Millennium Challenge Account – Bénin II

# Monitoring and Evaluation Plan

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*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 September 9, 2015 between the United States of America, acting through the Millennium Challenge Corporation, a United States Government corporation (MCC), and Benin, acting through its government;
- will support provisions described in the Compact; and
- is governed by and follows the 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 pursuant to 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

| | |
|---|---|
| ABERME | Agence Béninoise d'Electrification Rurale |
| ARE | Autorité de Régulation de l'Electricité |
| CAMM | Contract Administration Management Manual |
| CBA | Cost-Benefit Analysis |
| CCR | Compact Completion Report |
| CEB | Communauté Electrique du Bénin |
| CI | Common Indicator |
| CIF | Compact Implementation Funding |
| CP | Condition Precedent |
| CSC | Comité de suivi et de contrôle des contrats |
| DESE | MCA-Benin II Economics and Monitoring and Evaluation Department |
| DiD | Difference-in-Differences |
| DQR | Data Quality Review |
| EDR | Evaluation Design Report |
| EIF | Entry into Force |
| EMC | Evaluation Management Committee |
| ERR | Economic Rate of Return |
| ESP | Environmental and Social Performance |
| FGD | Focus Group Discussion |
| FY | Fiscal Year |
| GoB | Government of Benin |
| GSI | Gender and Social Inclusion |
| GWH | Gigawatt-hour |
| HSE | Health, Safety and Environment |
| HV | High Voltage |
| IPP | Independent Power Producer |
| ITS | Interrupted Time Series |
| ITT | Indicator Tracking Table |
| KII | Key Informant Interview |
| KPI | Key Performance Indicator |
| kV | Kilovolt |
| kWh | Kilowatt-hour |
| LV | Low Voltage |
| M&E | Monitoring and Evaluation |
| MCA | Millennium Challenge Account |
| MCC | Millennium Challenge Corporation |
| MIS | Management Information System |
| MoE | Ministry of Energy |

| | |
|---|---|
| MVA | Megavolt amperes |
| MWh | Megawatt-hour |
| NDCC | National Dispatch and Control Center |
| NPV | Net present value |
| OCEF | Off-Grid Clean Energy Facility |
| OGEAP | Off-Grid Electricity Access Project |
| POC | Point of Contact |
| PV | Photovoltaic |
| QDRP | Quarterly Disbursement Request Package |
| SCADA | Supervisory Control and Data Acquisition |
| SBEE | Société Béninoise d'Energie Electrique |
| SGA | Social and Gender Assessment |
| SMS | Short Messaging Service |
| TOR | Terms of Reference |
| USG | United States Government |

# COMPACT AND OBJECTIVE OVERVIEW

## Introduction

This Monitoring and Evaluation Plan serves as a guide for program implementation and management, so that the Millennium Challenge Corporation (MCC), Millennium Challenge Account-Benin II (MCA-Benin II) staff and board of directors, implementing entities, consultants, contractors, 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, and gender areas and how these effects will be achieved.

- *Sets out data and reporting requirements and quality control procedures*. Defines indicators, identifies data sources and collection frequency 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 describes the mechanisms that seek to assure the quality, reliability and accuracy of program performance information and data.

- *Establishes a monitoring framework.* Establishes a process to alert contractors, consultants, implementing entities, MCA- Benin II management, compact stakeholders, and MCC as to whether or not the program is achieving its major milestones or expected interim targets during program implementation and provides a basis for making program adjustments.

- *Describes the evaluation plan*. Explains in detail how MCC and MCA-Benin II will evaluate whether or not the interventions achieve their intended results and expected impacts over time.

- *Includes roles and responsibilities*. Describes in detail what the M&E staff are responsible for.

# Program Logic

## Country Background

Since its transition to democracy in the 1990s, Benin's economic progress has been uneven. Indeed, from 1991 to 2001, average economic growth stood at 4.7% against 3.6% between 2002 and 2011, and 5.6% between 2012 and 2014. It is estimated at around 4% in 2016. and at 5.5% for the year 2017 and 6.5% in 2018. This upward trend in the growth rate observed from 2016 and maintained in 2019, estimated at 6.5%, experienced a strong decrease in 2020 (3.8%) due to the effects of the COVID-19 pandemic. Very resilient, the Beninese economy achieved an estimated growth rate of 5.5% in 2021 with prospects for 6.5% in 2022 and 2023. Benin has experienced high population growth (averaging 3% per annum over the last decade) with an unequal distribution of the benefits which has led to only marginal improvements in the poverty rate (45.9% of Benin's population was considered poor in 2020 compared to 49.7% in 2015, the most recent year for which data are available)[1]

The structure of Benin's economy has not changed significantly since 1990, with an embryonic manufacturing sector and a reliance on agriculture for nearly one-third of GDP. The main area of growth is the service sector, mainly in transportation and logistics, which accounts for 56% of national income. About 95% of the economically active population is employed in the informal sector (which accounts for about 70% of GDP), and Benin's economy remains dependent on Nigeria, its most important trading partner.

## Compact Background

Benin was selected as eligible to develop a second compact by MCC's Board of Directors in fiscal year (FY) 2012.[2] A constraints analysis completed in October 2012 found **poor electricity infrastructure and an inadequate business environment** as the binding constraints to growth in Benin.

On September 9, 2015, acting on behalf of the United States Government ("USG"), MCC signed a second Compact with the Government of Benin (the "Government" or "GoB") focused on the electric power sector. The Compact, comprised of a US$375 million grant from the USG and a $28 million matching contribution from the GoB, aims to strengthen Benin's national electricity distribution utility, attract private sector investment, and fund infrastructure investments in electric generation and distribution as well as off-grid electrification for poor and unserved households. The Compact was amended in 2021 to extend its duration by one year and to add $16 million in additional resources to account for the consequences of the COVID-19 pandemic.

[1] World Bank, World Databank, 2015, 2020

[2] In FY 2014, Benin failed the Control of Corruption indicator and the Board limited the resources available to help further develop the compact. Benin passed the FY 2015 scorecard by passing twelve of twenty indicators, including Control of Corruption, and the Board reinstated eligibility and authorized resumption of all compact development activities.

The Compact in its entirety can be found at www.mcc.gov. Annex I to the Compact contains a detailed program description.

The Benin Compact will be implemented for a six-year period and has Entered-Into-Force[3] (EIF) on 22 June 2017. A Millennium Challenge Account entity, Millennium Challenge Account-Benin ("MCA-Benin II" or "MCA"), has been established to implement the Compact program. MCA-Benin II has been established as a legal entity in Benin and is governed by a public-private Board of Directors accountable to the President of the Republic of Benin.

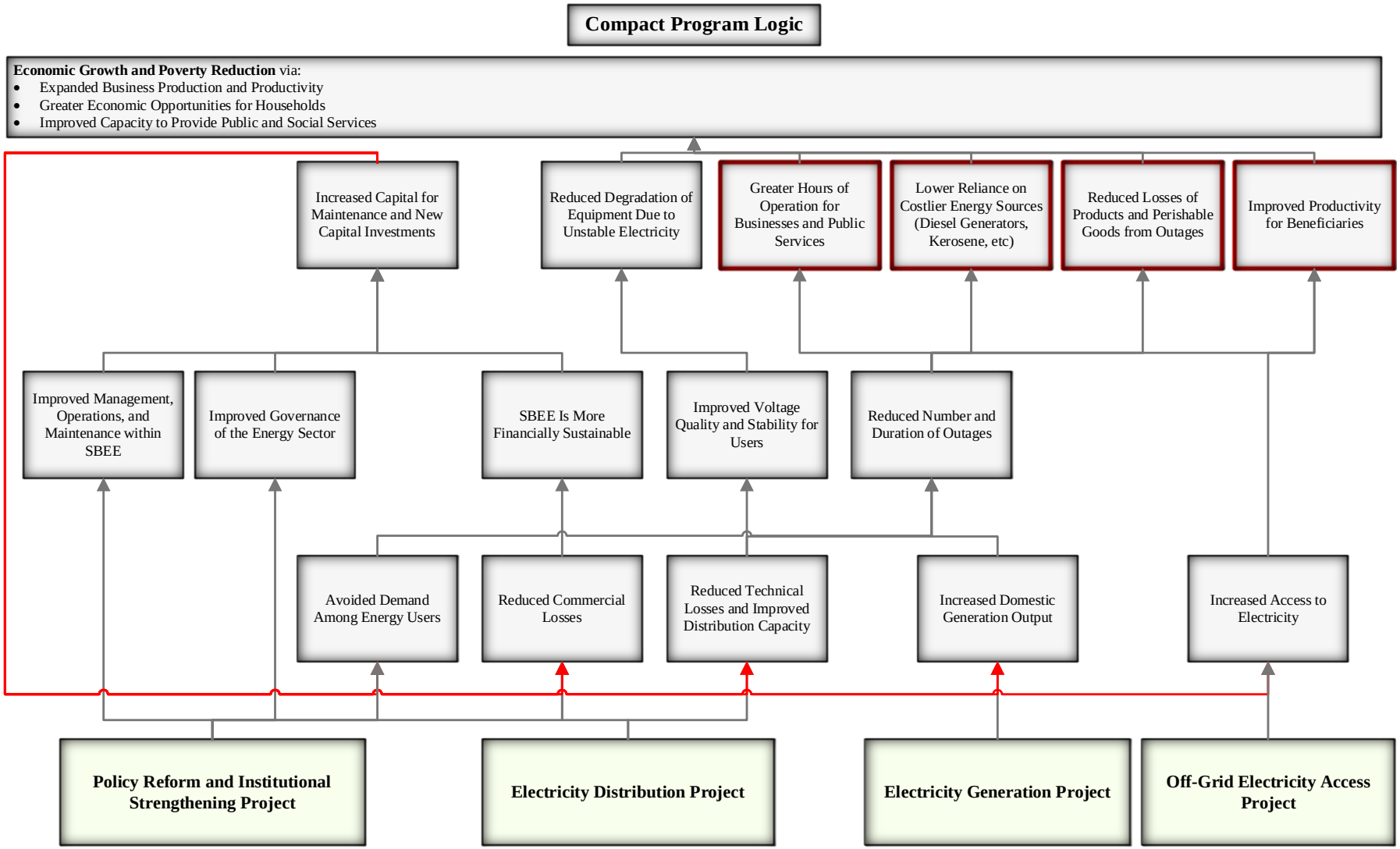
## Compact Logic

The objective of the Program ("Program Objective") is to expand business production and productivity, generate greater economic opportunities for households and improve the capacity to provide public and social services by improving the quantity and quality of the supply of electricity. The Program Objective is expected to be achieved through four Projects depicted below.

[3] Entry into force is the start of MCC's Compact effectiveness period.

## Compact Program Logic

Below is a Compact-wide program logic. More detailed, project-focused or activity-specific logics are in Annex IV.




NOTE: The results with a red border correspond to the Project Objectives of the generation, distribution, and off-grid projects as defined in Annex I of the Compact. "Reduced Degradation of Equipment Due to Unstable Electricity" is not formally defined as an objective-level result,

but it is included in the Program Logic in Annex III of the Compact. The Policy Reform and Institutional Strengthening Project Objective is not explicitly included in this diagram.

## Project Descriptions and Logics

### *Policy Reform and Institutional Strengthening Project Description and Logic*

**The Objective of the Policy Reform and Institutional Strengthening Project is to strengthen the capacity of the Société Béninoise d'Energie Electrique ("SBEE"), Autorité de Régulation de l'Electricité ("ARE"), and other Government of Benin institutions to improve the governance, management, and operations of the electricity sector ("Policy Reform and Institutional Strengthening Project Objective").** To achieve the Policy Reform and Institutional Strengthening Project Objective, the Compact will support interventions to (A) improve governance in the electricity sector by supporting an independent and professional regulator, reforming tariffs, introducing independent power producers (IPPs) and enhancing energy efficiency; (B) improve management, operations and maintenance within SBEE; and (C) inform and educate the public on tariffs, energy efficiency and other key electricity sector issues.

The *Policy, Regulation, and Institutional Support Activity* aims to improve the overall governance of the electricity sector in Benin by improving regulation, establishing a tariff policy, and providing an institutional framework for IPPs. MCC funding will support:

- Assistance to ARE through operational and capacity building; establishment of regulatory tools, processes, and procedures; preparation and implementation of tariff studies and development of a tariff policy and Tariff Plan to achieve cost-reflective tariffs, encourage private sector investment in power generation and ensure access for the poor;
- Expansion and strengthening of energy efficiency standards and labeling programs in Benin, including the formulation of technical standards, development of a program for product labeling, enhancement of product quality enforcement and testing, introduction of support for public sector procurement of energy efficient goods and industrial energy efficiency;
- Improvement of the environment for IPPs, including by establishing a legal and regulatory framework, standard forms of contract, credit enhancement mechanisms and a competitive solicitation process by means of technical assistance, transaction advisory services and other support; and
- Support of the legal review of the electricity codes (the Benin-Togo and the Benin Electricity Codes) to target necessary revisions and technical analysis of structuring options for Government and SBEE-owned generation assets, including creation of stand-alone generation enterprise.

The *Utility Strengthening Activity* aims to ensure the operational independence of SBEE and improve its core business functions so as to become more financially viable and better able to serve its customers. Together with the sector-wide improvements from the Policy, Regulation, and Institutional Support Activity, the Utility Strengthening Activity is expected to help improve key aspects of SBEE's operations and to result in its ability to better provide power to consumers of all income classes. MCC funding will support:

- A Contract Plan between GoB and SBEE to establish performance targets for the utility and mutual responsibilities of the government and the utility, signed in May 2017;

- A management services contract to improve the utility's performance in the following domains: planning, studies, and projects; technical; commercial; financial management and accounting; human resources; purchases, internal audit, information systems; health, safety, and environment (HSE); communications, and cross-cutting.
- An external contract auditor that will support the *Comité de suivi et de contrôle des contrats* (CSC) in validating a final list of key performance indicators (technical, commercial, human resources, environmental, and other) and monitor performance against the *contrat plan* and the management services contract.
- Improvements to human resources and customer service policies and procedures to ensure a work environment where women and men have equal opportunities to advance professionally.

The *Public Information and Education Activity* aims to inform the public about energy sector policy reforms and to change energy use behavior through information and education about energy efficiency, renewable electricity sources and related topics including tariff changes. To this end, the *Public Information and Education Activity* will create a program to educate customers about energy efficiency and renewable energy for household use. The Public Information and Education Activity will take into account differences in languages, education levels, gender and social groups, and rural and urban contexts and access to information and technology.

***Electricity Generation Project Description and Logic***

**The Objective of the Electricity Generation Project is to: (A) increase the hours of operation for businesses and public and social services; (B) reduce reliance on costlier sources of energy; (C) reduce losses of products and perishable goods; and (D) improve productivity for users of electricity (the "Electricity Generation Project Objective").** To accomplish the Electricity Generation Project Objective, MCC Funding will be used to increase Benin's domestic generation capacity by 50 MW while decreasing its dependence on external imported energy sources specifically by supporting transactions for four IPP photovoltaic plants.

This Project has changed considerably since MCC and the Government of Benin signed the Compact in September 2015. At that time, the Generation Project was comprised of three activities: the Thermal Generation Activity, Photovoltaic ("PV") Generation Activity, and the Hydroelectric Generation Activity.

A. In 2016, MCC removed the Thermal Generation Activity ($12.475 Million) from its investment as a result of the Government of Benin moving forward with the rehabilitation of the three thermal generating units using national funds. Simulations conducted in preparation for the drafting of the Investment Memorandum demonstrated that the planned Thermal Generation Activity increased the ERR from 7.5% to 11.5%.
B. MCC removed the Hydroelectric Generation Activity from the Compact as a result of an MCC feasibility study that identified significant risks. It found that environmental studies alone would take at least two years, which would make it difficult, if not impossible, to complete within the Compact period. The feasibility consultant also anticipated higher than expected costs and an unacceptably low ERR.
C. For the PV Generation Activity, MCC went from a design and build approach to an IPP transaction approach. Discussions with GoB on the change in approach commenced shortly

after compact signing as a way of introducing private sector investment into the power sector and leveraging compact funds. GoB approved the shift and the hiring of the transaction advisor for which the procurement was launched in 2017. The scope of the transaction advisory services, which commenced in mid-2018, includes developing the IPP framework, standard forms of contract (e.g., Power Purchase Agreement, Concession Agreement, Interconnection Agreement), developing the technical and environmental requirements for an IPP transaction, structuring and leading the transaction and assisting GoB through to commercial and financial close with the objective of seeing 50 MW of solar PV plants constructed and commissioned by the compact end date using private sector funding.

The **Photovoltaic ("PV") Generation Activity** aims to address Benin's power supply deficit by providing a renewable source of electricity. MCC funding will be used to fund transaction advisory fees; the cost of land acquisition and resettlement; preliminary environmental studies at the project sites; geotechnical studies and other site investigation work; as well as fees for credit enhancements mechanisms provided by third parties to support the transactions for the following plants.

