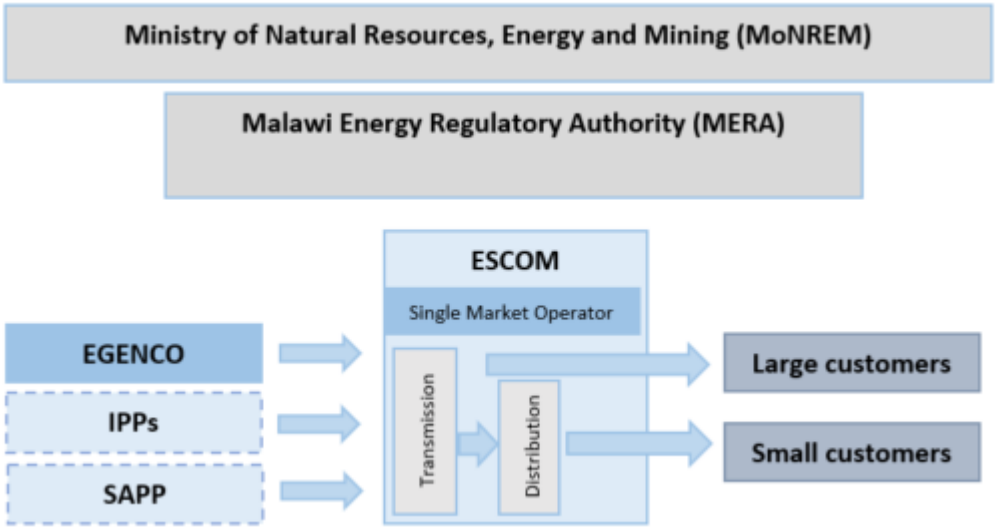
4. **Medium-term economic prospects appear positive.** The Government of Malawi (GoM) under MGDS III is looking beyond the recent crisis and establishing strong foundations for economic recovery and growth. Economic patterns show signs of positive structural change, with the share of agricultural employment falling and that of more productive sectors like industry and services increasing. Real GDP growth after two consecutive years of drought fell below 3 percent in 2016 but picked up again in 2017 increasing to 4 percent. Inflation dropped to 7.1 percent by December 2017[4]—its lowest level in recent years.

Sectoral and Institutional Context

5. **Malawi's power sector is guided and structured by the National Energy Policy (2003) and the Electricity (Amendment) Act of 2016.** The Ministry of Natural Resources, Energy and Mining (MoNREM) is tasked with the overall policy oversight. The Malawi Energy Regulatory Authority (MERA) was established in 2007 as an independent electricity regulator whose mandate is set out in the Energy Regulation Act (2004, with subsequent amendments). The role of MERA includes inter alia (i) reviewing tariff applications from ESCOM and recommending tariff changes to GoM, (ii) granting licenses for generation and distribution operators and (iii) arbitrating commercial disputes that arise under the 2004 energy legislation. Under the amended Electricity Act of 2016, the former utility ESCOM has been unbundled into two entities: the distribution and transmission utility ESCOM, and the generation utility EGENCO. ESCOM assumed the new function of the Single Buyer and procures power from EGENCO and from independent power producers (IPP) and in future, potentially from the Southern African Power Pool (SAPP). Under the supervision of ESCOM's Single Market Operator, ESCOM Transmission supplies power to large and small customers through ESCOM Distribution. While the utility focuses on connecting high and medium demand customers in urban and peri urban areas, the Government is electrifying rural trading centers across the country under the Malawi Rural Electrification Program (MAREP) based in MoNREM and funded through a 4.5 percent levy on energy sales (i.e. liquid fuels, ethanol, LPG and electricity).

Figure 1: Structure of the Malawi power sector

[4] Consumer Price Indices (July 2017): Government of Malawi National Statistical Office



6. **Malawi has abundant largely untapped solar and hydro resources.** The country's current installed generation capacity is 482 MW, of which 75 percent is from hydropower resources and the remainder from diesel power the latter in the form of emergency generation. All major power stations are located in the southern region along the Shire river. One small hydro station, the 4.5MW Wovwe plant, operates in the north of the country. The hydro-potential of the Shire River alone is estimated at about 600 MW, and another 400 MW of potential exists on smaller rivers. In addition, Malawi has great untapped solar potential with an average of 3,000 hours of sunshine per year. Finally, the country is also strategically located for interconnection with the SAPP to be achieved upon the commissioning of the proposed Mozambique-Malawi Regional Interconnector project.

7. **Notable results have been achieved with regard to infrastructure expansion and electricity service delivery.** Electricity connections have grown on average 11.5 percent in the past five years from 238,041 to 409,540 connections[5]. In the previous fiscal year alone (ending June 2018), ESCOM connected 35,000 customers. Under MAREP, 836 district administration and trading centers in rural areas were connected to electricity. Significant progress has been made in developing a robust transmission network. ESCOM's transmission system presently comprises some 1,340 km of 132 kV line and 1,100 km of 66 kV line and associated substations. Total system losses have seen a major improvement from 21 percent in 2012-13 to 14 percent in 2016-17[6]. The bill collection rate in Malawi has increased to 94 percent.[7] This has resulted from the installation of Automated Metering Infrastructure (AMI) for all industrial customers representing about 50 percent of ESCOM's annual base, and the migration of postpaid meters to pre-paid meters for domestic consumers.

8. Despite this progress, the sector is beset with a multitude of challenges.
9. **First, Malawi has one of the lowest electricity access rates in the world.** Currently, the electricity

[5] Information provided by ESCOM.
[6] ESCOM (2018). 5-Year Integrated Strategic Plan (2017-2022).
[7] http://rise.worldbank.org/country/malawi

rate stands at 11 percent with severe disparities between urban (42 percent) and rural areas (4 percent)[8]. The inequity among the rich and poor is stark – the poorest 20 percent reports 1 percent and the richest 20 percent reports 31 percent electrification rate.[9] The current annual population growth rate of 2.8 percent is outstripping the pace of electrification[10]. Malawi's off-grid sector is very nascent consisting of few donor-funded initiatives. Access to electricity and reliability of the network are major constraints also for the private sector. As per the latest 2018 Doing Business Report, procedures, time and cost to get connected to the electrical grid as well as the reliability of electricity supply and the transparency of tariffs in Malawi is ranked extremely low (169 out of 190 countries) and below the Sub-Saharan Africa average.

