Monitoring and Evaluation Plan of the Liberia Compact between the United States of America, acting through the Millennium Challenge Corporation and the Republic of Liberia

January 2021

Version 3

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PREAMBLE

This Monitoring and Evaluation (M&E) Plan:

- is part of the action plan set out in the MILLENNIUM CHALLENGE COMPACT (Compact) signed on October 2, 2015 between the United States of America, acting through the Millennium Challenge Corporation, a United States Government corporation (MCC), and the Republic of Liberia acting through its government;
- will support provisions described in the Compact; and
- is governed by and follows principles stipulated in the *Policy for Monitoring and Evaluation of Compacts and Threshold Programs* (MCC M&E Policy).

This M&E Plan is considered a binding document, and failure to comply with its stipulations could result in suspension of disbursements. It may be modified or amended as necessary following the MCC M&E Policy, and if it is consistent with the requirements of the Compact and any other relevant supplemental legal documents.

LIST OF ACRONYMS

BA	Beneficiary Analysis
CA	Constraints Analysis
CCR	Compact Completion Report
CPS	Common Payment System
CT	Current transformer
DQR	Data Quality Review
EPA	Environmental Protection Agency
ERR	Economic Rate of Return
ESP	Environmental and Social Performance
GoL	Government of the Republic of Liberia
GPOBA	Global Partnership on Output-Based Aid
GSI	Gender and Social Inclusion
HFO	Heavy Fuel Oil
ITT	Indicator Tracking Table
kV	Kilovolt
kW	Kilowatt
kWh	Kilowatt hour
LACEEP	Liberia Accelerated Electricity Expansion Project
LCPDP	Least Cost Power Development Plan
LEC	Liberia Electricity Corporation
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LSWC	The Liberia Water and Sewer Corporation
M&E	Monitoring and Evaluation
MCA	Millennium Challenge Account
MCA-L	Millennium Challenge Account Liberia
MCC	Millennium Challenge Corporation
MCC MIS	MCC Management Information System

MCHPP	Mt. Coffee Hydropower Plant
MHI	Manitoba Hydro International
MME	Ministry of Mines and Energy
MoGCSP	Ministry of Gender, Children and Social Protection
MoT	Ministry of Transportation
MPW	Ministry of Public Works
MW	Megawatts
NGO	Non-governmental organization
NPV	Net Present Value
NRF	National Road Fund
PIU	Project Implementation Unit
POC	Point of contact
PSIP	Public Sector Infrastructure Project
PV	Present Value
QDRP	Quarterly Disbursement Request Package
RMC	Regional Maintenance Center
RMMS	Road Maintenance Management System
RREA	Rural Renewal Energy Agency
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SGA	Social and Gender Assessment
WAPP	West African Power Pool
WDI	World Development Indicator

COMPACT AND OBJECTIVE OVERVIEW

Introduction

This Monitoring and Evaluation Plan serves as a guide for program implementation and management, so that the Millennium Challenge Account Liberia (MCA-L) management staff and Board of Directors, the Board of Directors of the Liberia Electricity Corporation (LEC), Implementing Entities, implementers, beneficiaries, and other stakeholders understand the progress being made toward the achievement of objectives and results, and are aware of variances between targets and actual achievement during implementation.

This Monitoring and Evaluation Plan is a management tool that provides the following functions:

- *Describes the program logic and expected results.* Gives details about what impacts the Compact and each of its components are expected to produce in economic, social inclusion, and gender-related outcomes and how these effects will be achieved.
- *Sets out data and reporting requirements and quality control procedures.* Defines indicators, identifies data sources, and frequency of reporting in order to define how performance and results will be measured. Outlines the flow of data and information from the project sites through to the various stakeholders both for public consumption and to inform decision-making. It also describes the mechanisms that assure the quality, reliability and accuracy of program performance information and data.
- *Establishes a monitoring framework.* Establishes a process to alert implementers, MCA-L management, LEC management, stakeholders and MCC to whether or not the program is achieving its major milestones during program implementation and provides the basis for making program adjustments.
- *Describes the evaluation plan.* Explains in detail how MCA-L and MCC will evaluate the Compact interventions to determine whether they are achieving their intended results and expected impacts over time.
- *Includes roles and responsibilities.* Describes in detail what the M&E staff are responsible for and outlines any M&E requirements that MCA-L and LEC must meet in order to receive disbursements.

Program Logic

Compact Background

Liberia is located on the western coast of Africa and has a population of approximately 4.4 million[1] people covering 37,420 square miles that border Guinea to the north, Côte D'Ivoire to the east, Sierra Leone to the west, and the Atlantic Ocean to the south.

Liberia is a post conflict country still working to revive itself from a fourteen year civil war, which decimated much of the country's existing infrastructure before ending in 2003. Liberia's Gross National Income per capita for 2019 was $580, a 4.9% decline from 2018. In 2018 it stood at $610 which represents a 1.6% from 2017

[1] World Bank, WDI, 18 September 2015. Washington, DC. However, the Least Cost Power Development Plan (LCPDP) estimates the population at approximately 4.0 million.

.[2] The economy is primarily dependent on subsistence agriculture and export of raw materials and remains vulnerable to external shocks given the volatitity of commodity prices, limited diversifification, dependence on imported foods and fuels, constraints to business investment and productivity, the insufficient supply and prohibitive high cost of energy generation and its deplorable road networkApproximately half of the population is rural..[3]

The Government of Liberia (GoL) and MCC undertook a Constraints Analysis (CA) to better understand the constraints to economic growth in Liberia. The CA, which was completed in September 2013, was based on the growth diagnostic methodology developed by Ricardo Hausmann, Dani Rodrik and Andrés Velasco of the Kennedy School of Government at Harvard University. Liberia's CA revealed two binding constraints to private sector investment, poverty reduction and economic growth in Liberia: (i) lack of access to reliable and affordable electricity; and (ii) high cost of and limited access to road infrastructure.

In September 2013, the GoL and MCC also conducted a Root Cause Analysis workshop to dive deeper into the underlying causes of the two binding constraints. Utilizing the principles of Results Focused Project Design,[4] the GoL and MCC, together with key stakeholders, identified a variety of root causes that contributed to the binding constraints identified in the CA. The root causes for unreliable power infrastructure were organized into three overarching areas: the existence of weak policy and regulatory environment, insufficient supply and distribution of electricity, and weak capacity across institutions in the electricity sector. The root causes of poor road infrastructure were also grouped into three areas: a weak policy and regulatory environment, inadequate planning and budgeting, and inadequate implementation and maintenance.

On October 2, 2015, the United States of America through the Millennium Challenge Corporation and the Government of Liberia signed a US$257 million Compact designed to reduce poverty through economic growth by investing in energy and road maintenance projects in Liberia. The selection and design of Compact Projects was informed by the Constraints Analysis and subsequent Root Cause Analysis. The Compact also supports key development priorities of the GoL as identified in the *Agenda for Transformation*, a five-year development strategy for FY 12-17, and *Liberia RISING 2030*, which is Liberia's long-term vision of socio-economic and political transformation and development.

The Compact officially entered into force on January 20, 2016.

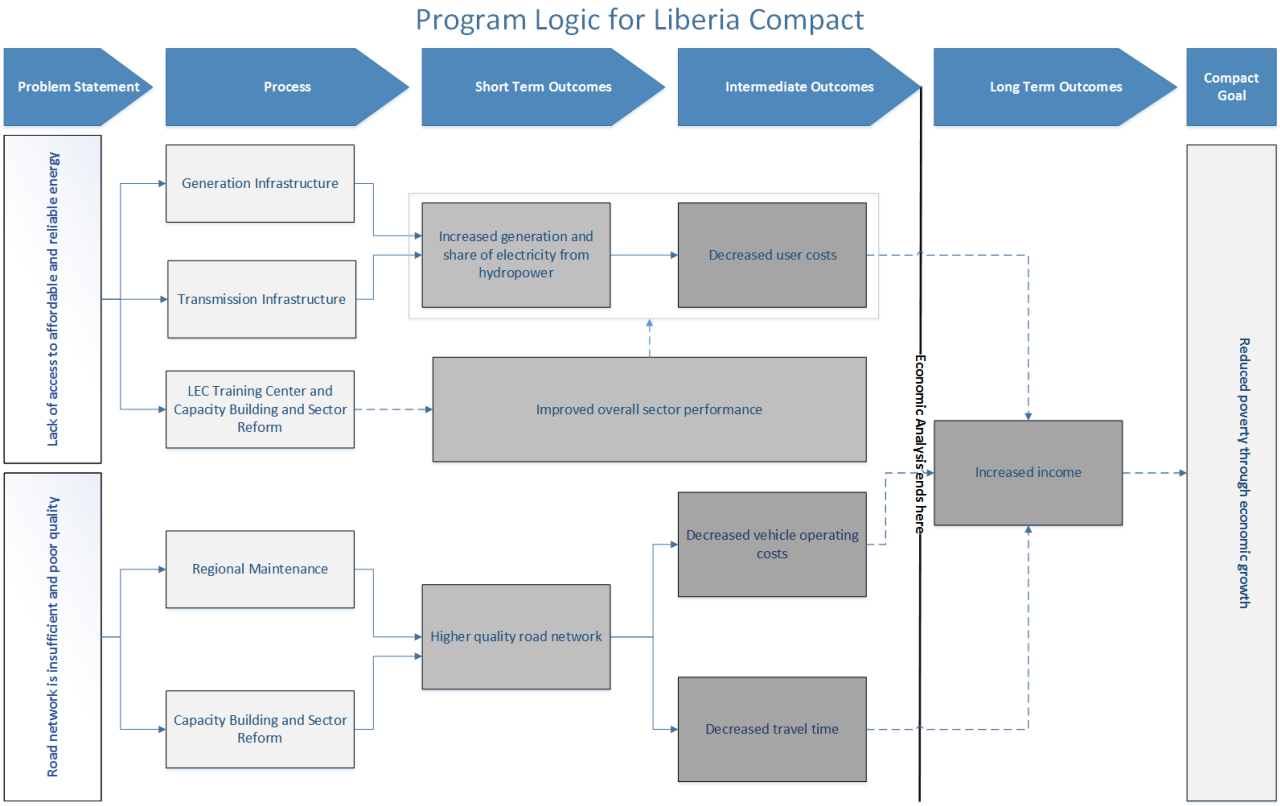
[2] www.macrotrends. net.
[3] See Liberia Constraints Analysis, MCC & Liberia Core Team, 2013 and World Bank, Liberia Accelerated Electricity Expansion Project, Project Appraisal Document, 2013, p.1.
[4] Asian Development Bank, "Guidelines for Preparing a Design and Monitoring Framework," Project Performance Management System, Second Edition, July 2007.

Compact Logic

The goal of the Liberia Compact is to reduce poverty through economic growth. MCC's assistance will be provided in a manner that strengthens good governance, economic freedom, and investments in the people of Liberia. The objectives of the Projects are to: (i) provide access to more reliable and affordable electricity; and (ii) improve the planning and execution of routine, periodic and emergency road maintenance. These goals and objectives are expected to be realized through MCC's investments, which are expected to increase power generation and the share of generation from renewable sources, improve overall power sector performance, and provide funding and support to improve the road maintenance system.

The diagram below illustrates and describes the expected causal relationships among the program components and synthesizes outcomes intended to achieve the Project objectives and the program goal.

Figure 1: Liberia Compact Logic



Project Description and Logic

Energy Project Description and Logic

At the time of Compact approval, Liberia had an electrification rate of less than two percent and one of the highest electricity tariffs in the world at US$0.52 per kilowatt hour (kWh). The average cost of generation for countries in sub-Saharan Africa was about US$0.15 per kWh, ranging from US$0.05 in energy-rich countries such as Nigeria to about US$0.25 for less energy-endowed countries like Cabo Verde. According to the World Bank, "the main reason for high cost of electricity in Liberia is the dependency on high-cost diesel generation."[5] The

[5] World Bank, Project Appraisal Document - LACEEP, May 2013, p.2.

CA also asserted that these costs mainly resulted from the destruction of Liberia's hydroelectric dam, which was the country's single largest source of power before the war, and the diminished capacity of LEC which provided as much as 191 Megawatts (MW) of electricity prior to the war. At Compact signing in 2015, LEC provided only 22 MW of power, which represented an increase from 9.6 MW in 2009. Liberia's power supply was also unreliable with frequent planned and unplanned outages.

The Compact's Energy Project aims to address several of the problems facing the energy sector in Liberia through four Activities. The Mt. Coffee Rehabilitation Activity aims to address the overarching problem in the energy sector, i.e., the lack of access to affordable and reliable electricity by increasing the amount of electricity generated in Liberia, facilitating a decrease in the overall electricity tariff, and helping to increase reliability and adequacy of electricity.

The Mt. Coffee Rehabilitation Activity builds on ongoing rehabilitation efforts funded by the Government of Norway, the German Development Bank, the Government of Liberia and the European Investment Bank. Initially, Mt. Coffee Hydropower Plant (MCHPP) was to be rehabilitated to a rated capacity of 66 MW with the GoL providing 20% of the costs. Rehabilitation costs increased substantially as a result of cost overruns and changes to the design, delays caused by the Ebola Virus Disease outbreak, and the decision to expand MCHPP's capacity to 88 MW in part due to the expected availability of MCC funding. The Mt. Coffee Rehabilitation Activity assumed responsibility for the GoL's financial commitment and includes the following specific components:

- the additional cost required to provide a total installed generation capacity of up to 88 MW;
- funding to cover gaps between existing stakeholder commitments and a total cost to complete the rehabilitation of MCHPP in an amount not to exceed $357 million;
- the cost of a second 66 kV transmission line from MCHPP to the Paynesville substation; and
- costs related to the establishment of certain dispute adjudication boards.

The remaining activities in the Energy Project are intended to support the results of the Mt. Coffee Rehabilitation Activity and address other root causes of the problems in the sector. The Energy Sector Reform Activity aims to address the weak policy and regulatory environment by providing support to the key institutions responsible for policy making, investment planning, asset management, and environmental, gender and social oversight of the sector – namely Ministry of Mines and Energy (MME), and LEC. This Activity comprises two Sub-Activities[6]:

- *Establishment of an Independent Regulator Sub-Activity*. Building upon planned programming from the European Union and the Government of Norway which focuses on the development of MME's Department of Energy, this Sub-Activity will assist in standing up an independent regulatory agency. The Sub-Activity will include a number of studies, including a situation assessment for the sector; demand, willingness-to-pay, and cost of service studies.

[6] The Compact described a third Sub-Activity that is no longer planned.

- *Management Support to LEC Sub-Activity*. This Sub-Activity supports the tendering and implementation of a management services contract for LEC. This short-term plan, selected by the GoL and informed by a study of public management and private sector participation options for LEC, will help lead to a financially sustainable utility. Other management options, such as a concession, are still within LEC's long-term vision for the utility.

The LEC Training Center Activity aims to improve capacity in the sector by building LEC's technical, operational, financial, and administrative capacity, and forming the core base for training of technicians in the electricity sector.

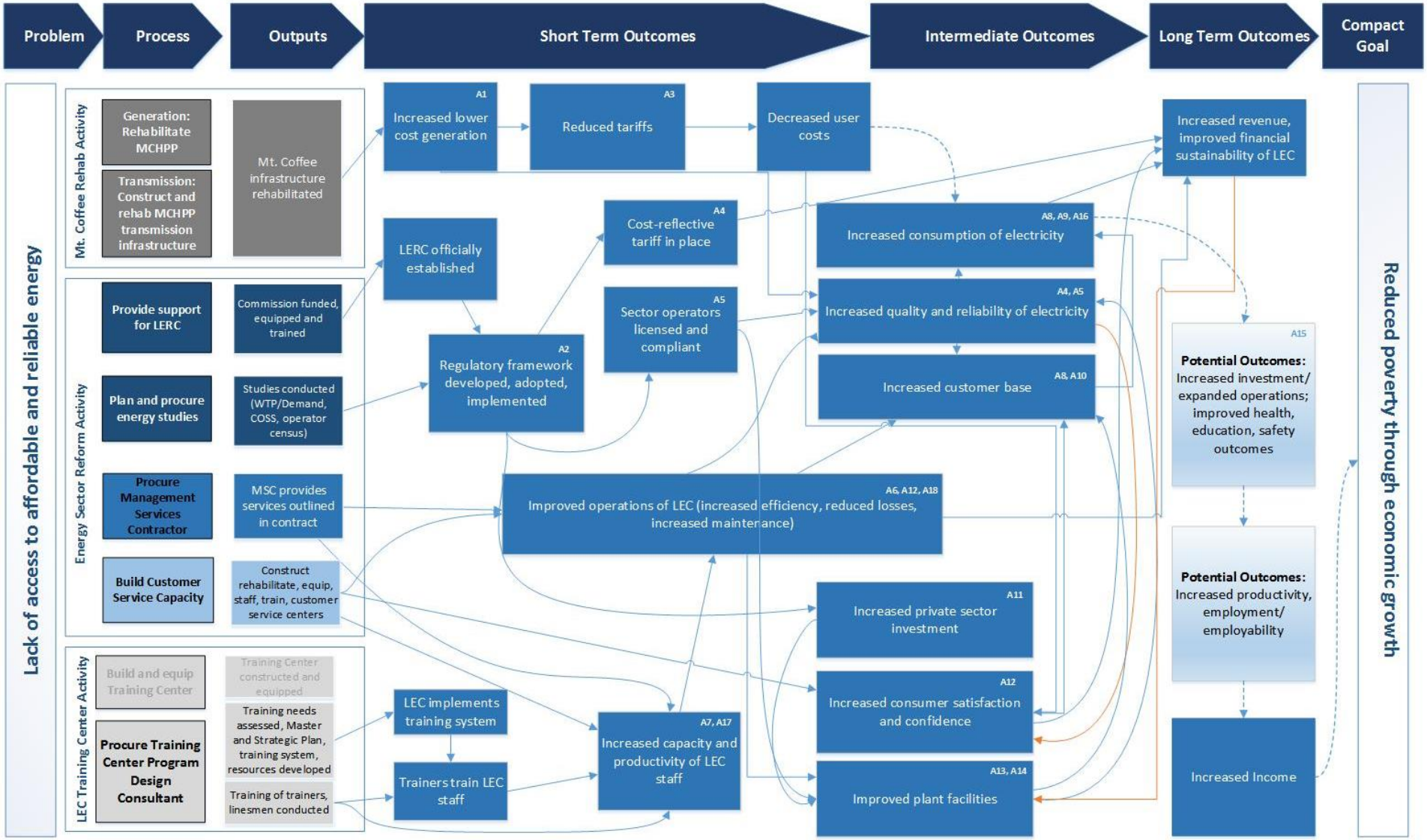
The Mt. Coffee Support Activity aims to provide additional support to the Mt. Coffee Rehabilitation Activity to mitigate environmental and social risks and ensure long-term sustainability. For example, MCC funding will support:

- the provision of small-scale community infrastructure (e.g., bridges) in order to ensure communities and/or settlements surrounding the MCHPP reservoir are not permanently blocked from accessing their farms, settlements, and/or other social services (e.g., health clinics, schools);
- additional human resources support to LEC, including the Project Implementation Unit (PIU), to ensure timely and professional management, oversight and reporting of environmental and social impacts and risks;
- a watershed management plan (including climate change and fisheries studies); and
- the cost of rehabilitating the raw water intake at MCHPP from the power house to the MCHPP site boundary; and
- rehabilitation of the raw water transmission line from MCHPP to the White Plains Water Treatment Works.

Finally, the Energy Project will also include technical assistance support to strengthen socially inclusive and gender-responsive planning and implementation capacity of MME and LEC as a part of the Energy Sector Reform Activity.

The diagram below illustrates and describes the expected causal relationships for the Activities contributing to achieving the objective of the Energy Project.

Figure 2: Liberia Energy Project Logic



The logic diagram above reflects the following set of assumptions:

A1 – Bringing Mt. Coffee online will lower LEC's operating costs.

A2 – Planned technical support from other donor(s) will complement MCA-L's intervention. Studies funded under the Compact will inform the implementation of the regulatory framework, including the tariff-setting process, and licensing operators.

A3 – Cost savings from lower-cost generation will be passed onto consumers; tariffs will recover the utility's costs, which is critical for running a sustainable utility.