A. A 10 MW PV power plant at Natitingou;
B. A 10 MW PV power plant at Djougou;
C. A 15 MW PV power plant at Parakou; and
D. A 15 MW PV power plant at Bohicon.

***Electricity Distribution Project Description and Logic***

The Objective of the **Electricity Distribution Project** is to (A) increase the hours of operation for businesses and public and social services, (B) reduce reliance on costlier sources of energy, (C) reduce losses of products and perishable goods due to outages, and (D) improve productivity for users of electricity (the "Electricity Distribution Project Objective"). To accomplish the Electricity Distribution Project Objective, MCC Funding will be used to modernize Benin's electricity distribution infrastructure to expand grid capacity to accommodate future growth, improve reliability and reduce losses and outages. The Electricity Distribution Project focuses on improving the grid serving Cotonou, and selected regional networks (Bohicon, Parakou, Djougou, Natitingou) as a complement to proposed solar generation investments, as well as on a national level by building a modern distribution dispatch and control center and backup to more effectively manage the network. The Electricity Distribution Project consists of three Activities.

The **Regional Grid Strengthening Activity** will support the replacement of lines, upgrading substations, installation of new switchgear connections and building of new substations for the cities of Bohicon, Natitingou, Parakou and Djougou to support the interconnection of this Compact's investments under the Photovoltaic Generation Activity, to meet demand growth in those regional population centers and reduce technical losses. This will result in:

- Replacement of transformers in and around Natitingou (78); Djougou (50); and Parakou (81);
- Construction of new 58.90 km of 33 kV lines including 44.8 km of underground lines (Djougou, Natitingou and Parakou) and 14.1 km of overhead lines in Parakou.
- Rehabilitation of 836 km of 33kV lines in Djougou, Natitingou and Parakou.

- Construction and extension of substations:
    - Bérecingou: Substation 33kV -- New 33kV building and switchgear.
    - Natitingou Nord: New Substation 33 kV
    - Vèdoko: Station 63/15 kV GIS -- New building and 63kV GIS switchgear
    - Maria Gléta: Station 63 kV AIS -- New control building, complete 63kV switchyard
    - Bohicon: Substation 20 kV -- New building with 20kV switchgear to replace the existing
    - Parakou: Substation 33 kV -- New building and 33kV switchgear

The **Cotonou Grid Strengthening Activity** will both increase the capacity of the Cotonou grid and improve reliability of the network through investments in a variety of priority infrastructure projects, including new lines, switchgears, substations and network extensions.

MCC financing will support the construction of 46.37 kilometers of new 63 kV lines:

- Vèdoko - Gbedjromèdé (5.1 km);
- Gbedjromèdé - Croix-Rouge (5.1 km);
- Croix-Rouge – Cim-Bénin (7.1 km);
- Akpakpa – Cim-Bénin (4.8 km);
- Vèdoko - Fidjrossè (5 km);
- Vèdoko - Cadjehoun (5.1 km);
- Fidjrossè - Cadjehoun (3.6 km);
- Vèdoko - Ancient Pont (7.5 km) and
- Ancient Pont - Akpakpa (3 km)

MCC financing will support the construction of 20 kilometers of new 15 kV lines:

- Gbedjromèdé - Croix-Rouge (5.31 km) and,
- Fidjrossè - Airport (14.7 km)

MCC financing will support the construction and rehabilitation of substations:

- Construction and extension of substations:
    - Gbèdjromèdé: Substation GIS 63/15 kV New
    - Croix-Rouge: Substation GIS 63/15 kV New
    - Cim Benin: Substation GIS 63/15 kV New
    - Fidjrossè: Substation GIS 63/15 kV New
    - Aéroport: Substation GIS 63/15 kV New
    - Ancien Pont: Substation GIS 63 kV -- Existing but completely modified and extended

The **National Electricity Dispatch Activity** will construct a national distribution and control center ("NDCC"), a necessary requirement to accommodate the planned photovoltaic generation and to provide real-time network monitoring, control, and data collection. MCC Funding will support (A) project preparation (site acquisition and/or preparation, permitting, environmental and

social assessment and resettlement action planning and implementation, including compensation and restoration of livelihood (to the extent necessary)); (B) acquisition and installation of master station hardware, software and related services for NDCC; (C) supervisory control and data acquisition ("SCADA") equipment; (D) telecommunication system equipment and installation; (E) new buildings for main and backup NDCC including furnishings; (F) testing and commissioning; (G) spare parts, tools, and training; and (H) engineering design, supervision and warranties. MCC funding also will be used for distribution substation modifications in preparation for connection to the SCADA system. The Activity included the installation of advanced meter infrastructure and automatic meter reading for large customers compatible with the SCADA system, but this component was removed during the design phase.

***Off-Grid Electricity Access Project***

Two-thirds of Benin's population does not have access to electricity. Many of these people are in rural areas where expansion of the existing grid is unlikely in the near or medium-term. **The Objective of the Off-Grid Electricity Access Project is to increase access to electricity and thereby (A) increase the hours of operation for businesses and public and social services, (B) reduce reliance on costlier sources of energy, (C) reduce losses of products and perishable goods, and (D) improve productivity for users of electricity (the "Off-Grid Electricity Access Project Objective").** To accomplish the Off-Grid Electricity Access Project Objective, MCC funding will provide financing for off-grid electrification, including institutional and household-level solar photovoltaic (PV) systems and mini-grid systems, and energy efficiency activities nationwide through a grant facility, together with necessary funding for policy and institutional strengthening to support the entire off-grid electricity sector in Benin.

The *Enabling Environment for Off-Grid Electricity Activity*: Benin does not have the capital required for a rapid expansion of the nation's electric network. To accelerate the rate of electrification, an enabling environment for off-grid electricity is essential. To that end, MCC Funding will support:

- Design and implementation of a national off-grid electrification framework in form and substance satisfactory to MCC ("*National Framework*"). The National Framework will articulate a model for off-grid electrification to include regulatory and institutional framework, licensing, tariff evaluations, regulations and technical standards. Such model will be designed to ensure minimum technical specifications, quality of service standards, licensing, pricing and contracting arrangements, and consideration of gender and social inclusion needs and concerns; and
- Development of market information, market characterization, outreach to the private sector and sector donors, and community-led engagement on the OCEF (Off-Grid Clean Energy Facility Activity).

The *Off-Grid Clean Energy Facility Activity* will increase access to electricity for the currently unconnected majority of the population in rural and peri-urban areas by reducing or removing initial cost and investment barriers for off-grid electricity service providers. MCC funding will support the establishment of OCEF and grants issued there under in four primary windows:

- Critical public infrastructure to provide stand-alone electricity generation capability ("*Window One*");

- Mini-grids providing electricity generation and distribution for household, commercial, agricultural and industrial use ("*Window Two*");
- Household generation, storage, and productive uses, such as renewable energy source devices for individual families ("*Window Three*"); and
- Energy efficiency measures for buildings, facilities and installations *("Window Four",* and together with Window One, Window Two and Window Three, the "*OCEF Window*").

OCEF will seek to leverage MCC funding through partnerships with private companies, non-governmental organizations, local governments, community-based organizations, municipalities, or other entities that demonstrate viable off-grid, clean energy solutions for Benin.

## Projected Economic Benefits

**Table 1: Results from Cost-Benefit Analysis (CBA) of Benin II Projects**

| Project | Original Economic Rate of Return (ERR) | Date Original Economic Rate of Return (ERR) Established | Current Economic Rate of Return (ERR) | Date Current Economic Rate of Return (ERR) Established |
|---|---|---|---|---|
| Policy Reform and Institutional Strengthening Project | 11.5% | April 2015 | 9.5% | April 2020 |
| Generation Project | | | | |
| Distribution Project | | | | |
| Off-Grid Electricity Access Project – Pooled Call 1 Solar Home System Grants | 10% | April 2019 | 10% | April 2019 |
| Off-Grid Electricity Access Project – Pooled Call 2 Mini-Grid Grants | 19% | June 2020 | 19% | June 2020 |
| Off-Grid Electricity Access Project – Pooled Call 2 Solar Home System Grants | 24% | June 2020 | 24% | June 2020 |

The On-Grid CBA combines the Generation, Distribution, and Policy Reform and Institutional Strengthening Projects to adequately reflect the complementarities among them.[4]

The Off-Grid Electricity Access Project grant ERRs were calculated for each individual grant on receipt of grant proposals under the off-grid facility. For each proposal call, the pooled ERR for approved grants with similar program logics (e.g., solar home systems, solar mini-grids, etc.) will be required to exceed 10%.

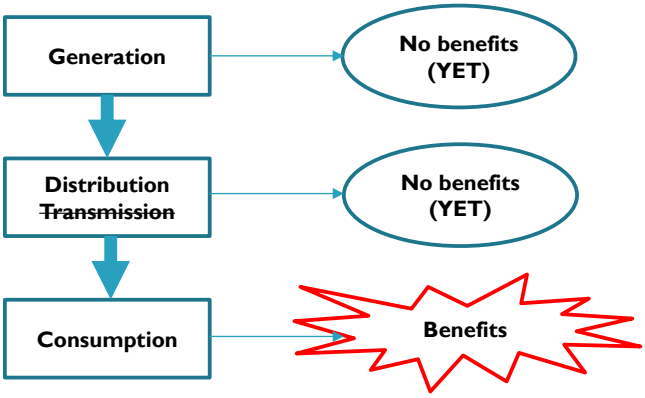
[4] MCC's Economic Analysis division is interested in modeling economic benefits derived from policy reform and institutional strengthening projects. For Benin II, the economist is currently exploring whether the following benefits could be modeled: increased labor productivity, reduced maintenance and rehabilitation cost, and improved allocation of energy (commercial loss reduction).

**Benin Power Compact Economic Analysis**

The Benin II on-grid cost-benefit analysis model forecasts the discounted stream of benefits resulting from increased energy consumption and reduced utility cost per unit of energy served resulting from compact activities. In particular, increased load carrying capacity and reduced technical losses on the distribution network, and increased generation supply are expected to increase energy served to consumers and to reduce the cost to the utility per kWh served. Due to strong complementarities between the on-grid activities, the on-grid ERR was calculated taking into account all Benin II Compact costs and benefits, except for those of the Off-Grid Electricity Access Project, which are analyzed separately. Costs for engineering design and construction have been obtained from feasibility studies, while administrative and M&E costs are an MCC estimation.

Benefits are modelled starting with forecast energy sources (including those financed by the compact), which are tracked through the distribution system. The delivery of these sources to consumers is constrained both by technical losses and the load carrying capacity of the network. Finally, consumption is constrained by forecast consumer demand. Increased energy consumption is valued in dollar terms by the price differential between what consumers are willing to pay and the actual cost of delivering the energy. Willingness to pay was calculated using a nationwide survey conducted by Benin's national statistics agency in partnership with MCC. The cost to the utility of delivering energy is based on the compact supported tariff study analysis.

The figure below summarizes how increased energy consumption benefits are captured in the benefit-cost analysis model. The figure shows that both improved distribution and new generation are expected to increase energy availability. The benefits accrue only if the energy is consumed.




Additional details on the Benin Power Compact Economic Methodology are found in Annex V.

The Off-gird project, *OGEAP*, ERRs were separately calculated for each OCEF grant proposal. For each proposal call, the pooled ERR for approved proposals with similar program logics (e.g. all stand-alone solar system proposals, all solar mini-grid proposals, etc) was required to exceed 10%. The primary benefit streams were 1) cost savings from substituting stand-alone solar system energy sources for more expensive energy sources consumed without the project, and 2) consumer surplus resulting from increased consumption as a result of the availability of lower-cost solar system energy. Substitution was assumed to occur for energy sources primarily used

for lighting but not for energy sources primarily used for cooking, consistent with observed effects in the literature. The Enabling Environment for Off-Grid Electricity Activity is considered a necessary precondition for these benefits to occur.

## Projected Program Beneficiaries

According to MCC's Guidelines for Economic and Beneficiary Analysis, beneficiaries are individuals expected to experience better standards of living due to Compact activities increasing their real incomes. The economic rate of return (ERR) analysis for proposed projects details benefit streams through which beneficiaries are expected to experience increased income.

Over the twenty-year ERR analysis period, 2,121,000 households (approximately 10.6 million people) are expected to benefit from the project.

The ratio between the present value of benefits and the present value of costs is US $1.18. Of that amount, US $0.04 benefit the "extremely poor", US $ 0.03 go the "poor", US $0.50 benefit the "near poor", and 0.61 US $ benefit the "not poor". The data also shows that of the US $1.11, US $0.88 benefit people with primary connections and US $0.30 benefit consumers in the secondary market.

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

**Projected Program Participants**

| **Project** | **Program Participant Definition** | **Est. Number of Program Participants**[5] |
|---|---|---|
| Policy Reform and Institutional Strengthening | SBEE staff, ARE staff, line ministries staff, IPPs and NGOs in the sector that have participated in project-funded trainings or implementation of the reforms | 2404 |
| Generation | Stakeholders (local, national or international) involved in the Generation activities | 325 |
| Distribution | Stakeholders (local, national or international) involved in the Distribution activities | 2000 |
| Off-Grid Electricity Access | ABERME staff, line ministries staff, NGOs, project developers that have participated in project-funded trainings or implementation of the OCEF | 584 |

Projected Program Beneficiaries (based on the original ERR)

[5] These figures are based on existing data from SBEE, Ministry of Energy and GOPA's reports. They have been validated by respective sector leads. However, they are likely to change as implementation progresses.

| Project | Program Beneficiary Definition | Est. Number of Beneficiaries | Present Value (PV) of Benefits[6] | Net Present Value (NPV)[7] |
|---|---|---|---|---|
| Generation Project | Number of individuals in households and owners of commercial enterprises[8] connected to the grid during the 20-year analysis period. | 10,600,000 | $296,269,000 | $10,646,000 |
| Distribution Project | | | | |
| Policy Reform and Institutional Strengthening Project | | | | |
| Off-Grid Electricity Access Project – Pooled Call 1 Solar Home System Grants | Number of individuals in households and owners of commercial enterprises obtaining a solar home system as a result of the grants in year 20. | 135,000 | $40,295,000 | $177,333 |
| Off-Grid Electricity Access Project – Pooled Call 2 Mini-Grid Grants | | 329,000 | $159,513,000 | $50,084,000 |
| Off-Grid Electricity Access Project – Pooled Call 2 Solar Home System Grants | Number of individuals in households and owners of commercial enterprises obtaining a solar home system as a result of the grants in year 20. | 89,000 | $32,197,000 | $7,186,000 |
| Overall Compact | | N/A | N/A | N/A |

**Benin Compact Beneficiary Analysis**

The beneficiary analysis for the compact builds on the current ERR model. Beneficiaries, in this case, are defined as individuals that benefit from the increased availability of electricity through the compact activities. As mentioned above, in the case of households, all members of the household benefitting from the compact are counted.

For informal and formal businesses, only the owner is counted as a beneficiary. Within the current ERR model, benefits accrue to firms with existing connections due to increased consumption of grid-supplied electricity, valued at an assumed willingness to pay. Where available information

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

[7] 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.

[8] Commercial enterprises include formal and informal businesses.

signals that the owner of business has already been counted as a beneficiary at the household level, to avoid double counting, s/he is removed from the category of business owner beneficiary.

# MONITORING COMPONENT

## Summary of Monitoring Strategy

The Compact will be monitored quarterly through the Indicator Tracking Table (ITT). There are four levels of indicators derived from the program logic framework: (i) process; (ii) output; (iii) outcome; and (iv) goal. The various indicator levels articulate in detail the program logic, thus allowing project stakeholders to understand to what extent Compact activities are likely to achieve their intended objectives. 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, as those levels of results typically take longer to be achieved.

Monitoring data will be analyzed quarterly to allow managers of MCA-Benin II and MCC to make programmatic adjustments as necessary with a view towards improving the overall implementation and results of the Program. An overview of each level of indicator follows:

- 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 the intermediate effects of an Activity or set of Activities and directly result from output indicators.

- Output indicators directly measure Project Activities. They describe and quantify the goods and services produced directly by the implementation of an Activity.

- Process indicators measure progress toward the completion of Project Activities. They are a precondition for the achievement of output indicators and a means to ascertain that the Compact work plan is proceeding on time.[9]

MCC has introduced common indicators for external reporting across all MCC Compacts. The common indicators relevant to the MCA-Benin II Compact are included in the Annexes I and II of this M&E Plan. They are marked with a P- reference in the Common Indicator Code (CI Code) column of Annex I where applicable. More information on MCC's Guidance on Common Indicators is available here. This plan also incorporates a breakdown or disaggregation of indicators (and data at all stages: definition, collection, and analysis) that are relevant to GSI (Gender and Social Inclusion) objectives and goals of the Compact, to the extent currently possible.

The Annex III of the Compact outlines the initial indicators for the Program. The M&E Plan builds on this information with additional indicators developed by MCA-Benin II and Compact stakeholders.

