Final Report

Liberia Energy Project: Evaluation Design for the Liberia Electricity Corporation Training Activity

December 2, 2020
Updated January 21, 2021

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Contents

Tables

Figures

Abbreviations

FGD	Focus group discussion
IRB	Institutional Review Board
KII	Key informant interview
LEC	Liberia Electricity Corporation
MCA-L	Millennium Challenge Account–Liberia
MCC	Millennium Challenge Corporation
MCHPP	Mt. Coffee Hydropower Plant

I. Introduction

Liberia's long civil war from 1989 to 2003, followed by widespread looting, resulted in the destruction of the Mt. Coffee Hydropower Plant (MCHPP)—the country's largest source of electricity before 1989—and the entire transmission and distribution network. This significantly reduced Liberia's electricity generation capacity, from a peak of 191 megawatts in 1989 to 23 megawatts in 2016. In addition to the destruction of electricity infrastructure, the Liberia Electricity Corporation (LEC), the state-run electricity utility, lost a significant amount of technical and management capacity.

In 2015, the Millennium Challenge Corporation (MCC) partnered with the Government of Liberia to increase electricity access, improve the quality and reliability of electricity supply, and ultimately reduce poverty through economic growth. MCC's compact with the Government of Liberia for the $202 million Liberia Energy Project includes four separate activities to address the challenges facing Liberia's power sector:

- **Activity 1:** The **Mt. Coffee Rehabilitation Activity**, which has repaired and expanded the MCHPP, providing an installed generation capacity of 88 megawatts
- **Activity 2:** The **Capacity Building and Sector Reform Activity**, which will support the creation of an independent regulatory agency; provide management oversight to the Liberia Electricity Corporation (LEC); and strengthen the capacity of LEC and, potentially, Liberia's Environmental Protection Agency
- **Activity 3:** The **Mt. Coffee Support Activity**, which addresses environmental and social risks associated with the rehabilitation of MCHPP and aims to increase productive uses of electricity
- **Activity 4:** The **LEC Training Activity**, which aims to improve the technical capacity of the energy sector workforce through improved training for LEC staff and technicians

In 2018, MCC contracted Mathematica to conduct impact and performance evaluations of the Liberia Energy Project. This report describes Mathematica's evaluation design for Activity 4—the LEC Training Activity. The estimated cost of the activity was $5.58 million. MCC reduced the scope of this activity from its original plans, given LEC's financial status and because of the limited time available for implementation of the activity, which began in 2020 and is scheduled to end in January 2021. The proposed evaluation design is aligned with the revised scope of the activity.