A4 – The tariff-setting process will adhere to LERC's regulations as stipulated in Section 13.3 of the 2015 Electricity Law and will be insulated from political interference.

A5 – LERC has the ability and resources to ensure compliance.

A6 – LEC has the capacity and resources to manage its operations effectively and efficiently, including reducing losses, increasing collections, and performing routine maintenance; LERC standards are effective.

A7 – There is sufficient staff capacity and continuity in order to accomplish MSC capacity building objectives. Increased capacity is sustained after MSC ends.

A8 – LEC increases ability to make customer connections. New customers can afford to pay for electricity; LEC can accommodate increased energy demand during dry season.

A9 – Increased generation capacity and the planned T&D investments are capable of increasing the quality and reliability of electricity.

A10 – LEC has sufficient manpower, skill, materials, and operational capacity to respond to user requests for connections.

A11 – A clear regulatory framework is a critical requirement for private sector investment.

A12 – Project outputs will result in appreciable improvement in customer services practices; LEC is willing and able to address customer complaints. Customer willingness to pay increases.

A13 – MSC works to attract donor funding. External actors will extend the transmission and distribution networks as planned. These extensions are critical to expanding LEC's consumer base.

A14 – LEC will invest in lifecycle maintenance and capital investment.

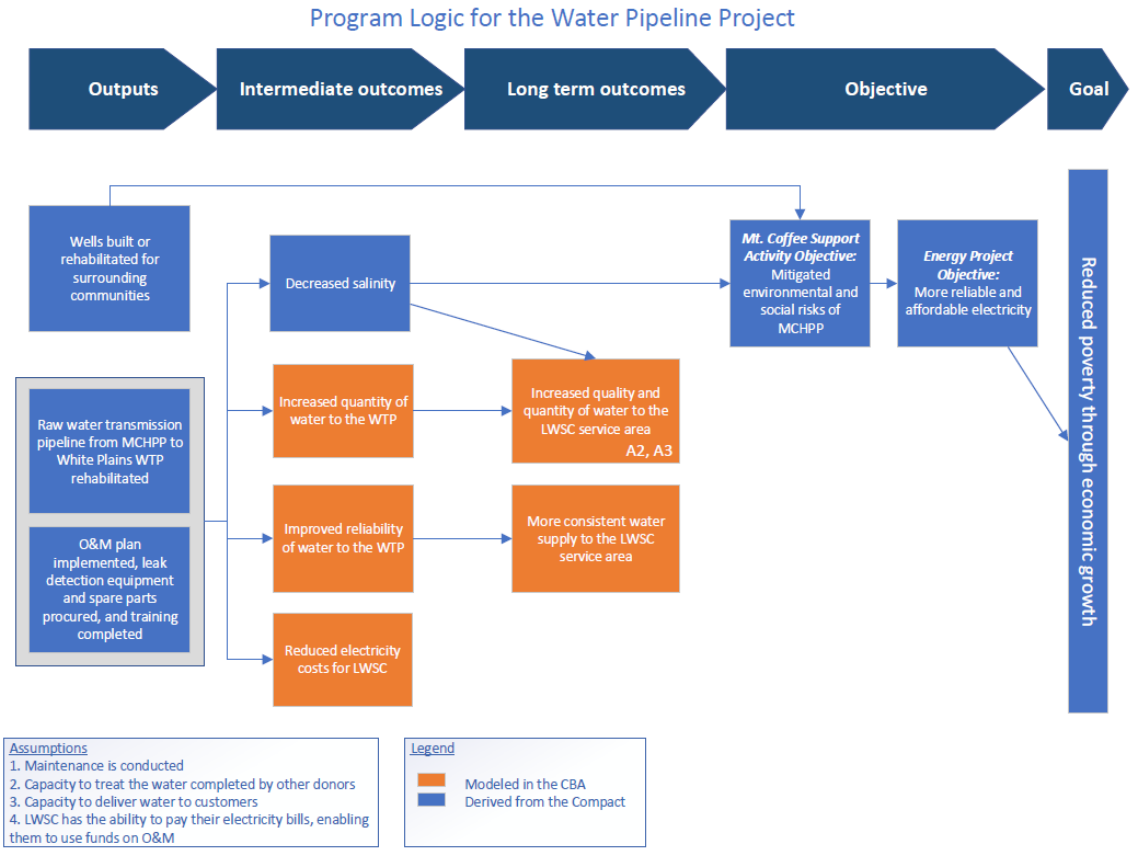
A15 – Electricity is used productively. Cost savings are invested and other constraints such as access to finance, or lack of political stability do not inhibit additional investments.

A16 – Customers pay for the electricity they consume.

A17 – Training of trainers system is effective.

A18 – The MSC is able to effect long-term change in LEC operations and stakeholders with interest and influence support these changes.

Figure 3: Liberia Pipeline Project Logic



The rehabilitation of the raw water pipeline from MCHPP to the White Plains Water Treatment Plant is part of the Mt. Coffee Support Activity, which aims to provide additional support to the Mt. Coffee Rehabilitation Activity to mitigate environmental and social risks and ensure long-term sustainability.

The program logic maps out two kinds of benefit streams. This first type of benefit stream (in blue) links to the objective of the Energy Project. This stems from decreased salinity of water delivered directly from MCHPP rather than from pumped water from the St. Paul River and therefore mitigating environmental impact of the hydropower plant.

The second category of benefit streams (in orange) is modeled in the cost benefit analysis, which do not link to the objective of the Project. However, due to the fact that there will be more high quality water flowing to the water treatment plant at a lower cost, it stands to reason that there are benefits accruing outside of the Energy Project objective. The logic posits that there will be increased quality, quantity, and reliability of water to the water treatment plant. This improved water is gravity fed so the costs of getting the water to the plant are expected to be lower. The logic asserts that the improved water to the water treatment plant will in turn lead to improved water in the network and in the service area.

This logic is based on the critical assumptions that the Liberia Water and Sewer Corporation (LWSC) has the capacity to maintain the pipeline and treat the increased water, and that the piped network has the capacity to deliver the water to the LWSC service area.

Roads Project Description and Logic

Although responsible for road maintenance, the Ministry of Public Works (MPW) does not currently have the financial resources to conduct sufficient maintenance. This is further exacerbated by the lack of existing data. An inventory of the road network did not exist at the time of Compact signing, and assessments were only done visually. This situation made it impossible to take a holistic approach to road maintenance planning and execution, even if funding had not been a constraint. Additionally, maintenance standards - routine, periodic, rehabilitation - were not well defined, and MPW was not able to state what the backlog or future maintenance requirements were for the network as a whole. What data were collected were at a very basic level and done sporadically.

Before the war, the unpaved road network was maintained in fairly good, all-weather quality. Since the war, however, maintenance had deteriorated for the reasons described above. In addition, during the rainy season most, if not all, of the unpaved roads deteriorated significantly, exerting a severe toll on individuals and businesses. Before the Compact started, Liberia recorded the highest freight cost during the rainy season at about US$0.50/MT/km compared to the rest of sub-Saharan Africa, where costs range from US$0.04-US$0.14/MT/km. The cost of transporting goods during the rainy season from parts of the country where road networks deteriorate significantly to Monrovia escalated by about 53%.[7] Further, road maintenance was undertaken mostly on an emergency repair basis, significantly raising the cost of road works and straining further an already miniscule budget.

The Roads Project aims to address such problems in the sector and improve the quality of Liberia's road network by supporting the piloting of a new maintenance regime and by building capacity. The Project Activities are expected to improve the weak policy and regulatory environment and inadequate maintenance occurring in the roads sector. Ultimately, improved management of the road sector is expected to result in a larger stock of well-maintained roads, which will decrease vehicle operating costs and provide time savings for road users.

As originally conceived, the Roads Project consisted of the National Road Maintenance Activity and the Roads Sector Reform Activity.

The National Road Maintenance Activity aimed to match GoL contributions for periodic road maintenance in an effort to better maintain and sustain Liberia's primary paved and unpaved roads and increase institutional capacity in the sector.

- *Matching Road Maintenance Fund Sub-Activity*. MCC funding will match GoL contributions that have been deposited by the GoL to an account (Matching Road Maintenance Fund Account) that are dedicated to periodic road maintenance on a one to one basis up to $15 million during the Compact Term, subject to measurable indicators of performance on maintenance planning, capacity and implementation.

[7] CA, p. 156.

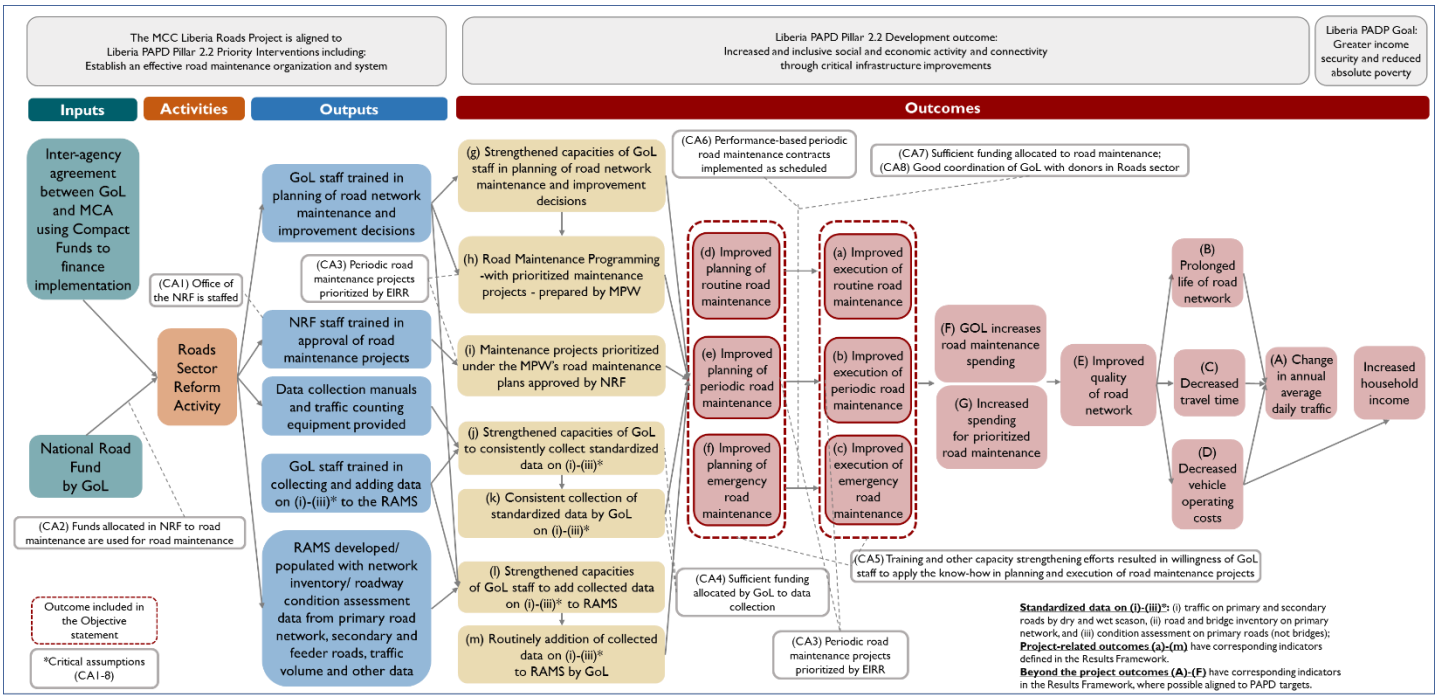
The Roads Sector Reform Activity aims to build capacity and provide technical assistance to the sector through the following tasks:

- Network Analysis/Data Collection: The United States Department of Transportation (DoT) will partner with the GoL via MCC/MCA-L to assist in collecting roadway condition, traffic volume, and other data for models to develop a national road inventory and support road maintenance planning.
- Sector Reform/Institutional Strengthening/Capacity Building: This task is intended to assist MCC and ensure that Compact transportation sector investments are coordinated with the projects of other major donors, and compliment their efforts in road maintenance activities and any other transportation planning and capacity building activities.

Funding for the National Road Maintenance Activity was withheld after the Government of Liberia did not meet Conditions Precedents relating to deposits into and maintenance of the Road Fund. As a result, the only part of the project being executed and evaluated is the Roads Sector Reform Activity.

The diagram below illustrates and describes the expected causal relationships and outcomes for the Roads Project.

Figure 4: Roads Project Program Logic



The logic diagram above contains several assumptions. One item not explicit in this diagram, but made explicit in the Evaluation Design Report, is that outcomes are not anticipated beyond the improved planning and execution of routine, periodic, and emergency maintenance. These outcomes are included in the diagram because they remain a possibility and align with MCC's approach to roads projects, but they are not likely to be achieved as the result of this project. For improved legibility outside of the diagram, the other assumptions are:

CA1 – Office of the National Road Fund (NRF) is staffed.
CA2 – Funds allocated in NRF to road maintenance are used for road maintenance.
CA3 – Periodic road maintenance projects prioritized by economic internal rate of return (EIRR).
CA4 – Sufficient funding allocated by GoL to data collection.
CA5 – Training and other capacity strengthening efforts resulted in willingness of GoL staff to apply the know-how in planning and execution of road maintenance projects.

Use of "(i)-(iii)" in several outputs refers to "(i) traffic on primary and secondary roads by dry and wet season, (ii) road and bridge inventory on primary network, and (iii) condition assessment on primary roads (not bridges).

Projected Economic Benefits[8]

An initial economic analysis of the Mt. Coffee Rehabilitation Activity was carried out prior to Compact approval. As shown in Table 1, using base-case assumptions (which are described below), the original economic rate of return (ERR) for the Activity was 13%. This initial economic analysis was developed before other components of the Energy and Roads Projects were fully designed. Further cost benefit analysis will be done for Compact closeout to calculate their economic returns.

Table 1. Summary of Economic Analysis Results

Project	Activity	Original Project-Level ERR	Original Activity-level ERR	Date Original Economic Rate of Return (ERR) Established	Revised Project-Level ERR	Revised Activity-level ERR	Date Revised Economic Rate of Return (ERR) Established
Energy Project	Mt. Coffee Rehabilitation Activity	11%	13%	06/2015	8-9%	10-11%	07/2017
	Mt. Coffee Support Activity		13%	06/2015		10-11%	07/2017
	LEC Training Center Activity		Not Calculated	N/A		N/A	N/A
	Energy Sector Reform Activity		Not Calculated	N/A		N/A	N/A
Road Project	National Roads	Not Calculated	Not Calculated	N/A	N/A	N/A	N/A

[8] This section will be updated in a subsequent M&E Plan revision to document key updates to the economic analysis of the Energy Project.

	Maintenance Activity						
	Roads Sector Reform Activity		Not Calculated	N/A		N/A	N/A

Energy Project Economic Analysis

The supply and distribution of electricity in Liberia is extremely limited, both in terms of the number of connections and the total demand for those connections. The table below shows the number of existing, active customers on the grid and their estimated peak load use of electricity at the time the Liberia Least Cost Power Development Plan (LCPDP) was prepared. Until May 2016, customers paid a tariff of $0.52/kWh (as reported by Manitoba Hydro International (MHI)),[9] due to the high fuel price for the high speed diesel generators that were in use for LEC's entire supply of electricity. When Mount Coffee came online, the tariff was dropped to $0.35 per kwh.

Table 2. LEC Customer Structure (2013)[10]

Customer Category	No. of Active Customers	Estimated Average Peak Load per Customer
Low income (single phase prepaid meter)	6,459	0.21 kW
Residential/small commercial, GoL and NGO single phase	6,447	0.59 kW
Commercial, GoL and NGO (three phase)	490	3.4 kW
GoL CT-metered	44	49 kW
Commercial CT-metered	65	25 kW
TOTAL	**13,505**	

As described above, power generated by MCHPP is expected to reduce the price of electricity for customers. For those already on the grid, they are expected to have fairly minimal increase in demand due to the change in cost. The estimated price elasticity of demand is -0.2.[11] Note that this is the same elasticity of demand used in the CBA. The largest portion of the benefits for existing customers is from a one-time price decrease. After that, their utility will be

[9] MHI is a private company that has been contracted to manage LEC.
[10] "Preparation of a Government of Liberia Least Cost Power Development Plan (LCPDP)," 2014. Prepared by Fichtner for MLME and LEC.
[11] Fichtner, LCPDP; 5-9.

measured by the amount they consume. The majority of the increase in demand, thus, is expected to be gained through additional connections to the grid. For new customers to the grid, they will receive a one-time benefit scaled by their willingness to pay, followed by a similar valuation based on their consumption. The economic rate of return depends heavily on this increase in demand from new connections.

Developing new connections is critical to the commercial viability of LEC. Until now, LEC has kept their customer base relatively small, largely because they did not have enough generation capacity to increase their base without worsening already considerable load shedding. While we know that there are generally plans by donors to fund up to 90,000 new household and commercial connections, the general expected timing of those new connections has been delayed.[12] Given the uncertainty around connections, the following are some potential scenarios of connections and the concomitant ERRs.

Table 3. Connection Scenarios and ERRs

Scenario Name	Demand (MW)	Number of Connections (Industrial)	Number of Connections (Household)	Timeline for Connections	ERR (all Project costs)	ERR (Mt. Coffee Rehabilitation Activity costs only)
Base scenario from LCPDP	52	1,450	90,000	2020	11%	13%
Pessimistic scenario (Low demand, slow connections)	26	1,000	90,000	2025	3%	5%
Low trust of LEC scenario (Low demand, quick connections)	26	1,000	90,000	2018	7%	9%
Low LEC capacity scenario (High demand,	75	3,000	150,000	2025	14%	16%

[12] MCC has learned about plans to fund additional connections since the economic analysis of MCHPP was initially developed. However, we are still trying to clarify the magnitude and timing of those plans, along with longer-term plans for the electricity tariff. We expect that the economic analysis will be updated once these inputs have been obtained.

Scenario Name	Demand (MW)	Number of Connections (Industrial)	Number of Connections (Household)	Timeline for Connections	ERR (all Project costs)	ERR (Mt. Coffee Rehabilitation Activity costs only)
slow connections)						
Optimistic scenario (High demand, quick connections)	75	3,000	150,000	2018	17%	20%

The base case scenario, as outlined in Fichtner's Least Cost Power Development Plan (LCPDP), includes a number of assumptions about growth and demand of users connected to the grid. Aside from the numbers of connections to the grid and the decreased tariff rate after MCHPP begins operating, other assumptions include:

- Price elasticity of demand = -0.2[13]
- World Price of Oil = US$100 per barrel in 2015, assumed to drop to $75 per barrel after that[14]
- Capacity Factor = .592 once all four Mount Coffee turbines are online[15]
- Load Factor = 0.72 for commercial users and 0.5 for residential[16,17]

While it is clear from available demand surveys that there is market demand for the cheaper generation provided by MCHPP, there is much that is uncertain about the scope and timeline of connecting that additional demand and whether there are other hindrances to connecting customers and to reaching the level of demand that would make generation at this scale economically viable.

There are very limited large businesses or housing complexes that could readily connect to the grid under the current scale of grid penetration. The question thus remains on how the grid will expand, who will pay for the expansion of connections, and whether businesses and households will be able and willing to connect. A willingness-to-pay study executed in the Monrovia area by the World Bank's Global Partnership on Output-Based Aid (GPOBA) in 2010 suggested that there is a fairly high willingness to pay, and only a small percentage (~15%) of households would not be able to afford to wire their house or purchase a Ready Board (small unit that obviates the need to wire a house, meant primarily for one room households). Donors have plans to fund over 90,000 new household and commercial connections, and LEC has done a demand study of potential larger customers to target for connection. Nevertheless, MCC experience in other contexts suggest that even when, by all accounts, there are customers

[13] LCPDP, 5-9.
[14] Calculations based on Technical and Financial Feasibility Study for the Reconstruction and Expansion of the Mount Coffee Hydropower Facility in Liberia, Stanley Consultants; 8-38.
[15] LCPDP, 11-21.
[16] LCPDP, 5-16
[17] For a full list of assumptions used in Fichtner's Least Cost Power Development Plan, see pages 5-12 and 5-14.

clamoring for connections, they do not always take the steps required to acquire network connections. Even now almost 5 years into the Compact, questions remain on how and when these connections will be completed and whether the demand projections by various parties (Fichtner (in the LCPDP), LEC, and others) will play out.