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

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) responsible party; and (vii) frequency of reporting. Some indicators will also be monitored during post-compact.

To ensure that the Compact is on track to meet its overall goals and objectives, the monitoring indicators will be measured against established baselines and targets, derived from project design documents, ex-ante economic rate of return analysis, and other available analysis. The targets reflect the underlying assumptions made in program design about what each activity will 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. Modification and revisions to the indicators may only be made according to the MCC M&E Policy. Any significant modifications to the indicators or other content will be summarized in Annex III of the M&E Plan. The first M&E plan revision was completed in June 2019.

The MCA-Benin II M&E Unit shall consult and assist implementing entities in setting up their data collection plan and reporting templates.

## Data Quality Reviews

Data quality is the primary responsibility of the MCA-Benin II staff, led by the M&E Director. The M&E Unit, other MCA staff, as appropriate, and implementing entities should regularly check data quality. The M&E Unit should verify that all reported data has appropriate source documentation and that calculations have been done correctly. The MCA-Benin II Economics and Monitoring and Evaluation Department (DESE) 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-Benin II may 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 meets 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 level 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.

MCA-Benin II will contract an independent data quality reviewer in compliance with the MCC Program Procurement Guidelines and the Procurement Operations Manual. A first data quality review was conducted in 2017 and a second in 2021.

## 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 revisions to Project work plans. Currently, MCC requires that MCA submit a Quarterly Disbursement Request Package (QDRP) each quarter. The QDRP must contain an updated ITT and a narrative report. MCA Benin II has not submitted an ITT narrative report since Q13 (July 2020 - Sept 2020). A complete ITT presents the preceding quarters' indicator actuals and current quarter indicator progress against targets set forth in this M&E Plan. 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 is used to inform decision-making at both levels.

The ITT is intended to be both an internal and external communications tool. The MCA Benin-II M&E/Econ Director should use the ITT to communicate implementation progress during meetings with MCA Benin-II Department heads and with external stakeholders. It is especially important for the MCA Benin-II Department of Public Relations to use the ITT to communicate project results to external stakeholders.

# 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-Benin II will use evaluation as a complementary tool 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.

The Policy indicates that every Project in a Compact must undergo a comprehensive evaluation (impact and/or performance) that is designed and implemented by independent, third-party evaluators hired by MCC. If the MCA-Benin II 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.

MCC and MCA-Benin II are committed to ensuring that the independent evaluations are as rigorous as warranted in order to understand the causal impacts of the program on the expected outcomes and to assess cost effectiveness. The next section on Specific Independent Evaluation Plans will describe the purpose, methodology, timeline, and the process for data collection and analysis for each independent evaluation.

MCA-Benin II 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. The results of all evaluations will be made publicly available in accordance with the MCC M&E Policy.

Other evaluation studies that complement the independent evaluations described above may be undertaken by MCC or MCA M&E or others.

Below is a table with some of the key indicators to be measured through independent evaluations. The PRIS Project is excluded from this table, because the data for most of that project's objective-level indicators will be derived from administrative sources.

| Results Statement | Indicator level | Indicator name[10] | CI Code | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information/comments |
|---|---|---|---|---|---|---|---|---|---|---|
| **Objectives for the Generation and Distribution Projects** | | | | | | | | | | |
| Reduced Degradation of Equipment Due to Unstable Electricity[11] | Outcome | Occurrence of equipment and appliance failure | NA | Average number of equipment or appliance failures occurring as a result of poor electricity | Number | Region Sex | In-person and high-frequency mobile phone surveys of businesses | Mathematica | Three (3) rounds of in-person data collection Thirteen (13) rounds of phone survey | |
| | | Average cost of replacing or repairing defective equipment/appliances | NA | Sum of costs to replace or repair damaged equipment / Total occurrences of equipment or appliance failures | Local currency | Region Sex | In-person and high-frequency mobile phone surveys of businesses | Mathematica | Same as above | |
| Greater Hours of Operation for Business and Public Services | | Weekly hours business is open | NA | Number of hours in a week that a business is open | Hours | Firm Size, Region Sex | In-person and high-frequency mobile phone surveys of businesses | Mathematica | Same as above | Public services are not included in the quantitative surveys. The effect on public services will be assessed qualitatively. |
| | | Outages during business hours | NA | Average number of outages occurring during business hours | Hours | Firm Size Region Sex | In-person and high-frequency mobile phone surveys of businesses | Mathematica | Same as above | |

[10] Baselines and Targets for this indicator will be determined and included in later versions of the Plan

[11] While included in the Compact, this outcome is not formally part of the Project Objective. It is closely related to the Objective on "Reduced Losses of Products and Perishable Goods".

| Results Statement | Indicator level | Indicator name[10] | CI Code | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information/comments |
|---|---|---|---|---|---|---|---|---|---|---|
| Lower Reliance on Costlier Energy Sources | | Share of costlier energy sources in total energy consumption | NA | Amount of energy consumed from generators, candles, kerosene, biomass, or other energy sources as percentage of total energy consumption | Percentage | Region, Firm size, Sex | In-person and high-frequency mobile phone surveys of businesses and households | Mathematica | Same as above | |
| | | Financial share of costlier energy sources in total energy consumption | NA | Cost of energy consumed from generators, candles, kerosene, biomass, or other energy sources as percentage of total cost of energy consumption | Percentage | Region, Firm size, Sex | In-person and high-frequency mobile phone surveys of businesses and households | Mathematica | Same as above | |
| Reduced Losses of Products and Perishable Goods | | Revenue lost from stopped production | NA | Average value of revenue lost due to electricity outages and poor electricity quality as percentage of total sales value | Percentage | Region, Firm size Sex | In-person and high-frequency mobile phone surveys of businesses | Mathematica | Same as above | |
| | | Cost of restarting production | NA | Average cost of restarting production when production is stopped because of outages or poor electricity quality | Local currency | Region, Firm size Sex | In-person and high-frequency mobile phone surveys of businesses | Mathematica | Same as above | |
| | | Cost of spoilage (destruction of raw materials) | NA | 1. Average cost of spoilage of perishable goods as a result of outages or poor electricity quality<br>2. Average cost of spoilage of production batches as a result of outages | Local Currency | Region, Firm size Sex | In-person and high-frequency mobile phone surveys of businesses and households | Mathematica | Same as above | |

| Results Statement | Indicator level | Indicator name[10] | CI Code | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information/comments |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | or poor electricity quality | | | | | | |
| Increased Productivity for All Users | | Business profit | NA | Profits in the past 30 days as reported by businesses | Percentage | Region, Firm size Sex | In-person and high-frequency mobile phone surveys of businesses | Mathematica | Same as above | |
| **Evaluation Level Results and Indicators for the Off-Grid Energy Access Project[12]** | | | | | | | | | | |
| Increased use of off-grid electricity **Objective - Level** | Outcome | New connections | N/A | TBD | Number | Consumer type | Surveys and grantee data | Social Impact | Baseline and endline | This result also has a corresponding monitoring indicator in Annexes 1 + 2 which will be collected through the ITT |
| | | Electricity consumption per month | N/A | TBD | Kilowatt hours | Consumer type | Surveys and grantee data | Social Impact | Baseline and endline | |
| Increased Adoption of Electrical Appliances | | Ownership and use (frequency/duration) of appliances and machines, timing of purchases | NA | TBD | TBD | TBD | Surveys | Social Impact | Baseline and endline | |
| | | Access to different modern energy services (e.g., lighting, refrigeration) | NA | TBD | Percentage | TBD | Surveys | Social Impact | Baseline and endline | |
| | | Consumer surplus from appliance ownership | NA | TBD | CFA Francs | TBD | Surveys | Social Impact | Baseline and endline | |
| Increased Hours of Operation of Businesses | | Weekly hours businesses and public services are open | NA | Number of hours in a week that a business is open | Hours | TBD | Surveys | Social Impact | Baseline and endline | |

[12] These evaluation indicators will be updated during the upcoming evaluation design report modification.

| Results Statement | Indicator level | Indicator name[10] | CI Code | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information/comments |
|---|---|---|---|---|---|---|---|---|---|---|
| and Public and Social Services **Objective - Level** | | Households using public services | NA | TBD | Number | TBD | Surveys | Social Impact | Baseline and endline | |
| | | Frequency of households using public services | NA | TBD | TBD | TBD | Surveys | Social Impact | Baseline and endline | |
| Reduced Reliance on Costlier Sources of Energy **Objective - Level** | | Other fuel and energy-related (equipment, battery, collection time) costs per month | NA | TBD | CFA Francs | TBD | Surveys | Social Impact | Baseline and endline | |
| Improved Productivity for Users of Electricity **Objective - Level** | | Time savings and changes in time allocation and timing across activities, especially for productive use per week | NA | TBD | Hours | TBD | Surveys | Social Impact | Baseline and endline | |
| Reduced Losses of Products and Perishable Goods **Objective - Level** | | Value of lost perishables per month | NA | TBD | CFA Francs | TBD | Surveys | Social Impact | Baseline and endline | |
| Improved Delivery of Social Services | | Perceptions of quality of local public services and business offerings | NA | TBD | Likert Scale | TBD | Surveys | Social Impact | Baseline and endline | |
| Increased Revenues for Businesses and Households | | Cases of air pollution-related illness | NA | TBD | Number | TBD | Surveys | Social Impact | Baseline and endline | |
| | | Average Household Expenditures related to air pollution per month | NA | TBD | CFA Francs | TBD | Surveys | Social Impact | Baseline and endline | |
| | | Revenue and/or net income per month | NA | TBD | CFA Francs | TBD | Surveys | Social Impact | Baseline and endline | |
| | | Number of firms in community | N/A | TBD | CFA Francs | Type of firm | Surveys and grantee data | Social Impact | Baseline and endline | |
| | | Non-fuel cost savings per month | NA | TBD | CFA Francs | TBD | Surveys | Social Impact | Baseline and endline | |

**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.
Examples of such special studies include:

- A staff survey of the *Société Béninoise d'Energie Electrique* (SBEE) will be conducted to provide an overview of SBEE staff perceptions to inform the work of the SBEE Management Services Contractor.
- A gender audit of SBEE has been undertaken to assess equal opportunities and access in human resources and customer service practices.
- An SBEE customer satisfaction study.

## Specific Independent Evaluation Plans

### Summary of Specific Independent Evaluation Plans

The following table summarizes specific evaluation plans.

| Evaluation Name | Evaluation Type | Evaluator | Primary/ Secondary Methodology | Final Report Date |
|---|---|---|---|---|
| **Policy Reform and Institutional Strengthening Evaluation** | Performance Evaluation | Mathematica | Pre-post, mixed methods performance evaluation grounded in political economy, which relies heavily on project monitoring data and key informant interviews (KIIs). | Late 2025 |
| **On-Grid Generation and Distribution Evaluation** | Performance and Impact | Mathematica | Interrupted time-series (ITS) approach, quantitative pre-post, and qualitative performance evaluation. | Sept 2026 |
| **Off-Grid Evaluation** | Performance and impact evaluation | Social Impact | Pre-post performance evaluation on assessing implementation and market effects; Impact evaluation using DiD design with ex-post matching of targeted households in treatment communes with controls in non-treated communes | January 2023 |

### Policy Reform and Institutional Strengthening Evaluation

The Policy Reform and Institutional Strengthening evaluation aims to assess the extent to which the project has met its desired goals (as well as any unanticipated consequences). The evaluation design report is saved here: https://data.mcc.gov/evaluations/index.php/catalog/262.

***Evaluation Methodology Description***
Mathematica is implementing a mixed method pre-post performance evaluation to assess the Reform Project's implementation, that is, whether the program was implemented as planned, how

well the activities and sub-activities were integrated, and what facilitated or inhibited implementation of the project. The evaluation will also use a combination of quantitative and qualitative data to assess outcomes of the project, focusing on whether, how and why activities and sub-activities achieved objectives. The table below lists the key outcome(s), methodology, and data source for each evaluation question. An asterisk (*) denotes outcomes that will not be reported in the interim report.

***Evaluation questions***

**Project Wide**

| Evaluation Question | Key Outcome | Methodology | Data Source |
|---|---|---|---|
| **Q.A.1.** What is the fidelity and degree of program implementation? In the event of deviations from the original design (e.g., in terms of objectives, activities, or beneficiaries), why did they occur and what were the implications for overall outcomes and intended results? What were the barriers and facilitators to implementation? | | Comparison of implementation goals versus results, using political economy lens to explain deviations | • Desk review<br>• KIIs<br>• Focus group discussions |
| **Q.A.2**. Were the sub-activities timed and sequenced in such a manner to facilitate the achievement of expected results? | | Synthesis of stakeholder perceptions | • Desk review<br>• KIIs |

**Energy Efficiency Sub-Activity**

| Evaluation Question | Key Outcome | Methodology | Data Source |
|---|---|---|---|
| **Q.B.1.** To what extent has the Government of Benin adopted and implemented policies and actions to improve energy efficiency? | Degree of adoption of key energy efficiency policies and actions | Descriptive analysis | • KIIs<br>• Document reviews<br>Administrative data |
| **Q.B.2.** To what extent were new or strengthened standards and labeling for energy efficiency implemented during the Compact? | Degree of implementation of new/strengthened standards and labels | Descriptive analysis | • KIIs<br>• Document reviews<br>Administrative data |

| | | | |
|---|---|---|---|
| **Q.B.3.** To what extent have retailers begun selling energy-efficient labeled merchandise? Has the proportion of energy efficient vs. non-energy efficient products on the market changed in terms of availability and sales? | Sales of energy-efficient–labeled appliances* | • Pre-post analysis<br>Qualitative outcomes analysis | • Survey of appliance sellers<br>• Observations at major retailers<br>• KIIs<br>Administrative data |
| **Q.B.4.** Have the recipients of energy efficiency audits changed their consumption? | KWh saved | Descriptive analysis | • KIIs<br>Administrative data |

**Independent Power Producer Sub-Activity**

| Evaluation Question | Key Outcome | Methodology | Data Source |
|---|---|---|---|
| **Q.C.1.** To what extent were new policies and frameworks for IPPs implemented? | • Degree of implementation of IPP framework | • Qualitative descriptive analysis | • Document review<br>• KIIs |
| **Q.C.2.** Have any IPP transactions reached financial close? | • Number and characteristics of IPPs reaching financial close | • Mixed-methods descriptive analysis | • Document review<br>• KIIs |
| **Q.C.3.** How much private investment is there in IPP power generation in Benin? | • Value of private investment | • Quantitative descriptive analysis | • Administrative data<br>• KIIs |
| **Q. C.4.** What percentage of Benin's electricity consumption is produced by IPPs? | • IPP production of energy* | • Pre-Post outcomes analysis of trend in IPP- generated electricity | • Administrative data from MCA/SBEE |
| **Q.C.5.** What percentage of Benin's electricity consumption is produced from clean energy sources? | • Clean energy production of energy* | • Pre-Post outcomes analysis of trend in clean energy generation | • Administrative data from MCA/SBEE |
| **Q.C.6.** Are the PPAs and associated agreements in place being respected? Is the utility paying the IPPs on time? Have any government guarantees been drawn on as a result of non-payment? Are there any | • PPA adherence*<br>• Guarantee call-up | • Qualitative analysis of stakeholder accounts | • Administrative data from ARE<br>• KIIs |

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| arbitrations or legal proceedings between the parties to an IPP transaction? | | | |
| **Q.C.7.** Do IPPs perceive the regulatory framework as credible and transparent? | • Perceived credibility and transparency of the framework | • Qualitative descriptive analysis of stakeholder perceptions | • KIIs |