10. **Second, power supply is constrained at times and vulnerable to hydrologic variability.** While Malawi's current installed generation capacity is 482 MW, demand is estimated at around 440MW leading to a supply deficit due to the low availability of hydro especially during the dry season. In addition, the hydropower sources are exposed to hydrologic variability and in the past two years severe droughts have led to reduced water levels in Lake Malawi and in the Shire River. This shortage resulted in prolonged load shedding of up to 12-16 hours or more a day during several months of the year, but the situation has abated somewhat with the introduction of new diesel generation. 108 MW of Emergency diesel generation capacity has been installed to immediately assist with the supply deficit although at a high cost of about US$ cents 42/kWh.

11. **Third, weak financial position of the utility further hampers the ability to undertake aggressive access expansion and ensure reliable service delivery.** The average electricity tariff is insufficient to meet ESCOM's cash flow requirements. Due to its financial situation, the utility has no borrowing capacity and the Government has been assuming debt for meeting ESCOM's capital expenditure needs. As a result of its financial position, ESCOM (i) has not been able to perform regular operation and maintenance (O&M), which led to poor customer service including service interruptions and increased restoration time; and (ii) has focused on only connecting high value customers able to afford the connection charge. Minor improvements in the tariff regime have been made over time. ESCOM submitted a new application to MERA to request a 60 percent increase in tariffs for the next 4-year period of 2018 to 2021 against which 31.8 percent was approved for the same duration of which 20 percent was made effective in 2018/19. The average tariff for 2018/19 is MWK 88.02 (about US$0.12) and will increase to MWK 95.15 (about US$0.13) in 2021/22.

12. **The GoM is addressing these challenges through a comprehensive power sector reform program:**

- **First, through investment in generation and transmission projects:** The GoM is aggressively expanding its generation and transmission capacity in the near-to-medium-term to ensure power supply adequacy and by matching demand growth and grid expansion plans through three major initiatives: (i) Immediate additional power from 108

[8] World Bank (2018). First Order Geospatial Least Cost Electrification Plan.

[9] Kojima M., Zhou X, Han J., de Wit J., Bacon R. and Trimble C: Who Uses Electricity in Sub-Saharan Africa – Findings from Household Surveys - In each country, people are divided into quintiles based on per capita expenditures, with quintile 1 being the poorest and quintile 5 being the richest.

[10] 0.82 percent on average in the past five years.

MW of emergency diesel generation and 120 MW of solar PV from independent power producers (IPPs)[11]; (ii) interconnecting to the SAPP through the Mozambique-Malawi Regional Interconnector transmission line, which will initially allow for an additional 50 MW of imported capacity from 2021 onwards; and (iii) increasing domestic generation through IPPs by embarking on reforms that attract more private investment in generation. The Bank, under the recently completed Energy Sector Support Project (P099626) supported the preparation of an Integrated Resource Plan, i.e. a least cost generation and transmission expansion plan that offers a list of priority energy projects through 2037.[12] The Bank is supporting the Government with the design and financing of the 308 MW Mpatamanga Hydropower Project, and the Mozambique-Malawi Regional Interconnector Project. The other donors, especially Millennium Challenge Corporation (MCC), are active in the sector (MCC compact closed in September 2018). The US$ 350.7 million US funded MCC compact invested in transmission and distribution system strengthening and expansion through investments in the transmission backbone project, transmission and distribution substations, and related TA support.

- **Second, by improving the financial and operational performance of the utility:** Since mid-2016, various initiatives have been undertaken to improve the financial and operational performance of the sector entities. MCC financed the implementation of ESCOM's turnaround aimed at restoring the utility's financial health and rebuilding the organization into a financially sustainable and well-managed utility. Consultants through MCC funding have conducted a financial modeling exercise that resulted in a set of recommendations on how to improve the financial health of the utility, including a sustainable debt management plan for ESCOM, plan for reducing ESCOM's high operating costs, a tariff adjustment methodology that will align tariff more with costs and new accounting policies to adhere more closely to international financial standards. These interventions have already yielded results, i.e. improvement in ESCOM's tax management, improved monitoring of CAPEX, and budget utilization, and improved corporate performance. MCC also supported ESCOM to introduce stronger operational practices to improve maintenance planning and execution, which will reduce the high system losses. In addition, ESCOM has moved most of its customers from post-paid to pre-paid meters. ESCOM is also implementing a revenue protection program (RPP) and has already moved through funding from the Bank's ESSP, 750 of its industrial customers representing 50 percent of ESCOM's revenues to advanced metering infrastructure, which will reduce non-technical losses.
- **Third, by enhancing transparency and effectiveness of the regulatory framework:** To allow for the implementation and management of the new structure of the electricity sector that introduced the single buyer, the market operator, and IPPs in generation, MERA has adopted a new grid code and market rules for Malawi's electricity market.

[11] The solar IPP program entailed a solar auction which was the first instance of this approach being used in Malawi's power sector.

[12] The Bank has further financed under the ESSP, the preparation of feasibility studies, ESIAs and tender documents for two large hydropower projects, and the western transmission backbone, along with solar resource mapping (ESMAP grant); assessment of geothermal potential, wind resource mapping, and bagasse fired generation. In addition, the Bank prepared through financing from the Government of Norway, the feasibility study and ESIA for the Mozambique-Malawi Regional Interconnector Project.

Several other efforts are underway: The Government is in the process of adopting a new National Energy Policy and a Renewable Energy Strategy, which will improve transparency of Malawi's regulatory framework, increase predictability and generate investor confidence. Through ESMAP support, the World Bank carried out a regulatory gap analysis as well as a review of policies and regulatory instruments, including the National Energy Policy, the Renewable Energy Strategy, and the IPP Framework, which resulted in recommendations for supporting the reform process.