If we follow the base case for demand projected by Fichtner, we get an ERR of 11%, inclusive of all capacity building activities that support the Mt. Coffee Rehabilitation Activity (both operations and maintenance) and connecting new customers to the grid (e.g. the LEC Training Center Activity). Just including costs currently envisioned by the donors, the ERR would be 13%. However, if the connection activities do not progress as envisioned or there are unforeseen barriers to accessing electricity, the ERR could drop well below the hurdle rate of 10%. For this reason, the Compact includes a connection assessment analysis that could identify and potentially help close the gaps to facilitate network access.

There are a number of investments included in the costs, whose potential benefits were not quantifiable at the time of the investment decision and which thus are not included in the model. When designs for these activities are developed, the economist will revisit the possibility of developing cost benefit analysis. These include:

i. **LEC Training Center Activity.** Though the benefits have not been quantified, in the medium or long term, the capacity to train staff locally will be necessary to support LEC's operations and maintain their fixed capital resources.
ii. **Second circuit transmission line to Paynesville (part of the Mt. Coffee Rehabilitation Activity).** The purpose of this transmission line is as a redundancy in case the first circuit ever fails. The probability of this occurring and then knowing how long the ensuing outage would last would be two critical variables to know in order to calculate the benefit of adding the second circuit. Unfortunately, we have no historical data or other means by which to estimate these figures and thus cannot calculate the benefits directly attributable to this redundancy.
iii. **Energy Sector Reform Activity.** Lack of capacity was highlighted in the Root Cause Analysis along a number of dimensions, affecting the ability to operate, maintain, and expand electricity operations by LEC and MME. Because designs do not yet exist for these activities, nor specific targeted outcomes, it is at the moment infeasible to conduct cost benefit analysis on this Activity.
iv. **Mt. Coffee Support Activity.** Similar to the Energy Sector Reform Activity, there is no detailed design of these activities to be able to create a cost benefit analysis.
v. **Water intake (part of the Mt. Coffee Rehabilitation Activity) and water pipeline (part of the Mt. Coffee Support Activity).** Based on the information available at the time of the investment, salinity increases as a result of the MCHPP and downstream of the MCHPP was considered a serious risk created by the MCHPP and mitigation measures were included in the Compact. These investments are not necessary to see the benefits of MCHPP, but they respond to MCC's concerns at the time the investment decision was made. There could be a completely separate program logic related to water intake. However, based on the information available at the time of the investment decision, it was not possible to build a robust economic model. Apart from mitigating a serious risk there would be additional benefits from a substantially expanded supply of water for Monrovia and decreased operating costs associated with a gravity-fed supply as opposed to pumping water from the river as currently occurs. Since

this cost is included in the MCHPP rehabilitation contracts, the costs have been included in the ERR model for the Mt. Coffee Rehabilitation Activity.

Roads Project Economic Analysis

At the time of MCC's investment decision, economic analysis was not available for the Roads Project. In general, road maintenance programs are expected to have significantly better economic returns than upgrading individual road segments. Thus it was expected that, once the Roads Project is designed it would have a good likelihood of achieving sufficient returns to justify the investment. However, due to uncertainty and rescoping within the Project, the team's economist did not produce a model for this Project.

Projected Program Beneficiaries

According to the *MCC Guidelines for Economic and Beneficiary Analysis*, beneficiaries of projects are considered individuals who experience better standards of living due to Compact activities aimed at increasing their real incomes. The economic rate of return analysis for proposed projects gives details on benefit streams through which beneficiaries should experience increased income.

A general overview of the span of program benefits across the population of Liberia, used for Compact justification to MCC's Investment Committee, is presented in the table below.

Table 4: Projected Program Beneficiaries

Project	Program Beneficiary Definition	Est. Number of Beneficiaries	Present Value (PV) of Benefits[18]	Net Present Value (NPV)[19]
Mt. Coffee Rehabilitation Activity	Number of individuals in households connected to the grid plus the number of commercial enterprises connected	460,000	$517,899,307	$83,718,571
Road Project	TBD	TBD	TBD	TBD

[18] The PV of benefits are included in the ERR as the "estimated discounted increase in income over the life of the project" or the "beneficiary income gain."

[19] The NPV illustrates the net benefits, which subtract the discounted costs from the discounted benefits. Cost-benefit analysis produces two main outputs: the ERR and NPV. This provides a more complete picture and allows for comparison at this level across projects.

Energy Project Beneficiary Analysis
The total beneficiary count for the Energy project, using the Fichtner base scenario, is approximately 460,000 people. If the number of household connections increased to 150,000, then a beneficiary count of 766,000 people is expected.

The Beneficiary Analysis (BA) for this project builds on the customer profile outlined in the ERR model. Beneficiaries, in this case, are defined as individuals who benefit from the increased availability of electricity through the Compact activities. This increased availability of electricity is expected to yield cost savings or otherwise improve beneficiaries' current standard of living. In the case of households, the BA counts all members of the household benefitting from the Compact, assuming an average household size of 5.1.[20]

In the case of firms benefitting from the Compact, only the owner is counted as a beneficiary. Within the ERR model, benefits accrue to firms with existing connections due to increased consumption of grid-supplied electricity, valued at an assumed willingness to pay. What the firm does with the assumed cost reduction is unknown; assuming that wages increase or that employment increases would be to include multiplier effects. Liberia experiences high unemployment which would lead to the expectation that wages would not increase without increases in labor productivity. Labor productivity increases may result from increases in capital productivity, but this would be expected to result from the employment of new capital. New capital could reduce the need for labor. Assumptions for such changes should only be made for targeted investments where extensive data has been collected on a specific sector, leading to a reasonable understanding of the expected adjustments. Thus, for the case of firms with existing grid connections, no assumption is made that firm employees benefit from the Compact. Firm owners are counted as beneficiaries but then removed, as they are expected to have been previously counted among those benefitting from residential connections and thus may be double counted.

When the results of the model indicate expected *new* commercial and industrial connections resulting from the Compact, the expected employees associated with these firms are included as beneficiaries. The average size of existing firms is used as the expected size of new firms, and the average size of households in Liberia is used to determine the assumed size of the employee's household. We do not currently have this data, so for the sake of the initial beneficiary count, all new commercial connections are estimated to have one beneficiary.

Roads Project Beneficiary Analysis
Because the activities under the Road Project were not sufficiently designed, the country team economist did not develop a beneficiary analysis during the Compact.

MONITORING COMPONENT

Summary of Monitoring Strategy

The Compact will be monitored systematically and progress reported regularly through the Indicator Tracking Table (ITT). There are four levels of indicators that follow from the program logic framework: (i) goal, (ii) outcome, (iii) output and (iv) process. The various indicator levels map to the program logic and thus allow Project developers and managers to understand to what extent planned activities are likely to achieve their intended objectives. Monitoring

[20] 2008 National Population and Housing Census: Preliminary Results. Liberia Institute of Statistics and Geo-Information Services (LISGIS), 2008.

data will be analyzed regularly to allow managers of MCA-L and MCC to make programmatic adjustments as necessary with a view towards improving the overall implementation and results of the Compact. Often most outcome and goal indicators are not monitored during the life of the Compact, but rather are reported through evaluations after the Compact is complete. Those levels of results typically take longer to be achieved.

Monitoring data will be analyzed regularly to allow managers of MCA-L and MCC to make programmatic adjustments as necessary with a view towards improving the overall implementation and results of the Program.

- Goal indicators measure the economic growth and poverty reduction that occur during or, most likely, after implementation of the program. For MCC Compacts, goal indicators will typically be a direct measure of local income and are typically measured through post compact evaluations.
- Outcome indicators measure intermediate effects of an Activity or set of Activities and are directly related through the program logic to the output indicators.
- Output indicators measure the direct result of the Project Activities. They describe and quantify goods or services produced directly by the implementation of an Activity.
- Process indicators record an event or measure progress toward the completion of Project Activities. They are a forerunner to the achievement of Project outputs and a means to ensure the work plan is proceeding on a timely basis.[21]

MCC has introduced common indicators for external reporting across all MCC Compacts. The common indicators relevant to the MCA-L Compact are included in this M&E Plan.

Annex III of the Compact outlines the initial indicators for the Compact. The M&E Plan builds on this information with additional relevant indicators developed by MCC, MCA-L project managers, and implementers.

The Indicator Definition Table provides relevant details for each indicator by Project and can be found in Annex I. It provides descriptions for the indicator structure by specifying each indicator's: (i) name; (ii) definition; (iii) unit of measurement; (iv) level of disaggregation; (v) data source; (vi) frequency of reporting; and (vii) party or parties responsible.

To ensure that the Program is on track to meet its overall goals and objectives, the monitoring indicators will be measured against established baselines and targets, derived from the ex-ante economic rate of return analysis, other types of analysis, and project planning documents. The targets reflect the underlying assumptions made in program design about what each Activity would likely achieve. Baselines and target levels for each indicator are defined in Annex II.

Indicators may need to be modified in future versions of the M&E Plan. Modifications and revisions to the indicators may only be made according to the MCC M&E Policy. Any

[21] The indicator levels are formally defined in MCC's *Policy for Monitoring and Evaluation of Compacts and Threshold Programs*.

significant modifications to the indicators or other content will be summarized in Annex III of the M&E Plan per the M&E Policy.

The M&E Unit shall consult and assist Implementing Entities in setting up their data collection plans and reporting templates.

Data Disaggregation

Where feasible and appropriate, monitoring and evaluation indicators will be disaggregated by sex, age, income, and/or vulnerable groups.

Data Sources

The indicators identified in the M&E Plan will require the collection of a range of data from various sources within Liberia such as the Implementing Entities and implementers. To the greatest extent possible, MCA-L will attempt to harmonize data collection with other existing data sources or planned surveys and ensure that the data collected through the project are useful and cost-effective. Specific data sources are outlined in Annex I of this M&E Plan.

Data Quality Reviews (DQRs)

Data quality is the primary responsibility of the MCA-L staff, led by the M&E Unit. The M&E Unit, other MCA-L staff, as appropriate, and implementing entities should regularly check data quality. The M&E Unit should verify that all reported data have appropriate source documentation and that calculations have been done correctly. The MCA-L M&E Unit will conduct field visits on a regular basis or whenever requested by MCC, to review the quality of the data gathered through this M&E Plan. MCA-L may also hire individual data quality monitors to monitor data collection and quality, as needed.

In addition to regular data quality checks by MCA staff, independent Data Quality Reviews (DQRs) will be conducted in accordance with the requirements of the MCC M&E Policy.

The objectives of DQRs are to assess the extent to which data meet the standards defined in the MCC M&E Policy in the areas of validity, reliability, timeliness, precision and integrity. DQRs will be used to verify the consistency and quality of data over time across implementing agencies and other reporting institutions. DQRs will also serve to identify where the highest levels of data quality is not possible, given the realities of data collection.

The particular objectives for the DQRs will include identification of the following parameters: i) what proportion of the data has quality problems (completeness, conformity, consistency, accuracy, duplication, integrity); ii) which of the records in the dataset are of unacceptably low quality; iii) what are the most predominant data quality problems within each indicator; iv) what are the main reasons behind low quality; and v) what steps can be taken to improve data quality. An initial DQR was contracted by MCC during Year 1 of the Compact; a follow-up data quality assessment of LEC data was conducted in Year 3 of the Compact. MCA-Liberia will conduct a subsequent DQR to verify the consistency and quality of data reported toward the M&E Plan, including a deep review of the accuracy of the Q19ITT, which inform much of the closeout results materials. As in the case of the ACMS, the DQR was planned to be finalized by the CED, which due to unforeseen circumstances related to the COVID-19 pandemic became unrealistic. As a result of registered delays, the DQR is planned to start by the end of November 2020 and to be carried out and finalized within the CCD. The estimated due date to finalize the DQR is April 15 2021.

M&E Capacity Program

MCA-L will be responsible for ensuring regular training of key project stakeholders in monitoring and evaluation in order to build the capacity of these stakeholders to remain compliant with the M&E requirements of the Compact. The capacity building program will be need-based, as determined through a) regular staff assessments, and b) as identified in the findings of the independent DQRs.

Standard Reporting Requirements

Reporting to MCC: Quarterly Disbursement Request Package

Performance reports serve as a vehicle by which the MCA Management informs MCC of implementation progress and on-going field revisions to Project work plans. Currently, MCC requires that MCA-L submit a Quarterly Disbursement Request Package (QDRP) each quarter. The QDRP must contain an updated ITT and a narrative report. A complete ITT presents the preceding quarters' indicator actuals and current quarter indicator progress against targets set forth in this M&E Plan. The QDRP narrative report provides a brief description of the previous quarter's Compact implementation progress and explains how requested funds will be used in the coming quarter. The QDRP narrative is the responsibility of all staff of MCA-L. The ITT is the source for MCC's internal and external reporting on indicator progress.

Additional guidance on reporting is contained in MCC's *Guidance on Quarterly MCA Disbursement Request and Reporting Package*.

Reporting to MCA and Local Stakeholders

Even though the QDRP is required to be sent to MCC, MCAs should also use these reports and the data included in them to assess progress and performance internally. The M&E teams attempt to align MCC and MCA reporting so that data are used to inform decision-making at both levels.

MCA-L Board Coordination Meetings

The M&E Directorate shall be responsible for reporting M&E results to the MCA-L Board on a quarterly basis. The reports will consist of ITTs and other materials that help depict progress towards Compact targets. These updates may include recommendations that are crucial to change or guide the implementation of projects for consideration by the MCA- L Board.

EVALUATION COMPONENT

Summary of Evaluation Strategy

While good program monitoring is necessary for program management, it is not sufficient for assessing ultimate results. Therefore, MCC and MCA-L will use different types of evaluations as complementary tools to better understand the effectiveness of its programs. As defined in the MCC M&E Policy, evaluation is the objective, systematic assessment of a program's design, implementation and results. MCC and MCA-L are committed to making the evaluations as rigorous as warranted in order to understand the causal impacts of the program on the expected outcomes and to assess cost effectiveness. This Evaluation Component contains three types of evaluation activities: (i) independent evaluations (impact and/or

performance evaluations); (ii) self-evaluation, and (iii) special studies, each of which is further described below. The results of all evaluations will be made publicly available in accordance with the MCC M&E Policy.

Independent Evaluations

According to the MCC M&E Policy, every Project in a Compact must undergo a comprehensive, independent evaluation (impact and/or performance). The next section on Specific Evaluation Plans will describe the purpose of each evaluation, methodology, timeline, and the process for collection and analysis of data for each evaluation. All independent evaluations must be designed and implemented by independent, third-party evaluators, which are hired by MCC. If MCA-L wishes to engage an evaluator, the engagement will be subject to the prior written approval of MCC. Contract terms must ensure non-biased results and the publication of results.

For each independent evaluation, MCA-L and relevant stakeholders are expected to review and provide feedback to independent evaluators on the evaluation design reports, evaluation materials (including questionnaires), baseline report (if applicable), and any interim/final reports in order to ensure proposed evaluation activities are feasible, and final evaluation products are technically and factually accurate. MCC's evaluation review process will follow the guidelines outlined in the MCC M&E Policy.

Self-Evaluation

Upon completion of each Compact program, the MCA will produce the Compact Completion Report (CCR) to document and reflect on implementation and lessons learned. The MCA-L staff will draft the CCR in the last year of Compact implementation. It should be noted that each department will be responsible for drafting its own section to the report for its own activities, subject to cross-departmental review.

Special Studies

Either MCC or the Government may request special studies or ad hoc evaluations of Projects, Activities, or the Program as a whole prior to the expiration of the Compact Term.

MCA-L will fund an Asset and Customer Mapping Study (ACMS) to be conducted by LEC. The study will seek to address problems associated with locating customers on the grid and the location of grid assets, and assist LEC to:

- Obtain accurate and validated network asset and customers data to accurately report on MCA-L/MCC indicators and assist LEC achieve its KPIs
- Reduce time taken to resolve customers' complaints of power outage and requests for new connections
- Improve the enforcement of transparency in LEC business operations and internal accountability
- Improve the planning, upgrading and implementation of T&D expansion projects on the national grid
- Define standards for the GIS data, and how other GIS projects will interface with the LEC Integrated Management System infrastructure in the future

Specific Evaluation Plans

Summary of Specific Evaluation Plans

The following table summarizes specific evaluation plans.

Table 5: Compact Evaluation Plans

Evaluation Name	Evaluation Type	Evaluator	Primary/ Secondary Methodology	Final Report Date
Energy Project Evaluation – Mount Coffee Rehabilitation and Sector Reform	Performance	Mathematica Policy Research	Pre-post	05/20/2025
Energy Project Evaluation – Utility Training Center	Performance	Mathematica Policy Research	Ex-post	12/2021
Energy Project Evaluation – White Plains Water Pipeline	Performance	Mathematica Policy Research	Ex-post	12/2021
Roads Project Evaluation	Performance	International Development Group	Pre-post	03/01/2023 or 03/01/2024

Energy Project Evaluation

Evaluation Questions and Methodology

The following evaluation questions and methodology applies to the Mt. Coffee Rehabilitation and Energy Sector Reform evaluation. Evaluation designs for the remaining Energy Project Activities are under review.

Overarching research questions	Evaluation design and methods
1. Were the activities implemented as planned? 2. What was the quality of implementation of the activities? 3. What lessons can be drawn from implementation of the activities?	Implementation analysis: • Review of quantitative administrative data, particularly measures captured in LEC's new Information Management System (IMS) funded by the WB. The evaluator will explore measures that demonstrate the quality of implementation of Activities 1 and 2, including key indicators of efforts to improve the productivity, functionality, and performance of infrastructure, the utility, and the energy sector's market structure, governance, and regulation • Review of project documents, including work plans, progress, annual and monitoring and evaluation (M&E) reports, as well as relevant media and news, and other important documents • Qualitative interviews of key informants and sector stakeholders with specific knowledge of implementation activities • Focus group discussions (FGDs) with staff (non-leadership roles) at implementing organizations • Site visits to observe and expand understanding of infrastructure, operations, and implementation that cannot be captured in written documents; presents an opportunity to ask more in-depth and relevant questions and inform future evaluation activities • Tracking implementation of Compact activities and sub-activities; complementary or contradictory interventions; relevant political events, economic shifts, energy pricing, and the contemporary societal context that affects implementation and the energy sector • Tracking the development, passage, and implementation of policies, laws, and regulations throughout the energy sector
4. To what extent, if any, does comparing the assumptions made in the forecasted economic model, actual program implementation, and evaluation findings generate lessons that can be applied to future economic models?	Cost-benefit analysis An analysis of the ERR model, along with suggested revisions and justification as warranted

Grid-level research questions and outcomes	Evaluation design, methods, and key indicators
1. To what extent, if any, has increased electricity generation contributed to increased reliability of Liberia's electricity supply, such as a reduction in planned and unplanned outages and improved voltage stability? 2. To what extent has capacity strengthening and sector reform improved LEC's operations and maintenance of the grid, so that increased generation leads to reduced outages and voltage stability? 3. To what extent, if any, have energy sector reform activities contributed to improvements in electricity regulation, policy formulation, and monitoring? How sustainable are these improvements?	Performance evaluation, which will integrate and triangulate data from multiple sources: *Note that analyses from the document and energy sector policy review, and qualitative interviews will be mapped to repeated measures of indicators of power production, T&D, and consumption to fully understand processes and mechanisms driving outcomes.* • Longitudinal analyses of repeated quantitative measures to assess indicators such as electricity generation, transmission, distribution, load factor, power availability, voltage stability and outages, consumption, number of customers, un-served demand, peak demand shortage, and transformer and overhead line failure rates • Review of documents and reports, as well as relevant media and news, that provide insights into (1) grid-level changes and (2) LEC's and the MSC's operations related to grid operations and maintenance • Qualitative key informant and stakeholder interviews, during which the evaluator will pose questions focused on a SWOT analysis of capacity strengthening and sector reform activities that facilitate or inhibit grid improvements, operations, and maintenance • Review of energy sector policies, laws, and regulations, and other evidence of activities affecting grid improvements

Energy sector research question and outcomes	Evaluation design, methods, and key indicators
1. What effect, if any, have LERC activities to regulate the legal, economic, and technical environment, or changes in the availability and reliability of electricity, had on IPPs operations? 2. What new energy policies, laws, and legal, economic, and technical regulations have been enacted or adopted, given the LERC's activities and support from the donor community? How have these contributed to modernizing the energy sector and making the sector financially viable?	Performance evaluation which will integrate and triangulate data from multiple sources: • Longitudinal analyses of repeated quantitative measures using administrative data, including indicators of power generation, T&D, and consumption, as well as electricity purchased from IPPs, and the role, type, and size of IPPs. Further, the evaluator will track tariff rates across user types • Review and tracing of documents and reports, energy sector policies, laws, and regulations and evidence of other sector reform activities that aim to optimize electricity consumption, quality of supply, prices, and financial performance, and capacity and maintenance, which will be mapped to an event timeline to inform the interplay between changes and effects; Also review of relevant media and news, that provide insights into (1) LERC's activities around legal, economic, and technical regulations, including the process and dates of the introduction, passage, and implementation of regulations and laws; and (2) activities and events leading to the modernization of the energy sector, the market structure, and sector governance and performance. • Qualitative key informant and stakeholder interviews, with questions focused on understanding facilitators and barriers to LERC devising and adopting the policies, laws, and regulations that modernize the energy sector and improve the utility's financial standing. Also focus on perceptions of LERC's credibility, legitimacy, transparency, independence, accountability, and ability to set tariffs. Respondents will also include interviews with IPPs to understand their role, type, size, number, and experience with power production and sales.