II. Overview of the LEC Training Activity

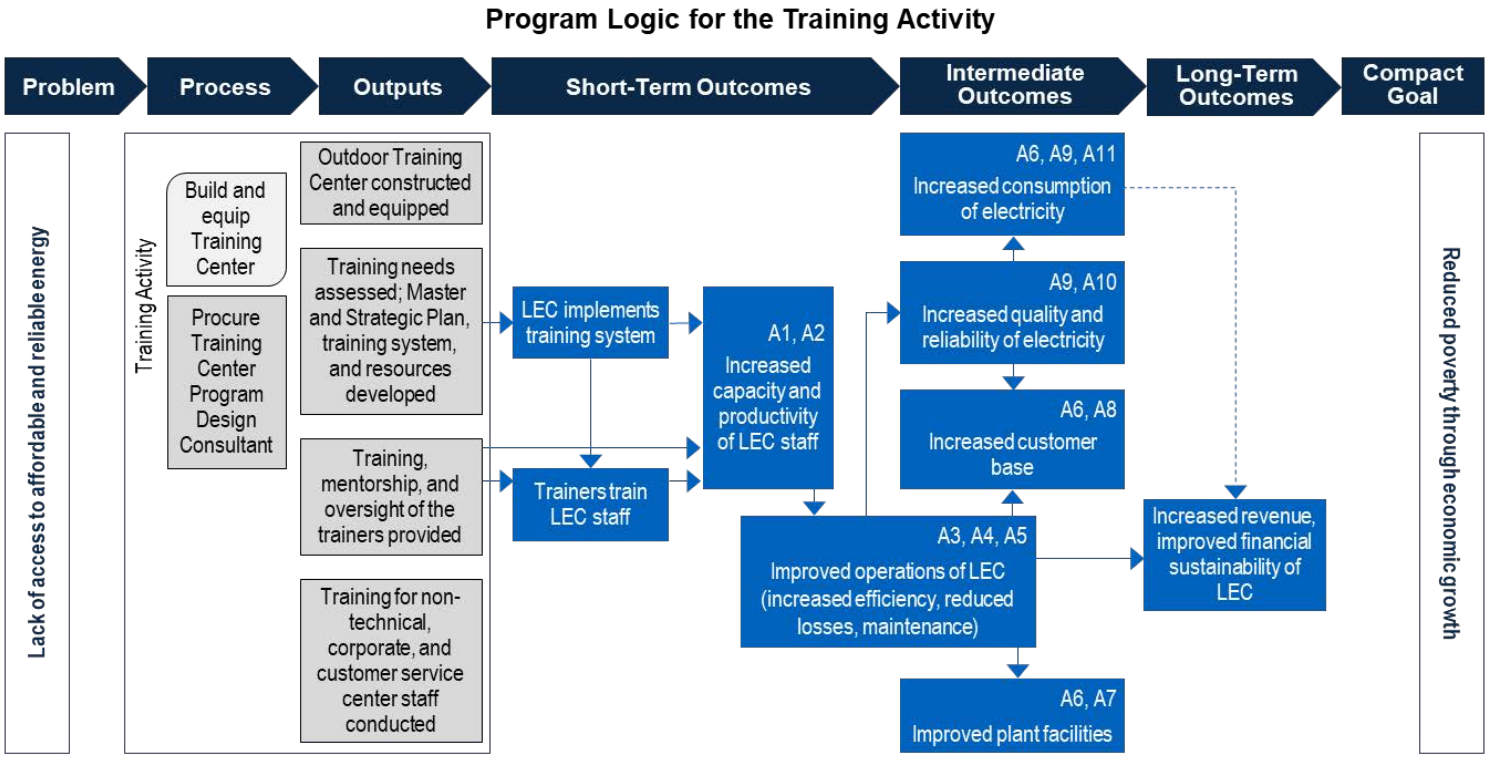
A. Background and theory of change

The Training Activity reflects Liberia's need to bolster LEC's capacity so that staff have the technical, operational, and commercial skills necessary to effectively execute the utility's operations and expand the grid infrastructure. Currently, LEC's workforce lacks the skills necessary to adequately perform essential utility functions. The LEC Training Activity aims to reduce this deficiency by strengthening the skills and capacity of LEC staff.

MCC's program logic for the LEC Training Activity includes the following outputs: constructing and equipping an outdoor training facility, assessing LEC's needs and developing training curriculum, identifying and training the trainers, and the training of staff (Figure 1). In the short term, these outputs are expected to lead to increased skills and capacity among the LEC workforce and improved utility performance. The intermediate outcomes in the program logic indicate that investments are expected to bolster LEC's grid management capacity, leading to improved facilities, improved electricity quality and reliability, increased access and connectivity among the population under the grid, and increased consumption of electricity among end users. In the long term, these outputs could in turn increase revenue and bolster LEC's financial sustainability.

The program logic has inherent assumptions about the functionality of LEC, the broader energy sector, and the overall political economy in Liberia, and it assumes these factors will not undermine the activity. For example, for training of trainers and wider workforce training to take place, LEC must be able to identify staff with sufficient time and expertise. This may be challenging given that key LEC staff have high workloads and may have to prioritize technical work over training. LEC's current fiscal constraints might also interfere with the Training Activity. For example, the reduction in LEC staff salaries could undermine enthusiasm for training. At the same time, many factors other than skills affect the overall performance of workers and the utility, and any impact on outcomes is dependent on these factors that are beyond the scope of training, such as performance incentives and the equipment available to do utility work. Further, in the broader energy sector, competing demands for resources and skilled staff could also weaken the activity if trained staff are hired by contractors for other donor-funded projects such as the new Transco Côte d'Ivoire, Liberia, Sierra Leone, Guinea (CLSG) power project. Finally, the political economy in Liberia is such that public services are underfunded. Morale among public sector employees in Liberia in general, and at LEC in particular, is low given high rates of corruption, unpaid salaries in the public sector, and poor public services. These issues could all further destabilize the LEC Training Activity.