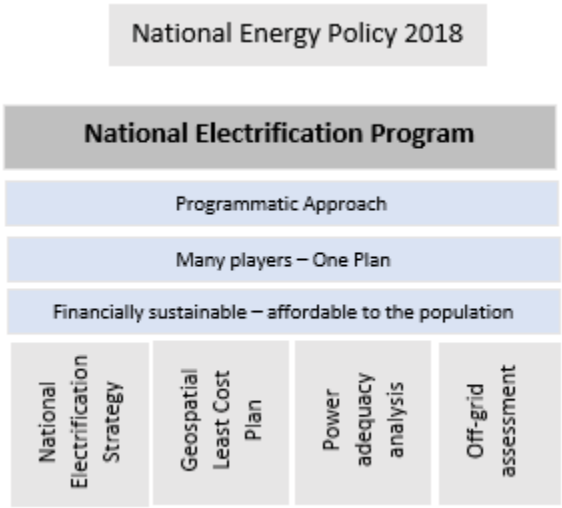
13. **GoM aims to rapidly scale-up electricity access to reach about 80 percent by 2035 and it is developing a National Electrification Program.** In 2018, GoM updated the National Energy Policy of 2003 to define the national energy development agenda in relation to the Malawi Vision 2020, Malawi Growth and Development Strategy III, and the Sustainable Development Goals (SDGs). The overall goal of the National Energy Policy 2018[13] is to establish a guiding framework including policy and strategic direction for achieving increased access to affordable, reliable, sustainable, efficient and modern energy for every person in the country. It emphasizes the importance of establishing the institutional and regulatory framework to support achievement of energy access goals. According to the National Energy Policy 2018 currently being reviewed by the Cabinet, the GoM currently aspires to reach 80 percent electricity connectivity by 2035[14]. The National Electrification Program (NEP), currently under preparation with Bank TA support, embodies the following principles:

i. a fast-paced ambitious grid connections rollout Program implemented by ESCOM and MAREP;
ii. enhanced design and reach of an off-grid access rollout program alongside grid connections; and
iii. a catalogue of technical assistance (TA) activities targeted at strengthening the institutional framework in order to deliver universal access to electricity. Responsibility of the overall program oversight of the NEP will lie with MoNREM.

14. **The NEP represents a strategic shift by the GoM, from the track record of numerous fragmented activities financed by development partners to a programmatic and holistic electrification approach.** The NEP's design and implementation is organized to rally all designated sector agents, development partners and other stakeholders around a common sector platform and sector-wide implementation framework and process ('Many players – One plan"). Furthermore, the Government recognizes the necessity of supplementing its limited budgetary and fiscal resources to ensure mobilization of adequate financing that can be sustained over the duration of the NEP's implementation, particularly for capital expenditures associated with on-grid (MV, LV, final service drops and connections) and off-grid access rollout.

Figure 2: Malawi's National Electrification Program

[13] Currently awaiting Cabinet approval.
[14] 35 percent Tiers 4 & 5 and 45 percent Tiers 1,2 & 3.



15. The Bank is supporting the NEP with the following ESMAP financed activities:

i. National Electrification Strategy defines the targets of the program as well as the key strategic elements that will ensure efficiency, effectiveness, and timeliness in program delivery);
ii. Geospatial least cost electrification plan, estimates optimal modality (grid and off-grid) for access provision, taking into account technical and economic viability, georeferenced demand centers, and load forecasts, all anchoring the financing prospectus;
iii. Off-grid market assessment specifies the operational implementation design for the off-grid pre-electrification program for the scale-up of stand-alone solar systems solutions and mini grids; and
iv. Power adequacy analysis ensures grid electrification roll-out is aligned with plans for commissioning new generation capacity as determined under the Integrated Resource Plan for Malawi.

16. **According to preliminary conclusions of the geospatial least cost electrification plan[15] grid electrification is likely to be the dominant least cost electrification technology.** Most (95 percent) of Malawi's population lives within 10 km of the existing MV grid network; and a high percentage of those currently live within 5 km of an existing ESCOM network infrastructure. The strategic implication of this finding is that over the longer-term grid connections represent the least cost delivery modality for achieving universal access. The most important practical insight for electrification planning for Malawi in the near-term is the large number of potential connections in range of existing transformers that can be reached with little to no additional medium voltage lines in the near-term (2019-2022). 40-45 percent of the national population representing 1.1 million households live within 1 km of existing ESCOM lines. Connecting these households will bring the national access rate to 38 percent. The Plan also highlights that the capital expenditures for grid connections can be reduced by at least 25 percent when applying best practices under a national electrification plan.

17. **The pre-electrification segment of 2 million households represents the immediate off-grid market.** Given that energy demand for rural households will be low for at least a couple of years before

[15] The preliminary Least Cost Electrification Plan has been prepared and is currently reviewed by the Government.

they start using higher power consuming appliances[16], solar represents the best and fastest pre-electrification alternative. Use of solar power in Malawi is growing; the Business Innovation Facility (BIF)[17] conducted a small off-grid lighting and phone charging study in 2016 capturing a snapshot of household technologies, habits and expenditure. The study highlights that 13 percent of off-grid households use solar lighting, 9 percent portable solar lights, and 4 percent fixed solar lights. Promoting the use of solar, including for productive use, would be a good pre-electrification option with the opportunity of a more sustainable (market-driven) approach that would eventually eliminate dependency on Government and/or donor resources. The World Bank supported off-grid market assessment suggests up to 3.7 million households could require off-grid solar solutions by 2030 (i.e. 310,000 units p.a.). This translates to a potential market of about US$265 million for the 12-year period, or US$22 million a year.

18. **Limited access to finance is the primary factor preventing the off-grid solar (OGS) companies to expand their businesses and customer base**. There are no local manufacturers in Malawi and all systems are being imported, mostly from China. The amount of the financing requirements expressed by the companies in the off-grid market assessment adds up to US$30 million. Most of this (70-80 percent) would be required to finance stock and receivables (working capital financing), while 20 – 30 percent would be required to invest in the development of the distribution network (i.e. selecting agents, training them, providing them with financial support, etc.)**.** The OGS MSMEs, operate in a nascent and an unknown market for financial institutions Commercial banks are currently not lending to OGS enterprises; only one microfinance institution (MFI) and one commercial bank have started to pilot consumer finance for solar. These companies have been relying on a mix of own equity and grants to invest and support their business. To make products affordable, solar companies are also providing consumer financing through a PAYG system, allowing installment payments for up to 18 months (with only 20 percent upfront payment). This means OGS companies are taking credit risk and lock-in their working capital, thereby limiting their capacity to grow. The cost of credit in Malawi is also a prohibitive factor, making commercial debt unaffordable for OGS companies, most of which are in their early years of operation or new entrants. Commercial interest rates currently range from 30 percent to over 100 percent for micro loans[18].