End-user research questions, outcomes, and impacts	Evaluation design, methods, and key indicators

1. To what extent, if any, have the Mt. Coffee Rehabilitation and Energy Sector Reform Activities affected the number of users connecting to the grid and the demand for electricity? 2. To what extent do customers invest in energy-intensive appliances or equipment? What is the effect of energy on time use (household production, leisure, school work, and employment)? What, if any, are the spillover effects on non-electrified households? How do all of these impacts vary by differences in gender, socioeconomic status, and other demographic characteristics? 3. How did new households, commercial, industrial, and other consumers decide to connect? For potential consumers, why have they not connected? What barriers do potential customers face when trying to connect to the grid? How have changes in the reliability of electricity affected connected and unconnected households' perceptions of the quality of electricity? Are there differences in these issues by respondents' gender and socioeconomic status?	Performance evaluation which will integrate and triangulate data from multiple sources: • Longitudinal analyses of repeated quantitative measures of administrative data; measures include the number of customers and new applications, wait time for applicants, electricity consumption, total energy sold, and measures of customer satisfaction with LEC • Review of documents, reports, and media that provide insights into how Activities 1 and 2 have affected new connections • Stakeholder interviews with commercial, industrial, public sector, and other consumers selected to represent a range of enterprise types and sizes to investigate decisions to connect, barriers to connecting, perceptions of electricity quality, and energy-related behaviors, such as changes in consumption, new purchases and services, and productivity • FGDs with connected and unconnected households and small enterprises to investigate decisions to connect, barriers to connecting, and energy-related behaviors, such as changes in consumption, new purchases, productivity and time use, and potential spillover effects

Utility-level research questions and outcomes	**Evaluation design and methods**
1. How has the electricity tariff changed since MCHPP was rehabilitated? To what extent does it cover the costs of electricity generation and other operating costs? 2. To what extent, if any, has LEC's management improved since the new management contract became effective? What progress has the GoL made toward establishing a longer-term management arrangement for LEC? 3. How sustainable is LEC as a utility? What are the biggest barriers to its sustainability?	Performance evaluation which will integrate and triangulate data from multiple sources: • Longitudinal analyses of measures using administrative data on indicators such as tariff rates across user types, energy forecasts, and mismatch between demand, load, and forecast, peak demand shortage, transformer and overhead line failure rates, customer pay rates, collection rates, response to supply and meter complaints, generation unit cost, staff productivity index, energy lost, and other priority indicators. Data will be aligned with ESBI's key performance indicators. • Analysis of LEC management using indicator tracking, analysis of work plans, comparing plans with actual activities, systems, and processes; review of M&E reports, annual reports • Qualitative key informant and stakeholder interviews, with questions focused on LEC's management and operations, including the MSC's efforts to bolster LEC's functionality and effectiveness as a utility and the sustainability of plans, processes, data, and other systems

The following key outcomes will be included in those measured through the evaluation:

Table 6: Energy Project Key Outcomes

Program Logic Result	Indicator	Definition	Unit	Baseline	Target	Target Date[22]

[22] Although the target date is indicated as 2021, the original economic analysis anticipated these targets being achieved by 2017.

Decreased user costs	Cost savings to existing customers	Cost savings experienced by current LEC customers as a percentage of original electricity costs	Percentage	0	58	2021
Decreased user costs	Cost savings for new industrial connections	Cost savings experienced by new industrial customers as a percentage of original electricity costs	Percentage	0	47	2021
Decreased user costs	Cost savings for new commercial connections	Cost savings experienced by new commercial customers as a percentage of original electricity costs	Percentage	0	58	2021

Data Sources

Two types of data will be used in the evaluation: primary data collected specifically for the evaluation and secondary data, such as administrative data, which already exists.

Table 7: Energy Project Primary Data Collection

Survey Name	Quantitative or Qualitative	Define Sample	Sample Size	Number of Rounds	Exposure Period (months)	Expected Dates of Primary Data Collection
Document review	Qualitative	N/A	N/A	Continuous	The exposure period varies based on the activity and outcomes of interest	Regularly throughout evaluation
Interviews with key informants and stakeholder	Qualitative	MCHPP MME, LERC LEC, CMC MCC, MCA, EU, KfW, NORAD, Power Africa, WB IPPs, CIE	2 4-6 4-6 10+ 4-6	2-5[1]	Grid outcomes: • 1 – 3 years Energy sector: • 12 – 48 months Utility outcomes: 6 - 24 months	10/2018-11/2019 and annually thereafter
Interviews with end-users Focus group discussions with end-users	Qualitative	Enterprises of various sizes Public sector Households and small enterprises	10 10 10, with 8-10 FGD participants	3	12 - 48	Baseline: 8/2019 Midline: 8/2021-10/2021 Endline: 8/2023-10/2023
Site visits	Qualitative	MCHPP and substation T&D infrastructure	TBD	3	For infrastructure related outcomes: 12 months – 3 years For utility related outcomes: 6 - 12 months	Baseline: 9/2018-11/2019 Midline: 9/2020-11/2021 Endline: 10/2022-11/2023
Administrative data from LEC, LERC, MME	Quantitative	N/A	N/A	Continuous	6 - 12	Monthly
Small end user listing (households and small businesses)	Quantitative	Connected EAs in Monrovia	All households/businesses in 30 EAs	1	12 - 24	Baseline: • Connected 9/2018 Unconnected 4/2019-5/2019

[1] It is possible to collect data more often than once a year dependent on key milestones and events.

Survey Name	Quantitative or Qualitative	Define Sample	Sample Size	Number of Rounds	Exposure Period (months)	Expected Dates of Primary Data Collection
		Unconnected communities in Greater Monrovia	All households/businesses in ~125 EAs			
Community survey	Quantitative	Connected end users in Monrovia Unconnected small end users in Greater Monrovia	30 communities 25 communities	3	12 - 24	Baseline: • Connected: 9/2018 • Unconnected: 4/2019-5/2019 Midline: • Connected: 10/2020-12/2020 • Unconnected: 4/2021-5/2021 Endline: • Connected: 10/2023 Unconnected: 11/2023
Household and small enterprise survey	Quantitative	Connected small end users in Monrovia Unconnected small end users in Greater Monrovia	1,500 1300	3	12 - 24	Baseline: • Connected: 9/2018-12/2018 • Unconnected: 5/2019-6/2019 Midline: • Connected: 10/2020-12/2020 • Unconnected: 5/2021-6/2021 Endline: • Connected: 10/2023-12/2023 Unconnected: 12/2023-2/2024
Enterprise survey Public institution survey	Quantitative	Medium and large businesses and public institutions in Monrovia	200-300	3	12 - 24	Baseline: • Connected: 9/2018-12/2018 • Unconnected: 5/2019-6/2019 Midline:

Survey Name	Quantitative or Qualitative	Define Sample	Sample Size	Number of Rounds	Exposure Period (months)	Expected Dates of Primary Data Collection
						• Connected: 10/2020-12/2020 • Unconnected: 5/2021-6/2021 Endline: • Connected: 10/2023-12/2023 Unconnected: 12/2023-2/2024

Existing Data

- LEC Administrative Data
- Other secondary data

Summary of Activities or Sub-Activities without Evaluations

Evaluation designs for the Mt. Coffee Support and LEC Training Center Activities are under review currently; evaluation questions are presented below. Results of the GSI interventions will be measured as a part of the Mt. Coffee Rehabilitation and Energy Sector Reform evaluation.

Mt. Coffee Support Activity

1. Did implementation of the White Plains Pipeline go according to plan?
2. To what extent, if any, has the water transmission line increased the supply of water to the White Plains facility, improved water quality, and reduced risks associated with salt-water intrusion, sediment and other impurities?
3. Has the new pipeline design led to a reduction in operating costs now that water is gravity fed at no cost?
4. What is the status of the existing water network? To what extent can it accommodate the increased supply? Will the WPP limit the ability of LWSC to meet a growing demand for water? Is the asset being maintained?
5. What is the cost benefit analysis of the pipeline? (Recalculation and justification)

LEC Training Activity

1. How is the LEC Training program functioning in practice? How effective is the LEC Training Center Activity at training LEC staff?
2. How sustainable is the LEC Training Activity? Do LEC staff have the time, capacity, and budget to operate the training program? Are new LEC staff offered training and how does LEC maintain continuity of skills and capacity within the workforce?

GSI Investments

1. Were enterprises, especially those owned by women, able to connect to grid electricity?

2. To what extent, if any, do female and youth customers report increased satisfaction with LEC service? What explains those changes?

Roads Project Evaluation

MCC developed a Principles into Practice paper based on a review of its early investments and evaluations in the transport sector, which includes a set of lessons for improving our transport practice going forward for both project design and evaluation design. In particular, this review has highlighted the importance of understanding the program logic of the investment before designing an evaluation, collecting updated high quality data, as well as ensuring that the benefit of the evaluation is greater than its cost. With these lessons in mind, MCC has contracted an independent evaluator to assess the performance of the road maintenance regime resulting from the National Road Maintenance and Road Sector Reform Activities.

Evaluation Questions

Planning and Implementation

1. To what extent did the project have a clear plan? Was it implemented according to plan?

Engineering Analysis and Economic Model

1. What is the economic return of the road maintenance investments? What factors drove changes to the ERRs over time? How could the project have been designed to result in a higher ERR?

Maintenance

1. What are the relevant road authority's maintenance practices? How have these changed since the beginning of the Compact?

2. Objective Question (Main Evaluation Question): How were routine, periodic and emergency maintenance works planned and executed by the Government before the Compact and how are they planned and executed after the Compact? Did planning and execution of routine, periodic and emergency road maintenance improve?

a. Did the improved planning and execution of road maintenance result in maintenance cost savings?
b. How does the execution of road maintenance compare to the GoL's maintenance plans?
c. If maintenance is carried out using the improved methods implemented by MCC using HDM-4 and cost savings result, are cost savings returned to the Government of Liberia, or are the added available funds used to carry out further maintenance?
d. What is the role of the private sector in the new maintenance regime and how does this compare to the role envisioned for it under the Project?
e. The established procedure put in place by the program includes, (1) Data collection, (2) Data analysis, (3) Planning, (4) NRF Approval of planned prioritized MPW works, (5) Allocation of funding by NRF, (6) Timely award of road maintenance contracts, and (7) Execution. The success of this program going forward depends on continuing this process. How likely is it post-compact that Government will perpetuate this cycle? What, if anything, could MCC have done differently to ensure this cycle would last longer?
f. How sustainable is the new maintenance regime? Volpe's assistance is currently slated to end at the end of July 2019. After that, Volpe will only be assisting with RAMS, but won't be helping MPW with HDM-4, data collection, etc. Sustainability activities could continue Volpe's assistance for one more cycle. Can GoL continue to use the system on their own? Why? If not, what could MCC have done differently to ensure the GoL would continue to use the system on their own?
g. Does the overall quality of the road network improve, as a result of MCC's investments in maintenance planning and execution?

3. What organizational, political, and economic factors are shaping road maintenance decisions and practices in Liberia?

    a. How is road maintenance regulated?
    b. How and to what extent did the Compact help to clarify and strengthen governance and regulatory arrangements for road maintenance?
    c. How is road maintenance funded and how does this compare to funding needs and projections?
    d. How did this change from before the MCC intervention to after?
    e. What evidence is there that MCC facilitated those changes (if relevant)?
    f. Are there factors influencing road transport agencies' policies and practices that could have been addressed by MCC to improve investment outcomes? What are these factors, and how should they be assessed during project design?
    g. Are the funds in the Road Fund being used to maintain the road network?

Optional: *Road Usage Patterns*[23]

1. Have road usage patterns changed, in terms of who is traveling on the roads, why, what they are transporting, what they are paying for transport, and how long it takes to move along key routes? Previous scopes of work for MCC road evaluations have

[23] Evaluation questions marked "optional" are tied to the possible-but-unlikely oucomes depicted in the program logic. While the evaluation may ultimately address these questions, we do not currently expect to be able to answer these questions at the time of the final report.

separated Research Question 3 into two parts because they were being contracted only for endline data collection and analysis. Since this contract is being signed before project implementation, there is no need to separate the research question into two parts.

Optional: *Transportation Market Structure*

1. Given the existing transportation market structure, what portion of VOC savings will be passed on to consumers of transportation services? If not all savings are passed on, could this project have cost effectively addressed these inefficiencies? How? How is the transportation market structured and what is the likelihood that VOC savings will be passed on to consumers of transportation services? Did this change from before the MCC intervention to after? What evidence is there that MCC facilitated those changes (if relevant)?

Evaluation Methodology Description

The evaluation of the Roads Project will explore the short-term and intermediate outcomes in the program logic and the role of critical assumptions.

The methodology for the evaluation is a pre-post performance evaluation, relying heavily on key informant interviews to assess the road maintenance regime following MCC's work in the sector. The optional evaluation questions will be evaluated with an ex-post methodology if they meet the empirical thresholds included in the Evaluation Design Report.

The following key outcomes will be included in those measured through the evaluation:

Table 8. Roads Project Key Outcomes

Result	Indicator
Improved execution of routine road maintenance Improved execution of periodic road maintenance Improved execution of emergency road maintenance	Kilometers of primary, secondary, and urban roads maintained
Improved execution of routine road maintenance	Share of financial needs for routine maintenance projects met with budget disbursed
Improved execution of periodic road maintenance	Share of financial needs for periodic maintenance for PSIPs met with budget disbursed
Improved execution of emergency road maintenance	Average response time between start and completion of emergency road maintenance
Improved planning of routine road maintenance Improved planning of periodic road maintenance	ARMEP submitted on schedule and approved on time
Improved planning of emergency road maintenance	Emergency planning response time

The exposure period (the period of time between project completion and final data collection) will be between 12 and 24 months.

Data Sources

Two types of data will be used in the evaluation: primary data collected specifically for the evaluation and secondary data, such as administrative data, which already exists.

Table 9: Roads Project Primary Data Collection

Survey Name	Quantitative or Qualitative	Define Sample	Sample Size	Number of Rounds	Exposure Period (months)	Expected Dates of Primary Data Collection
KIIs	Qualitative	Staff of MPW (IIU, RMMU, etc), NRF, MoT, MoFDP and other stakeholders	20-40	2	13-25 months24	Baseline: (2020) Endline: (2022-2023)
Complementary Online Mini-Survey	Quantitative	Staff of MPW (IIU, RMMU, etc), NRF, MoT, MoFDP and other stakeholders	20-40	2	13-25 months	Baseline: (2020) Endline: (2022-2023)
Traffic Counts	Quantitative	Road users	N/A	1	13-25 months	Baseline: (2020) Endline: (2022-2023)
Vehicle Intercept Survey	Qualitative	Road users	N/A	1	13-25 months	Baseline: (2020) Endline: (2022-2023)

Existing Data

- MPW Administrative Data
- NRF Administrative Data
- Other secondary data

24 The endline will be initiated depending on a benchmark set in the Evaluation Design Report. "If the budget allocation is done as per the prioritized maintenance plan, endline data collection will be conducted in July/August 2022. However, the team recognizes that due to unforeseen economic events, such as the impact of COVID-19, the Liberian economy might not return to business as usual until 2021. Therefore, if the budget approval process in 2021 does not make budget allocations based on the prioritized plan, the evaluation team will monitor the progress made from July 2021 to July 2022."

IMPLEMENTATION AND MANAGEMENT OF M&E

Responsibilities

MCA-L M&E Unit

The MCA-L M&E Unit will be part of the MCA Management Team, and will be composed of an M&E Director who will have the key responsibility of leading and managing all M&E activities and an M&E Manager who will support the M&E Director in performing the M&E activities. Additionally, the M&E Unit will hire short-term support on an as-needed basis. The M&E Unit will carry out, or hire contractors to complete the following and other related activities:

- Direct implementation of all activities laid out in the M&E Plan and ensure all requirements of the M&E Plan are met by MCA-L and reporting entities;
- Ensure that the M&E Plan is modified and updated as improved information becomes available;
- Oversee development and execution of an M&E system (including data-collection, data analysis and reporting systems) integrated with the MCC Management Information System (MIS);
- Elaborate and document M&E Policies, Procedures and Processes in an M&E Manual or other format, to be used by all MCA-L staff and project implementers;
- Communicate the M&E Plan and explain the M&E system to all key stakeholders involved in the Compact, particularly project implementers (including the MCHPP PIU), to ensure a common understanding by all. This could take the form of orientation and capacity building sessions or ongoing coordination efforts, and could focus on issues such as:
    - Explaining indicator definitions, data collection methods, and timing/frequency of data collection and reporting,
    - Data quality controls and verification procedures,
    - Evaluation questions and methodology, etc.;
- Develop and use a documentation system to ensure that key M&E actions, processes and deliverables are systematically recorded. This may be accomplished either as part of the M&E information system or independently. The documentation may encompass the following elements:
    - Indicators and material evidence for reported values,
    - M&E Plan versions,
    - Reporting manuals and templates,
    - Key M&E deliverables including TORs, contracts/agreements, data collection instruments, reports/analyses, etc.;
- Develop (with the MCA-L Communications/Outreach Unit and Environmental and Social Performance (ESP), and Gender and Social Inclusion (GSI)/Social and Gender Assessment (SGA) officers) and implement a systematic results dissemination approach that draws on verified ITT data to ensure participation of all stakeholders, and to facilitate feedback of lessons learned into the Compact implementation process;

- Organize and oversee regular independent data quality reviews on a periodic basis to assess the quality of data reported to MCA-L;
- Participate in project monitoring through site visits, review of project reports and analysis of performance monitoring and other data;
- Update the M&E work plan periodically;
- Manage the M&E budget efficiently;
- Contribute to the design of the evaluation strategy;
- Collaborate with the Procurement Director to prepare and conduct procurement of M&E contracts;
- Ensure that data collection mechanisms are designed to collect data disaggregated by gender, income category, age, and other dimensions, as applicable and practical, and that the findings are presented at the appropriately disaggregated level;
- As the champion of results based management, the M&E Unit will take steps to foster a results oriented culture throughout MCA-L and its implementing partners – this includes making sure that M&E information is used by the MCA management and project teams to improve Compact performance (feedback loop).
- Ensure data collection, storage, and dissemination activities maximize protection of confidentiality of survey respondents' personally identifiable information. This may require:
    - Facilitating local Institutional Review Board clearance for data collection,
    - Using lock and key cabinets for paper files,
    - Using secure file transfer systems,
    - Encrypting data files,
    - Employing password protection on data systems and data encryption,
    - Requiring signed acknowledgements of roles and responsibilities,
    - Requiring relevant stakeholders to sign non-disclosure agreements, and
    - Incorporating data protection standards into the organization's records management procedures, or if necessary, developing a records management procedure that includes such standards for any data collection managed by MCA-L.

The M&E Director will be a part of MCA-L's internal Management Unit, composed from MCA leadership, Project Directors and other Directors. The M&E Director will report directly to the MCA-L CEO and maintain close cooperation with Project Directors. Collaboration with the procurement team will be very important to prepare and conduct timely procurement of M&E related contracts as well as ensuring that other implementation contracts contain necessary data reporting provisions.