**Regulation and Tariff Policy Sub-Activity**

| Evaluation Question | Key Outcome | Methodology | Data Source |
|---|---|---|---|
| **Q.D.1.** To what extent has the new tariff policy been implemented? To what extent do electricity tariffs in Benin reflect the cost of service? | • Degree to which tariffs are cost-reflective | • Qualitative analysis with a political economy lens<br>• SBEE financial analysis | • Document review<br>• KII<br>• Administrative data |
| **Q.D.2.** Has the sector regulator assumed its mandated role in setting and adjusting tariffs? | • Extent to which ARE sets and adjusts tariffs | • Qualitative analysis | • KII |
| **Q.D.3.** What is the level of public acceptance of the new tariffs among the different categories of households, businesses, and public services? Have consumers changed their consumption of electricity after new tariffs went into effect? | • Payment of electricity bills | • Pre-post analysis of consumption<br>• Qualitative descriptive analysis | • Administrative data<br>• Telephone surveys<br>• Rapid focus groups<br>• Press review |
| **Q.D.4.** Are the structures and procedures in place to allow recurring adjustments to the tariff, such that it will be able to remain cost-reflective into the future? | • Tariff-setting tool in use, data available for input to tariff -setting tool | • Qualitative sustainability analysis | • Document review<br>• Administrative data<br>• KIIs |
| **Q.D.5.** How has the new tariff structure affected SBEE's balance sheet, income | • SBEE solvency | • Pre-post analysis<br>• Qualitative contribution analysis | • Administrative data<br>• Document review |

| | | | |
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| statement, and cash flow statement? | | | |
| **Q.D.6.** How much infrastructure improvement (including network expansion, maintenance improvement, new capital investments, and staff training) was financed by increased cash flow, if any? | • Increased capital for utility maintenance and new capital investments | • Pre-post outcomes analysis of trend in SBEE infrastructure expenditures<br>• Qualitative contribution analysis | • Administrative data<br>• KIIs<br>• Document review |
| **Q.D.7.** Was the tariff adjustment tool used to change tariffs? If not, what drove tariff changes? | • Use of tariff-setting tool | • Qualitative descriptive analysis with a political economy lens | • Document review<br>• KIIs |
| **Q.D.8.** To what extent has the Grid Code been implemented? | • Degree of Grid Code impleme ntation | • Qualitative analysis o f stakeholder perceptions | • Document review<br>• KIIs |
| **Q.D.9.** To what extent is ARE operational? Does ARE have the resources necessary to successfully carry out its mandate? | • ARE technical, financial, and operational capacity | • Qualitative analysis of stakeholder perceptions | • Document review<br>• KIIs |
| **Q.D.10.** To what extent has ARE been able to make major decisions independently from the Government? | • ARE political indepen dence | • Qualitative analysis of stakeholder perceptions | • Document review<br>• KIIs |

**Utility Strengthening Activity**

| Evaluation Question | Key Outcome | Methodology | Data Source |
|---|---|---|---|
| **Q.E.1**. To what extent have GoB and SBEE abided by the terms of the approved *contrat-plan* since its adoption? | • Implementation of *contrat-plan* outputs and outcomes | • Qualitative analysis of stakeholder perspectives<br>• Quantitative descriptive analysis of contract outputs | • Document review<br>• Administrative data<br>• KII |
| **Q.E.2.** Has the management contractor been able to meet its commitments under | • Management contractor tenure and contract compliance* | • Qualitative descriptiv e analysis | • Document review<br>• Administrative data<br>• KII<br>• Focus groups |

| | | | |
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| the management contract? | | | |
| **Q.E.3a.** What performance improvements have been achieved during the term of the management contractor?<br>**Q.E.3b.** How has the management contractor performed against the KPIs in the management contract?<br>**Q.E.3c.** Has the management contractor provided training and capacity building to the local management of SBEE? | • Management contractor performance* | • Qualitative descriptive analysis | • Document review<br>• Administrative data<br>• KII |
| **Q.E.4.** What are the perceptions (by GoB, SBEE employees and other stakeholders) of the performance of the management services contractor? | • GoB and SBEE satisfaction with management contractor | • Mixed-methods descriptive analysis | • KII<br>• FGS<br>• Telephone or SMS survey |
| **Q.E.5.** How do independent power producers (IPPs) perceive SBEE's ability to meet its obligations under PPAs? | • Private sector investment in energy* | • Qualitative descriptive study with a political economy lens | • Document review<br>• KIIs |
| **Q.E.6.** Did SBEE's cost recovery and financial health improve? | • Utility balance sheet | • Pre-post analysis | • Administrative data |
| **Q.E.7.** To what extent did SBEE's billing and payment processes improve from the perspective | • Staff and customer satisfaction with billing and payment | • Pre-post analysis | • Administrative data<br>• Surveys |

| | | | |
|---|---|---|---|
| of its personnel and of its customers? | | | |
| **Q.E.8.** Did SBEE improve its bill collection and reduce its overall commercial losses? | • Commercial losses<br>• Collection rate | • Pre-post analysis | • Administrative data |
| **Q.E.9**. To what extent has labor productivity increased at the utility? | • Change in staff qualifications, gender, retention | • Pre-post analysis | • Administrative data |
| **Q.E.10.** Did the technical assistance from the MC to SBEE lead to improved maintenance practices? | • Changes in maintenance practices | • Qualitative analysis of stakeholder perceptions | • Document review<br>• KIIs |
| **Q.E.11.** Does SBEE have the capacity to continue maintaining infrastructure (both MCC and non- MCC funded)? | • SBEE technical, financial, and operational capacity* | • Qualitative sustainability analysis | • Document review<br>• KIIs |
| **Q.E.12**. In what other ways have SBEE managem ent practices changed? Are these changes associated with more efficient operations? | • Efficiency of SBEE management practices* | • Qualitative descriptive study | • Document review<br>• KIIs |

**Public Information and Education Activity**

| Evaluation Question | Key Outcome | Methodology | Data Source |
|---|---|---|---|
| **Q.F.1.** To what extent were the communications campaigns implemented? Did the audience understand the campaigns' content as intended? Did | • Audience understanding of campaign messages and content, change in beliefs or perception | • Qualitative analysis of stakeholder perceptions and knowledge | • Document review<br>• Rapid-feedback focus groups |

| | | | |
|---|---|---|---|
| audience perceptions change? | | | |

### *Data Sources*

The table below summarizes the planned quantitative data collection to support the Benin Policy Reform and Institutional Strengthening evaluation. This table combines primary and secondary data sources.

| Survey Name | Quantitative or Qualitative | Define Sample | Sample Size | Number of Rounds | Exposure Period (months) | Expected Dates of Primary Data Collection |
|---|---|---|---|---|---|---|
| Survey of business selling appliances (energy efficiency) | Quantitative | Businesses | 20-30 | 3 | NA | Baseline: Early 2020<br>Interim: Early 2022<br>Endline: Late 2023 |
| SBEE customers (telephone) | Quantitative | SBEE customers | 350-385 hh, 50-80 firms | 2 | NA | Baseline: Early 2020<br>Endline: Late 2023 |
| SBEE employees (telephone) | Quantitative | SBEE employees | 400 | 2 | NA | Baseline: Early 2020<br>Endline: Late 2023 |
| Key informant interviews | Qualitative | MCC/MCA staff | 10-12 | 3 | NA | Baseline: Early 2020<br>Interim: Early 2022<br>Endline: Late 2023 |
| | | ABERME, customs, and energy assoc. representatives | 5 | | | |
| | | Social Impact off-grid evaluation team | 1 | | | |
| | | IPP representatives | 5-7 | | | |
| | | MCC communications specialist | 1 | | | |
| | | Energy code consultant | 1 | | | |
| | | ARE staff and ARE donors | 7-9 | | | |
| | | Contrat-plan consultant, SBEE technical staff, | 6-9 | | | |

| Survey Name | Quantitative or Qualitative | Define Sample | Sample Size | Number of Rounds | Exposure Period (months) | Expected Dates of Primary Data Collection |
|---|---|---|---|---|---|---|
| | | MoE representatives | | | | |
| | | Management contractor, auditor, MCA, GoB | 10-12 | | | |
| | | SBEE directors | 5-8 | | | |
| | | AFD, EU | 2 | | | |
| | | Communications consultant (IdeaConsult) | 1 | | | |
| | | EE audit recipients | 3-5 | | | |
| Focus group discussions | Qualitative | Female business owners, SBEE customers | 7-10 | 2 | NA | Baseline: Early 2020<br>Endline: Late 2023 |
| | | SBEE staff | 4-6 | 1 | NA | Endline: Late 2023 |
| | | Communication campaigns audience | 7-10 | 3 | NA | Baseline: Early 2020<br>Interim: Early 2022<br>Endline: Late 2023 |

Note: The evaluation design report does not specify the exposure period.

The evaluation will also use administrative data including from the following sources:

- National platform for EE norms and labeling (Plateforme Nationale Dédiée aux Normes et de l'Etiquetage Energétique)
- EE audit consumption data
- IPP generation data
- SBEE revenue and expenditures
- Transaction advisor (Nodalis)
- Management contractor
- Gopa infrastructure consultant

Finally, the evaluation's data collection includes project document review, a media review, and direct observations at business selling EE appliances.

### On-Grid Generation and Distribution Evaluation

The On-Grid evaluation aims to assess the extent to which the Electricity Generation and Electricity Distribution Projects have met their desired goals (as well as any unanticipated consequences). The evaluation design report is saved here: https://data.mcc.gov/evaluations/index.php/catalog/214.

As a reminder, the Objective of both these projects is: (A) increase the hours of operation for businesses and public and social services; (B) reduce reliance on costlier sources of energy; (C) reduce losses of products and perishable goods; and (D) improve productivity for users of electricity. The evaluation will measure these objective-level results, although they do not have targets nor were they modeled in the cost-benefit analysis. Also, the evaluation does not include 'social services' in its quantitative survey sample.

#### *Evaluation Methodology Description*

The independent evaluator has designed a mixed-methods evaluation of the Electricity Generation and Distribution Projects to answer the evaluation questions listed below. As detailed in the Evaluation Design Overview table below, several of the the evaluation questions can be answered through rigorous impact evaluations, whereas the evaluation will address others through performance evaluations incorporating both quantitative and qualitative data. Two of the quantitative impact evaluations will estimate impacts of the Electricity Generation and Distribution Projects—separately and in combination—on (1) grid-level outcomes, such as electricity supply, reliability, and quality; and (2) end-user outcomes, such as the energy expenditures of firms and households. To estimate the impacts on electricity supply, reliability, and quality, the independent evaluator will implement ITS (Interrupted Time-Series) analyses of high-frequency data collected from grid monitors and smart meters placed systematically in the electricity network. To estimate the impacts on outcomes for small, medium, and large businesses, and households, the independent evaluator will implement ITS analyses using high-frequency data obtained from periodic mobile phone surveys. The independent evaluator will complement the ITS analyses with a quantitative performance evaluation (a pre-post analysis) that uses survey data to study how grid-level and beneficiary outcomes change over time.

#### *Evaluation questions*

The table below lists the key outcomes, methodology, and data source for each evaluation question. Questions 9, 10, and 11 marked with a "+" relate to the Objective-level results.

| Evaluation Question | Key Outcomes/Themes | Methodology | Data Source |
|---|---|---|---|
| **Q1.** Did the project design change, and how well were the activities implemented? | • Project design and changes over time<br>• Implementation plan and changes over time<br>• Implementation successes and challenges | • Qualitative performance evaluation | • Review of project documents<br>• Interviews with MCA-Benin staff, SBEE staff, Ministry of Energy staff, and project engineers<br>• Site visits |

| Evaluation Question | Key Outcomes/Themes | Methodology | Data Source |
|---|---|---|---|
| | • Complementarity of Electricity Generation and Distribution Projects | | |
| **Q2.** How sustainable are MCC's investments? | • Perceptions of sustainability<br>• Maintenance of infrastructure<br>• Usage and maintenance of grid-monitoring equipment | • Qualitative performance evaluation | • Review of project documents<br>• Interviews with MCA-Benin staff, SBEE staff, Ministry of Energy staff, project engineers, and members of the Energy Sector Donor Roundtable<br>• Site visits |
| **Q3.** How have outside factors influenced the project? | • Availability of energy imports<br>• Completion of North-South 161-kV line<br>• Role of CEB<br>• Other government/donor energy investments<br>• Increases in domestic energy demand | • Qualitative performance evaluation | • Review of project documents<br>• Interviews with SBEE staff, Ministry of Energy staff, and members of Energy Sector Donor Roundtable |
| **Q4.** What is the ex-post ERR of MCC's investments? | • Impacts on beneficiary outcomes<br>• Final project costs | • Quantitative impact analyses<br>• Quantitative performance evaluation<br>• Qualitative performance evaluation | • High-frequency measurement of grid outcomes<br>• Surveys of households and businesses<br>• Review of project documents |
| **Q5.** What are the lessons learned? | • Design and implementation plans, changes, successes, and challenges<br>• Impacts on beneficiary outcomes<br>• Impacts on grid-level outcomes | • Synthesis of evaluation analyses | • Mathematica evaluation analyses<br>• Review of compact closeout documents<br>• Interviews with stakeholders |
| **Q6.** Did the project narrow the supply-demand gap? | • Domestic energy generation capacity and output<br>• Demand for electricity | • Quantitative impact analyses<br>• Qualitative performance evaluation | • High-frequency measurement of grid outcomes<br>• Review of SBEE data |

| Evaluation Question | Key Outcomes/Themes | Methodology | Data Source |
|---|---|---|---|
| **Q7**. How did the project impact electricity reliability, quality, and technical losses? | • Outage frequency and duration<br>• Measures of electricity quality<br>• Technical losses | • Quantitative impact analyses<br>• Qualitative performance evaluation | • High-frequency measurement of grid outcomes<br>• Review of SBEE data |
| **Q8.** How did the response time to technical problems change? | • Duration of outages caused by technical problems<br>• Response time to business and household service calls | • Quantitative impact analyses<br>• Qualitative performance evaluation | • High-frequency measurement of grid outcomes<br>• High-frequency mobile phone surveys of businesses<br>• Review of SBEE data<br>• FGDs with households<br>• Interviews with businesses |
| **Q9.** What are the impacts of the projects on business outcomes? + | • Time use/hours of operation/work disruptions<br>• Energy sources<br>• Investment in and degradation of electrical equipment<br>• Losses of products and perishable goods<br>• Productivity/revenue | • Quantitative impact analyses<br>• Quantitative performance evaluation<br>• Qualitative performance evaluation | • High-frequency mobile phone surveys of businesses<br>• Surveys of businesses<br>• Interviews with businesses |
| **Q10.** What are the impacts of the project on household outcomes? + | • Productivity<br>• Time use<br>• Energy sources<br>• Investment in and degradation of appliances<br>• Losses of products and perishable goods | • Quantitative impact analyses<br>• Quantitative performance evaluation<br>• Qualitative performance evaluation | • High-frequency mobile phone surveys with households<br>• Surveys of households<br>• FGDs with households |
| **Q11.** To what extent did the outcomes for public/social services (for example, health facilities, schools) change after the projects were implemented? + | • Hours of operation<br>• Usage of electrical equipment<br>• Investment in and degradation of equipment<br>• Perception of electricity reliability and quality<br>• Perception of electricity as constraint | • Qualitative performance evaluation | • Interviews with public institutions |

| Evaluation Question | Key Outcomes/Themes | Methodology | Data Source |
|---|---|---|---|
| **Q12.** What are the impacts of new connections on household and small business outcomes? | • Energy use and electricity consumption<br>• Adult and child time use (households)<br>• Employment, Income Generating Activities, income, consumption (households)<br>• Time use and hours of operation (businesses)<br>• Investment in electrical equipment<br>• Productivity and revenue<br>• Decision to connect and constraints to connecting<br>• Expected and realized benefits of connecting | • Quantitative impact analyses<br>• Qualitative performance evaluation | • Surveys of households and small businesses in the household<br>• FGDs with households |

Mathematica will supplement the quantitative impact and performance evaluations with a qualitative performance evaluation, which will include an implementation analysis and a qualitative evaluation of outcomes. This evaluation will use data from document reviews, interviews, and focus group discussions (FGDs) to generate findings on the implementation and sustainability of the Electricity Generation and Distribution Projects, and will provide additional context through which to understand the findings on beneficiary outcomes.

***Data Sources***

Primary Data Collection

| Survey Name | Quantitative or Qualitative | Define Sample | Sample Size | Number of Rounds | Exposure Period (months) | Expected Dates of Primary Data Collection |
|---|---|---|---|---|---|---|
| Grid Monitor Data | Quantitative | Infeed and arrival distribution lines | 80 | Continuous | Periodic data collection ending after 24-36 months of exposure | 2018-2024 |
| Smart Meter Data | Quantitative | Residential low voltage customers | 290 | Continuous | Periodic data collection ending after 24-36 months of exposure | 2018-2024 |
| | | Professional low voltage customers | 145 | | Periodic data collection ending after 24-36 months of exposure | 2018-2024 |
| | | Medium voltage customers | 45 | | Periodic data collection ending after 24-36 months of exposure | 2018-2024 |
| ITS mobile phone surveys | Quantitative | Households and businesses connected to the grid | 1,150 electrified businesses (750 small and 400 medium and large 1,500 electrified households | Thirteen. Every four months | Periodic data collection ending after 24-36 months of exposure | 2018-2024 |
| Pre-post business and household surveys | Quantitative | Households and businesses connected to the grid | 300 small businesses and 300 households | 3 | Interim: 24-36 months<br>Final: 36-60 months | Baseline (2019)<br>Interim (2020-2021)<br>Final (2020-2023) |
| Interviews | Qualitative | MCA-Benin and MCC staff | 4-8 | 3 | Interim: 12 – 36 months<br>Final: 36-60 months | Baseline (2019)<br>Interim (2020-2021)<br>Final (2020-2023) |
| | | SBEE management and engineering staff, DGE, and ARE | 8–10 | 3 | | |
| | | SBEE line workers and customer service | 4-6 | 3 | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Engineers and contractors from the implementing agencies | 4-6 | 3 | | |
| | | Local community leaders, local officials, and/or representatives from energy associations | 8-12 | 3 | | |
| | | Male and female owners, managers, and representatives of small, medium, and large businesses | 12-15 | 3 | | |
| | | Director and managers from schools, health clinics, and other public institutions | 8-12 | 3 | | |
| Focus group discussion | Qualitative | Primary male and female household members | 8–12 | 3 | | |

**Off-Grid Electricity Access Evaluation**

In September 2018, MCC contracted Social Impact to conduct an independent evaluation of the Off-Grid Electricity Access Project. The Evaluation Management Committee approved a first version of the evaluation design report (EDR) in March 2019. The EDR is posted on MCC's evaluation catalogue here: https://data.mcc.gov/evaluations/index.php/catalog/241. In consultation with MCC, MCA, and stakeholders, the independent evaluator will revise the design report according to implementation progress, particularly in relation to the facility's second call for proposals.