19. **There are ongoing activities in the development of mini-grids as well, yet the market is currently pre-mature.** The Government of Scotland is funding two renewable energy projects during 2015 to 2018 including the Sustainable Off-grid Electrification of Rural Villages (SOGERV) project. The project aims to electrify rural households, businesses and community energy infrastructure. In addition, the Powering Development in Mulanje (PDM) off-grid electrification project is meant to catalyze social and economic development of poor communities around Mulanje. The European Union (EU) is funding several renewable energy projects in Malawi including the supply and installation of solar powered stations to deliver electricity to households, businesses, and irrigation. The UNDP supported the development of a mini-grid in Mulanje that has a 60kW micro-hydro generation scheme that supplies 280 households. The UNDP and the UNICEF have recently partnered on a new program to provide off-grid solar to health centers and regional government hospitals in Malawi. While the geospatial least cost electrification plan has identified mini grid locations for investment, the Government will need to determine the business

[16] Demand is usually limited to a few lamps, radio and/or television; these products can easily be powered by solar systems.

[17] BIF conducted a small off-grid lighting and phone charging study capturing a snapshot of household technologies, habits and expenditure in Malawi with a sample size of 513 districts: Blantyre, Zomba, Lilongwe, Mzuzu, Rumphi, Chikwawa, Salima.

[18] This is attributable to several factors, including high cost of funds especially for small financial institutions, high perceived risks of MSMEs and consumer lending, high operational costs

modalities for mini-grids and establish the regulatory framework under which mini-grids can operate.

20. **The proposed project will establish a platform for implementation of NEP in both grid and off-grid supply solutions**. As part of the first phase of the NEP, ESCOM has launched a US$500,000 Accelerated Electrification Program (AEP) aimed at increasing access to grid-connected electricity among the rural and low-income urban households. The project will allow consumers to get access to an electricity connection and house wiring for a fee of US$100 to be repaid in installments. The AEP shall be integrated into MEAP through the ESCOM FY 19 and beyond connections program.

21. **The proposed project will more than double the existing electrification rate and create a platform to rapid scale-up access to electricity.** The proposed project provides financing to connect 300,000 households within close proximity to the existing grid network (see Figure 3). This will increase the current electricity rate from currently 11 percent to 20 percent by the project's completion in 2023. In addition, through the off-grid solar market roll-out, at least 200,000 households will access electricity, increasing the overall access rate by another 6 percent. However, the market roll-out promoted by the project will have a much larger transformative impact for reaching the households that will not be connected to the grid in the foreseeable future by creating an environment for OGS companies to scale. Finally, the technical assistance provided under the proposed operation will address the key bottlenecks of the sector to move the country towards universal access to electricity.

C. Proposed Development Objective(s)

Development Objective(s) (From PAD)

The development objective of the project is to increase access to electricity services in Malawi.

Key Results

People provided with new or improved electricity service (number) (Corporate Results Indicator)

D. Project Description

Component 1: Grid Electrification (US$115 million)

22. Grid densification/extension: This component will finance cost-effective, priority investments in grid electrification by providing households living in close proximity to an existing distribution infrastructure leveraging on the geospatial analysis to maximize the number of connections per provided financing. Specifically, the component will finance low voltage (LV) extensions, service drops, and pre-payment meters. Some of the new connections may also require reinforcing hardware elements of the supplying MV feeder for ensuring quality and reliability of supply for new connections. The project will also support the elimination of connection barriers due to unaffordable internal wiring costs by providing ready boards to low-income households that cannot afford internal wiring costs.

23. Demand side management: This component will also include distribution of free energy efficient LED bulbs to enhance the affordability and reduce household electricity consumption. This will save

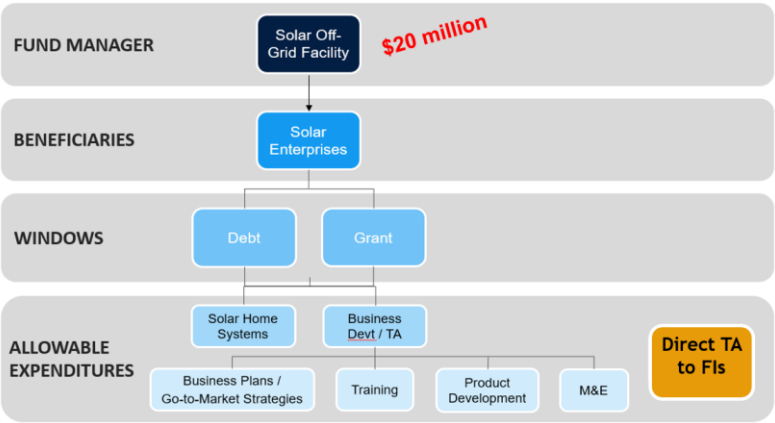
consumers the cost of procuring compact fluorescent lamps or incandescent bulbs of wattage ranging between 20 watts and 100 watts. Each household will receive 2 to 3 LED bulbs of 7 watts each and through this initiative, household electricity consumption (particularly for the low-income households) will be reduced by about 20%.

24. Project selection methodology: As per the selection methodology developed by ESCOM, project areas will be identified on the basis of clusters of potential customers within 500 meters of a service transformer. Each cluster point will be linked to a service transformer and feeder, to gauge the number of connected customers per cluster point, transformer and feeder using ESCOM meter data. The potential load per cluster point will be determined using household density and associated After Diversity Maximum Demand (ADMD). The impact of this load on the medium voltage network will be determined through a load flow analysis while a simple low voltage (LV) feeder model will be used to check LV feeder voltages and loading. If the network has capacity to supply the additional customers, the quantity of material and associated costs will be determined using design indicators based on the area density. The list of projects will be prioritized based on cost per connection and added to the current list of backlog projects (of currently 26, 919 customers). The final list will be a combination of new and backlog projects.