Figure 1. Logic model for the LEC Training Activity



A1-There is sufficient staff capacity and continuity in order to accomplish MSC capacity building objectives. Increased capacity is sustained after MSC ends.
A2-Training of trainers system is effective.
A3-LEC has the capacity and resources to manage it operations effectively and efficiently, including reducing losses, increasing collections, and performing routing maintenance; LERC standards are effective.
A4-Project outputs will result in appreciable improvement in customer service practices; LEC is willing and able to address customer complaints. Customer willingness to pay increases.
A5-The MSC is able to effect long-term change in LEC operations and stakeholders with interest and influence support these changes.
A6-LEC increases ability to make customer connections. New customers can afford to pay for electricity; LEC can accommodate increased energy demand during dry season.
A7-Increased generation capacity and the planned T&D investments are capable of increasing the quality and reliability of electricity.
A8-LEC has sufficient manpower, skill, materials, and operational capacity to respond to user requests for connections.
A9-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.
A10-LEC has the ability and resources to ensure compliance.
A11-Customers pay for the electricity they consume.

Source: MCC

B. Literature review

Power utilities in developing countries tend to struggle with high costs, unreliable supply, inadequate expansion of access, and low quality of service (Bacon 2018). This poor performance is thought to be due in part to the poor quality of the workforce and overstaffing (Gómez-Ibáñez 2007). In response, donors have often incorporated training and technical assistance to build the internal capacity of utilities as part of their assistance. Yet despite the popularity of such training interventions at public utilities, their effect on utility performance is not well understood. While measuring trainees' retention of information and skills is relatively easy to do, it is more difficult to determine how that information affects their decision making and productive output.

Nevertheless, the evidence on the benefits of technical assistance for public utilities shows that training can improve performance, at least under certain circumstances. This evidence is based primarily on evaluations of water utilities and on self-reported indicators of job performance. In a review of case studies of public water utilities, researchers found that training programs can be effective at boosting productivity, but this effect is mediated by the presence (or absence) of internal accountability measures (for example, performance reviews, performance incentives). Among the utilities considered, the level of investment in training programs ranged from .06 to 3 percent of annual operating budgets (Baietti et al. 2006). In another study, survey data from the public water utility of Tanzania showed that training was strongly associated with employee performance across a host of self-reported measures (Karia et al. 2016). Similar results were found for public utilities in Ghana (Mensah 2014). Taken together, these findings suggest that there are credible benefits to training programs at public utilities even if the causal mechanism is not completely clear.

Gómez-Ibáñez (2007) discusses several pitfalls to avoid when implementing a training program at a public utility in a developing country. The study noted that training programs in the past have often focused on imparting specialized tools and technical competencies; however, whereas these may have been necessary to achieve significant performance improvements, they are rarely sufficient to overcome obstacles that stem from structural and organizational inefficiencies, which tend to respond better to training regimens tailored particularly to the needs of the organization. In addition, some interventions have sought to remedy organizational inefficiencies by importing training curricula from developed countries; these have generally failed. Particularly problematic are curricula that deal with cultural norms around individual and group responsibility and navigating the relationship between politicians and civil servants. The study also emphasized that interventions need to look beyond training in order to be successful and tackle a broader set of organizational reforms.

Our evaluation of the LEC Training Activity will contribute to addressing some of the gaps in the literature. In particular, the proposed qualitative implementation and performance evaluation will provide useful evidence on the effects of technical assistance in the context of a public power utility. Our evaluation will not only add to the overall evidence base, but also will be useful in guiding LEC management, Liberian policymakers, and donors, all of whom want to ensure the sustainability of the MCHPP infrastructure and improved management practices after the end of the compact. We also hope to identify additional learnings for MCC about the challenges of engaging in training activities to help improve operations and to maximize the benefits from the compact's investments in the power sector.

C. LEC Training Activity design and implementation

The LEC Training Activity will apply a train-the-trainer model and will use the facilities available at LEC and MCHPP. LEC will identify employees who will be trained as trainers and will subsequently provide on-the-job training to other LEC staff. The activity also includes the procurement of tools and equipment for training and support for curriculum development. The on-the-job training will focus on technical skills for LEC's engineers and linesmen, and skills related to sales, utility operations, revenue mobilization, and inventory control. Training will also touch upon non-technical skills related to management, occupational health and safety, and customer service. Altogether, the LEC Training Activity is expected to yield a better prepared workforce, able to improve Liberia's electricity quality and reliability, better manage the LEC grid infrastructure, and make more grid connections to help meet Liberia's electricity demand.