***Evaluation Methodology Description***

The evaluation of OGEAP will have two main components. The first of these is a qualitative performance evaluation of the Enabling Environment Activity and the OCEF grant facility (as a facility or mechanism, rather than looking at results of individual grants). The second component will be a quantitative impact evaluation, based on community-level matching and a DiD (difference-in-differences) identification strategy, centered on a collection of grants. The questions guiding both of these evaluations were revised during the inception phase though discussions with MCC, MCA, and other stakeholders.

**Off-Grid Enabling Environment and OCEF Grant Facility**

| Evaluation Question | Key Outcomes | Methodology | Data Source |
|---|---|---|---|
| **Q1.** Was the OCEF grant facility designed and implemented in a way that encouraged high-quality proposals and projects? | • Implementation fidelity<br>• Design relevance | • Qualitative pre-post performance evaluation | • Desk Review<br>• KIIs<br>• Applicant Survey |
| **Q2**. To what extent has the regulatory framework for off-grid energy been implemented? | • Implementation fidelity<br>• Capacity of key stakeholders relevant to implementation roles<br>• Perception of level of implementation of framework among private sector firms | • Qualitative pre-post performance evaluation | • Desk Review<br>• KIIs<br>• Applicant Survey |
| **Q3.** To what extent did OGEAP encourage additional investment in the sector in Benin? | • Level of investment in the off-grid sector<br>• Perception of the role of OGEAP in encouraging that investment | • Qualitative pre-post performance evalaution | • Desk Review<br>• KIIs<br>• Applicant survey |

**Off-Grid Investments**

| Evaluation Question | Key Outcomes | Methodology | Data Source |
|---|---|---|---|
| **Q1.** What were the impacts of the investments on end users? | | | |
| **A)** Did they increase access to and consumption of energy? Was connection status and consumption sustained over time? | • # New connections, by technology (including generation and storage capacity); working connections | • Quantitative matching with difference-in-differences impact evaluation | • Grantee data (and Applicant Survey); field audits by engineer |
| | • Electricity consumption (kW-hour/connection-month) over time, if metered | • Quantitative matching with difference-in-differences impact evaluation | • Grantee data; *household* & *firm surveys* |
| **B)** Did they affect expenditures on energy? | • Connection costs (CFA/connection); expenditure (CFA/connection-month); default rates on contracts over time (%) | • Quantitative matching with difference-in-differences impact evaluation | • Grantee data (and Applicant Survey); *household* & *firm surveys* |
| | • Other fuel and energy-related (equipment, battery, collection time) costs (CFA/month) | • Quantitative matching with difference-in-differences impact evaluation | • Household & firm surveys |
| **C)** Did they increase appliance ownership? | • Purchase (0/1) and spending (CFA) for promotional appliances | • Quantitative matching with difference-in-differences impact evaluation | • Grantee data, if applicable |
| | • Ownership and use (frequency/duration) of appliances and machines, timing of purchases | • Quantitative matching with difference-in-differences impact evaluation | • Household & firm surveys |
| | • Access to different modern energy services (e.g., lighting, refrigeration) | • Quantitative matching with difference-in-differences impact evaluation | • Household & firm surveys |

| Evaluation Question | Key Outcomes | Methodology | Data Source |
|---|---|---|---|
| | • Consumer surplus from appliance ownership (CFA) | • Quantitative matching with difference-in-differences impact evaluation | • Household surveys |
| **D)** Did they increase the hours of operation and coverage of businesses and public services? | • Hours of operation of public services / businesses (hours/week) | • Quantitative matching with difference-in-differences impact evaluation | • Community & firm surveys |
| | • Household use of public services (0/1), and frequency of use | • Quantitative matching with difference-in-differences impact evaluation | • Household surveys |
| | • Perceptions of quality of local public services and business offerings (Likert-scale) | • Quantitative matching with difference-in-differences impact evaluation and Qualitative pre-post performance evalaution | • Community & household surveys |
| **E)** Did they increase revenue generation, net income, consumption of perishables, and/or productivity? | • Time savings (hours/week) and changes in time allocation and timing across activities, especially for productive use (e.g., study, paid work, domestic work) | • Quantitative matching with difference-in-differences impact evaluation | • Household surveys |
| | • Incidence of air pollution-related illness (cases/household; 7-day recall); and expenditures (CFA/household-month) | • Quantitative matching with difference-in-differences impact evaluation | • Household surveys |
| | • Revenue and/or net income (CFA/month) | • Quantitative matching with difference-in-differences impact evaluation | • Household & firm surveys |

| Evaluation Question | Key Outcomes | Methodology | Data Source |
|---|---|---|---|
| | • Non-fuel cost savings (CFA/month) | • Quantitative matching with difference-in-differences impact evaluation | • Household & firm surveys |
| | • Value of lost perishables (CFA/month) | • Quantitative matching with difference-in-differences impact evaluation | • Household & firm surveys |
| | • # and types of firms | • Quantitative matching with difference-in-differences impact evaluation and Qualitative pre-post performance evalaution | • Grantee data; Community surveys |
| **Q2.** What was the distribution of those impacts? Were the above impacts distributed differently across key population sub-groups, namely gender, age, or income groups? | • All above measures, disaggregated by sex (male/female), age group (<18 years; 18-30; >30 years), level of education (none, primary only, secondary or greater), and income (poverty status) or occupation (unemployed, agriculture, or non-agriculture) | • Quantitative matching with difference-in-differences impact evaluation | • Sources listed above for all outcomes |
| **Q3.** How did impacts vary according to the exposure period? | • All above measures, analysed using an econometric model that accounts for the duration of exposure | • Quantitative matching with difference-in-differences impact evaluation | • Sources listed above for all outcomes |
| **Q4.** What factors drive or constrain adoption of new technologies related to off-grid energy (both connections and equipment, appliances or energy services)? | • All outcomes under evaluation questions 1a-c, but particularly adoption of connections and of appliances/energy services | • Quantitative matching with difference-in-differences impact evaluation | • Sources listed above for all outcomes 1a-c |

| Evaluation Question | Key Outcomes | Methodology | Data Source |
|---|---|---|---|
| **Q5.** Via what mechanisms did revenue generation or productivity increase? (i.e., for what types of activities/ businesses did energy stimulate investment and growth?) | • All outcomes under 1d-e, disaggregated by business/service type | • Quantitative matching with difference-in-differences impact evaluation | • Sources listed above for outcomes under 1d-e |
| **Q6.** Can the OCEF-supported investments be considered cost-beneficial or cost-effective, relative to alternatives? | • Valuation of impact measures (demand; valuation of public services) | • Quantitative matching with difference-in-differences impact evaluation | • Household & firm surveys |
| | • Cost of interventions | • Quantitative matching with difference-in-differences impact evaluation | • Grantee data (and Applicant Survey) |

***Data Sources***

Primary Data Collection

| Survey Name | Quantitative or Qualitative | Define Sample | Sample Size | Number of Rounds | Exposure Period (months) | Expected Dates of Primary Data Collection[13] |
|---|---|---|---|---|---|---|
| Applicant Surveys | Quantitative | Private sector off-grid energy firms | 60 | 3 | 36 | Round 1: April 2019 (Call 1); December 2019 (Call 2)<br><br>Round 2: Early 2021<br><br>Round 3: April 2022 (Call 1); December 2022 (Call 2) |
| Grantee Reporting Data | Quantitative | Grantee | 20 | Ongoing | 36 | Throughout evaluation |
| Beneficiary Surveys | Quantitative | Households | 4224 at baseline; 2112 at follow-up | 2 | 36 | Round 1: Rolling baseline, beginning in April 2019 (call 1)/ December 2019 (call 2)<br><br>Round 2: Equivalent month to baseline, in 2022 |
| | | Village Enterprises | 600-1200 | | | |

[13] To be changed in the modified evaluation design report.

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Communities | 60-120 | | | |
| Interviews | Qualitative | MCC Staff | 5 | 2 | 36 | Round 1: Baseline or immediate outcomes for some questions<br><br>Round 2: Approximately 3 years |
| | | MCA Benin Staff | 3 | | | |
| | | Implementer | 3 | | | |
| | | Private Sector | 10 | | | |
| | | Government of Benin | 6 | | | |
| | | Other Donors | 5 | | | |

## Summary of Activities or Sub-Activities without Evaluations

The Women's Economic Empowerment Activity will not be evaluated. This Activity does not support the achievement of the Project Objective.

# IMPLEMENTATION AND MANAGEMENT OF M&E

## Responsibilities

The MCA-Benin II Monitoring and Evaluation Division is composed of a Director who will have the key responsibility of leading and managing all M&E/Econ activities; and two staff members who will support the Director in performing the M&E/Econ activities. Additionally, the division will hire short-term support on an as needed basis. The division 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;
- As the champion of results-based management, the M&E Unit will take steps to foster a results oriented culture throughout MCA 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 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 a guidance document to be used by all MCA-Benin II 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, to ensure a common understanding by all. This could take the form of orientation and capacity building sessions 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, and
    - Impact evaluation questions and methodology.
- 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 Terms of References (TORs), contracts/agreements, data collection instruments, reports/analyses, etc.;

- Develop, with the Communication Unit, Environmental and Social Performance (ESP) officers, and Gender and Social Inclusion (GSI) unit, and implement a systematic results dissemination approach that draws on verified ITT data;
- Organize and oversee regular independent data quality reviews on a periodic basis to assess the quality of data reported to MCA;
- 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 team to prepare the TOR, and participate in the proposal evaluation as part of the procurement process.
- Responsible for the effective contract administration of the resulting M&E contracts in accordance with the MCA-Benin Contract Administration Management Manual (CAMM);
- Ensure that data collection mechanisms are designed to collect data disaggregated by sex and other social inclusion dimensions, as applicable and practical, and that the findings are presented at the appropriately disaggregated level; and
- 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 procedures that includes such standards.

The M&E Director will be a part of MCA-Benin II's internal Management Unit, composed from MCA leadership, Project Directors, and other Directors. Collaboration with the procurement team will be very important to prepare the TORs in a timely manner to assist the Procurement Directorate in conducting 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 Communications Unit.

In order to prepare for post-compact monitoring by the Government, the MCA-Benin II DESE should identify a post-compact point of contact (POC) within the GoB early on in the program (in Year 3 of the Compact implementation) 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.

## MCA 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. However, any MIS development must be coordinated closely with both the MCC MIS and the MCA MIS initiatives.

## 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. In the fourth quarter of every year of the Compact, or as necessary, the M&E/EA Director of MCA-Benin II and representatives of MCC M&E staff will review how well the M&E Plan has met its objectives. The 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 are 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, in agreement with MCC M&E, when the need for change has been identified in the review. The revision and approval process will follow the guidelines outlined in the MCC M&E Policy.

# M&E BUDGET

The budget for the implementation of the proposed M&E activities for the five-year term of the Compact is US$ 5.25 million. This was decreased to $3,040,277 in April 2020, because the MCA/M&E budget included funding for survey data collection that ended up being supported by M&E due diligence funds. The M&E budget slightly increased to $3,890,277 in August 2021 when the Compact was extended by one year. Both changes were done as part of larger Compact modifications. The M&E budget does not include the M&E staff in the MCA 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 program duration, but the distribution of funding between line items may be adjusted according to the results of the M&E Plan's reviews or quarterly if needed.

While the resources for the carrying-out of surveys are allocated by MCA- Benin II from the Compact funds, the evaluation design and analysis is to be funded directly by MCC. The estimated

budget of MCC-contracted independent evaluations is $7 Million, which includes data collection costs.

| M&E Budget | CIF | Compact | Total (2017) | Total (2020) | Total (2021) |
|---|---|---|---|---|---|
| Planning | | $ 250,000 | $ 250,000 | | |
| M&E Training | | $ 370,000.00 | $ 370,000 | | |
| Performance Indicator Monitoring: Data Collection, Compiling and Analysis | $ 350,000 | $ 450,000 | $ 800,000 | | |
| M&E Studies and Surveys | | $ 3,390,000 | $ 3,390, | | |
| Communication | | $ 250,000 | $ 250,000 | | |
| Miscellaneous | | $190,000 | $ 190,000 | | |
| **Total** | **$ 350,000** | **$4,900,000** | **$5,250,000** | **$3,040,277** | **$3,890,277** |

## M&E Focal Points

Implementing entities responsible for providing data to the MCA-Benin II will assign M&E focal points to participate in M&E activities. These focal points will come from the following institutions:

Implementers

- SBEE (Commercial, Generation, Distribution, and Research Departments)
- Beninese Agency for Rural Electrification and Energy Control (ABERME)
- Energy Regulator (ARE)

Non-Governmental Organizations

- Consumer Defense League of Benin
- Professional Associate for Renewable Energy Specialists (AISER Benin)
- African Women Entrepreneurship Program (AWEP)
- National Confederation of Artisans of Benin (CNAB)
- National Association of Communes in Benin (ANCB)

Private Sector

- Counsel of Private Investors (CIPB)
- National Council of Management
- Chamber of Commerce and Industry of Benin (CCIB)

Public Sector

- General Directorate of Energy, Director of Studies, Statistics, Planning, and Regulation

- Statistics Department/DPP. Ministry of Industry, Commerce, and Artisanry

Cross-Cutting Ministries

- General Directorate of Economic Affairs (DGAE) at the Ministry of the Economy and Finance
- General Directorate of Programming and Monitoring Public Investments (DGPSIP) at the Ministry of Development
- National Institute of Statistics and Economic Analysis (INSAE)