Seminars, workshops, elaboration and distribution and dissemination of M&E materials shall be conducted in close cooperation with the MCA-L Communications/Outreach Unit.

In order to prepare for post Compact monitoring by the Government, the MCA-L M&E Unit should identify a post Compact point of contact (POC) for MCC early on in the program and work with that POC to build understanding of the MCC program and monitoring process. This POC should be part of the Government entity that will commit to continuing M&E of Compact investments after the Compact End Date. The M&E Unit should also identify the team that will be responsible for reviewing evaluation reports that are delivered post Compact (e.g., project

leads), to ensure that the relevant project stakeholders review and provide feedback prior to the publication of final reports.

Monitoring and Evaluation (M&E) Director

The M&E Director shall be responsible for the overall M&E strategy and review of Compact implementation. The Director will also act as an advisor to the CEO and MCA-L Senior Management. The Director shall periodically measure, report and communicate (in collaboration with the Communications/Outreach Unit) the performance and results of the Compact, which will inform implementation decisions and help the Compact achieve its objectives. The Director will also analyze the overall program execution, covering both financial and physical implementation and monitoring key assumptions and risks made in the ERR calculations for the program.

Monitoring and Evaluation Manager

The Monitoring and Evaluation Manager shall assist in the full range of M&E activities, including day to day monitoring and analysis, and providing timely and relevant information to key project stakeholders.

Coordination

MCA- L Data Management System for Monitoring and Evaluation

All MCAs must use the MCC MIS for reporting the QDRP (including the ITT) to MCC. In addition, an MCA may decide to develop its own MIS for M&E to collect data from implementers that can track program progress and monitor each Activity to facilitate timely and accurate reporting. However, any MIS development must be coordinated closely with both the MCC MIS and MCA MIS initiatives, other service providers, and government ministries.

Review and Revision of the M&E Plan

The M&E Plan is designed to evolve over time, adjusting to changes in program activities and improvements in performance monitoring and measurement. The M&E Plan may be modified or amended without amending the Compact. However, any such modification or amendment of the M&E Plan by MCA-L must be approved by MCC in writing and must be otherwise consistent with the requirements of the Compact and any relevant supplemental agreements. With notice to MCA-L, MCC may make non-substantive changes to the M&E Plan as necessary. Some examples of non-substantive changes could include revising units to correspond to MCC's approved list of units of measurement or standardizing indicator names.

Timing and Frequency of Reviews and Modifications

In the fourth quarter of every Compact year, starting in calendar year 2019, or as necessary, the M&E Director of MCA-L and representatives of MCC M&E staff will review how well the M&E Plan has met its objectives (i.e., an "Annual Review"). The Annual Review is intended to ensure that the M&E Plan measures program performance accurately and provides crucial information on the need for changes in project design. More specifically, the review:

- Ensures that the M&E Plan shows whether the logical sequence of intervention outputs and outcomes is occurring;
- Checks whether indicator definitions are precise and timely;

- Checks whether M&E indicators accurately reflect program performance;
- Updates indicator targets, as allowed by the MCC M&E Policy; and
- Adds indicators, as needed, to track hitherto unmeasured results.

The M&E Plan will be revised by MCA-L, in agreement with MCC M&E, when the need for change has been identified in an Annual Review. The revision and approval process will follow the guidelines outlines in the MCC M&E Policy.

The Annual Reviews will adhere to the following schedule; however, the M&E Plan may be reviewed and modified at other times, e.g., as Compact investments are further defined:

Table 10: Schedule for Annual Reviews

Compact Year	Timing of Annual Review
5	October-December 2020

Documenting Modifications

Justification for deleting an indicator, modifying an indicator baseline or target, modifying Beneficiary information or major adjustments to the evaluation plan will be adequately documented in English in Annex III to the revised M&E Plan. MCA-L shall use the standard modification template provided by MCC for documenting these modifications.

Approval and Peer Review of M&E Plan Modifications

All M&E Plan modifications made by the MCA-L will be submitted to MCC for formal approval. The M&E Plan may undergo peer review within MCC before the beginning of the formal approval process. Before requesting MCC approval, changes to the M&E Plan shall be approved by the MCA-L Board of Directors if they are considered substantial, as determined by MCA-L and MCC.

M&E BUDGET

The budget for the implementation of the proposed M&E activities for the five-year term of the Compact is US$ 5.5 million. The line items of this budget will be reviewed and updated as the program develops, on an annual or quarterly basis, when the respective quarterly detailed financial plan is submitted to MCC with the quarterly disbursement request.

The M&E budget does not include the M&E staff in the MCA-L Management Unit whose salaries and field trips are included in the administrative budget of the Compact. The budget should not exceed the total amount over the five years, but the distribution of funding between line items and years may be adjusted according to the results of the M&E Plan's annual or quarterly reviews, if needed.

While the resources for carrying-out surveys during Compact implementation are allocated by MCA-L using Compact funds, the evaluation design and analysis is funded directly by MCC. MCC budgeted approximately $5,000,000 to fund the external evaluators and the initial data quality review, but ultimately spent approximately $3,250,000 so far.

Table 11: Estimated Compact MYFP M&E Budget

Item	Total
Monitoring Oversight	$735,388.52
Capacity Building for M&E	$500,000.00
Evaluation & Special Studies	$2,014,611.48
MCA Process Evaluations	$0,000
Total	**$3,250,000.00**

OTHER

M&E Work Plan

The MCA-L M&E Directorate shall develop an M&E work plan based on the proposed activities in the M&E budget. This work plan shall be for the whole duration of the Compact five year period. The main activities shall include the procurement of consultant services, procurement of monitoring equipment, if necessary, and software, stakeholder workshops, data collection and analysis, and procurement and implementation of surveys. The M&E work plan will be developed and available within the second quarter of Compact implementation, and updated at least annually.

ANNEX I: INDICATOR DOCUMENTATION TABLE

Liberia Compact
Annex I: Indicator Documentation Table

Program Logic Result	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information
Energy Project										
Increased lower cost generation	P-15	Outcome	Total electricity supply	Total electricity, in megawatt hours, produced or imported in a year.	Megawatt hours	Electricity supply source	LEC Quarterly Reports	LEC Generation	Quarterly	The categories for the disaggregation "Electricity supply source" are: Domestic (P-15.1) and Imports (P-15.2). Liberia currently imports a small amount of energy from Cote d'Ivoire to serve communities in three border counties. Unfortunately, this energy is not well documented by LEC. Once that information is more readily available, and once energy is being imported from CLSG, we will determine a way to incorporate that reporting. The baseline value differs from those used in the original and revised CBA models (i.e., original model: 54,860; revised model: 71,574). The baseline value used in the M&E Plan is based on LEC data as of December 2015, while the baseline value used in the original CBA is based on the 2014 Least Cost Power Development Plan.
Increased lower cost generation	P-15	Outcome	Total electricity supply – revised CBA	Total electricity, in megawatt hours, produced or imported in a year.	Megawatt hours	Electricity supply source	LEC Quarterly Reports	LEC Generation	Quarterly	The categories for the disaggregation "Electricity supply source" are: Domestic (P-15.1) and Imports (P-15.2). Liberia currently imports a small amount of energy from Cote d'Ivoire to serve communities in three border counties. Unfortunately, this energy is not well documented by LEC. Once that information is more readily available, and once energy is being imported from CLSG, we will determine a way to incorporate that reporting. The baseline value differs from those used in the original and revised CBA models (i.e., original model: 54,860; revised model: 71,574). The baseline value used in the M&E Plan is based on LEC data as of December 2015, while the baseline value used in the original CBA is based on the 2014 Least Cost Power Development Plan.
Increased consumption of electricity, increased revenue	P-23	Outcome	Total electricity sold	The total megawatt hours of electricity sales to all customer types.	Megawatt hours	Tariff class	LEC Quarterly Reports	LEC	Quarterly	The categories for the disaggregation "Tariff class" are: Residential (P-23.1); Commercial (P-23.2); Industrial (P-23.3); Government; and Other.

Increased consumption of electricity, increased revenue	P-23	Outcome	Total elecitricity sold – revised CBA	The total megawatt hours of electricity sales to all customer types.	Megawatt hours	Tariff class	LEC Quarterly Reports	LEC	Quarterly	The categories for the disaggregation "Tariff class" are: Residential (P-23.1); Commercial (P-23.2); Industrial (P-23.3); Government; and Other.
Increased customer base	P-25	Outcome	Percentage of households connected to the national grid	Number of households that have access to a legal connection to electricity service from an electrical utility or service provider / Total number of households in the country.	Percentage		LEC Quarterly Reports and LCPDP	LEC, MCA-L	Annual	
Increased customer base	P-25.1	Outcome	Households that have access to a legal connection to electricity service from an electrical utility or service provider	Number of households that have access to a legal connection to electricity service from an electrical utility or service provider.	Number		LEC Quarterly Reports	LEC	Annual	This indicator assumes that each residential connection reported by LEC represents one household.
Increased customer base	P-25.2	Outcome	Total number of households in the country	Total number of households in the country.	Number		LCPDP	MCA-L	Annual	In the absence of a means to track annual changes in the number of households, the projections from the LCPDP on page 5-8 (i.e., targets for this indicator) will be treated as actuals in Compact reporting.
Increased customer base		Outcome	Customers connected to the grid	Number of customers that have a legal connection to electricity service from LEC	Number	Customer class, customer phase	LEC Quarterly Reports	LEC	Quarterly	The baseline value is higher than the baseline value used in the CBA model (i.e., 13,599). The former is based on LEC data as of December 2015, while the latter is based on the number of LEC customers documented in the 2014 Least Cost Power Development Plan.
Increased customer base		Outcome	Cusomers connected to the grid – revised CBA	Number of customers that have a legal connection to electricity service from LEC	Number	Customer class, customer phase	LEC Quarterly Reports	LEC	Quarterly	The baseline value is higher than the baseline value used in the CBA model (i.e., 13,599). The former is based on LEC data as of December 2015, while the latter is based on the number of LEC customers documented in the 2014 Least Cost Power Development Plan.

Increased quality and reliability of electricity		Outcome	System Average Interruption Frequency Index (SAIFI)	Sum of all customer interruption durations / Total number of customers	Rate		LEC Quarterly Reports	LEC	Annual	SAIFI is only counted at the 22kV level and above; the number of customers associated with each feeder is estimated and is likely an underestimate. This indicator will aggregate the monthly index values to report the quarterly and annual totals.
Increased quality and reliability of electricity		Outcome	System Average Interruption Duration Index (SAIDI)	Sum of durations, in customer-hours, of all customer interruptions in a year / Total number of customers connected to network in the same year	Hours		LEC Quarterly Reports	LEC	Annual	SAIDI is only counted at the 22kV level and above; the number of customers associated with each feeder is estimated and is likely an underestimate. This indicator will aggregate the monthly index values to report the quarterly and annual totals.
Increased quality and reliability of electricity		Outcome	Adequacy of supply	The minimum value in a quarter of the following: total dependable capacity available from all power plants in a month divided by peak daily demand in the corresponding month	Rate		LEC Quarterly Reports	LEC	Quarterly	
Increased quality and reliability of electricity		Outcome	Available power plant generation capacity	Total dependable capacity available from all power plants in the month with the lowest calculated adequacy of supply	Megawatts		LEC Quarterly Reports	LEC	Quarterly	Formula: available power plant generation capacity in a month = power plant dependable capacity (MW) * hours plant was available at that capacity during month / hours in month
Increased quality and reliability of electricity, increased consumption of electricity		Outcome	Peak demand	Daily peak demand for on-grid power in the month with the lowest calculated adequacy of supply	Megawatts		LEC Quarterly Reports	LEC	Quarterly	
Improved plant facilities	P-16	Outcome	Power plant availability	Unweighted average across all power plants of the following: total number of hours per quarter that a plant is able and available to produce electricity / Total number of hours in the same quarter.	Percentage	Liberia power plants	LEC Quarterly Reports	LEC	Quarterly	Targets will not be established for this indicator because it aggregates values that do not reflect Compact performance directly and for which LEC does not have operational targets. The categories for the disaggregation "Liberia power plants" are: Mt. Coffee, HFO, and Diesel generators.
Reduced tariffs, Cost-reflective tariff in place		Outcome	Electricity tariff	Average tariff per kilowatt-hour	US Dollars	Customer class	Tariff documentation from LEC Board	LEC	Quarterly	LEC does not currently differentiate between customer classes but plans to introduce a new tariff regime eventually. The "average" tariff will be the weighted average of different classes based on

										consumption amount and number of customers.
	Mt. Coffee Rehabilitation Activity (Mt. Coffee Support Activity)									
Increased lower cost generation	P-26	Outcome	Share of renewable energy in the country	Total installed generation capacity of on- or off-grid renewable energy, in megawatts / Total installed generation capacity (P-17).	Percentage		LEC Quarterly Reports	LEC	Quarterly	Given significant unknowns about private off-grid generation capacity, this indicator will only report on on-grid capacity.
Mt. Coffee infrastructure rehabilitated	P-17	Outcome	Installed generation capacity	Total generation capacity, in megawatts, installed plants can generate within the country.	Megawatts	Power generation source	LEC Quarterly reports	LEC	Quarterly	Given significant unknowns about private off-grid generation capacity, this indicator will only report on on-grid capacity.
Increased lower cost generation	14	Outcome	Mt. Coffee Hydropower Plant Capacity Factor	The ratio of the energy (MWh) generated by MCHPP in one year to the energy that it could have produced at continuous full power operation over the same period	Percentage		LEC Quarterly Reports	LEC	Annual	Formula: Annual electricity generated by Mt. Coffee (MWh)/installed capacity (88 MW) * (24 hours/day) * 365 days, i.e., Annual electricity generated by Mt. Coffee (MWh)/752,960 MWh
Increased lower cost generation	15	Outcome	Percentage of electricity supplied by Mt. Coffee Hydropower Plant	Total electricity, in megawatt hours, produced by MCHPP in a quarter / Total electricity, in megawatt hours, produced or imported in a quarter for supply to the grid	Percentage		LEC Quarterly Reports	LEC	Quarterly	
Increased lower cost generation	16	Outcome	Percentage of electricity supplied by Mt. Coffee Hydropower Plant – revised CBA	Total electricity, in megawatt hours, produced by MCHPP in a quarter / Total electricity, in megawatt hours, produced or imported in a quarter for supply to the grid	Percentage		LEC Quarterly Reports	LEC	Quarterly	
Mt. Coffee infrastructure rehabilitated	P-6	Output	Generation capacity added	Generation capacity added, measured in megawatts, resulting from construction of new generating capacity or reconstruction, rehabilitation, or upgrading of existing generating capacity funded with MCC support.	Megawatts	Power generation source	PIU Quarterly Reports	PIU	Quarterly	This indicator is only referring to generation capacity from MCHPP.The disaggregation "Power generation source" is included for tracking purposes only and all generation capacity is considered on-grid (P-6.1).

Mt. Coffee infrastructure rehabilitated	P-9	Output	Transmission substation capacity added	The total added transmission substation capacity, measured in mega volt amperes, that is energized, commissioned, and accompanied by a test report and supervising engineer's certification resulting from new construction or refurbishment of existing substations that is due to MCC support.	Megavolt ampere		PIU Quarterly Reports	PIU	Quarterly	This indicator is only referring to transmission substation capacity from MCHPP.
Mt. Coffee infrastructure rehabilitated	P- 7	Output	Kilometers of transmission lines upgraded or built	The sum of linear kilometers of new, reconstructed, rehabilitated, or upgraded transmission lines that have been energized, tested and commissioned with MCC support	Kilometers		PIU Quarterly Reports	PIU	Quarterly	
Rehabilitate MCHPP, Construct and rehab MCHPP transmission infrastructure		Process	Percent disbursed for Mt. Coffee Hydropower Plant rehabilitation	The total amount disbursed for MCHPP rehabilitation divided by the total current amount allocated for MCHPP rehabilitation	Percentage		PIU Quarterly Reports	PIU	Quarterly	This indicator reflects pooled donor funding
Rehabilitate MCHPP, Construct and rehab MCHPP transmission infrastructure		Process	Total amount allocated for Mt. Coffee Hydropower Plant rehabilitation	The total value of all signed construction contracts and funding allocated for oversight, environmental and social mitigation, initial operations and maintenance, and contingencies for MCHPP rehabilitation	US Dollars		PIU Quarterly Reports	PIU	Quarterly	This indicator reflects pooled donor funding
Rehabilitate MCHPP, Construct and rehab MCHPP transmission infrastructure		Process	Value disbursed for Mt. Coffee Hydropower Plant rehabilitation	The amount disbursed for MCHPP rehabilitation, including costs associated with construction, oversight, environmental and social mitigation, initial operations and maintenance, and contingencies	US Dollars		PIU Quarterly Reports	PIU	Quarterly	This indicator reflects pooled donor funding
Rehabilitate MCHPP, Construct and rehab MCHPP transmission infrastructure	P-4	Process	Percent disbursed of power infrastructure construction contracts	The total amount of all signed construction contracts for power infrastructure investments disbursed divided by the total current value of all signed contracts.	Percentage		Common Payment System (CPS) Monthly Report	MCC	Quarterly	This indicator represents the percentage of MCC's financial commitment to the Mt. Coffee Hydropower Rehabilitation Activity that has already been fulfilled.