Millennium Challenge Account–Liberia (MCA-L) has contracted with the Tata group, a firm based in India, as a utility training consultant to provide technical assistance and capacity strengthening (through the training of trainers) for the establishment and implementation of the on-the-job training and assessment model. Deliverables include training needs assessments and feasibility studies, training manuals and curricula, specifications for tools and equipment, and a crosswalk between LEC job roles and their associated skills and competencies with the training and resources needed to support skill development. Another key deliverable is a set of clearly defined performance evaluation metrics for the activity. Our understanding of the current state of implementation is as follows:

- The construction of the outdoor training facility is underway, though smaller in scale than the original vision. MCA-L has purchased the tools and equipment for LEC training purposes.
- The training of trainers began in September 2020 and will last through the end of the year. Because of the COVID-19 pandemic, training has been delivered remotely online.
- On-the-job training of the LEC workforce should begin in earnest in early 2021 and will take place in person and online at LEC's Bushrod and Waterside facilities. Tata will provide general capacity building for staff and continued mentoring support to trained trainers during a first round of trainings to occur in late 2020.

III. Evaluation Design

We propose an evaluation design that enables us to answer the key evaluation questions about the LEC Training Activity.

A. Evaluation questions and methodology

In Table 1, we list the evaluation questions, summarize our proposed approach to answering them, and outline the data sources that we will use to address each question.

Table 1: Overview of evaluation questions, evaluation methodology, and data sources

Evaluation questions[a]	**1.** How is the LEC Training Activity functioning in practice? How effective is the LEC Training Activity at training LEC staff? **2.** To what extent is the LEC Training Activity meeting skill needs at LEC both in terms of the number of people trained and the quality and relevance of skills provided? **3.** 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?
Evaluation methodology	Performance evaluation in the form of a qualitative study to assess implementation and performance over time
Data sources	• Document review • Site visit to observe training operations • Key informant interview (KIIs) with MCC, MCA-L, training consultants, LEC management, LEC trainers, and other LEC staff; also telephone interviews with stakeholders at regional centers of excellence to compare their approach with LEC's efforts • Focus group discussions (FGDs) with LEC staff trainees
Exposure period	We expect that LEC staff trained as trainers should acquire skills within three months of training and that LEC trainees should acquire skills within three to six months of general capacity building and on-the-job training. We expect training processes to be sustained after the end of the compact.[b]

Source: Mathematica

[a]The evaluation questions have been updated based on conversations with MCC in September 2020 about the revised approach to the Training Activity. Two questions that were in the original scope of the study have been dropped: "What training content can be provided domestically and what should be obtained outside of Liberia?" and "Was the LEC Training Activity business plan sound and was the activity launched in time for processes to be engrained?" The first question is no longer relevant because the activity will no longer bring expertise from abroad as originally envisioned in the master plan. For the second question, the business plan evolved into the master and strategic plan; the evaluation question is therefore redundant to question 3 and so is being excluded.

[b] MCC did not articulated an expected timeframe for results, nor were the training activity's expected benefits modeled in a cost-benefit analysis. Therefore, this exposure period is based on the evaluator's review of the literature and the activity's design.