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Policy Reform and Institutional Strengthening (Project-Wide)** | | | | | | | | | | |
| Increased Capital for Utility Maintenance and New Capital Investments | | Outcome | SBEE investments in new infrastructure | Total amount invested by SBEE in infrastructure using its own funds | CFA Francs | None | SBEE's Financial and Administrative Division | SBEE | Annual | None |
| | | Outcome | SBEE investments in maintaining infrastructure | Total amount invested by SBEE in infrastructure maintenance using its own funds | CFA Francs | None | SBEE's Financial and Administrative Division | SBEE | Annual | None |
| **Policy, Regulation, and Institutional Support Activity** | | | | | | | | | | |
| Increased Adoption of Energy Efficient Appliances and Measures | | Outcome | Adoption rate for energy efficient appliances | Proportion of consumers (households and businesses) that are willing to pay for at least one EE appliance. | Percentage | Customer class (Households, Businesses, Public entities); Sex (Female, Male); and Business Type (Formal; Informal) | Survey | DESE/MCA Benin II | Other | This survey will be held twice during the duration of the compact. Average is not a type of disaggregation; As the sample included households and businesses, the average is the global value for this indicator which is calculated with household and businesses values considering their respective weights |
| | | Outcome | Amount invested in energy efficiency measures | Amount invested in energy efficiency measures by public entities and industrial companies benefiting from MCA-funded energy efficiency audits | CFA Francs | Funding source (MCA-Benin II; Other sources) | Benefiting entities | MCA Benin II | Annual | Yearly targets to be provided considering industrial companies that benefited EE audits |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| Increased Domestic Generation Output in Benin | | Outcome | Total generation output | Combined generation output from existing and new projects in the country | Megawatt hours | Renewable energy type (PV, Hydro, Thermal) | DGRE data collection sheet | DGRE | Annual | This indicator considers all types of generation outputs regardless of funding sources and energy types |
| Increased Private Investment in Power Generation | | Outcome | Amount invested in IPPs' projects | Total amount of debt and equity provided for IPP projects | US dollars | None | ARE | ARE | Annual | None |
| Increased Cost Recovery for SBEE | P-24 | Outcome | Operating cost-recovery ratio | Total revenue collected / Total operating cost. Total operating cost is defined as operating expenses plus depreciation. | Percentage | None | SBEE Quarterly Data collection sheet | SBEE | Quarterly | None |
| | P-24.1 | Outcome | Total revenue collected | The total revenue collected by the utility in a given period. | US dollars | | | | | |
| | P-24.2 | Outcome | Total operating cost | Operating expenses plus depreciation. | US dollars | | | | | |
| Tariffs will be cost reflective | | Outcome | Cost-reflective tariff regime | Average tariff per kilowatt-hour / Average revenue requirement per kilowatt-hour of electricity supplied to customers | Percentage | Client type (Post-payment LV, Post-payment MV, Pre-payment LV) | SBEE | ARE | Annual | None |
| | | Outcome | Average cost per kwh supplied | Average cost per kwh supplied | CFA Francs | Client type (Post-payment LV, Post-payment MV, Pre-payment LV) | Quarterly Report/MHI Gd'Or and Smart Vend | SBEE Sales division | Quarterly | Management contractor indicator code: C16 |
| | | Outcome | Average cost per kwh invoiced | Average cost per kwh invoiced | CFA Francs | Client type (Post-payment LV, Post-payment MV, Pre-payment LV) | Quarterly Report/MHI Gd'Or and Smart Vend | SBEE Sales division | Quarterly | Management contractor indicator code: C11 |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| ARE approves new tariffs | | Outcome | Approval of cost-reflective tariffs | Date on which ARE approves electricity tariff application | Date | None | ARE Notice | ARE | Once | None |
| ARE has financial and operational independence in decision making | | Outcome | Financial self-reliance of ARE | Amount of ARE revenue from fees (0.5% of SBEE's revenue) and file examination fees divided by the total budget (sums of fees, examination fees and allocated budget) | Percentage | None | ARE's 2019-2021 three year investment and financing Plan | ARE | Annual | None |
| The sector regulator (ARE) is fully operational | | Outcome | Number of notices provided by ARE in a given year | Number of notices provided by ARE in a given year | Number | None | ARE Website | ARE | Annua1 | None |
| GOB entities will adopt policies and actions to improve energy efficiency | | Outcome | Energy efficiency standards formulated and enforced | Date of adoption of energy efficiency standards by GoB | Date | None | Decree of adoption and application of energy efficiency standards | DGRE | Once | None |
| GOB entities will adopt policies and actions to improve energy efficiency | | Outcome | Energy efficiency labels adopted | Number of energy efficiency labels (standards) passed and adopted by GoB | Number | N/A | Decree of adoption of energy efficiency labels | DGRE | Annual | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| Financial close reached and private capital leveraged | - | Outcome | Generation Capacity Reached Financial Close | Number of MW from Compact-supported transactions for which all 'project and financing agreements have been signed, all conditions on those agreements have been met, and the private party can start drawing down the financing to start work on the project' | MW | None | Signed project and financing agreements | Ministry of Energy<br>ARE | Annual | The definition of financial close is provided by the Public-Private Partnership Knowledge Lab. The indicator corresponds to a Power Africa indicator. |
| IPPs Solar Power Plant built and functional | | Outcome | Capacity installed by IPPs | Total MW installed by IPPs | Megawatt | Funding source (MCA-Benin II; Other sources) | ARE Data collection sheet | ARE | Annual | The M&E team will try to find alternative sources if ARE is unable to provide this information. |
| | | Outcome | Generation from new IPPs | Total megawatt hours generated in a calendar year from the new IPPs under the Compact's IPP sub-activity | Megawatt hours | None | ARE Data collection sheet | ARE | Annual | None |
| PPAs signed with one or more firms with ARE approval | | Outcome | PPAs signed | Number of PPAs signed and approved by ARE with support from MCC | Number | None | ARE | ARE | Annual | According to ARE Transcope Energy Ltd, Paras Energy and Volta River Authority signed in 2020 and in perspective we have GREAN Yellow and Egnong who will sign no later than 2023. |
| GoB approves institutional framework for IPPs | | Outcome | Approval of IPP institutional framework | Date of approval for IPP institutional framework | Date | None | ARE | DGRE | Once | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| GoB approves Tariff Policy and Tariff Plan | | Outcome | Approval of Tariff Policy and Tariff Plan | Date of Tariff Policy and Tariff Plan approval by the government | Date | None | ARE, Ministry of Energy | Ministry of Energy | Once | None |
| | | Process | Validation and adoption of tariff study report | Date of adoption of the final tariff study report | Date | None | MCA Benin II | MCA Benin II | Once | None |
| SBEE applies for cost-reflective tariffs | | Output | Proposal of cost-reflective tariffs | Date on which the utility submits cost-reflective tariff application to ARE | Date | None | Cost-reflective tariffs proposal of SBEE | SBEE | Once | None |
| The sector regulator (ARE) is fully operational | | Output | Percentage of job positions filled in ARE | Number of individuals on ARE's payroll divided by the total number of positions in the official organizational chart | Percentage | None | ARE's 2019-2021 three year investment and financing Plan | ARE | Annual | None |
| Implementation of the Independent regulator | | Output | ARE headquarters are built and in service | Date at which ARE headquarters is constructed and IT and office equipment is installed | Date | None | Building and equipment acceptance report | MCA | Once | None |
| The sector regulator (ARE) is fully operational | | Output | ARE staff trained on Tariff regime | Number of ARE staff who have attended at least one training session on tariff regime | Number | None | ARE Data collection sheet | ARE | Annual | None |
| Evaluation of Current Needs & Opportunities for Energy Efficiency for Public Entities and Industrial Companies | | Output | Number of public entities and industrial companies audited | Number of public entities and industrial companies benefiting from an MCA-funded energy efficiency audit | Number | Type of entities (Industrial companies; Public entities) | Report of SGS Sénégal SA | Groupement SGS Sénégal SA | Once | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| Code for low and medium voltage electricity grid developed | | Output | Grid Code developed | Date at which the sector regulator (ARE) approves the medium and low voltage grid codes | Date | None | ARE official Notice of approval | ARE | Once | Grid code development was not initially considered by the Compact, but was found to be necessary for the IPP sub-activity. |
| Update to the Benin-Togo Energy Code | | Output | Energy code updated | Date of approval of the updated Code by both governments (GoB and GoT) | Date | None | Ministry of Energy | DGRE | Once | None |
| Implementation of the Master Plan | | Output | Master plan adopted | Date of adoption of the Master Plan of the Energy Sub-Sector by the government | Date | None | Ministry of Energy | DGRE | Once | None |
| **Utility Strengthening Activity** | | | | | | | | | | |
| Service quality for electricity consumers sustainably improved | | Outcome | Continuity of service indicator (apart from external cause) | (Number of minutes in a year) x (Undistributed energy) / (Total energy delivered to the Grid) | Minutes | None | SYSTEM \| Collection of information related to the energy delivered to the grid ; MANUAL \| Non-Distributed Energy Calculation | SBEE/DT | Quarterly | Indicator used to calculate variable compensation Management contractor's KPI: Reference T1 |
| Government net arrears to SBEE reduced | | Outcome | Government net arrears to SBEE | Amount of the GoB debt to SBEE | CFA Francs | None | Arrears payment report | MCA Benin II | Quarterly | Identify the raw data that goes into the calculation of the indicator (debt and receivable to release the balance)<br>This indicator only looks at GoB debt to SBEE, and not the money that SBEE owes to CEB and GoB. In 2018, SBEE owed almost twice as much to the government than the |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | government did to SBEE. |
| SBEE Employee competencies improved | | Outcome | Training hours per staff | Number of training hours provided by group x number training participants / total number of SBEE personnel | Hours | Sex (Female; Male) | Quarterly Report/MHI | SBEE/HR/Audit Department | Quarterly | Management contractor's KPI: Reference H1 |
| Improved collection rate | | Outcome | Recovery rate per billing session (month M) and by category of consumers on date M+6 | Total amount recovered for the month M+6 / Total amount of invoices for the month M and debts over 6 months. | Percentage | Consumer type (Low voltage, Medium voltage) Public entities | Quarterly Report/MHI Gd'Or and Smart Vend | SBEE Sales division or Internal Audit Department | Quarterly | New definition adopted by the SBEE. Management contractor's KPI: Reference C7 |
| | | Outcome | On-time collection rate for low voltage private customers | Amount collected from bills of low voltage private customers / amount of bills issued during the same period for the same customer class | Percentage | None | Quarterly Report/MHI Gd'Or and Smart Vend | SBEE Sales division or Internal Audit Department | Quarterly | Indicator used to calculate variable compensation Management contractor's KPI: Reference C8 |
| | | Outcome | On-time collection rate for medium voltage private customers | Amount collected from bills of medium voltage private customers / amount of bills issued during the same period for the same customer class | Percentage | None | Quarterly Report/MHI Gd'Or and Smart Vend | SBEE Sales division or Internal Audit Department | Quarterly | Indicator used to calculate variable compensation Management contractor's KPI: Reference C9 |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Outcome | On-time collection rate for public sector customers | Amount collected from bills of public customers / amount of bills issued during the same period for the same customer class | Percentage | None | Quarterly Report/MHI Gd'Or and Smart Vend | SBEE Sales division or Internal Audit Department | Quarterly | Indicator used to calculate variable compensation Management contractor's KPI: Reference C10 |
| Customer service improved | | Outcome | Average time for consumers troubleshooting | Average time between a customer communicates a technical complaint and the problem is resolved | Hours | SBEE Regions (DRL1; DRL2; DRA; DRO/P DRZ/C;DRM/C ; DRB/A;DRA/D ) | Quarterly Report/MHI | SBEE | Quarterly | Management contractor's KPI: Reference T8 |
| | | Outcome | Quotation issuance for new connection | Average number of days between a customer's request for a new connection and the issuance of a quotation | Days | SBEE Regions (DRL1; DRL2; DRA; DRO/P DRZ/C;DRM/C ; DRB/A;DRA/D ) | Survey | SBEE MCA-Bénin II | Annual | Data to be collected through survey by SBEE. **Details on calculation method included in the INSAE baseline study report.** |
| | | Outcome | Time to connect | Average number of days between payment of the quoted amount and the date the connection is effective | Days | SBEE Regions (DRL1; DRL2; DRA; DRO/P DRZ/C;DRM/C ; DRB/A;DRA/D ) | Survey | SBEE MCA-Bénin II | Annual | Data to be collected through survey by SBEE. |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Customer satisfaction improved | | Outcome | Customer satisfaction index | Rating of customer service (technical and non-technical) by SBEE customers | Percentage | Customer types (Households; Businesses) | Surveys | SBEE, MCA Benin II | Other | Management contractor's KPI: Reference C15 Frequency of reporting: twice |
| Employee satisfaction improved | | Outcome | SBEE staff satisfaction index | Average of responses to question (a) + average of responses to question (b) / 2 * 10. Question (a): On a scale of 0 to 10, how satisfied are you with your working conditions (office, environment, hygiene/health, and security). Question (b): On a scale of 0 to 10, to what extent does your work meet your expectations? | Percentage | Sex (Female; Male) | Surveys | SBEE, MCA Benin II | Other | Frequency of reporting: twice |
| Operational performance improved | | Outcome | Efficiency of the electrical distribution network | The difference between the quantity of electricity injected into the network and billed compared to the quantity injected into the network. | Percentage | None | Quarterly Report/MHI | SBEE | Quarterly | Management contractor's KPI: Reference C1 |
| Improved operational efficiency and productivity | | Outcome | Labor productivity | Number of SBEE employees / 1000 customers | Percentage | None | Quarterly Report/MHI | SBEE/Internal Audit Department | Annual | Management contractor's KPI: Reference C14 |
| Procurement processes improved | - | Outcome | Digitized stock | Gap between value of stock in MIS and value of the physical stock | Percentage | None | Quarterly Report/MHI | SBEE | Annual | Reference A1 The difference is calculated by product. The rate is calculated with the |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | absolute value of the differences per product divided by the value of the digitized stock following the inventory and after logical corrections. |
| SBEE has a PTA and a budget in accordance with the Contract Plan | | Outcome | PTA adoption according to contract Plan | Number of anuual work plans adopted by SBEE's board of directors aligned per the Contrat Plan management | Number | None | SBEE | SBEE | Annual | None |
| | | Outcome | Budget adoption in accordance with contract plan | Number of anuual budgets adopted by SBEE's board of directors aligned per the Contrat Plan | Number | None | SBEE | SBEE | Annual | None |
| | | Outcome | Budget execution in accordance with contract plan | Proportion of budget spent in accordance with Contrat Plan | Percentage | None | SBEE | SBEE (DAF Office) | Annual | None |
| Support for SBEE Management Contract | | Outcome | SBEE staff trained | Total number of SBEE staff trained in accordance with Management Contract | Number | Sex | SBEE | SBEE | Quarterly | None |
| Pre-paid meters installed in public and private entities | | Outcome | Transition to pre-paid metering system | Number of customers with pre-paid meters installed / Total number of customers | Percentage | None | Quarterly Report/MHI Gd'Or and Smart Vend | SBEE Sales division | Annual | Management contractor's KPI: Reference:C5 |
| Installation of pre-paid meters in public administration buildings | | Outcome | Number of prepaid meters installed in public entities. | Number of prepayment meters installed in public entities. | Number | None | Raport de Suivi des CP | MCA Bénin II | Annual | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| SBEE has a maintenance management system | | Outcome | Maintenance system installation | Date on which the new system management is created and launched | Date | None | SBEE | SBEE | Once | MCC is no longer funding the maintenance management system. However, M&E is still tracking these results due to their importance in the project logic. |
| SBEE Implements New Maintenance System | | Outcome | Maintenance system equipment | Percent SBEE regions with fully equipped maintenance tools | Percentage | None | SBEE | SBEE | Annual | |
| Network made sustainable and reliable | | Outcome | Number of outages observed at the substation HTA | Total number of outages observed at the substation HTA | Number | None | SBEE | SBEE | Quarterly | Reference T3 |
| Network made sustainable and reliable | | Outcome | Duration of outages observed at the substation HTA | Total hours of outages observed at the substation HTA | Hours | None | SBEE | SBEE | Quarterly | Reference T4 |
| Network made sustainable and reliable | | Outcome | Percentage of overloaded distribution stations | Number of overloaded distribution stations/total distribution stations | Percentage | None | SBEE | SBEE | Quarterly | Reference T6 |
| Transactions Advisor competitively recruited | | Output | Transactions Advisor installed | Date of installation of the Transactions Advisor | Date | None | Notice to proceed | MCA Bénin II | Once | None |
| Management contractor competitively recruited | | Process | Management contract signed | Date at which the management contractor is signed by all relevant parties | Date | None | Management contract | MCA-Benin II | Once | None |
| **Public Information and Education Activity** | | | | | | | | | | |
| Greater Acceptance of Tariff Changes and Their Benefits | | Outcome | Tariff acceptance rate | Total number of respondents who (1) state being aware of the tariff change, (2) think at least one aspect of electricity service is affected by the tariff change, and (3) think the | Percentage | Consumer class (Households; Commercial; Industrial). Sex (Male; Female) for Households only | Surveys | MCA Benin II | Other | Frequency of reporting: twice |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | service provided is worth the additional cost divided by the total number of respondents for whom (1) and (2) is true. Survey results were extrapolated and represent national-level estimates. | | | | | | |
| Greater Public Awareness of Tariff Changes | | Outcome | Tariff awareness rate | Percentage of survey respondents who responded 'yes' to the question: "Are you aware of SBEE's new rates?" | Percentage | Consumer class (Households; Commercial; Industrial). Sex (Male; Female) for Households only | Surveys | MCA Benin II | Other | Frequency of reporting: twice |
| N/A | | Output | Awareness campaigns held on tariffs | Total number of awareness campaigns held on tariff changes | Number | None | SBEE | SBEE, DGE, MCA Benin II | Quarterly | None |
| N/A | | Output | Awareness campaigns held on energy efficiency | Total number of awareness campaigns held on efficient use of energy by households | Number | N/A | DGRE | DGE, MCA Benin II | Quarterly | None |