Rehabilitate MCHPP, Construct and rehab MCHPP transmission infrastructure	P-3	Process	Value of signed power infrastructure construction contracts	The value of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars		Liberia Compact	MCC	Quarterly	This indicator tracks MCC's contribution to the Mt. Coffee Hydropower. Rehabilitation Activity rather than the actual value of signed infrastructure contracts, which is tracked in a different indicator. These construction costs also include approximately $2 million to rehabilitate a water intake at the MCHPP site as these costs cannot be separated from the other MCHPP contract costs.
Rehabilitate MCHPP, Construct and rehab MCHPP transmission infrastructure	P-4.1	Process	Value disbursed of power infrastructure construction contracts	The amount disbursed of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars		CPS Monthly Report	MCC	Quarterly	The value disbursed will be equal to the value signed.
	Mt. Coffee Support Activity									
	Training Center Sub-Activity									
Increased capacity and productivity of LEC staff		Outcome	Learner satisfaction	Average score on post training feedback form, on a scale of 1 to 5 for the UTC trainings	Number		Post training feedback form	LEC and UTC	Once	
Increased capacity and productivity of LEC staff		Outcome	Attendance and/or engagement of learners	(Number of days / hours present) / (Number of days/ hours registered for) averaged across participants	Percentage		LEC and UTC	LEC and UTC	Quarterly	
Increased capacity and productivity of LEC staff		Outcome	Assessment pass rate	The number of those that successfully completed training/Number of participants registered	Percentage		LEC and UTC	LEC and UTC	Quarterly	
Increased capacity and productivity of LEC staff		Outcome	Degree of achievement of learning outcomes	Average score on post training tests	Percentage		Post training test	LEC and UTC	Quarterly	

Increased capacity and productivity of LEC staff		Outcome	Change in test scores	Average percent change between pre and post test assessment	Percentage		Post training test	LEC and UTC	Quarterly	
Procure Training Center Program Design Consultant		Output	Training center consultant	Date Training Center program design consultant contract signed	Date		LEC and UTC	LEC and UTC	Once	
Outdoor Training Center consutructed and equipped		Output	Operational OTC	Date Outdoor Training Center is constructed, and equipment is delivered	Date		LEC and UTC	LEC and UTC	Once	
Training needs assessed, Master and Strategic Plan, training system and resources developed		Output	Training plan	Date training plan is delivered	Date		LEC and UTC	LEC and UTC	Once	
Training, mentorship, and oversight of the trainers provided	E-5	Output	Instructors trained	The number of classroom instructors who complete MCC-supported training focused on instructional quality as defined by the compact training activity.	Number	Sex	UTC and TATA reports	LEC	Quarterly	
Training for non-technical, corporate, and customer service center staff conducted		Output	Students participating in MCC-supported education activities	The number of students enrolled or participating in MCC-supported educational schooling	Number	Sex	LEC and UTC	LEC and UTC	Quarterly	

LEC implements training system		Output	Training system implementation	The date LEC training system is implemented	Date		LEC and UTC	LEC and UTC	Once	
Trainers train LEC staff		Output	Knowledge transfer	Date trainers program complete training LEC staff	Date		LEC and UTC	LEC and UTC	Once	
Pipeline Sub-Activity										
O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Outcome	O&M Plan implemented	Date O&M plan is implemented	Date		WTP	LWSC	Once	
Decreased salinity		Outcome	Electrical connectivity measure	Amount of salinity present in raw water as measured in µS/cm	Ratio		WTP	LWSC	Quarterly	LWSC to provide technical information/explanation about how they measure salinity
Increased quantity of raw water to the WTP		Outcome	Raw water supplied volume	The volume of raw water in millions of liters per day supplied to that part of the water supply system to which the water balance calculation relates	Million Gallons of Water per day (MGD)		WTP	LWSC	Quarterly	Pre-war capacity was 16million gallons per day (MGD)
Improved continuity of service of raw water supply to the WTP		Outcome	Water coming to LWSC through the pipeline	Raw water delivered daily to LWSC from the pipeline	Hours per day		WTP	LWSC	Quarterly	

Reduced electricity use for LWSC		Outcome	Reduced electricity use for LWSC	Amount of electricity used by LWSC to pump water	Kilowatt hours		WTP	LWSC	Quarterly	
Increased quantity of treated water to the LWSC service area		Outcome	Volume of treated water produced	Total volume of water produced in cubic meters per day for the service area, i.e. leaving treatment works operated by the utility and purchased treated water, if any	Cubic meters per day		WTP	LWSC	Quarterly	
Most consistent supply of treated water to the LWSC service area		Outcome	Continuity of service	Average hours of service per day for treated water supply	Hours per day		WTP	LWSC	Quarterly	It entails a measurement of the duration, reliability, continuity and consistency of supplying treated water to LWSC service area
O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Outcome	Induvidual staff trained	The number of people trained to implement the O&M plan	Number	Sex	WTP	LWSC	Quarterly	
O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Outcome	Leak detection equipment and spare parts delivered	Date of official handover of leak detection equipment and spare parts to WTP	Date		WTP	LWSC	Once	This is could entail an official handover of equipment to LWSC WTP

Wells built or rehabilitated for surrounding communities		Output	Water points constructed	The number of non-networked, stand-alone water supply systems constructed, such as: protected dug wells, tube-wells / boreholes, protected natural springs and rainwater harvesting / catchment systems.	Number		WTP	LWSC	Once	Include in the additional information new wells constructed vs. rehabilitated.
O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Output	Manual is complete	Date Training Manual is completed	Date		WTP	LWSC	Once	
O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Output	Training complete	Date Training on leak detection equipment is completed	Date		WTP	LWSC	Once	
O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Output	Staff trained	Number of people trained on leak detection equipment use	Number	Sex	WTP	LWSC	Once	This covers the number of staff selected and trained on the use and maintenance of leak detection equipment
O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Output	O&M plan launch	Date O&M plan is launched	Date		WTP	LWSC	Once	This is about the official launch of the O&M Plan

O&M plan implemented, leak detection equipment and spare parts procured, and training completed		Output	Training completed	Date training on the O&M plan is completed	Date		WTP	LWSC	Once	
Energy Sector Reform Activity										
Construct, rehabilitate, equip, staff, train, customer service centers		Output	LEC customer service center renovated	Date LEC Waterside customer service center has been reopened for service following completion of renovation	Date		TBD	MCA-Liberia	Once	
Management Support to LEC Sub-Activity										
Improved operations of LEC		Outcome	Aggregate technical and commercial losses	The amount of electricity generated or input to system (kWh) minus the amount in US$ for which payment is collected from customers converted to energy (kWh) divided by the amount of electricity generated or input to system (kWh) x 100	Percentage		LEC reports	LEC Generation, LEC Commercial and LEC Finance	Quarterly	AT&C = 1 – (revenue collected converted into MWh / total electricity supply (MWh)) x 100, where the annual value is an average of the monthly values
Improved operations of LEC	P-20	Outcome	Commercial losses	Total distribution system losses minus distribution technical losses	Percentage		LEC reports	LEC Generation, LEC Commercial and LEC Finance	Quarterly	$\%Com = \%Gen - \%Ttl - \%Ct = \%EAfS - \%Dtl - \%Billing$; where Energy Generated (Gen) = 100%; consumption at transmission level (Ct) = 0 (because there are currently no transmission-level customers); transmission technical loss (Ttl) is estimated at 3%; Energy Available for Sale = EAfS; Distribution Technical Losses (Dtl) are estimated at 12%; Billing = LEC Internal Consumptions + Energy billed to consumers
Improved operations of LEC, improved plant facilities		Outcome	Maintenance expenditure – asset value ratio	Actual maintenance expenditures / Total value of fixed assets	Percentage		LEC reports	LEC Finance	Annual	
Improved operations of LEC, improved plant facilities		Outcome	Maintenance expenditures	Actual maintenance expenditures	US Dollars		LEC reports	LEC Finance	Annual	

Improved operations of LEC, improved plant facilities		Outcome	Asset value	Total value of fixed assets	US Dollars		LEC reports	LEC Finance	Annual	
Increased revenue, improved financial sustainability of LEC	P-24	Outcome	Operating cost recovery ratio	Total revenue collected / Total operating cost	Percentage		LEC reports	LEC Finance	Annual	
Increased revenue, improved financial sustainability of LEC		Outcome	Total revenue collected	Total revenue collected	US Dollars		LEC reports	LEC Finance	Quarterly	
Increased revenue, improved financial sustainability of LEC		Outcome	Collection rate	[Trailing twelve months of total value of post-paid bills collected /Total value of bills issued for same customers in trailing twelve months] x 100	Percentage		LEC reports	LEC Finance	Annual	
Improved operations of LEC		Outcome	Operating expenses per kWh sold	The total operating expense divided by kWh sold	US Dollars		LEC reports	LEC Finance	Annual	Total operating expense' includes: at least the fuel costs, O&M expenses, administrative expenses (salaries & benefits, outside services, insurance claims, foreign travel, vehicle expenses, LEC Board expenses, other administrative expenses etc.) and other expenses such as depreciation, interest and foreign exchange gain/loss. Because the baseline value for LEC's financial indicators reflect LEC's fiscal year (i.e., July 1-June 30), the baseline value of operating expense per kWh sold reflects the July 1, 2014 – June 30, 2015 period. The Y4 and Y5 targets represent calendar years, which is how data will be reported against this indicator.

Improved operations of LEC		Outcome	Operating expenses	The total operating expense in a year	US Dollars		LEC reports	LEC Finance	Annual	Total operating expense' includes: at least the fuel costs, O&M expenses, administrative expenses (salaries & benefits, outside services, insurance claims, foreign travel, vehicle expenses, LEC Board expenses, other administrative expenses etc.) and other expenses such as depreciation, interest and foreign exchange gain/loss. Because the baseline value for LEC's financial indicators reflect LEC's fiscal year (i.e., July 1-June 30), the baseline value of operating expenses reflects the July 1, 2014 – June 30, 2015 period. The Y4 and Y5 targets represent calendar years, which is how data will be reported against this indicator.
Increased consumption of electricity, increased revenue	P-23	Outcome	Totall electricity sold (kWh)	The total kilowatt hours of electricity sales to all customer types	kWh		LEC reports	LEC Finance	Annual	
Increased customer base		Outcome	New connections added each year	Customer connections executed during the performance period that have been registered with LEC and added to the customer database	Number	LEC/donor	LEC reports	LEC Commercial	Annual	
Establishment of an Independent Regulator Sub-Activity										
LERC officially established		Outcome	LERC management structure established	Date the following LERC positions have been filled: three Commissioners, Managing Director, Head: Licensing & Public Affairs, Head: Economic Regulation, Head: Technical Regulation	Date		Quarterly update	LERC	Once	
LERC officially established		Outcome	LERC officially launched	Date of public event with key sector stakeholders to announce the launch and functioning of LERC	Date		Press release	MCA-Liberia	Once	
LERC officially established		Outcome	LERC inaugural budget approved	Date LERC's inaugural budget for fiscal year 2021 (covering July 1, 2020 through June 30, 2021) has been approved by Board of Commissioners	Date		LERC budget	LERC	Once	

LERC officially established		Outcome	LERC inaugural budget passed into law	Date Board of Commissioner-approved inaugural budget has been passed into law by National Legislature	Date		National budget that has been approved by the legislature and signed into law by the President	MCA-Liberia	Once	
Regulatory framework developed, adopted, implemented		Outcome	LERC regulatory framework approved	Date that the following components of a regulatory framework have been approved by LERC: (1) licensing regulations (which will include quality of service and system planning regulations); (2) licensing manual; (3) tariff regulations; and (4) quality of supply regulations	Date		Quarterly update	LERC	Once	
Regulatory framework developed, adopted, implemented		Outcome	Dispute resolution procedures approved	Date LERC has approved procedures to address customer complaints and other related disputes	Date		Quarterly update	LERC	Once	
Cost-reflective tariff in place		Outcome	Interim LEC tariffs approved by LERC	Date LERC has approved interim tariffs for electricity sold by LEC	Date		Board of Commissioner's Tariff Approval Resolution or Decision	LERC	Once	
Sector operators licensed and compliant		Outcome	LEC licensed as an electricity operator	Date LERC has issued a license to LEC to operate as an electricity provider	Date		License to operate	LERC	Once	
Sector operators licensed and compliant		Outcome	Non-LEC entity licensed as an electricity operator	Date LERC has issued a license to a non-LEC entity to operate as an electricity provider	Date		License to operate	LERC	Once	
Roads Project										
Improved execution of routine road maintenance		Outcome	Kilometers of primary, secondary, and urban roads maintained	Kilometers of primary, secondary, and urban roads maintained	Kilometers	Road Type	RAMS	ICDU for PAPD at MoFDP	Semi-Annual	

Improved execution of routine road maintenance		Outcome	Share of financial needs for routine maintenance projects met with budget disbursed	Total amount disbursed on routine maintenance divided by total financial needs for routine maintenance specified in Annual Maintenance Expenditure Program (ARMEP)	Percentage		Annual budget execution report of MoFDP, ARMEP	NRF	Annual	
Improved execution of periodic road maintenance		Outcome	Share of financial needs for periodic maintenance for PSIPs met with budget disbursed	Total amount disbursed on periodic for Public Sector Infrastructure Project (PSIP)s maintenance divided by total financial needs for periodic routine maintenance specified in Annual Maintenance Expenditure Program (ARMEP). PSIPs were chosen because it aligns more closely with work attributable to MCC's interventions.	Percentage		Annual Budget Execution Report of MoFDP, ARMEP	NRF	Annual	For projects funded by Development Partners, the information is at the PFMU at MoFDP which makes data collection more time consuming. Looking only at PSIP projects will simplify the data collection for this indicator with the same quality of information.
Improved execution of emergency road maintenance		Outcome	Average response time between start and completion of emergency road maintenance	Average response time between the start and completion of emergency road maintenance works until the complete cut of a primary road is removed (and traffic can continue)	Days		Annual Maintenance Reports	MPW	Annual	
Improved planning of routine road maintenance and improved planning of periodic road maintenance		Outcome	ARMEP submitted on schedule and approved on time	ARMEP submitted on schedule and approved on time by the IMSC before the start of the next fiscal period on July 1. Indicator will be reported in binary	Number		Signed ARMEP	NRF & MPW	Annual	
Improved planning of emergency road maintenance		Outcome	Emergency planning response time	Average response time between the time an emergency has been reported (e.g. complete cut of the road) and the start of the emergency road maintenance works	Days		Maintenance contract documents	MPW	Annual	

Strengthened capacities of GoL staff in planning of road maintenance and improvement decisions		Outcome	Road maintenance planning capacity	Average score from 1 to 5 of training participants pre-course assessments and post-course assessments from 6 trainings related to road network maintenance planning, using HDM-4	Number	Training area	Volpe Training Reports	MCA-L	Once	Disaggregation by Training Area will be the following: Familiarity, Perception of use, Ease, Capability, Comfort
Road maintenance programming – with prioritized maintenance projects		Outcome	First One-Year RMP uses HDM-4 to prioritize periodic road maintenance	First One-Year RMP 2019 prepared by MPW uses HDM-4 as decision support model for prioritizing periodic road maintenance projects	Date		MPW One-Year Road Maintenance Plan	MPW IIU	Once	
Road maintenance programming – with prioritized maintenance projects		Outcome	First Five Year RMP uses HDM-4 to prioritize periodic road maintenance	Five-Year NMRMP 2019-2023 prepared by MPW uses HDM-4 as decision support model for prioritizing periodic road maintenance projects	Date		MPW Five-Year Road Maintenance Plan	MPW IIU	Once	
Maintenance projects prioritized under the MPW's road maintenance plans approved by NRF		Outcome	Share of periodic maintenance projects in One-Year Road Maintenance Program that are budgeted in the ARMEP	Share of periodic maintenance projects in the One-Year Road Maintenance Program of MPW which are budgeted in the Annual Road Maintenance Expenditure Program of the NRF	Percentage		ARMEP	MPW IIU	Annual	
*Strengthened capacities of GOL to consistently collect standardized data on (i)-(iii)**		Outcome	Average score of standardized data collection training participants	Average score of training participants pre-course assessments and post-course assessments from 5 trainings related to collecting standardized data on (i) traffic on primary and secondary roads by wet and dry season, (ii) road and bridge inventory on primary network, and (iii) condition assessment on primary roads (not bridges)	Number		Volpe Training Reports	MPW IIU	Annual	

*Consistent collection of standardized data by GOL on (i)-(iii)**		Outcome	Standardized data collection performed in line with ARMEP	Annual instance of data collection performed in line with Annual Expenditure Road Maintenance Program for standardized data on (i) Traffic on primary and secondary roads by wet and dry season, (ii) road and bridge inventory on primary network, and (iii) condition assessment on primary roads (not bridges)	Number		MPW Data Report	MPW IIU	Annual	
Strengthened capacities of GOL to add collected data on (i)-(iii) to the RAMS*		Outcome	Average score of adding standardized data training participants to RAMS	Average score of training participants pre-course assessments and post-course assessments from 5 trainings related to adding standardized data on (i) Traffic on primary and secondary roads by wet and dry season, (ii) road and bridge inventory on primary network, and (iii) condition assessment on primary roads (not bridges) onto the RAMS	Number		Evaluator KIIs	MPW IIU	Other	Data will be reported twice: one time at the pre-assessment, and one time after the training has taken place
Routine addition of collected data on (i)-(iii) to RAMS by GOL*		Outcome	Data uploaded to RAMS according to the RAMS plan	The number of times per year that standardized data is added to the RAMS system according to the RAMS plan	Number		ARMEP	MPW IIU	Annual	
GoL staff trained in planning of road network maintenance and improvement decisions		Output	GoL staff trained in planning of road network maintenance and improvement decisions	GoL staff trained in planning of road network maintenance and improvement decisions	Date		Training Records	NRF & MPW	Once	
NRF staff trained in approval of road maintenance projects		Output	NRF staff trained in approval of road maintenance projects	NRF staff trained in approval of road maintenance projects	Date		Certificates of Completion	NRF	Once	
Data collection manuals and traffic counting equipment provided		Output	Data collection manuals and traffic counting equipment provided	Official handover date of data collection manuals and traffic counting equipment	Date		Data collection manuals	MPW	Once	
GoL staff trained in collecting and adding data to RAMS		Output	GoL staff trained in collecting and adding data to RAMS	GoL staff trained in collecting and adding data on traffic on primary and secondary roads by dry and wet season, road and bridge inventory on primary network, and condition assessment on primary roads (not bridges)	Date		Training reports	MPW	Once	

RAMS developed/populated with network inventory/roadway condition assessment data from primary road network, secondary and feeder roads, traffic volume and other data		Output	RAMS developed and populated	RAMS system is incorporated into MPW workflow and populated with data	Date		RAMS, MPW One-Year Road Maintenance Plan, inventory reports	MPW	Once	
Programmatic		Process	Axle Load Control Law passed and signed into law	Date the Axle Load Control Law is signed into law	Date		Law	MoT	Once	This is a condition precedent.
Collection of road data		Process	Roadway inventory developed	Database of roadway condition data and other data related to structures on the road network accepted by MPW	Date		Documentation of acceptance of database and data dictionary	MPW	Once	The exact types of data will be determined in consultation with GoL/GIZ who are involved in roadway inventory work currently.
Collection of road data		Process	Traffic counts conducted	Database of traffic volume data by vehicle type for dry and wet seasons on the primary and secondary road network using the count locations from the Transport Master Plan completed	Date		Documentation of acceptance of database and data dictionary	MPW	Once	
Asset management plan development		Process	Asset management plan developed	Date upon which an Asset Management Plan for prioritizing and allocating road maintenance resources has been accepted by MPW	Date		Documentation of acceptance of Asset Management Plan	MPW	Once	

ANNEX II: TABLE OF INDICATOR BASELINES AND TARGETS

Liberia

Annex II: Table of Indicator Baselines and Targets

Indicator Level	Indicator Name	Unit of Measure	Indicator Classification	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	Timeline for resolving TBDs
					Jan-16 to Dec-16	Jan-17 to Dec-17	Jan-18 to Dec-18	Jan-19 to Dec-19	Jan-20 to Jan-21		
Energy Project											
Outcome	Total electricity supply	Megawatt hours	Level (Cumulative)	62039 (2015)	206,550	319,070	319,070	319,070	319,070	319,070	.
Outcome	*Total electricity supply (Domestic)*	*Megawatt hours*	*Level (Cumulative)*	*48975 (2015)*							
Outcome	*Total electricity supply (Imports)*	*Megawatt hours*	*Level (Cumulative)*	*0 (2015)*							
Outcome	*Total electricity supply (Unspecified)*	*Megawatt hours*	*Level (Cumulative)*								
Outcome	Total electricity supply – revised CBA	Megawatt hours	Level (Cumulative)	62039 (2015)	98,766	146,498	203,062	231,737	254,180	254,180	
Outcome	*Total electricity supply – revised CBA (Domestic)*	*Megawatt hours*	*Level (Cumulative)*	*48975 (2015)*							
Outcome	*Total electricity supply – revised CBA (Imports)*	*Megawatt hours*	*Level (Cumulative)*	*0 (2015)*							
Outcome	*Total electricity supply – revised CBA (Unspecified)*	*Megawatt hours*	*Level (Cumulative)*								

Outcome	Total electricity sold	Megawatt hours	Level (Cumulative)	37464 (2015)	128,480	198,460	198,460	198,460	198,460	198,460	
Outcome	*Total electricity sold (Residential)*	*Megawatt hours*	*Level (Cumulative)*	19237 (2015)							
Outcome	*Total electricity sold (Commercial)*	*Megawatt hours*	*Level (Cumulative)*	9065 (2015)							
Outcome	*Total electricity sold (Industrial)*	*Megawatt hours*	*Level (Cumulative)*	*0 (2015)*							
Outcome	*Total electricity sold (Government)*	*Megawatt hours*	*Level (Cumulative)*	*7806 (2015)*							
Outcome	*Total electricity sold (Other)*	*Megawatt hours*	*Level (Cumulative)*	*1294 (2015)*							
Outcome	*Total electricity sold (Unspecified)*	*Megawatt hours*	*Level (Cumulative)*	*62 (2015)*							
Outcome	*Total electricity sold (Single-phase)*	*Megawatt hours*	*Level (Cumulatve)*	*18822 (2015)*	*50,610*	*92,740*	*92,740*	*92,740*	*92,740*	*92,740*	
Outcome	*Total electricity sold(Three-phase)*	*Megawatt hours*	*Level (Cumulative)*	*7124(2015)*	*20,710*	*34,540*	*34,540*	*34,540*	*34,540*	*34,540*	
Outcome	*Total electricity sold (CT)*	*Megawatt hours*	*Level (Cumulative)*	*11518 (2015)*	*57,160*	*71,180*	*71,180*	*71,180*	*71,180*	*71,180*	
Outcome	Total electricity sold – revised CBA	Megawatt hours	Level (Cumulative)	37464 (2015)	54,420	80,720	111,887	127,687	140,053	140,053	