B. Evaluation methodology, data sources, and timing

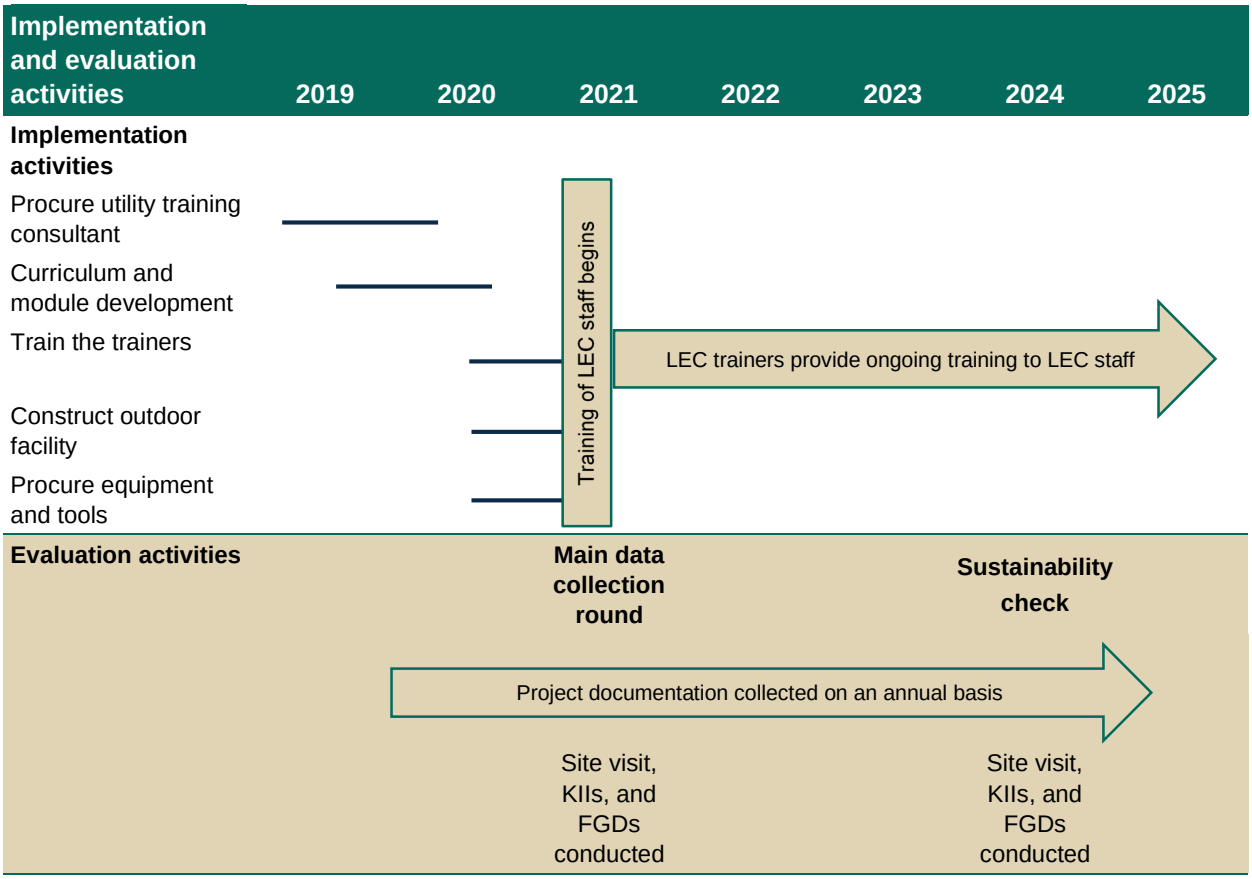
The evaluation will be in the form of a qualitative study to assess implementation and performance over time. We will start by collecting documentation of activity design and collecting project documentation annually. We propose a main data collection round in 2021 to answer primary evaluation questions

(evaluation questions 1, 2, 3 in Table 1). We will look at implementation and progress to date on achieving the short-term outcomes described in the activity's logic model. In this round, we plan to collect project documentation and conduct site visits, KIIs, and FGDs. The main goal would be to verify the expectation that LEC trainees acquired the skills necessary to increase their productivity shortly after training. We will produce a final report based on data from this round.

In addition, we propose a sustainability check in 2024 to determine the final status and sustainability of the training (evaluation question 3 in Table 1). This will provide an update to our evaluation findings in the final report. Given its scope, we envision a lighter data collection round than the main round for the sustainability check, consisting primarily of a site visit and fewer KIIs and FGDs. Additionally, we will leverage the fact that we will be in country for other MCC evaluations. Results from this round will be captured in the broader evaluation report for Activities 1 and 2 of the compact.

The timing of the two data collection rounds will coincide with the interim and final evaluation rounds for Activities 1 and 2 of the compact. Table 2 depicts the timeline of data collection with respect to implementation.

Table 2: Timeline for implementation and evaluation of the LEC Training Activity



Source: Mathematica

KII = key informant interview; FGD = focus group discussion.

We will carefully collect information to answer the evaluation questions efficiently and comprehensively. The approach will produce insights into the processes and mechanisms in action, capture implementation

strengths and weaknesses, identify successes and gaps, and provide timely insights. Table 3 summarizes the topics to be addressed from data sources and how they map with the evaluation questions. Next, we describe the proposed data sources, timing, and focus of each data collection activity in more detail.

We will conduct a **document review** to assess the project design, early implementation, and project effectiveness over time. We will request each of the training consultant's deliverables including the inception report, work plans, master and strategic plans, performance metrics, training needs and skills assessment reports, training plans, materials, delivery reports, and the final report. We will also request relevant documentation on training activities from the human resource department at LEC, including the types of trainings offered, the frequency of trainings, and the number of participants. Following the establishment of the LEC Training Activity—once the consultant is no longer active and LEC fully takes over training—we will continue to request documents, including implementation reports, performance metrics, reports from human resources, and other relevant documentation directly from LEC. Further, documentation of training activities will be used to inform qualitative activities and to triangulate report findings with qualitative data. We plan to collect information annually through 2024.