Component 2: Off-grid market development (US$20 million)

25. The component will bridge the financing gap faced by solar companies operating in Malawi and hence address the challenges to developing the OGS market. Finance will be required for (i) importers to increase stock and buy down the cost of the system through larger volumes; and (ii) distributors for working capital that currently is locked to provide PAYG, the most accessible end-use financing. This component will set up a financing facility managed by a qualified fund manager that will provide access to loans and grants to eligible enterprises offering quality assured solar off-grid systems. Solar companies will use funds to finance stock, develop business models and build the distribution channels to reach consumers. This component draws from successful experiences of off-grid facilities, in Bangladesh, Kenya, Ethiopia and Zambia.

Figure 3: Proposed solar off-grid facility



26. The facility will provide financing through the following two windows and will be managed by a competitively selected fund manager:

- **Debt window** to support working capital constraints, especially upfront costs associated with the importing and building of an inventory of solar products. The solar companies lack the financial cash flow to import and build an inventory of products, which would allow for faster turn-around of sales and also for lower pricing of the systems due to economies of scale. In addition, solar companies are taking credit risk by advancing up to 80 percent of financing of the system to enable households to purchase systems on a PAYG-basis. The debt facility will provide credit at market rates to solar importers and distributors to import and build an inventory as well as allowing them to provide medium-term consumer financing on a pay-as-you-go basis. Financing will be provided in local currency depending on the needs of the solar companies and on a first-come-first-serve basis after careful review of the companies' business plan. Individual loan terms (size, tenor, security, etc.) to companies will be determined by the Fund Manager during initial screening and diligence. The market assessment shows that loans in local currency with tenors of 2-4 years in loan amounts ranging between US$300,000 to up to US$5 million are preferred by the companies.

- **Results-based financing (RBF)** to provide critical business development support and building the distribution channels at scale. The RBF window will not only help with buying down the opportunity costs of solar companies to expand their business in the market but also allow for start-up companies to enter the market and increase competition. RBF will specify installment payments based on the achievement of pre-agreed connection milestones and satisfactory after sales service support. Given that traditional RBF mechanisms pay out only after sales are confirmed, poorly capitalized small enterprises and new entrants may have difficulty benefiting from them early in the project. Therefore, the RBF mechanism will offer funding for the initial setup, marketing, and consumer-awareness activities including training of sales agents. Firms will receive additional incentives for working with marginalized groups as well as women entrepreneurs and sales agents and for products promoting agricultural productive uses (e.g. for irrigation, drying, cooling). An independent verification agent (IVA) will be tasked with ensuring that companies meet their obligations to customers and remain in compliance with Lighting Global product and after-sales service requirements at all times.

27. **The facility will provide technical support to OGS companies to build successful business models[19].** The project will facilitate partnerships between financial institutions, OGS companies and business development providers that could lead to development of credit products that do not currently exist in the market. For example, to address the challenge of lack of collateral, technical support could be provided to financial institutions to offer asset-based lending (using PAYG receivables as assets) or cashflow based lending.

28. **The component is designed to serve the poor and to ensure affordability constraints of the beneficiaries**. The component complements densification activities under component 1, by focusing on

[19] Technical support could also be provided to help OGS companies effectively management their operations (including M&E) as well as financial obligations, including future forex requirements for periodic importation of stock through market hedging instruments, e.g. through simple FX Forward contracts.

more rural and remote areas with a population of generally lower income and higher affordability constraints. The RBF window will provide the necessary incentives to OGS companies to expand their businesses into more rural and remote areas by financing the additional costs linked to the expansion of distribution channels. An affordability analysis was conducted as part of the off-grid market assessment. Results show that 60 percent of the population can afford a Tier 1 or 2 system. Affordability is further increased by promoting PAYG solutions allowing households to pay for systems over time.

29. **USAID through its Power Africa program is preparing a similar off-grid facility with an RBF component of US$ 1.5 million.** The facility is planned to be launched in January 2019. Power Africa has proposed that interventions by donors in the Malawi off-grid electrification space be phased with the Bank's contribution immediately following the delivery of the Power Africa program as a Phase II activity. The complementarity of the two programs and alignment of objectives and delivery modalities is being determined during program design.

30. **During the implementation of this component, the project will seek to draw on relevant technical knowledge of its Global Practices (GPs) and maintain technical collaboration and coordination with the Bank's Finance, Competitiveness, and Industry (FCI) Unit, and with IFC,** including drawing on IFC's experience of implementing the Lighting Africa program in other countries. Collaboration with IFC may include working together to provide support for new product development or new markets and segments and building capacity of financial institutions to understand and begin to play a role in financing the solar market. IFC currently does not have investments in Malawi's financial institutions. Through this component, the project will contribute to the "*creating market*" strategy of IFC by building capacity in the market, hence creating future investment opportunities for the private sector (including IFC).

Component 3: Technical Assistance and Capacity Building (US$15 million)

31. This component will finance various technical assistance (TA) and capacity building activities to ensure ESCOM, MoNREM and other sector stakeholders have adequate technical, planning, and operational capacity to implement the electrification roll-out activities and effectively undertake activities under Component 1 and 2 of the project. This will entail the following:

32. **Sub-component 3.1: Technical Assistance to ESCOM (US$5 million):** This will mainly finance activities to support ESCOM to effectively implement component 1, including support for detailed project design, planning, and supervisory oversight. More specifically the sub-component will finance (i) capacity building and implementation support for the Project Implementation Unit (PIU) in ESCOM related to core functions, including (Financial Management) FM, procurement, safeguards, and monitoring and evaluation; (ii) preparation of a Program Operations Manual informed by a least-cost geospatial roll-out plan; (iii) training at ESCOM's Training facility of ESCOM front line construction supervision management personnel, and private sector contractors for implementing a scaled up on-grid connections program; (iv) mainstreaming more broadly, selective high impact DSM measures; (v) GIS platform for network reticulation planning, design; (vi) System-wide MV feeder- specific upgrading Master Plan through 2030; including affordable new connections fee policy; and (vii) preparation and implementation of a gender capacity building plan and program, and designing a recruitment, mentoring and leadership development program targeting potential, new and existing female employees at ESCOM.