Outcome	*Total electricity sold – revised CBA (Residential)*	*Megawatt hours*	*Level (Cumulative)*	19237 (2015)							
Outcome	*Total electricity sold – revised CBA (Commercial)*	*Megawatt hours*	*Level (Cumulative)*	9065 (2015)							
Outcome	*Total electricity sold – revised CBA (Industrial)*	*Megawatt hours*	*Level (Cumulative)*	*0 (2015)*							
Outcome	*Total electricity sold – revised CBA (Government)*	*Megawatt hours*	*Level (Cumulative)*	*7806 (2015)*							
Outcome	*Total electricity sold – revised CBA (Other)*	*Megawatt hours*	*Level (Cumulative)*	*1294 (2015)*							
Outcome	*Total electricity sold – revised CBA (Unspecified)*	*Megawatt hours*	*Level (Cumulative)*	*62 (2015)*							
Outcome	*Total electricity sold – revised CBA (Single-phase)*	*Megawatt hours*	*Level (Cumulative)*	*18822 (2015)*	*32,848*	*46,072*	*62,375*	*74,823*	*87,310*	*87,310*	
Outcome	*Total electricity sold – revised CBA (Three-phase)*	*Megawatt hours*	*Level (Cumulative)*	*7124 (2015)*	*4,832*	*7,519*	*10,766*	*12,896*	*12,869*	*12,869*	
Outcome	*Total electricity sold – revised CBA (CT)*	*Megawatt hours*	*Level (Cumulative)*	*11518 (2015)*	*16,740*	*27,130*	*38,746*	*39,968*	*39,874*	*39,874*	
Outcome	Percentage of households connected to the national grid	Percentage	Level	3.9 (2015)							

Outcome	Households that have access to a legal connection to electricity service from an electrical utility or service provider	Number	Level	30475 (2015)							
Outcome	Total number of households in the country	Number	Level	789245 (2015)	808,465	827,685	846,904	866,124	885,344	885,344	
Outcome	Customers connected to the grid	Number	Level	36964 (2015)	59,350	105,101	105,101	105,101	105,101	105,101	
Outcome	*Customers connected to the grid (Residential)*	*Number*	*Level*	*33296 (2015)*							
Outcome	*Customers connected to the grid (Commercial)*	*Number*	*Level*	*3,441 (2015)*							
Outcome	*Customers connected to the grid (Industrial)*	*Number*	*Level*	*0 (2015)*							
Outcome	*Customers connected to the grid (Government)*	*Number*	*Level*	*159 (2015)*							
Outcome	*Customers connected to the grid (Other)*	*Number*	*Level*	*65 (2015)*							
Outcome	*Customers connected to the grid (Unspecified)*	*Number*	*Level*	3 (2015)							
Outcome	*Customers connected to the grid (Single-phase)*	*Number*	*Level*	35531 (2015)	58,000	103,000	103,000	103,000	103,000	103,000	
Outcome	*Customers connected to the grid (Three-phase)*	*Number*	*Level*	1236 (2015)	1,215	1,940	1,940	1,940	1,940	1,940	
Outcome	*Customers connected to the grid (CT)*	*Number*	*Level*	197 (2015)	135	161	161	161	161	161	

Outcome	Customers connected to the grid – revised CBA	Number	Level	36964 (2015)	38,879	52,792	66,705	80,552	94,153	94,153	
Outcome	*Customers connected to the grid – revised CBA (Residential)*	*Number*	*Level*	*33296 (2015)*							
Outcome	*Customers connected to the grid – revised CBA (Commercial)*	*Number*	*Level*	*3,441 (2015)*							
Outcome	*Customers connected to the grid – revised CBA (Industrial)*	*Number*	*Level*	*0 (2015)*							
Outcome	*Customers connected to the grid – revised CBA (Government)*	*Number*	*Level*	*159 (2015)*							
Outcome	*Customers connected to the grid – revised CBA (Other)*	*Number*	*Level*	*65 (2015)*							
Outcome	*Customers connected to the grid – revised CBA (Unspecified)*	*Number*	*Level*	3 (2015)							
Outcome	*Customers connected to the grid – revised CBA (Single-phase)*	*Number*	*Level*	35531 (2015)	38,149	51,746	65,343	78,940	92,537	92,537	
Outcome	*Customers connected to the grid – revised CBA (Three-phase)*	*Number*	*Level*	1236 (2015)	598	900	1,202	1,450	1,454	1,454	
Outcome	*Customers connected to the grid – revised CBA(CT)*	*Number*	*Level*	197(2015)	132	146	160	162	162	162	

Outcome	System Average Interruption Frequency Index (SAIFI)	Rate	Level	TBD							
Outcome	System Average Interruption Duration Index (SAIDI)	Hours	Level	TBD							
Outcome	Adequacy of supply	Rate	Level (Average)	0.95 (2015)			1.2	1.2	1.2	1.2	
Outcome	Available power plant generation capacity	Megawatts	Level (Average)	11.94 (2015)							
Outcome	Peak demand	Megawatts	Level (Average)	12.6 (2015)							
Outcome	Power plant availability	Percentage	Level	63 (2015)							Targets will not be established per Additional Information in Annex I.
Outcome	*Power plant availability (Mt. Coffee)*	*Percentage*	*Level*	*0 (2015)*			97	97	97	97	
Outcome	*Power plant availability (HFO)*	*Percentage*	*Level*	*0 (2015)*							
Outcome	*Power plant availability (Diesel generators)*	*Percentage*	*Level*	*63 (2015)*							
Outcome	*Power plant availability (Unspecified)*	*Percentage*	*Level*								

Outcome	Electricity tariff	US Dollars	Level	0.52(2015)							Targets are TBD pending a Cost of Service study to occur in Y2 and a determination of whether to establish a target or consider as "N/A" since it is unclear that a single tariff will be "correct" though it might be possible to identify a single point if a suitable range is narrow enough. Determination expected in Y2 or Y3.
Outcome	*Electricity tariff (Residential)*	*US Dollars*	*Level*	*0.52 (2016)*							
Outcome	*Electricity tariff (Commercial)*	*US Dollars*	*Level*	*0.52 (2016)*							
Outcome	*Electricity tariff (Industrial)*	*US Dollars*	*Level*								
Outcome	*Electricity tariff (Government)*	*US Dollars*	*Level*	*0.52 (2016)*							
Outcome	*Electricity tariff (Other)*	*US Dollars*	*Level*	*0.52 (2016)*							
Outcome	*Electricity tariff (Unspecified)*	*US Dollars*	*Level*								
Mt. Coffee Rehabilitation Activity											
Outcome	Share of renewable energy in the country	Percentage	Level	0 (2015)	28	61	57	57	57	57	

Outcome	Installed generation capacity	Megawatts	Level	22 (2015)	79	145	155	155	155	155	
Outcome	*Installed generation capacity (On-grid)*	*Megawatts*	*Level*	*22 (2015)*	*79*	*145*	*155*	*155*	*155*	*155*	
Outcome	*Installed generation capacity (Unspecified)*	*Megawatts*	*Level*								
Outcome	Mt. Coffee Hydropower Plant Capacity Factor	Percentage	Level	0 (2015)		55.6	55.6	55.6	55.6	55.6	
Outcome	Percentage of electricity supplied by Mt. Coffee Hydropower Plant	Percentage	Level	0 (2015)	18	57	57	57	57	57	
Outcome	Percentage of electricity supplied by Mt. Coffee Hydropower Plant – revised CBA	Percentage	Level	0 (2015)	4	69	70	68	66	66	
Output	Generation capacity added	Megawatts	Cumulative	0 (2016)	22	88	88	88	88	88	
Output	*Generation capacity added (On-grid)*	*Megawatts*	*Cumulative*	*0 (2016)*	*22*	*88*	*88*	*88*	*88*	*88*	
Output	Transmission substation capacity added	Megavolt Ampere	Cumulative	0 (2016)	122	122	122	122	122	122	
Output	Kilometers of transmission lines upgraded or built	Kilometers	Cumulative	0 (2016)	24	51	51	51	51	51	
Process	Percent disbursed for Mt. Coffee Hydropower Plant rehabilitation	Percentage	Level	39 (2016)	86	100	100	100	100	100	
Process	Total amount allocated for Mt. Coffee Hydropower Plant rehabilitation	US Dollars	Cumulative	356762257 (2016)	356,762,257	356,762,257	356,762,257	356,762,257	356,762,257	356,762,257	

Process	Value disbursed for Mt. Coffee Hydropower Plant rehabilitation	US Dollars	Cumulative	137924885 (2016)	308,371,500	356,762,257	356,762,257	356,762,257	356,762,257	356,762,257	
Process	Percent disbursed of power infrastructure construction contracts	Percentage	Level	0 (2016)	54	100	100	100	100	100	
Process	Value of signed power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	146,800,000	146,800,000	146,800,000	146,800,000	146,800,000	146,800,000	
Process	Value disbursed of power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	80,000,000	146,800,000	146,800,000	146,800,000	146,800,000	146,800,000	
Mt. Coffee Support Activity											
LEC Training Center Activity											
Outcome	Learner Satisfaction	Number	Level						4	4	
Outcome	Attendance and/or engagement of learners	Percentage	Level						90	90	
Outcome	Assessment pass rate	Percentage	Level						60	60	
Outcome	Degree of achievement of learning outcomes	Percentage	Level						60	60	
Outcome	Change in test scores	Percentage	Level	0					25	25	
Output	Training center consultant hired	Date	Date				16-Mar-18			16-Mar-18	
Output	Operational OTC	Date	Date						3-Nov-20	3-Nov-20	
Output	Training Plan created	Date	Date								
Output	Instructors trained	Number	Cumulative	0					65	65	
Output	Students participating in MCC-supported education activities	Number	Cumulative	0					75	75	

Output	Training System implementation	Date	Date						22-Dec-20	22-Dec-20	
Output	Knowledge Transfer	Date	Date								
Pipeilne Activity											
Outcome	O&M Plan implemented	Date	Date								
Outcome	Leak detection equipment and spare parts delivered	Date	Date								
Outcome	Staff trained	Number	Cumulativ e	0							
Outcome	Electrical connectivity measure	Ratio	Level	0					0	0	
Outcome	Raw water supplied volume	Ratio	Level	10					20	20	
Outcome	Water coming to LWSC through the pipeline	Hours per day	Level	12					18	18	
Outcome	Reduced electricity use for LWSC	KWH	Level						TBD	TBD	
Outcome	Volume of treated water produced	Cubic meters per day	Level	8					16	16	
Outcome	Continuity of service	Hours per day	Level	12					18	18	
Output	Training completed	Date	Date								
Output	Training completed	Date	Date								
Output	Water Points Constructed	Number	Cumulative	0							
Output	Manual is complete	Date	Date								
Output	Training complete	Date	Date								

Output	Staff trained	Date	Date								
Output	O&M Plan launch	Date	Date								
Energy Sector Reform Activity											
Output	LEC customer service center renovated	Date	Date						31-Oct-20	31-Oct-20	
Management Support to LEC Sub-Activity											
Outcome	Aggregate Technical and Commercial Losses	Percentage	Level (Average)	TBD				TBD	TBD	TBD	
Outcome	Commercial Losses	Percentage	Level (Average)	TBD				TBD	TBD	TBD	
Outcome	Maintenance expenditure – asset value ratio	Percentage	Level	0.4 (2015)				2	2	2	
Outcome	Maintenance expenditures	US Dollars	Level	790,000 (2015)				10,275,000	11,491,000	11,491,000	
Outcome	Asset value	US Dollars	Level	202,162,000 (2015)				503,783,000	497,381,000	497,381,000	
Outcome	Operating cost recovery ratio	Percentage	Level (Cumulative)	88 (2015)				64	115	115	
Outcome	Total revenue collected	US Dollars	Level (Cumulative)	18,395,000 (2015)				29,093,000	76,342,000	76,342,000	
Outcome	Collection rate	Percentage	Level	77.4 (2015)				91	98	98	
Outcome	Operating expenses per kWh sold	US Dollars	Level (Average)	0.58 -2015				0.52	0.29	0.29	
Outcome	Operating expenses	US Dollars	Level (Average)	20,909,000 (2015)				45,503,000	66,099,000	66,099,000	

Outcome	Total electricity sold	kWh	Level (Average)	36,278,566 (2015)				127,687,000	140,053,000	140,053,000	
Outcome	New connections added each year	Number	Level (Cumulative)					TBD	TBD	TBD	
Outcome	*New connections added each year (LEC)*	Number	Level (Cumulative)					TBD	TBD	TBD	
Outcome	*New connections added each year (Donor)*	Number	Level (Cumulative)					TBD	TBD	TBD	
Establishment of an Independent Regulator Sub-Activity											
Outcome	LERC management structure established	Date	Date					31-Dec-19		31-Dec-19	
Outcome	LERC officially launched	Date	Date						31-Mar-20	31-Mar-20	
Outcome	LERC inaugural budget approved	Date	Date						30-Mar-20	30-Mar-20	
Outcome	LERC inaugural budget passed into law	Date	Date						30-Sep-20	30-Sep-20	
Outcome	LERC regulatory framework approved	Date	Date						31-Dec-20	31-Dec-20	
Outcome	Dispute resolution procedures approved	Date	Date						31-Dec-20	31-Dec-20	
Outcome	Interim LEC tariffs approved by LERC	Date	Date					30-Nov-19		30-Nov-19	
Outcome	LEC licensed as an electricity operator	Date	Date					31-Dec-19		31-Dec-19	
Outcome	Non-LEC entity licensed as an electricity operator	Date	Date						29-Feb-20	29-Feb-20	
Roads Project											
	Road Sector Reform Activity										
Outcome	Kilometers of primary, secondary, and urban roads maintained	Kilometers	*Cumulative*	*TBD (2016)*							

	Kilometers of primary, secondary, and urban roads maintained (Primary)	Kilometers	*Cumulative*	*TBD (2016)*							
	Kilometers of primary, secondary, and urban roads maintained (Secondary)	Kilometers	*Cumulative*	*TBD (2016)*							
	Kilometers of primary, secondary, and urban roads maintained (Urban)	Kilometers	*Cumulative*	*TBD (2016)*							
Outcome	Share of financial needs for routine maintenance projects met with budget disbursed	Percentage	*Level*	*TBD (2019)*							
Outcome	Share of financial needs for periodic maintenance for PSIPs met with budget disbursed	Percentage	*Level*	*TBD (2019)*							
Outcome	Average response time between start and completion of emergency road maintenance	Days	*Level*	*TBD (2019)*							
Outcome	ARMEP submitted on schedule and approved on time	Number	*Cumulative*	*0*							
Outcome	Emergency planning response time	Days	*Level*	*TBD (2019)*							
Outcome	Road maintenance planning capacity	Number	*Level*	*2.22 (2018)*							

Outcome	*Road maintenance planning capacity (Familiarity)*	Number	*Level*	*2.4 (2018)*							
Outcome	*Road maintenance planning capacity (Perception on use)*	Number	*Level*	*2.3 (2018)*							
Outcome	*Road maintenance planning capacity (Ease)*	Number	*Level*	*2.1 (2018)*							
Outcome	*Road maintenance planning capacity (Capability)*	Number	*Level*	*2.0 (2018)*							
Outcome	*Road maintenance planning capacity (Comfort)*	Number	*Level*	*2.3 (2018)*							
Outcome	First One-Year RMP uses HDM-4 to prioritize periodic road maintenance	Date	*Date*						*1-Jun-20*	*1-Jun-20*	
Outcome	First Five Year RMP uses HDM-4 to prioritize periodic road maintenance	Date	*Date*						*1-Jun-20*	*1-Jun-20*	
Outcome	Share of periodic maintenance projects in One-Year Road Maintenance Program that are budgeted in the ARMEP	Percentage	Level	TBD (2016)							
Outcome	Average score of standardized data collection training participants	Number	Level	0 (2016)							

Outcome	Standardized data collection performed in line with ARMEP	Number	Cumulative	0 (2016)							
Outcome	Average score of adding standardized data training participants to RAMS	Number	Level	0 (2016)							
Outcome	Data uploaded to RAMS according to the RAMS plan	Number	Cumulative	0 (2019)							
Output	GoL staff trained in planning of road network maintenance and improvement decisions	Date	Date								
Output	NRF staff trained in approval of road maintenance projects	Date	Date								
Output	Data collection manuals and traffic counting equipment provided	Date	Date								
Output	GoL staff trained in collecting and adding data to RAMS	Date	Date								
Output	RAMS developed and populated	Date	Date								
Process	Axle Load Control Law passed and signed into law	Date	*Date*		1-Oct-16					1-Oct-16	
Process	Roadway inventory developed	Date	*Date*				31-Dec-17			31-Dec-17	
Process	Traffic counts conducted	Date	*Date*				30-Jun-18			30-Jun-18	
Process	Asset Management Plan developed	Date	*Date*				30-Jun-18			30-Jun-18	

ANNEX III: M&E PLAN MODIFICATIONS

Indicator Changes:

M&E Plan Annex III Indicators History							
Liberia							
Total electricity supply							
December-19	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**
	Revised Targets:	206,550.00	319,070.00	319,070.00	319,070.00	319,070.00	319,070.00
	Previous Targets:	TBD	TBD	TBD	TBD	TBD	TBD
	Justification:	TBD replaced with target					
	Justification Description:	Targets established based on the Energy Project's original CBA in order to track progress.					
Total electricity supply - revised CBA							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
		48,975.00			62,039.00		
	Justification:	Corrections to erroneous data					
	Justification Description:	Baseline value was updated to reflect the total electricity supplied for calendar year 2015. These data bec ame available after a validation exercise was completed by Tetra Tech in 2018 and are more accurate than the previous baseline value, which aggregated supply between July 2014 and June 2015.					
Total electricity sold							
Project:	1. Energy Sector Project						

Activity:							
Sub-Activity:							
December-19	**Change Description:**	**New Indicator**					
	Justification:	Relevant due to ERR recalculation					
	Justification Description:	This indicator will track progress against revised CBA projections that reflect delays in making LEC connect ions.					
December-19	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**

	Revised Targets:	128,480.00	198,460.00	198,460.00	198,460.00	198,460.00	198,460.00
	Previous Targets:	TBD	TBD	TBD	TBD	289,396.00	289,396.00
	Justification:	TBD replaced with target					
	Justification Description:	Targets and disaggregations established and/or revised based on the Project's cost-benefit analysis (CBA) model. The original Y5 target was calculated by multiplying the amount of electricity supplied, as forecast in the CBA, by the tarif f rate. However, this was incorrect because it did not first account for commercial losses, which are technically not "sold," though t hey are consumed. The revised target accounts for commercial losses. New disaggregations have been added for single-phase, thr ee-phase, and CT customers to align with the customer categories tracked in the CBA. These disaggregations sum to the tot al but do not map neatly to the residential, commercial, industrial, government, and other customer categories as tracked by LEC.					
Total electricity sold							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
		36,956.00			37,464.00		
	Justification:	Corrections to erroneous data					
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.					
Total electricity sold (Residential)							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
		17,430.00			19,237.00		
	Justification:	Corrections to erroneous data					

	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.