Table 3. Mapping of topics to be addressed, data sources, and evaluation questions

Evaluation questions	Data sources	Topics to be addressed
1. How is the LEC Training Activity functioning in practice? How effective is the LEC Training Activity at training LEC staff?	• Document review of project design, training consultant's deliverables, documentation of training activities from LEC, training evaluation forms, and performance metrics • Virtual site visits to observe online training • KIIs with MCC, MCA-L, training consultants, LEC management, LEC trainers, other LEC staff, and stakeholders at regional centers of excellence • FGD with LEC staff trainees	• Logic of project design • Implementation of training of trainers and on-the-job training, including successes and challenges over time • Perceived quality of training • Knowledge change among staff • Changes in behavior of staff • Factors that facilitated or inhibited change among staff • Overall LEC technical and managerial capacity
2. To what extent is the LEC Training Activity meeting skill needs at LEC both in terms of the number of people trained and the quality and relevance of skills provided?	• Document review of training activities and materials from LEC, implementation reports, and performance metrics • KIIs with training consultants, LEC management, LEC trainers, and other LEC staff • FGD with LEC staff trainees	• Skill needs of LEC • How types of training offered and training materials relate to skill needs • Gaps in training topics • Frequency of trainings • Type of staff and number of participants to the trainings • Perceived usefulness of training to day-to-day work of staff

Evaluation questions	Data sources	Topics to be addressed
3. 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?	• Document review of training activities and materials from LEC, implementation reports, and performance metrics • Site visit to observe outdoor facility • KIIs with LEC management, LEC trainers, and other LEC staff • FGD with LEC staff trainees	• Budget allocated to training and its financial sustainability • State of the outdoor training facility and equipment • Training processes after the compact ends • Workload and suitability of LEC trainers • Nature and quality of training received by new staff • Frequency of professional development among old and new staff

Source: Mathematica

LEC = Liberia Electricity Commission; KII = key informant interview; MCC =Millennium Challenge Corporation; MCA-L = Millennium Challenge Account–Liberia; FGD = focus group discussion.

Next, we will conduct virtual **site visits** to the observe online training or watch videos of previous trainings. We will assess the general capacity building activities for staff to better understand the objective and delivery of these trainings. During the sustainability check, we will conduct an actual site visits of the outdoor training facility. These visits will expand our understanding of on-site operations that cannot be captured in interviews or reports, and will provide the opportunity to ask more targeted, in-depth questions. Additionally, site visits will help us connect project operations to outcomes, extend our understanding of the broader power sector, and inform future rounds of data collection.

We will also conduct **key informant interviews (KIIs)** with stakeholders at MCC, MCA-L, the training consultants from both Tata and Azorom,[1] LEC management, and prospective LEC trainers (who will participate in train-the-trainer activities). At the main data collection round, we will focus on understanding project design and LEC's training and capacity gaps. Informed by project documentation, we will assess stakeholders' perceptions of the materials, including how plans align with LEC's needs, whether gaps exist, and whether plans are achievable. We will also assess stakeholders' perceptions of the performance metrics, the suitability of LEC trainers, LEC's capacity to offer training vis-à-vis other responsibilities, and project impacts on operations. During the sustainability check in 2024, we will investigate the ongoing functionality of the training program, perceptions of the trainers, how the training is meeting the needs of the LEC workforce, and overall LEC technical and managerial capacity. We will also assess perceptions of the Training Activity business plan, the timing of the activity, and sustainability.

Finally, we will conduct **focus group discussions (FGDs)** with LEC staff trained at the Training Activity to assess their training experiences. Before the FGDs, we will review information on which trainings they participated in, training evaluation forms for those trainings, and KII data on the suitability of the training. This background will inform our questions, ensuring that we can narrow in on key strengths and weaknesses of the training and possible gaps in training or LEC's capacity.

C. Analysis plan

We will answer the evaluation questions by integrating and triangulating findings from the various data sources. For the document review, we will systematically organize, screen, and categorize materials by

[1] Azorom was involved in the initial design of training before Tata took over as training consultant and implementer.

source and topic to better understand how the documents relate to the training activity and outcomes. This will also enable us to identify relevant themes that emerge from the materials. We will review new documents as they become available to track implementation, monitor developments related to project activities, and assess LEC performance metrics over time.