33. **Sub-component 3.2: Technical Assistance to MoNREM (US$10 million):** This sub-component will support: (i) capacity strengthening of the PIU in MONREM tasked with oversight under component 1 and

the implementation of activities under component 2; (ii) Mini-grid Development – Standardized Framework and Design Standards such as pre-feasibility studies for up to ten mini grid locations; along with a suitable institutional and regulatory framework to design, finance, implement and operate mini-grids that pass specified qualifying criteria; (iii) fund management fee under component 2; (iii) technical assistance for off-grid market development like targeted government policy and regulation; quality assurance; gender-informed consumer awareness; and technical assistance for financial institutions; (iv) institutional design of semi-autonomous Rural Electrification Agency, and Fund including repositioning MAREP's role going forward with focus on mini-grid; and (v) critical sector studies.

E. Implementation

Institutional and Implementation Arrangements

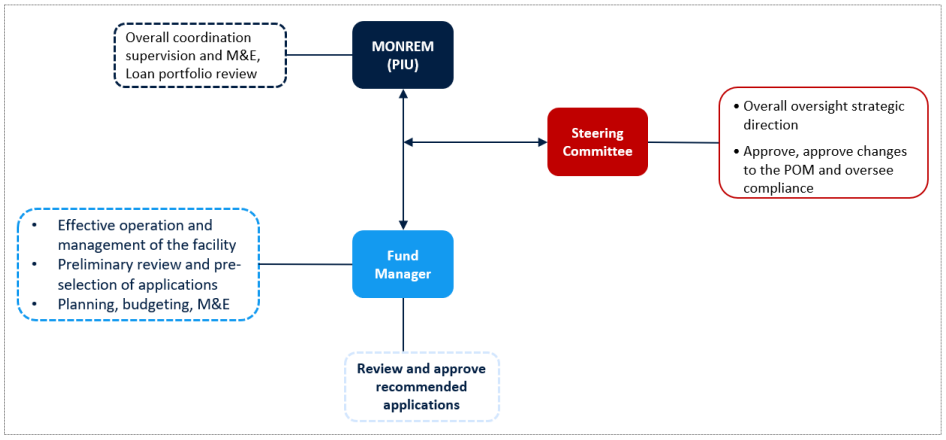
34. **Implementing arrangements**: There will be two implementing agencies for the project. ESCOM will be the main implementing agency for Component 1, while Component 2 will be implemented by MoNREM. Both entities will implement Component 3. Two PIUs will be created within (i) the ESCOM Projects Department and (ii) the Department of Energy in MoNREM that will be tasked with project administration, contract management, monitoring and evaluation as well as reporting of all project-related matters.

35. **Component 1:** ESCOM will appoint an internal Project Coordinator for the overall coordination across all units and stakeholders during project preparation and implementation. Network planning, technical design and feasibility studies of sub-projects falls under the responsibility of ESCOM's System Planning Unit. The ESCOM Corporate Planning Unit in collaboration with ESCOM's Finance, Commercial and System Planning Units, will be responsible for preparing the proposed investment budget for the project. Several regional project offices under the central PIU would be responsible for managing construction and operation of their respective sub-projects. ESCOM's regional project offices will be responsible for preparing the project safeguards documents including environment and social management plans (ESMPs) and resettlement action plans (RAPs). ESCOM is experienced in implementing World Bank-funded and other donor-funded projects. However, in the past, ESCOM has been heavily relying on qualified international consulting firms for implementation of these projects. An international project supervision engineering firm will be engaged for MEAP Component 1, and shall be responsible for preparing detailed designs, and for supervising project implementation in coordination with ESCOM's PIU and the above departments during the first two years of the project. The firm will include as part of the technical team an Environmental and a Social Specialist. Project supervision responsibility shall be transferred to ESCOM during year 2 of project implementation, once sufficient capacity and staffing is available to assume those functions. A capacity building and transition plan shall be agreed upon with ESCOM prior to effectiveness. In addition, the PIU will strengthen its capacity with regard to core functions, including Financial Management (FM), procurement, safeguards, and monitoring and evaluation. This support is provided through component 3. In addition, as part of the reform process, an extensive TA package is included in the project to strengthen its capacity and capability to implement the NEP.

36. **Component 2:** The responsibilities under Component 2 require niche and specialized skills that are not available within the Ministry. Hence, the off-grid facility will be managed by a qualified fund manager. The fund manager will be tasked with: (i) effective operation and management of the fund

windows, including planning, financial management, budgeting as well as M&E; and (ii) pre-selection of the applicants based on the criteria determined in the POM. The fund manager, potentially an accounting/consulting firm or commercial bank, will be competitively selected. MoNREM's PIU will be tasked with the procurement of the fund manager, overall supervision and monitoring (including safeguards), especially reviewing the loan portfolio. A Steering Committee will provide overall project oversight, strategic direction and will approve POM, changes and compliance. MoNREM is experienced in handling World Bank and other donor-funded projects. Especially, the Department of Energy in MoNREM has been overseeing the bidding process and implementation of projects under MAREP. The project will provide necessary TA to strengthen MoNREM's capacity of core functions relevant for project implementation (especially with regards to procurement and safeguards). This support is provided through component 3.

Figure 4: Fund implementing arrangement



37. **Project implementation manuals:** The project's implementation will be guided by two implementation manuals: (1) A project-level implementation manual (PIM), which will set out detailed institutional, administrative, financial, technical and operational guidelines and procedures for the implementation of the Project, including detailed safeguards, financial management, procurement arrangements as well as monitoring and evaluation. The PIM needs to be prepared, adopted by the Borrower and sent to the World Bank Task Team for no-objection prior to the project's effectiveness. (2) In addition, the fund manager procured under Component 2 will prepare a fund-level project operational manual (POM), which will detail the selection and eligibility criteria based on which companies are being selected under the facility, the loan and grant terms, the financial management arrangements of the facility (including detailed fund flow) as well as a monitoring and verification system for the facility. The POM will be adopted by the fund manager and hence only be available after its recruitment. The POM will not be available by the project's effectiveness. But disbursements of funds under the facility (Component 2 disbursement category) will only be allowed after adoption of the POM.