Total electricity sold (Commercial)				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				
December-19	**Change Description:**	**Baseline Modification**		
	Change:	Previous	Revised	
		8,656.00	9,065.00	
	Justification:	Corrections to erroneous data		
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.		
Total electricity sold (Government)				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				
December-19	**Change Description:**	**Baseline Modification**		
	Change:	Previous	Revised	
		8,592.00	7,806.00	
	Justification:	Corrections to erroneous data		
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.		
Total electricity sold (Other)				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				
December-19	**Change Description:**	**Baseline Modification**		

	Change:	Previous	Revised
		2,255.00	1,294.00
	Justification:	Corrections to erroneous data	

	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.					
Total electricity sold (Unspecified)							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
					62.00		
	Justification:	Corrections to erroneous data					
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.					
Total electricity sold - revised CBA							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**New Indicator**					
	Justification:	Relevant due to ERR recalculation					
	Justification Description:	This indicator will track progress against revised CBA projections that reflect delays in connecting LEC cust omers.					
Percentage of households connected to the national grid							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
Current Version	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**

	Revised Targets:						
	Previous Targets:	TBD	TBD	TBD	TBD	TBD	TBD
	Justification:	TBD replaced with target					

	Justification Description:			
Customers connected to the grid				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				
December-19	**Change Description:**	**Baseline Modification**		
	Change:	Previous	Revised	
		34,231.00	36,964.00	
	Justification:	Corrections to erroneous data		
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.		
Customers connected to the grid (Residential)				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				
December-19	**Change Description:**	**Baseline Modification**		
	Change:	Previous	Revised	
		30,475.00	33,296.00	
	Justification:	Corrections to erroneous data		
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.		
Customers connected to the grid (Commercial)				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				

December-19	**Change Description:**	**Baseline Modification**	
	Change:	Previous	Revised
		3,534.00	3,441.00

	Justification:	Corrections to erroneous data	
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.	
Customers connected to the grid (Government)			
Project:	1. Energy Sector Project		
Activity:			
Sub-Activity:			
December-19	**Change Description:**	**Baseline Modification**	
	Change:	Previous	Revised
		158.00	159.00
	Justification:	Corrections to erroneous data	
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.	
Customers connected to the grid (Other)			
Project:	1. Energy Sector Project		
Activity:			
Sub-Activity:			
December-19	**Change Description:**	**Baseline Modification**	
	Change:	Previous	Revised
		64.00	65.00
	Justification:	Corrections to erroneous data	
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.	
Customers connected to the grid (Unspecified)			
Project:	1. Energy Sector Project		

Activity:	
Sub-Activity:	

December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
					3.00		
	Justification:	Corrections to erroneous data					
	Justification Description:	Revised baseline values are considered more accurate because they are based on a data validation exercis e completed by Tetra Tech in 2018. Additional baselines recorded for the newly-added disaggregations.					
Customers connected to the grid - revised CBA							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**New Indicator**					
	Justification:	Relevant due to ERR recalculation					
	Justification Description:	This indicator will track progress against revised CBA projections that reflect delays in making LEC connect ions.					
Customers connected to the grid - revised CBA (CT)							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**
	Revised Targets:				TBD	TBD	TBD
	Previous Targets:						
	Justification:	Program, Project or Activity scope change					
	Justification Description:	Given the MSC's responsibility for operating LEC efficiently, SAIFI now represents a performance indicator rather than a contextual indicator and targets will help assess whether the Compact is on track to accomplish part of the Energy Pr oject objective.					
System Average Interruption Frequency Index (SAIFI)							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							

December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
		25.10			TBD		
	Justification:	Program, Project or Activity scope change					
	Justification Description:	Baseline changed to TBD because (1) the previous quarterly value is no longer relevant, and (2) a re-baseli ning and target-setting effort is expected in connection with the MSC contract, and those values will be incorporated into the M& E Plan.					
Current Version	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**
	Revised Targets:						
	Previous Targets:				TBD	TBD	TBD
	Justification:	TBD replaced with target					
	Justification Description:						
	Justification Description:						
System Average Interruption Duration Index (SAIDI)							
Project:	1. Energy Sector Project						
Activity:							
Sub-Activity:							
December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
		109.50			TBD		
	Justification:	Program, Project or Activity scope change					
	Justification Description:	Baseline changed to TBD because (1) the previous quarterly value is no longer relevant, and (2) a re-baseli ning and target-setting effort is expected in connection with the MSC contract, and those values will be incorporated into the M& E Plan.					
December-19	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**
	Revised Targets:				TBD	TBD	TBD

	Previous Targets:						
	Justification:	Program, Project or Activity scope change					

	Justification Description:	Given the MSC's responsibility for operating LEC efficiently, SAIDI now represents a performance indicator rather than a contextual indicator and targets will help assess whether the Compact is on track to accomplish part of the Energy Pr oject objective.		
Adequacy of supply				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				
December-19	**Change Description:**	**Baseline Modification**		
	Change:	Previous	Revised	
		0.96	0.95	
	Justification:	Corrections to erroneous data		
	Justification Description:			
Available power plant generation capacity				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				
December-19	**Change Description:**	**Baseline Modification**		
	Change:	Previous	Revised	
		10,194.00	11.94	
	Justification:	Corrections to erroneous data		
	Justification Description:	Change baseline value to reflect the revised definition.		
Peak demand				
Project:	1. Energy Sector Project			
Activity:				
Sub-Activity:				

December-19	**Change Description:**	**Baseline Modification**	
	Change:	Previous	Revised
		10,657.00	12.60

	Justification:	Corrections to erroneous data	
	Justification Description:	The baseline had to be corrected from MWh to MW and from a quarterly average to the monthly value th at yields the lowest adequacy of supply. The baseline value represents peak demand for March 2015, which was the month in 2015 with the lowest calculated adequacy of supply.	
Training center consultant hired			
Project:	1. Energy Sector Project		
Activity:			
Sub-Activity:			
Current Version	**Change Description:**	**New Indicator**	
	Justification:	New issues emerged, suggesting importance of a new indicator	
	Justification Description:		
Share of renewable energy in the country			
Project:	1. Energy Sector Project		
Activity:	1.1 Mt. Coffee Support Activity		
Sub-Activity:			
December-19	**Change Description:**	**Baseline Modification**	
	Change:	Previous	Revised
		0.30	0.00
	Justification:	New information, approved by MCC, on existing or new variables emerges	
	Justification Description:	The denominator for this indicator is intended to capture all generation capacity in the country. However, there is a significant but unknown amount of off-grid private electricity generation capacity in Liberia. The indicator previously incl uded off-grid renewable capacity managed by RREA, which is very small, and dilutes the indicator unnecessarily. In order to increas e the indicator's accuracy and better document the significance of Mt. Coffee to LEC's generation capacity, the indicator will only ref er to on-grid capacity, both in the numerator and denominator. The baseline value was updated to reflect this change.	
Installed generation capacity			
Project:	1. Energy Sector Project		

Activity:	1.1 Mt. Coffee Support Activity
Sub-Activity:	

December-19	**Change Description:**	**Baseline Modification**					
	Change:	Previous			Revised		
		22.06			22.00		
	Justification:	New information, approved by MCC, on existing or new variables emerges					
	Justification Description:	There is a significant but unknown amount of off-grid private electricity generation capacity in Liberia, whi ch complicates the reporting for this indicator, which is intended to capture all generation capacity in the country. In order to increase the indicator's accuracy, this will only refer to on-grid capacity.					
December-19	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**
	Revised Targets:	79.00	145.00	155.00	155.00	155.00	155.00
	Previous Targets:	79.06	145.06	155.06	155.06	155.06	155.06
	Justification:	Change maintains integrity of ERR					
	Justification Description:	Per the explanation above, these targets account for on-grid generation capacity only, and excludes a 10M W project that has not come to fruition.					
Percentage of electricity supplied by Mt. Coffee Hydropower Plant							
Project:	1. Energy Sector Project						
Activity:	1.1 Mt. Coffee Support Activity						
Sub-Activity:							
December-19	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**
	Revised Targets:	18.00	57.00	57.00	57.00	57.00	57.00
	Previous Targets:						
	Justification:	TBD replaced with target					
	Justification Description:	Targets were not originally identified for this indicator given all of the different factors that affect it. Howe ver, as a parameter in the CBA, targets have been defined in order to compare performance on this indicator to the assumptions use d in the CBA.					
Percentage of electricity supplied by Mt. Coffee Hydropower Plant - revised CBA							
Project:	1. Energy Sector Project						

Activity:	1.1 Mt. Coffee Support Activity
Sub-Activity:	

December-19	**Change Description:**	**New Indicator**					
	Justification:	Relevant due to ERR recalculation					
	Justification Description:	This indicator will track progress against revised CBA projections that reflect delays in making LEC connect ions.					
Transmission substation capacity added							
Project:	1. Energy Sector Project						
Activity:	1.1 Mt. Coffee Support Activity						
Sub-Activity:							
December-19	**Change Description:**	**Target Modification**					
		Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**End of Compact**
	Revised Targets:	122.00	122.00	122.00	122.00	122.00	122.00
	Previous Targets:	200.00	200.00	200.00	200.00	200.00	200.00
	Justification:	Corrections to erroneous data					
	Justification Description:	Initial targets for this indicator were based on an erroneous source. MCHPP has four turbines, each of whi ch will connect to a substation with 28 MVA of capacity, with another 10 MVA being installed for auxiliary purposes. As a resul t, the revised target for this indicator is 122 MVA rather than 200 MVA.					
O&M plan implemented							
Project:	1. Energy Sector Project						
Activity:	1.1 Mt. Coffee Support Activity						
Sub-Activity:	Water Pipeline Sub-Activity						
Current Version	**Change Description:**	**New Indicator**					
	Justification:	New issues emerged, suggesting importance of a new indicator					
	Justification Description:						
Electrical connectivity measure							
Project:	1. Energy Sector Project						
Activity:	1.1 Mt. Coffee Support Activity						
Sub-Activity:	Water Pipeline Sub-Activity						

Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator

	Justification Description:	
Raw water supplied volume		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Water coming to LWSC through the pipeline		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Reduced electricity use for LWSC		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	

Volume of treated water produced	
Project:	1. Energy Sector Project
Activity:	1.1 Mt. Coffee Support Activity
Sub-Activity:	Water Pipeline Sub-Activity

Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Continuity of service		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Individual staff trained		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Leak detection equipment and spare parts delivered		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Water points constructed		

Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Manual is complete		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Training complete		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Staff trained		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	

Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	

O&M plan launch		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Training completed		
Project:	1. Energy Sector Project	
Activity:	1.1 Mt. Coffee Support Activity	
Sub-Activity:	Water Pipeline Sub-Activity	
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Learner satisfaction		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Attendance and/or engagement of learners		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		

Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Assessment pass rate		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Degree of achievement of learning outcomes		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Change in test scores		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	

Training Center consultant	
Project:	1. Energy Sector Project

Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Operational OTC		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Training plan		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Instructors trained		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		

Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	

Students participating in MCC-supported education activities		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Training system implementation		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Knowledge transfer		
Project:	1. Energy Sector Project	
Activity:	1.2 LEC Training Center Activity	
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Aggregate technical and commercial losses		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		

December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator tracks all technical and commercial losses, which is a performance indicator that reflects the MSC's ability to manage the LEC network efficiently.
Commercial losses		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator tracks all commercial losses, which is an MCC Common indicators and reflects the MSC's abi lity to manage the LEC network efficiently.
New connections added each year		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator is a Key Performance Indicator under the MSC contract and maps directly to bonus payments, and therefore presents a different perspective on customer connections than customers connected to the grid.
Maintenance expenditure-asset value ratio		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		

December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria

	Justification Description:	This is an MCC Common Indicator that gives an indication of whether the utility is conducting appropriate preventative, operational, or corrective maintenance to existing assets.
Operating cost-recovery ratio		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This is an MCC Common Indicator that gives an indication of the economic sustainability of the utility over time but this is based in collection.
Collection rate		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Operating expenses per kWh sold		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria

	Justification Description:	Added to align with a Key Performance Indicator in the Management Services Contractor's (MSC) contract, and establish targets against which to track performance. This indicator gives an indication of the economic sustainability of the utility over time, and when compared to the value of the average tariff rate, it indicates whether the utility is operating at a profit or a loss.

Operating expenses		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	Input to an indicator that was added to align with a Key Performance Indicator in the Management Servic es Contractor's (MSC) contract, and establish targets against which to track performance.
Totall electricity sold (kWh)		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	Input to an indicator that was added to align with a Key Performance Indicator in the Management Servic es Contractor's (MSC) contract, and establish targets against which to track performance.
LERC management structure established		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.

LERC officially launched	
Project:	1. Energy Sector Project
Activity:	1.3 Energy Sector Reform Activity
Sub-Activity:	

December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.
LERC inaugural budget approved		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.
LERC inaugural budget passed into law		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.
LERC regulatory framework approved		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.
Dispute resolution procedures approved		

Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.
Interim LEC tariffs approved by LERC		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.
LEC licensed as an electricity operator		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.
Non-LEC entity licensed as an electricity operator		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		

December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward establishing a fully functional independent regulator.

LEC customer service center renovated		
Project:	1. Energy Sector Project	
Activity:	1.3 Energy Sector Reform Activity	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator will track progress toward upgrading LEC's customer service capacity
Percentage of households in LEC service area connected to the national grid		
Project:	1. Energy Sector Project	
Activity:	Mt. Coffee Rehabilitation Activity - 0086	
Sub-Activity:		
December-19	**Change Description:**	**Indicator Retired**
	Justification:	Indicator quality is determined poorer than initially thought when included in plan
	Justification Description:	Because LEC has primarily operated in and around Monrovia, electrification rates are frequently provided for both the entire country, and separately for the Monrovia area. Therefore, the M&E Plan attempted to report on both metrics. However, the reference to the "LEC service area" in the title implies that the entire country is not LEC's service area and therefore is misleading and inappropriate for including in the plan.
Households in LEC service area that have legal connections to electricity service from LEC		
Project:	1. Energy Sector Project	
Activity:	Mt. Coffee Rehabilitation Activity - 0086	
Sub-Activity:		
December-19	**Change Description:**	**Indicator Retired**
	Justification:	Indicator quality is determined poorer than initially thought when included in plan

	Justification Description:	Because LEC has primarily operated in and around Monrovia, electrification rates are frequently provided for both the entire country, and separately for the Monrovia area. Therefore, the M&E Plan attempted to report on both metrics. However, the reference to the "LEC service area" in the title implies that the entire country is not LEC's service area and therefore is misleading and inappropriate for including in the plan.

Total number of households in LEC service area		
Project:	1. Energy Sector Project	
Activity:	Mt. Coffee Rehabilitation Activity - 0086	
Sub-Activity:		
December-19	**Change Description:**	**Indicator Retired**
	Justification:	Indicator quality is determined poorer than initially thought when included in plan
	Justification Description:	Because LEC has primarily operated in and around Monrovia, electrification rates are frequently provided for both the entire country, and separately for the Monrovia area. Therefore, the M&E Plan attempted to report on both metrics. However, the reference to the "LEC service area" in the title implies that the entire country is not LEC's service area and therefore is misleading and inappropriate for including in the plan.
Power plant availability		
Project:	1. Energy Sector Project	
Activity:	Mt. Coffee Rehabilitation Activity - 0086	
Sub-Activity:		
December-19	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	This indicator was created to replace a similar version of the indicator where the children summed up to the parent indicator. In this case, the parent is an average of the children, which more accurately represents how this indicator is calculated.
Kilometers of primary, secondary, and urban roads maintained		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	

Percentage of road network in good or fair condition	
Project:	2. Roads Project

Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Irrelevant due to change in Program, Project or Activity scope
	Justification Description:	
Road segments in good or fair condition		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Irrelevant due to change in Program, Project or Activity scope
	Justification Description:	
Road segments in good or fair condition (Good)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Irrelevant due to change in Program, Project or Activity scope
	Justification Description:	
Road segments in good or fair condition (Fair)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Irrelevant due to change in Program, Project or Activity scope
	Justification Description:	

Road segments in good or fair condition (Unspecified)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Irrelevant due to change in Program, Project or Activity scope
	Justification Description:	
Road segments in Liberia's road network		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Irrelevant due to change in Program, Project or Activity scope
	Justification Description:	
Percentage of roads maintained according to the annual maintenance plans developed under the Compact		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Share of financial needs for routine maintenance projects met with budget disbursed		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	

Kilometers receiving periodic maintenance according to the annual maintenance plans developed under the Compact	
Project:	2. Roads Project
Activity:	
Sub-Activity:	

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Kilometers receiving periodic maintenance according to the annual maintenance plans developed under the Compact (Primary)	
Project:	2. Roads Project
Activity:	
Sub-Activity:	

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Kilometers receiving periodic maintenance according to the annual maintenance plans developed under the Compact (Secondary)	
Project:	2. Roads Project
Activity:	
Sub-Activity:	

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Kilometers receiving periodic maintenance according to the annual maintenance plans developed under the Compact (Feeder roads)	
Project:	2. Roads Project

Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Kilometers receiving periodic maintenance according to the annual maintenance plans developed under the Compact (Unspecified)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Share of financial needs for periodic maintenance for PSIPs met with budget disbursed		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Average response time between start and completion of emergency road maintenance		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	

Kilometers that need periodic maintenance according to the annual maintenance plans developed under the Compact		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Kilometers that need periodic maintenance according to the annual maintenance plans developed under the Compact (Primary)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Kilometers that need periodic maintenance according to the annual maintenance plans developed under the Compact (Secondary)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Kilometers that need periodic maintenance according to the annual maintenance plans developed under the Compact (Feeder roads)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Kilometers that need periodic maintenance according to the annual maintenance plans developed under the Compact (Unspecified)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
ARMEP submitted on schedule and approved on time		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Expenditures on road maintenance		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Expenditures on road maintenance (Primary)	
Project:	2. Roads Project

Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Expenditures on road maintenance (Secondary)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Expenditures on road maintenance (Feeder roads)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Expenditures on road maintenance (Unspecified)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Expenditures on road maintenance (Emergency)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Expenditures on road maintenance (Routine)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Expenditures on road maintenance (Periodic)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Emergency planning response time		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Percentage of periodic maintenance projects completed on time		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Percentage of periodic maintenance projects completed on time (Secondary)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Percentage of periodic maintenance projects completed on time (Primary)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Percentage of periodic maintenance projects completed on time (Feeder roads)	
Project:	2. Roads Project

Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Road maintenance planning capacity		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Variance of amount paid for periodic maintenance projects from original contract cost		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Variance of amount paid for periodic maintenance projects from original contract cost (Primary)		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Variance of amount paid for periodic maintenance projects from original contract cost (Secondary)			
Project:	2. Roads Project		
Activity:			
Sub-Activity:			
Current Version	**Change Description:**	**Indicator Retired**	
	Justification:	Indicator has been added which is superior in measuring same variable	
	Justification Description:		
Variance of amount paid for periodic maintenance projects from original contract cost (Feeder roads)			
Project:	2. Roads Project		
Activity:			
Sub-Activity:			
Current Version	**Change Description:**	**Indicator Retired**	
	Justification:	Indicator has been added which is superior in measuring same variable	
	Justification Description:		
First One-Year RMP uses HDM-4 to prioritize periodic road maintenance			
Project:	2. Roads Project		
Activity:			
Sub-Activity:			
Current Version	**Change Description:**	**New Indicator**	
	Justification:	Existing indicators do not sufficently meet adequacy criteria	
	Justification Description:		
First Five Year RMP uses HDM-4 to prioritize periodic road maintenance			
Project:	2. Roads Project		
Activity:			
Sub-Activity:			

Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Share of periodic maintenance projects in One-Year Road Maintenance Program that are budgeted in the ARMEP		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Average score of standardized data collection training participants		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Standardized data collection performed in line with ARMEP		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	

Average score of adding standardized data training participants to RAMS	
Project:	2. Roads Project

Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
Data uploaded to RAMS according to the RAMS plan		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
GoL staff trained in planning of road network maintenance and improvement decisions		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	Existing indicators do not sufficently meet adequacy criteria
	Justification Description:	
NRF staff trained in approval of road maintenance projects		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	

Data collection manuals and traffic counting equipment provided		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
GoL staff trained in collecting and adding data to RAMS		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
RAMS developed and populated		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**New Indicator**
	Justification:	New issues emerged, suggesting importance of a new indicator
	Justification Description:	
Road Fund operational		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Road Fund passed and signed into law		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Agreement with Volpe for implementation signed		
Project:	2. Roads Project	
Activity:		
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Funds provided to the Road Fund		
Project:	2. Roads Project	
Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Funds provided to the Road Fund (Government appropriations)	
Project:	2. Roads Project

Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Funds provided to the Road Fund (Grants and loans)		
Project:	2. Roads Project	
Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Funds provided to the Road Fund (Road user charges)		
Project:	2. Roads Project	
Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Funds provided to the Road Fund (Unspecified)		
Project:	2. Roads Project	
Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	

Percentage of relevant positions that are occupied by a trained staff member		
Project:	2. Roads Project	
Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Percentage of relevant positions that are occupied by a trained staff member		
Project:	2. Roads Project	
Activity:	2.2 Roads Sector Reform Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Matching funds for road maintenance provided by MCC		
Project:	2. Roads Project	
Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Pilot road maintenance centers operational		
Project:	2. Roads Project	
Activity:	2.1 National Roads Maintenance Activity	
Sub-Activity:		

Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	
Road Maintenance Management System accepted		
Project:	2. Roads Project	
Activity:	2.2 Roads Sector Reform Activity	
Sub-Activity:		
Current Version	**Change Description:**	**Indicator Retired**
	Justification:	Indicator has been added which is superior in measuring same variable
	Justification Description:	