We will analyze data from the site visits and KIIs to acquire stakeholder perspectives on the training activity's implementation, the quality and relevance of the training provided, and its sustainability in building the capacity of the organization. The analysis will seek to understand the respondents' perspectives, identify new information, confirm patterns or findings, and detect divergent experiences. We will develop a detailed coding strategy that is aligned with the evaluation questions and conduct a thorough content analysis of the transcripts. We will use NVivo or similar qualitative data analysis software to code the transcripts, then we will review and organize the resulting codes into themes that are present across multiple respondents. We will identify consistent and differing themes across respondents and over time. Finally, we will use these emerging themes to compare findings against other data sources, noting commonalities and discrepancies for further inquiry.

Once we have analyzed each data source, we will triangulate findings to identify trends and relationships, confirm patterns or findings, and detect discrepancies or disparate experiences. We will also use the implementation findings to contextualize our findings on the performance of the trainings over time.

D. Ensuring high quality data collection

The evaluation's success depends on the collection of high quality data, particularly the accuracy, reliability, and timeliness of the data. We will build on our successful data collection efforts in the ongoing energy sector evaluation and gather deeper insights into the capacity of the LEC workforce during the Training Activity assessment. We will anticipate risks and minimize threats to quality that are inherent in the data collection process, particularly in Liberia. Before undertaking any data collection efforts, we will provide detailed data collection plans, safety measures, and procedures for obtaining all necessary permissions from local authorities. We will submit these to MCC and MCA-L for approval, as well as obtain ethical approval, before any fieldwork. Survey instruments and protocols will also be submitted for review and input from MCC, MCA-L, and additional stakeholders as necessary.

We will ensure high quality data by providing thorough and consistent oversight on all aspects of the data collection process. We will work closely with our local partner, The Khana Group, and oversee all their efforts—from identifying and training enumerators to developing teams, conducting interviews, transcribing and translating, and submitting data for analysis. Mathematica and the local data collector may conduct some of the high-level interviews jointly. To ensure that protocols are properly followed, Mathematica will conduct interviewer observations and attend interviewer debriefings.

E. Report timeline and dissemination

Based on the data collection timeline described in Section III.B, we envision the following schedule for data collection, analysis, and report submission (Table 4). For the main data collection round, we will produce a report in September 2021 summarizing implementation findings to document what was achieved. Instead of a standalone report for the sustainability check, we will incorporate this round's findings into the final evaluation report of Activities 1 and 2 of the compact, which received the bulk of funding for the compact. We expect to deliver this report in January 2025.

Table 4: Data collection, analysis, and report submission timeline

Name of round	Data collection	Data analysis	First draft report expected	Final report expected
Interim	January–April 2021 (Site visit, KIIs, and FGDs)	May–June 2021	July 2021	September 2021
Endline	January–April 2024 (Site visit, KIIs, and FGDs)	May–June 2024	July 2024	January 2025

Source: Mathematica

KII = key informant interview; FGD = focus discussion group.

To ensure that the results and lessons from the evaluation reach a wide audience, we will work with MCC to increase the visibility of the evaluation and findings targeted to the energy sector, particularly for policymakers and practitioners. We will distribute draft reports to stakeholders for feedback before finalization and will present findings at MCC headquarters in Washington, DC, and MCA-L headquarters.

We expect the broader research community to have a strong interest in the findings from the evaluation. To facilitate wider dissemination of findings and lessons learned, we will collaborate with MCC and other stakeholders to identify additional forums—conferences, workshops, and publications—for sharing the results and will encourage other donors and implementers to integrate the findings into their programming.

IV. Challenges and Mitigation Strategy

We anticipate several challenges as we implement the LEC Training Activity evaluation. Below, we discuss these and our proposed mitigation strategies. Note that we do not expect any of the challenges to undermine successful implementation of the evaluation.

Access to LEC staff. LEC staff can sometimes be difficult to gain access to through email and telephone calls, though we have always gained easy access to staff when in Liberia. We have learned that country presence is important for activities related to LEC evaluation. We will schedule activities and provide written requests for documents and activities, send follow-up reminders, and schedule in-country data collection to allow time for delays and rescheduling as needed. In addition, we will build rapport with the key informants during the main data collection round so that they can continue to supply us requested documents and data until 2024.

Changes to the LEC Training Activity design and implementation timeline. We know that project delays and design changes may affect the evaluation approach. We will continue to be flexible to keep the evaluation design aligned with modifications to the project and the context. We will document any further substantive modifications to the design of the LEC Training Activity and modify our evaluation approach accordingly, seeking MCC and other stakeholder input along the way.