## Electricity Generation and Distribution Projects

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| **Electricity Generation and Distribution Projects - Outcomes** | | | | | | | | | | |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| Reduced number and duration of outages | | Outcome | System Average Interruption Duration Index (SAIDI) | Sum of durations, in customer-hours, of sampled customer interruptions in a quarter / Total number of sampled customers connected to network in the same quarter. | Hours | None | Smart meter data platform | SBEE Technical Directorate | Quarterly | SBEE does not currently measure SAIDI and SAIFI. MCC is funding the installation of grid monitors and smart meters to be able to measure these indicators. |
| | | Outcome | System Average Interruption Frequency Index (SAIFI) | Sum of sampled customer-interruptions in a quarter / Total number of sampled customers connected to network in the same quarter. | Rate | None | Smart meter data platform | SBEE Technical Directorate | Quarterly | SBEE does not currently measure SAIDI and SAIFI. MCC is funding the installation of grid monitors and smart meters to be able to measure these indicators. |
| Decreased Gap between supply and demand | P-15 | Outcome | Total electricity supply | Total electricity, in megawatt hours, produced or imported in a year. | Megawatt hours | Electricity supply source : Domestic (IPP owned; SBEE production, Government owned) and Imports. | CEB, SBEE, IPP | DGRE | Annual | None |
| | P-23 | Outcome | Total electricity sold | The total megawatt hours of electricity sales to all customer types. | Megawatt hours | Customer class: Households, Businesses, (commercial and industrial), Other | CEB, SBEE, IPP | DGRE | Quarterly | Disaggregation Other covers: Public Lighting, SBEE and SONEB staff consumption |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Outcome | Total additional energy consumption from Grid Strengthening Activity | Total sum of the energy supplied by the new substations constructed and rehabilitated minus the maximum amount of energy transmitted by the substations before the works. | Megawatt hours | None | Targets are from emails with the economist based on the latest CBA models | MCC Economics Team | Quarterly | Does not include any additional energy or other benefits resulting from the NDCC. |
| | | Outcome | Total electricity demand | Actual demand (consumption) + demand from connected customers who are not served (through load shedding, for instance) | Megawatt hours | None | CEB, SBEE, IPP | DGRE | Annual | Source Contract Plan, Revised values derived from the provisional report of the National Electrification Strategy |
| Reduced technical losses | P-19 | Outcome | Distribution system losses | 1 – [Total megawatt hours billed / Total megawatt hours received from transmission] | Percentage | None | SBEE, CEB | SBEE | Quarterly | Cost benefit analysis data |
| Improved Voltage Quality and Stability for Users | | Outcome | Distribution network voltage | Percentage of time that the voltage on the network is ±10 % 220 V | Percentage | None | SBEE, CEB | SBEE | Quarterly | None |
| **Electricity Generation and Distribution Projects - Outputs** | | | | | | | | | | |
| Improved grid capacity | P-11 | Output | Distribution substation capacity added | The total added substation capacity, measured in megavolt amperes that is energized, commissioned, and accompanied by a test report and supervising engineer's certification resulting from new | Megavolt ampere | EGP Activity (Regional activity; Cotonou Activity) | MCA Benin II | MCA Benin II (Distribution Project) | Once | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | construction or refurbishment of existing substations supported by MCC. | | | | | | |
| Switchgears and sub-station capacity added | | Output | Number of switchgear stations and substations built | Number of switchgear stations and substations built with MCC project funds | Number | EGP Activity (Regional activity; Cotonou Activity) | Minutes of final reception of the stations/substations built | MCA Benin II (Distribution Project) | Once | None |
| | | Output | Number of switchgear stations and substations rehabilitated | Number of switchgear stations and substations rehabilitated | Number | By EGP activity (Cotonou activity; Regional activity) | Minutes of final reception of the stations/substations rehabilitated | MCA Benin II (Distribution Project) | Once | None |
| Construction and rehabilitation of distribution network | P-10 | Output | Kilometers of distribution lines upgraded or built. | The sum of linear kilometers of new, reconstructed, rehabilitated, or upgraded distribution lines that have been energized, tested and commissioned with MCC support | Kilometers | Voltage level (63Kv; 33Kv; 15Kv) and EGP activity (Cotonou activity; Regional activity) | Monthly report of PMF | MCA Benin II (Distribution Project) | Quarterly | None |
| | | Process | Kilometers of distribution line installed | The sum of linear kilometers of new, reconstructed, rehabilitated, or upgraded distribution lines that have been installed but have not been commissioned with MCC support. | Kilometers | Types of lines (63Kv; 33Kv; 15Kv) and EGP Activity (Cotonou activity; Regional activity) | Monthly report of PMF | MCA Benin II (Distribution Project) | Quarterly | None |
| Dispatch center constructed | | Output | National Dispatch Control Center constructed | Provisional acceptance of construction is received according to contractual specifications | Date | None | Minutes of final reception of the building of the NDCC | MCA Benin II SBEE | Once | Specific technical requirements of NDCC will be detailed in the contract for the NDCC. Final acceptance is expected one year after provisional acceptance. |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| Dispatch center constructed | | Output | National Dispatch Control Center is equipped with furniture and office supplies | Final acceptance of equipment is received according to contractual specifications | Date | None | Minutes of final reception of the office equipment and furniture of the NDCC building | MCA Benin II SBEE | Once | None |
| SCADA and NDCC systems installed | | Output | Telecommunication system equipment installed | All telecommunication system equipment installed according to contractual specifications | Date | None | Minutes of final reception of the Telecom equipment installed | MCA Benin II SBEE | Once | None |
| | | Output | Supervisory control data acquisition (SCADA) equipment installed | SCADA installed according to contractual specifications | Date | None | Minutes of final reception of the SCADA equipment installed | MCA Benin II SBEE | Once | None |
| | | Output | Substations connected to SCADA/NDCC | Actual number of existing and new substations connected to the SCADA/NDCC before the end of the Compact | Number | None | MCA Benin II SBEE | MCA Benin II SBEE | Quarterly | None |
| | | Output | Back-up National Dispatch Control Center constructed | Provisional acceptance of construction is received according to contractual specifications | Date | None | Minutes of final reception of the BUNDCC building | MCA Benin II SBEE | Once | None |
| | | Output | Individuals trained in the NDCC system | Number of individuals participating in at least one training session | Number | Sex (Male/Female) | MCA Benin II SBEE | MCA Benin II SBEE | Quarterly | None |
| Automated meter reading (AMR) technology is installed | | Output | Number of AMR devices installed | Number of AMR technology meters installed through MCC funding | Number | Grid monitor and smart meters | MCA Benin II | MCA Benin II SBEE | Annual | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| and functional | | | | | | | | | | |
| **Electricity Generation and Distribution Projects - Process** | | | | | | | | | | |
| | | Process | Value of signed power infrastructure feasibility and design contracts | The value of all signed feasibility, design, and environmental impact assessment contracts, including resettlement action plans, for power infrastructure investments using 609(g) and compact funds. | US dollars | None | SAP | MCA Benin II's DAF | Quarterly | None |
| | | Process | Percent disbursed of power infrastructure feasibility and design contracts | The total amount of all signed feasibility, design, and environmental impact assessment contracts, including resettlement action plans, for power infrastructure disbursed divided by the total current value of signed contracts | Percentage | None | SAP | MCA Benin II's DAF | Quarterly | None |
| | | Process | Value disbursed of power infrastructure feasibility and design contracts | The amount disbursed of all signed feasibility, design, and environmental impact assessment contracts, including resettlement action plans, for power infrastructure using 609(g) and compact funds. | US dollars | None | SAP | MCA Benin II's DAF | Quarterly | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Process | Value of signed power infrastructure construction contracts | The value of all signed construction contracts for power infrastructure investments using compact funds | US dollars | None | SAP | MCA Benin II's DAF | Quarterly | None |
| | | Process | Percent disbursed of power infrastructure constructure 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 | None | SAP | MCA Benin II's DAF | Quarterly | None |
| | | 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 | None | SAP | MCA Benin II's DAF | Quarterly | None |
| | P-5 | Process | Temporary employment generated in power infrastructure construction | The number of people temporarily employed or contracted by MCA-contracted construction companies to work on construction of new power infrastructure or reconstruction, rehabilitation, or upgrading of existing power infrastructure. | Number | Sex (Female/Male); Labor source (Foreign/Local); Skill level (Skilled/Semi-skilled/Un-skilled) | SAP | MCA Benin II's DAF | Quarterly | None |

## Off-Grid Energy Access Project

| Off-Grid Energy Access Project (Project-Wide) |
|---|

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| Increased Use of Off-Grid Electricity | | Outcome | Off-grid electricity consumption | Total number of kWh consumed by off-grid electricity clients | Kilowatt Hour | Sex (Male; Female) | OCEF Projects | MCA | Annual | Only the mini-grid beneficiaries' consumption will be measured due to the infeasibility of collecting data on the other off-grid energy products, including solar home kits. |
| Increased Market for Off-Grid Electricity Solutions | | Outcome | Number of jobs created | Total number of jobs created in off-grid electricity solutions as a result of MCC investment | Number | OCEF Windows (Window 1, Window 2, Window 3, Window 4) | Data collection sheet NIRAS | NIRAS | Annual | Number of direct jobs should be obtained from ARE and ABERME. |
| **Off-Grid Clean Energy Activity** | | | | | | | | | | |
| Increased access to off-grid energy solutions for households, businesses and public services | | Outcome | Access to off-grid electricity | Number of households, businesses, and public sector entities having purchased or acquired an off-grid electricity product or connection from an OCEF-funded project | Number | Sex (Male; Female) Consumer class (Households, Businesses, Public Entities) | OCEF Projects | MCA | Annual | None |
| | | Output | Off-grid capacity | Total Megawatts of installed off-grid generation capacity in the country through MCC funding | Megawatts | None | OCEF Projects | MCA | Annual | None |
| Off-grid sector companies receive co-financing to introduce or expand their products and | | Output | Number of OCEF-funded projects | Total number of projects funded by OCEF. A project can include multiple organizations | Number | "Off-grid energy activity" (Window 1, Window 2, Window 3, Window 4) | Co-financing agreements OCEF | MCA Benin II, NIRAS | Annual | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| services in Benin | | Process | OCEF amount committed | Total OCEF contribution committed amount as written in co-finance agreements | US dollars | Off-grid energy activity (Window 1, Window 2, Window 3, Window 4) | MCA Benin II, NIRAS | MCA Benin II, NIRAS | Annual | None |
| | | Output | OCEF amount disbursed | Amount of funds disbursed from facility manager to OCEF Projects | US dollars | Off-grid energy activity (Window 1, Window 2, Window 3, Window 4) | MCA Benin II, NIRAS | MCA Benin II, NIRAS | Annual | None |
| | | Process | Project Promotor Amount committed | Total amount that OCEF project promoters have committed to spending on the OCEF-funded projects | US dollars | Off-grid energy activity (Window 1, Window 2, Window 3, Window 4) | MCA Benin II, NIRAS | MCA Benin II, NIRAS | Annual | None |
| | | Output | Project Promotor Amount disbursed | Total amount that OCEF project promoters have spent in support of the OCEF-funded projects | US dollars | Off-grid energy activity (Window 1, Window 2, Window 3, Window 4) | MCA Benin II, NIRAS | MCA Benin II, NIRAS | Annual | None |
| **Enabling Environment for Off-Grid Electricity** | | | | | | | | | | |
| Increased capability of Government of Benin to facilitate entry of off-grid energy companies | | Outcome | Government staff working in off-grid energy sector | Number of ARE, ABERME, and ANM staff members or consultants whose job description or de facto job function includes review of off-grid electrification projects | Number | GoB Agency (ARE, ABERME, and ANM) | ARE and ABERME | MCA | Annual | None |

| Program Logic Result | CI Code | Indicator Level | Indicator Name | Definition | Unit of Measure | Disaggregation | Primary Data Source | Responsible Party | Frequency of Reporting | Additional Information |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Outcome | Number of ABERME final notices on off-grid proposals | Number of ABERME decisions (approval or rejection) of reviewed proposals for off-grid electricity projects. | Number | None | ARE and ABERME | MCA | Annual | None |
| The Government of Benin adopts the off-grid electrification framework (policy, master plan, and regulatory framework) | | Outcome | Adoption of off-grid framework | Date at which the Government of Benin adopts the off-grid electrification framework, which includes the policy, master plan, and regulatory framework | Date | None | Secretary General of the Government | MCA | Once | None |