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F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The investments under the proposed operation will be implemented nationwide. The investments that will trigger safeguards policies are in the components: 1) New on-grid electricity connections, which will support ESCOM's new electricity connections program during 2019-22 and finances distribution infrastructure (low voltage extensions, service drops and pre-payment meters) and limited medium voltage infrastructure; and 2) Off-grid market development, which will finance a facility managed by a qualified fund manager (to be procured as part of project implementation), which will provide access to loans and grants to eligible enterprises offering quality assured solar off-grid systems. The physical characteristics that need to be considered in this project are trees, soils, agricultural fields and human settlements. While a long list of locations of the investments in Component 1 has been prepared as part of ESCOM's five-year investment plan, specific locations to be funded under the project will be determined by the outcome of the on-going distribution planning process. As a result exact site location is not be available during project preparation. Similarly, site locations of Component 2 are not yet determined and will only become available during project implementation once loans and grants are disbursed and the companies provide the results of connections. Therefore, framework instruments have been prepared for component 1 and 2 in accordance with the laws of Malawi and the WB Environmental and Social safeguards policies. In the case of component 1, Environmental and Social Management Framework (ESMF) and Resettlement Policy Framework (RPF) have been prepared. For Component 2, only ESMF has been prepared as resettlement is not expected under this component. Safeguards instruments have been reviewed by the Bank and relevant regulatory agencies in Malawi, and disclosed in country and in the Bank's external website prior to completion of appraisal. The project is proposed to be assigned EA category B because the proposed investments may result in potential negative environmental and social impacts that can be reversed, are temporary in nature and scope, and can be easily and cost-effectively mitigated. It is also expected that impacts will be site-specific and may not affect an area broader than the sites of the physical works.

G. Environmental and Social Safeguards Specialists on the Team

Mercy Chimpokosera-Mseu, Environmental Specialist
Violette Mwikali Wambua, Social Specialist

SAFEGUARD POLICIES THAT MIGHT APPLY

Safeguard Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	Yes	The operation will finance the upgrading and reinforcement of existing medium-voltage (MV) and low-voltage (LV) extensions as well as service drops.

		Physical civil works are expected to be undertaken in the operation that will have environmental and social impacts including, deforestation, dust and noise pollution, soil disturbances, health and safety concerns, potential land acquisition, the possibility of labor influx and associated risks such as the spread of disease, GBV and SEA. Component 2 will finance a facility of loans and grants for solar off-grid companies. Since exact locations of investments in both components 1 and 2 have not been identified, an Environmental and Social Management Framework (ESMF) has been prepared to ensure that a process for identifying, assessing, and mitigating environmental and social impacts is integrated in the development of the specific subprojects. The ESMF has been prepared through a Consultative Process and disclosed both in-country by GoM and by World Bank on the Website. All subprojects shall be screened and where necessary, ESIAs/ESMPs shall be undertaken during project implementation as part of feasibility and design development, including incorporating any recommended mitigation measures into the bidding and contractual documents for the civil works. The ESMF referred to WBG Environmental, Health, and Safety Guidelines for Electric Power Transmission and Distribution. The ESMPs will also make reference to the same guidelines, and the guidelines can be accessed on the following website https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines. The guidelines provide measures to manage magnetic fields, risk of bush fires, risk of electrocution of birds and management of hazardous wastes such as PCB, Sulfur Hexaflouride, creosote etc. Guidelines on Occupational and Community Health and Safety will also be applied.
Performance Standards for Private Sector Activities OP/BP 4.03	No	
Natural Habitats OP/BP 4.04	Yes	There is likelihood that expansion of distribution lines may affect some possible natural habitats especially on way leaves. The ESMF, as part of the screening process, has generally identified natural habitats as watersheds and wildlife/forest reserves

		that will potentially be affected by the specific subprojects. Site specific ESMPs where OP4.04 is triggered will have a biodiversity management plan.
Forests OP/BP 4.36	Yes	There is likelihood that expansion of distribution lines especially on wayleaves may affect some natural, protected or communal; forests. The ESMF includes specific measures to avoid or minimize the potential negative impacts on forest reserves.
Pest Management OP 4.09	Yes	The project will involve use of concrete and wooden poles. OP 4.09 has been triggered because of chemicals such as creosote or Sulfur Hexafluoride that are usually used to treat wooden poles. A plan within the ESMF has been developed on the management of treated poles.
Physical Cultural Resources OP/BP 4.11	Yes	This is based on the proposed operation's physical works, excavations, impounding and constructions in new locations. These types of activities have the potential to encounter physical and cultural resources. Any PCR encountered will be treated using the Chance Finds Procedures incorporated in the ESMF and that will be applied to subsequent ESIAs/ESMPs .
Indigenous Peoples OP/BP 4.10	No	There are no groups meeting the criteria of OP 4.10 in the Project Area hence the policy is not triggered.
Involuntary Resettlement OP/BP 4.12	Yes	The proposed project will entail land acquisition, and potential economic displacement is expected to provide for way leaves for the distribution lines. Construction and associated civil works in the operation will affect land, assets, and livelihoods. As the locations of the investments in Component 1 are unknown, a Resettlement Policy Framework (RPF) has been prepared to clarify the principles, legal and institutional procedures and design criteria for resettlement and rehabilitation to be applied to individual investments. The RPF also describes the consultation processes, participatory approaches and procedures for filing grievances and resolving disputes that will be applied in the preparation and implementation of site specific Resettlement Action Plans (RAPs). A GRM for the project has been proposed in both the ESMF and RPF. The RPF has been consulted upon and has been disclosed both in-country by the GoM and by World Bank on the Website.

Safety of Dams OP/BP 4.37	No	This policy is not applicable to this operation since the project will not involve any dam works.
Projects on International Waterways OP/BP 7.50	No	This policy is not applicable to this operation since its not involving any international water ways
Projects in Disputed Areas OP/BP 7.60	No	This policy is not applicable to this operation since the project will not be implemented in any area of dispute.

KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:

The project has triggered safeguard policies on environment assessment, pest management, forestry, natural habitat, land acquisition and physical and cultural resources. Potential positive impacts associated with the proposed project include reduced indoor pollution from use of firewood and charcoal; reduction on women's workload; improved security through lighting; improved delivery of services by sectors such as health and education; increased incentives for small-scale enterprises. Adverse impacts associated with the proposed operation are construction related and include the loss of vegetation; habitats; soil erosion concerns; increased noise and waste; community and occupational health and safety related risks during construction; labour influx associated risks such as the spread of HIV and other communicable diseases and disruptions to local communities from the presence of foreign labor including the risk of GBV and SEA. There is the possibility of encountering physical and cultural resources during construction and potential for the loss of land, assets and livelihoods to provide for the right of way and way leaves required for new electricity connections and for network strengthening and expansion infrastructure. Hazardous materials emanating from solar batteries also pose a risk to lives of people, soil, water resources and animals.
While substantial due to the broad scope of the project, these risks and impacts are site specific, reversible and have a footprint that can be managed and/or mitigated.

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

Impacts arising from loss of vegetation will need to be well managed especially along the wayleaves to avoid soil erosion resulting to long term impacts on soil fertility and productivity. Hazardous chemical waste from batteries can seriously affect human health if not properly managed.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

As the project's main scope is low voltage electricity distribution lines of medium to short distances, it is expected that alternative routing will be considered to minimize environmental and social impacts. In that regard, specific ESIAs/ESMPs will include an alternatives analysis to select way leaves and materials with less environmental and social risk/impacts.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

The project will be implemented by ESCOM and MoNREM both of which will set up Project Implementation Units that will have overall responsibility for safeguards, oversee preparation of safeguard instruments (ESMPs and RAPs) and

implementation. Based on the assessment of safeguards implementation in preceding projects, i.e. the Energy Sector (P099626) project, both ESCOM's and MoNREM's capacity to manage social safeguards is deemed weak and inadequate. ESCOM has committed to a corporate reorganization that will fully staff the Environment and Social Unit and maintain experienced safeguards officers. However, it is recommended that ESCOM puts in place qualified capacity to manage safeguards in this project in the event that the reorganization does not happen, is delayed or is deemed inadequate. The same is recommended for MoNREM. Evidence of the necessary safeguard capacity put in place has been set as a condition for negotiations and in addition the project will set aside funds for safeguards capacity building in the course of project implementation.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

The key stakeholders are the communities and customers that will benefit from the project, Project Affected Persons, line ministries, regulatory bodies, national agencies, environmental authorities at national and local levels, Local authorities/District councils, Private Sector and relevant NGOs. Line ministries including ministry of natural resources energy and mining, ministry of lands housing and urban development and national agencies including Environmental Affairs Department and a number of private sector entities have been consulted in the preparation of the ESMF and RPF. Some communities have been consulted in the preparation of the ESMF and RPF, though the documents, overall, provide general views of the project because specific locations have not been identified yet. However, specific communities and PAPs will be consulted during preparation of environmental and social management plans and resettlement plans as the specific ESIAs/ESMPs/RAPs will entail participation and consultation processes in accordance to the national law and the Bank's requirements. The safeguard instruments - ESMF and RPF - have been prepared and disclosed on ESCOM and MONREM websites, World Bank external website and have been disclosed through press release. Hard copies will be made available at ESCOM regional offices for ease of access to the general public.

B. Disclosure Requirements

Environmental Assessment/Audit/Management Plan/Other

Date of receipt by the Bank	Date of submission for disclosure	For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors
28-Jan-2019	29-Mar-2019	

"In country" Disclosure

Malawi

22-Mar-2019

Comments

Disclosed through ESCOM HQ, Regional Offices, and website and MoNREM website.

Resettlement Action Plan/Framework/Policy Process

Date of receipt by the Bank	Date of submission for disclosure
28-Jan-2019	29-Mar-2019

"In country" Disclosure
Malawi
22-Mar-2019

Comments

Disclosed through ESCOM HQ, Regional Offices and website and MoNREM website and through print media.

Pest Management Plan

Was the document disclosed prior to appraisal?	Date of receipt by the Bank	Date of submission for disclosure
Yes	21-Mar-2019	22-Mar-2019

"In country" Disclosure
Malawi
22-Mar-2019

Comments

Disclosed as part of ESMF through ESCOM HQ, Regional Offices and website and MoNREM website and through print media.

If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/Audit/or EMP.

If in-country disclosure of any of the above documents is not expected, please explain why:

ESMF and RPF have been disclosed in-country on the websites of MoNREM (March 20, 2019) and ESCOM (March 22, 2019).

C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting)

OP/BP/GP 4.01 - Environment Assessment

Does the project require a stand-alone EA (including EMP) report?
Yes
If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?
Yes
Are the cost and the accountabilities for the EMP incorporated in the credit/loan?
Yes

OP/BP 4.04 - Natural Habitats

Would the project result in any significant conversion or degradation of critical natural habitats?
No
If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?
NA

OP 4.09 - Pest Management

Does the EA adequately address the pest management issues?
Yes
Is a separate PMP required?
No
If yes, has the PMP been reviewed and approved by a safeguards specialist or PM? Are PMP requirements included in project design? If yes, does the project team include a Pest Management Specialist?
NA

OP/BP 4.11 - Physical Cultural Resources
Does the EA include adequate measures related to cultural property?
Yes
Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?
Yes

OP/BP 4.12 - Involuntary Resettlement

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?
Yes
If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?
Yes

OP/BP 4.36 - Forests

Has the sector-wide analysis of policy and institutional issues and constraints been carried out?
NA
Does the project design include satisfactory measures to overcome these constraints?
NA
Does the project finance commercial harvesting, and if so, does it include provisions for certification system?
No

The World Bank Policy on Disclosure of Information

Have relevant safeguard policies documents been sent to the World Bank for disclosure?
Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?
Yes

All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?
Yes

Have costs related to safeguard policy measures been included in the project cost?
Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?
Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?
Yes

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