The current global pandemic, COVID-19. The COVID-19 pandemic has disrupted travel and work plans for many international projects. We recognize that it may still not be possible for our staff to travel to conduct site visits, KIIs, and FGDs due to the pandemic. Mathematica is currently adjusting work plans for our ongoing projects to adapt to this situation, and we will draw on that experience to move to remote data collection, if necessary. We will work closely with MCC to monitor the COVID-19 situation in

Liberia and will decide on alternative approaches together. If travel restrictions continue, Mathematica will use online conference platforms such as Webex, Zoom, or Skype to conduct interviews and focus groups with key stakeholders, including implementing partners. We are currently employing these techniques in ongoing international evaluations with MCC.[1] We may also engage our local data collectors to conduct the site visits for us and to collect interview and focus group data. In this scenario, our team would prepare detailed interview and data collection guides, conduct virtual training, and oversee the quality of data collection using techniques such as remotely participating in on-ground interviews, daily check-ins with consultants, and ongoing review of audio files and pictures from the site visits.

[1] For example, we have successfully conducted more than a dozen remote interviews with stakeholders as part of our MCC-funded evaluation of an education program in Guatemala. We have maintained data quality using video, which has allowed us to connect with respondents and to follow up on nonverbal cues.

V. Administrative

A. Summary of Institutional Review Board (IRB) requirements and clearances

Mathematica is committed to protecting the rights and welfare of human subjects by obtaining approval from an IRB for relevant research and data collection activities. IRB approval requires three sets of documents: (1) a research protocol, in which we describe the purpose and design of the research, and provide information about our plans for protecting study participants, their confidentiality, and human rights, including how we will acquire consent for their participation; (2) copies of all data collection instruments and consent forms that we plan to use for the evaluation; and (3) a completed IRB questionnaire that provides information about the research protocol, how we will securely collect and store our data, our plans for protecting participants' rights, and any possible threats to participants resulting from any compromise of data confidentiality. We anticipate the IRB review of this study to qualify for expedited review because it presents minimal risk to participants. IRB approval is valid for one year; we will submit annual renewals for approvals for subsequent years as needed.

We will also ensure that the study meets all U.S. and local research standards for ethical clearance, including submitting our study for approval by Liberia's ethical review committee. We will coordinate with our consultant and data collection partner to submit the full list of required materials—including a description of the methodology, the instruments and enumerator manuals, a community awareness plan, the timeline, the budget, and a dissemination plan—to the required local agency. Mathematica may request support from MCA-L to facilitate the process. If either the U.S. IRB or local authorities recommend changes to protocols or instruments, the survey firm, MCC, and Mathematica will work together to accommodate the changes, and all parties will agree on the final protocol before data collection begins.

B. Data access, privacy, and file preparation

Mathematica and The Khana Group will ensure confidentiality of all respondents, including confidentiality of participating in the data collection, of personally identifiable information, and of other sensitive data. For the primary qualitative data to be collected under this evaluation, the Mathematica team will ensure the safe handling and transfer of electronic files and ensure that they are stored on Mathematica's secure server. Data files will be accessible only to project team members who clean or analyze the data. If needed, electronic data files will only be shared across team members using a secure file transfer system, such as a file transfer protocol, file exchange website (FX site), or a SharePoint site. All files with sensitive information, including those for secondary data analyses and document review, will be stored in a designated encrypted project folder secured with AES 256-bit encryption.

After producing and finalizing the reports, we will prepare corresponding user manuals and codebooks for the qualitative data according to the most recent guidelines set forth by MCC. We will work with MCC's Disclosure Review Board to find a mutually agreeable solution regarding the necessity and potential to create public use data files for transcripts of our KIIs or FGDs. Public use data files will be free of personal or geographic identifiers that would enable unassisted identification of individual respondents, and we will remove or adjust data that introduce reasonable risks of deductive disclosure of the identity of individual participants.

C. Evaluation team roles and responsibilities

Our team will contribute our extensive experience and expertise to meet MCC's evaluation needs. Program manager **Dr. Candace Miller** will be responsible for managing the team of experts and delivering high quality products to MCC. **Ms. Poonam Ravindranath, Ms. Kristine Bos, and Mr. Matt Spitzer** will support the collection of high quality data and analysis. **Dr. Arif Mamun** will provide quality assurance on all deliverables.

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