# ANNEX II: TABLE OF INDICATOR BASELINES AND TARGETS

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Policy Reform and Institutional Strengthening (Project-Wide)** | | | | | | | | | | | | | | |
| Outcome | SBEE investments in new infrastructure | None | CFA Francs | Level (Cumulative) | 25,963,000,000 | 2017 | 75,000,000,000 | 147,000,000,000 | 100,000,000,000 | 46,501,888,000 | 233,103,627,000 | 250,306,418,000 | 250,306,418,000 | Target data source :Contrat Plan p.18 and et plan d'Affaire SBEE p.33 et 34 and Rapport Trimestriel MHI T2 2021, p.89<br>Baseline data source : Rapport de collecte des données de référence p.30 |
| Outcome | SBEE investments in maintaining infrastructure | None | CFA Francs | Level (Cumulative) | 127,098,000 | 2017 | NA | 133,050,000 | 69,940,000 | 57,650,000 | TBD | TBD | TBD | Target source : SBEE's budget. The other targets will be provided as soon as the SBEE develops its equipment maintenance plan |
| **Policy, Regulation, and Institutional Support Activity** | | | | | | | | | | | | | | |
| Outcome | Adoption rate for energy efficient appliances | Average | Percentage | Level | 30.55 % | 2020 | NA | NA | NA | NA | NA | 50% | 50% | Target source: Discussion with MCA Project team in August 2021 |
| | | Household | Percentage | Level | 27.70 % | 2020 | NA | NA | NA | NA | NA | 50% | 50% | |
| | | Household - Male | Percentage | Level | 30.20 % | 2020 | NA | NA | NA | NA | NA | 50% | 50% | |
| | | Household - Female | Percentage | Level | 19.30 % | 2020 | NA | NA | NA | NA | NA | 50% | 50% | |
| | | Businesses | Percentage | Level | 36.10 % | 2020 | NA | NA | NA | NA | NA | 50% | 50% | |
| | | Businesses - Formal | Percentage | Level | 58.20 % | 2020 | NA | NA | NA | NA | NA | 50% | 50% | |
| | | Businesses - Informal | Percentage | Level | 34.10 % | 2020 | NA | NA | NA | NA | NA | 50% | 50% | |
| | | Public entities | Percentage | Level | NA | NA | NA | NA | NA | NA | NA | 50% | 50% | The baseline survey did not include "public entities" in its sample. There is no current plan to include "public entities" in future surveys. |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | Amount invested in energy efficiency measures | Total | CFA Francs | Cumulative | 0 | 2019 | NA | NA | NA | NA | NA | NA | NA | MCA/M&E has not been able to obtain targets from the energy efficiency consultant. |
| | | MCA-Benin II | CFA Francs | Cumulative | 0 | 2019 | NA | NA | NA | NA | NA | NA | NA | |
| | | Other sources | CFA Francs | Cumulative | 0 | 2019 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Total generation output | Total | Megawatt hours | Level (Cumulative) | 329,416.40 | 2016 | NA | NA | 646,350.00 | 1,061,090.00 | 1,411,750.00 | 1,475,010.00 | 1,475,010.00 | Target Source: DGRE |
| | | (PV) | Megawatt hours | Level (Cumulative) | 5,334.60 | 2016 | NA | NA | 7,520.00 | 7,430.00 | 7,430.00 | 44,470.00 | 44,470.00 | |
| | | (Hydro) | Megawatt hours | Level (Cumulative) | 1,125.30 | 2016 | NA | NA | 118,210.00 | 71,930.00 | 87,260.00 | 87,260.00 | 87,260.00 | |
| | | (Thermal) | Megawatt hours | Level (Cumulative) | 322,956.50 | 2016 | NA | NA | 520,620.00 | 981,730.00 | 1,317,060.00 | 1,343,280.00 | 1,343,280.00 | |
| Outcome | Amount invested in IPPs' projects | None | US dollars | Cumulative | 0 | 2019 | 0 | 0 | 0 | 50,000,000 | 50,000,000 | 50,000,000 | 50,000,000 | Target source: 2019 Compact modification CBA |
| Outcome | Operating cost- recovery ratio | None | Percentage | Level (Cumulative) | | | 152% | 173% | 274% | 170% | 111% | TBD | TBD | Targets values obtained from SBEE Budget. The increase observed in year 3 is due to public subside. SBEE has not provided targets for year 6. |
| | Total revenue collected | | US dollars | Level (Cumulative) | | | 455,000 | 505,000 | 821,000 | 502,000 | 342,000 | TBD | TBD | |
| | Total operating cost | | US dollars | Level (Cumulative) | | | 299,000 | 293,000 | 300,000 | 295,000 | 307,000 | TBD | TBD | |
| Outcome | Cost-reflective tariff regime | All | Percentage | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | SBEE has yet to provide reliable and validated estimate of the Average cost per kilowatt-hour of electricity supplied to customers. But it plans to determine the indicator target. |
| | | Post-payment LV | Percentage | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | Post-payment MV | Percentage | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pre-payment LV | Percentage | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| Outcome | Average cost per kwh Supplied | All | CFA Francs | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | This indicator also informs the result improved financial sustainability. |
| | | Post-Payment LV | CFA Francs | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | Post-payment MV | CFA Francs | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | Pre-payment LV | CFA Francs | Level | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| Outcome | Average cost per kwh invoiced | All | CFA Francs | Level | 112.33 | 2020 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | Source of Baseline: MHI KPIs |
| | | Post-Payment LV | CFA Francs | Level | 122.00 | 2020 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | Post-payment MV | CFA Francs | Level | 104.00 | 2020 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | Pre-payment LV | CFA Francs | Level | 111.00 | 2020 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| Outcome | Approval of cost-reflective tariffs | None | Date | Date | | | | 24-Aug-18 | | | | | 24-Aug-18 | Data on approval of cost reflective tariff is collected every two years according to tariff reform cycle. |
| Outcome | Financial self-reliance of ARE | None | Percentage | Level | 0 | 2018 | NA | NA | 65.00% | 67.00 % | 61.00% | 61.00% | 61.00% | Source of 2019, 2020, and 2021 targets: ARE's 2019-2021 three-year investment and financing Plan |
| Outcome | Number of notices provided by ARE in a given year | None | Number | Level (Cumulative) | 12 | 2016 | NA | NA | NA | NA | NA | NA | NA | Data source: are.bj/avis-2016<br>We don't think targets will be set, but we generally expect an increase over time as ARE becomes more active in the sector. |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | Energy efficiency standards formulated and enforced | None | Date | Date | | | | 18-May-19 | | | | | 18-May-19 | |
| Outcome | Energy efficiency labels adopted | None | Number | Cumulative | 0 | 2019 | NA | NA | NA | NA | 3 | 3 | 3 | |
| Outcome | Generation Capacity Reached Financial Close | None | MW | Cumulative | 0 | 2017 | 0 | 0 | 0 | 50 | 50 | 50 | 50 | Targets are based on information presented to MCC's investment management committee for the March 2019 modification to the Compact. |
| Outcome | Capacity installed by IPPs | Total | Megawatts | Cumulative | 0 | 2017 | 0 | 0 | 0 | 50 | 50 | 80 | 80 | Targets are based on information presented to MCC's investment management committee for the March 2019 modification to the Compact. |
| | | MCA-Benin II | Megawatts | Cumulative | 0 | 2017 | 0 | 0 | 0 | 50 | 50 | 50 | 50 | |
| | | Other sources | Megawatts | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 30 | 30 | Source: MHI's Q6 report, which lists future IPPs. |
| Outcome | Generation from new IPPs | None | Megawatt hours | Cumulative | 0 | | 0 | 0 | 0 | 0 | 87,600 | 87,600 | 87,600 | Target source: CBA report |
| Outcome | PPAs signed | None | Number | Cumulative | 0 | 2020 | NA | NA | NA | NA | 1 | 1 | 1 | |
| Outcome | Approval of IPP institutional framework | None | Date | Date | | | | 17-Jul-18 | | | | | 17-Jul-18 | |
| Outcome | Approval of Tariff Policy and Tariff Plan | None | Date | Date | | | | 27-Jul-18 | | | | | 27-Jul-18 | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Process | Validation and adoption of tariff study report | None | Date | Date | | | 28-Feb-18 | | | | | | 28-Feb-18 | |
| Output | Proposal of cost-reflective tariffs | None | Date | Date | | | NA | NA | NA | NA | NA | NA | NA | SBEE does not provide targets for this indicator. |
| Output | Percentage of job positions filled in ARE | None | Percentage | Level | | | NA | NA | 79.49% | 92.31 % | 100.00 % | 100.00 % | 100.00 % | Target source: ARE's 2019-2021 three years investment and financing Plan |
| Output | ARE headquarters are built and in service | None | Date | Date | | | | | | 11-May-21 | | | 11-May-21 | See Page 9 of the independent evaluation baseline report on how MCC's planned support changed to focus on the construction of the ARE building in light of the EU's support to ARE. |
| Output | ARE staff trained on new tariff regime | None | Number | Cumulative | 0 | NA | NA | NA | NA | NA | NA | NA | NA | MCA/ARE/consultant not having targets. |
| Output | Number of public entities and industrial companies audited | Total | Number | Cumulative | 0 | 2018 | 0 | 0 | 30 | 30 | 30 | 30 | 30 | Target Source: Energy efficiency audit consultant's inception report |
| | | Public entities | Number | Cumulative | 0 | 2018 | 0 | 0 | 20 | 20 | 20 | 20 | 20 | |
| | | Industrial companies | Number | Cumulative | 0 | 2018 | 0 | 0 | 10 | 10 | 10 | 10 | 10 | |
| Output | Grid Code Developed | None | Date | Date | | | | | 30-Oct-19 | | | | 30-Oct-19 | Target based on grid consultant's deliverables schedule |
| Output | Energy code updated | None | Date | Date | | | | | 22-Jun-20 | | | | 22-Jun-20 | |
| Output | Master plan adopted | None | Date | Date | | | 22-Jun-17 | | | | | | 22-Jun-17 | |
| **Utility Strengthening Activity** | | | | | | | | | | | | | | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | Continuity of service indicator (apart from external cause) | None | Minutes | Level (Cumulative) | 5,388.00 | 2020 | NA | NA | NA | 3,232.80 | 2,155.20 | 1,077.60 | 1,077.60 | Target source: Baseline and target from 'Protocole de mesure des indicateurs de performance et la fixation des valeurs initiales ' |
| Outcome | Government net arrears to SBEE | None | CFA Francs | Level | 12,393,977,405 | 2018 | NA | NA | NA | NA | NA | NA | NA | Baseline source: MCA CP Report Q16<br>SBEE and the project are unable to provide target |
| Outcome | Training hours per staff | All | Hours | Level | 3.6 | 2020 | NA | NA | NA | NA | NA | 23 | 23 | Baseline and target source: MHI KPIs |
| | | Female | Hours | Level | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| | | Male | Hours | Level | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Recovery rate per billing session (month M) and by category of consumers on date M+6 | All | Percentage | Level | 63.00% | 2020 | NA | NA | NA | 85.00% | NA | 99.33% | 99.33% | Baseline and target source: MHI KPI. Targets are not available for all years. |
| | | Low Voltage Consumers | Percentage | Level | 80.00% | 2020 | NA | NA | NA | NA | NA | 98.00% | 98.00% | |
| | | Medium Voltage Consumers | Percentage | Level | 74.00% | 2020 | NA | NA | NA | 90.00% | 96.00% | 100.00% | 100.00% | |
| | | Public entities | Percentage | Level | 35.00% | 2020 | NA | NA | NA | 80.00% | NA | 100.00% | 100.00% | |
| Outcome | On-time collection rate for low voltage private customers | None | Percentage | Level | 61.00% | 2020 | NA | NA | NA | 75.00% | 80.00% | 90.00% | 90.00% | Baseline and target source: MHI KPI. Targets are not available for all years. |
| Outcome | On-time collection rate for medium voltage private customers | None | Percentage | Level | 56.00% | 2020 | NA | NA | NA | 80.00% | 95.00% | 100.00% | 100.00% | Baseline and target source: MHI KPI. Targets are not available for all years. |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | On-time collection rate for public sector customers | None | Percentage | Level | 23.00 % | 2020 | NA | NA | NA | 80.00 % | 95.00% | 100.00 % | 100.00 % | Baseline and target source: MHI KPI. Targets are not available for all years. |
| Outcome | Average time for consumers troubleshooting | Overall | Hours | Level | 4.8 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRL1 | Hours | Level | 0.0 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRL2 | Hours | Level | 0.0 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRA | Hours | Level | 2.4 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRO/P | Hours | Level | 0.0 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRZ/C | Hours | Level | 2.4 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRM/C | Hours | Level | 0.0 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRB/A | Hours | Level | 4.8 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRA/D | Hours | Level | 33.6 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Quotation issuance for new connection | Overall | Days | Level | 8.3 | 2017 | NA | NA | NA | NA | NA | NA | NA | SBEE has not established targets for this indicator. |
| | | DRL1 | Days | Level | 4.3 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRL2 | Days | Level | 4.4 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRA | Days | Level | 11.1 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRO/P | Days | Level | 9.2 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRZ/C | Days | Level | 5.8 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRM/C | Days | Level | 6.9 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRB/A | Days | Level | 8.8 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRA/D | Days | Level | 11.9 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Time to connect | Overall | Days | Level | 34.2 | 2017 | NA | NA | NA | NA | NA | NA | NA | SBEE has not established targets for this indicator. |
| | | DRL1 | Days | Level | 18.7 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRL2 | Days | Level | 29.7 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRA | Days | Level | 26.9 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRO/P | Days | Level | 27.5 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRZ/C | Days | Level | 74.5 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRM/C | Days | Level | 33.5 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| | | DRB/A | Days | Level | 47.6 | 2017 | NA | NA | NA | NA | NA | NA | NA | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DRA/D | Days | Level | 42.8 | 2017 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Customer satisfaction index | All | Percentage | Level | 50.42 % | 2020 | NA | NA | NA | NA | NA | 71.69% | 71.69% | |
| | | Households | Percentage | Level | 47.10 % | 2020 | NA | NA | NA | NA | NA | 70% | 70% | |
| | | Businesses | Percentage | Level | 56.90 % | 2020 | NA | NA | NA | NA | NA | 75% | 75% | |
| Outcome | SBEE staff satisfaction index | All | Percentage | Level | 62.2 | 2018 | NA | NA | NA | NA | NA | NA | NA | SBEE has not established targets for this indicator. |
| | | (Male) | Percentage | Level | 60.5 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Female) | Percentage | Level | 61.8 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Efficiency of the electrical distribution network | None | Percentage | Level | 76 | 2021 | NA | NA | NA | 80 | 83 | 85 | 85 | Baseline and target source: MHI KPI. Targets are not available for all years. |
| Outcome | Labor productivity | None | Percentage | Level | 2.50% | 2020 | NA | NA | NA | 2.40% | 2.20% | 2% | 2% | Baseline and target source: MHI KPI. Targets are not available for all years. |
| Outcome | Digitized stock | None | Percentage | Level | 28.00 % | NA | NA | NA | NA | NA | NA | 0.05% | 0.05% | Baseline and target source: MHI KPI. Targets are not available for all years. |
| Outcome | PTA adoption according to Contract Plan | None | Number | Level | 0 | 2017 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | According to OHADA, budget and PTA must be adopted no later than December 31st of each year. |
| Outcome | Budget adoption in accordance with contract plan | None | Number | Level | 0 | 2017 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | According to OHADA, budget and PTA must be adopted no later than December, 31st of each year. |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | Budget execution in accordance with contract plan | None | Percentage | Level | 0 | 2017 | NA | NA | NA | NA | NA | NA | NA | SBEE does not provide targets for this indicator. |
| Outcome | SBEE staff trained | All | Number | Cumulative | 0 | 2019 | NA | NA | NA | NA | NA | NA | NA | MCA does not have targets for this indicator |
| | | (Male) | Number | Cumulative | 0 | 2019 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Female) | Number | Cumulative | 0 | 2019 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Transition to pre-paid metering system | None | Percentage | Level | 43.00 % | 2021 | NA | NA | NA | 60% | 80% | 90% | 90% | Source of baseline and target: MHI KPIs. Targets for all years are not available. |
| Outcome | Number of prepaid meters installed in public entities. | None | Number | Cumulative | 0 | 2017 | 5,700 | TBD | TBD | TBD | TBD | TBD | TBD | SBEE has not provided targets. MHI plan to estimate the number of meters. |
| Outcome | Maintenance system installation | None | Date | Date | | | | 13-Mar-19 | | | | | 13-Mar-19 | |
| Outcome | Maintenance system equipment | None | Percentage | Level | | | NA | NA | NA | NA | NA | NA | NA | SBEE does not provide targets for this indicator. |
| Outcome | Number of outages observed at the substation HTA | None | Number | Level (cumulative) | NA | NA | NA | NA | NA | NA | NA | NA | NA | SBEE does not provide targets for this indicator. |
| Outcome | Duration of outages observed at the substation HTA | None | Hours | Level (cumulative) | NA | NA | NA | NA | NA | NA | NA | NA | NA | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | Percentage of overloaded distribution stations | None | Percentage | Level (cumulative) | 3.74 | 2020 | NA | NA | NA | NA | 3 | 1 | 1 | |
| Output | Transactions Advisor installed | None | Date | Date | | | 4-Dec-17 | | | | | | 4-Dec-17 | |
| Process | Management contract signed | None | Date | Date | | | 31-Mar-18 | | | | | | 31-Mar-18 | Source of the target date is the February 14, 2017 implementation letter related to modification of the Utility Strengthening Activity. |
| **Public Information and Education Activity** | | | | | | | | | | | | | | |
| Outcome | Tariff acceptance rate | All | Percentage | Level | 25.29 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Household) | Percentage | Level | 25.30 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Female) | Percentage | Level | 24.80 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Male) | Percentage | Level | 25.40 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Commercial) | Percentage | Level | 21.40 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Industrial) | Percentage | Level | 21.40 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Tariff awareness rate | All | Percentage | Level | 1.61 | 2020 | NA | NA | NA | NA | NA | NA | NA | MCA has not provided targets. |
| | | (Household) | Percentage | Level | 1.60 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Female) | Percentage | Level | 1.30 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Male) | Percentage | Level | 1.70 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Commercial) | Percentage | Level | 3.30 | 2020 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Industrial) | Percentage | Level | 5.90 | 2020 | NA | NA | NA | NA | NA | NA | NA | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Output | Awareness campaigns held on tariffs | None | Number | Cumulative | 0 | 2018 | NA | 10 | 11 | 11 | NA | 19 | 19 | Date source: Exchange with Project and DCRP |
| Output | Awareness campaigns held on energy efficiency | None | Number | Cumulative | 0 | 2018 | NA | NA | 0 | 2 | NA | 8 | 8 | Date source: Exchange with Project and DCRP |

## Electricity Generation and Distribution Projects

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Electricity Generation and Distribution Projects - Outcomes** | | | | | | | | | | | | | | |
| Outcome | System Average Interruption Duration Index (SAIDI) | None | Hours | Level | 18.27 | 2021 | NA | NA | NA | NA | NA | NA | NA | Data source: the smart meters platform - (AM Afrique as vendor). Baseline data is calculated to the first three months after the smarts meters platform go live. |
| Outcome | System Average Interruption Frequency Index (SAIFI) | None | Rate | Level | 21.34 | 2021 | NA | NA | NA | NA | NA | NA | NA | Data source: the smart meters platform - (AM Afrique as vendor). Baseline data is calculated to the first three months after the smarts meters platform go live. |
| Outcome | Total electricity supply | **Total** | Megawatt hours | Level (Cumulative) | 1,378,377.10 | 2015 | 1,307,268 | 1,386,704 | 1,468,847 | TBD | TBD | TBD | TBD | Data source: DGRE statistics; Targets values are not aligned with the cost-benefit analysis model. DGRE will provide targets for Year 4 to 6 and disaggregation value. |
| | | (Domestic) | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | (IPP-owned) | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (SBEE production) | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | (Government owned) | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | (Imports) | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| Outcome | Total electricity sold | Total | Megawatt hours | Level (Cumulative) | 988,000.80 | 2015 | 1,076,695.01 | 1,145,025.54 | 1,123,292.08 | 1,196,789.31 | 1,160,098.10 | TBD | TBD | Data source: SBEE budget.<br>SBEE will provide targets for Year 4 to 6 and disaggregation value. |
| | | Households | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | Businesses | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | (Commerical) | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | (Industrial) | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| | | Other | Megawatt hours | Level (Cumulative) | | | TBD | TBD | TBD | TBD | TBD | TBD | TBD | |
| Outcome | Total additional energy consumption from Grid Strengthening Activity | None | Megawatt hours | Level (Cumulative) | 0 | 2020 | 0 | 0 | 0 | 46,235 | 74,884 | 151,766 | 151,766 | Targets are from emails with the economist based on the latest CBA models |
| Outcome | Total electricity demand | None | Megawatt hours | Level | 1,233,272 | 2016 | 1,307,268 | 1,468,847 | 1,401,890 | 1,549,740 | 11,741,470 | 1,902,220 | 1,902,220 | Source: Contract Plan, Revised values derived from the provisional report of the National Electrification |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | Distribution system losses | None | Percentage | Level | 18.80 % | 2018 | 18.80 % | 19.70% | 20.50% | 21.40 % | 15.40% | 15.70% | 15.70% | Targets are from emails with the economist based on the latest CBA models. These differ from the management contractor's targets for network performance included for the PRIS project. |
| Outcome | Distribution network voltage | None | Percentage | Level | | | NA | NA | NA | NA | NA | NA | NA | |
| **Electricity Generation and Distribution Projects - Outputs** | | | | | | | | | | | | | | |
| Output | Distribution substation capacity added | Total | Megavolt ampere | Cumulative | 0 | 2017 | 0 | 0 | 0 | 0 | 1,088.50 | NA | 1,088.50 | The end of compact target revised in 2021 reflects amounts in the awarded construction contracts. |
| | | (Regional activity) | Megavolt ampere | Cumulative | 0 | 2017 | 0 | 0 | 0 | 0 | 521.50 | NA | 521.50 | The end of compact target revised in 2021 reflects amounts in the awarded construction contracts. |
| | | (Cotonou activity) | Megavolt ampere | Cumulative | 0 | 2017 | 0 | 0 | 0 | 0 | 567.00 | NA | 567.00 | The end of compact target revised in 2021 reflects amounts in the awarded construction contracts. |
| Output | Number of switchgear stations and substations built | Total | Number | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 12 | 12 | The end of compact target revised in 2021 reflects amounts in the awarded construction contracts. Annual targets based on the Project Management Consultant's work plan are still pending. |
| | | (Regional Activity) | Number | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 6 | 6 | Bérecingou : Substation 33kV -- New 33kV building and switchgear. Natitingou Nord : New Substation 33 kV Vèdoko : Station 63/15 kV GIS -- New building and 63kV GIS switchgear Maria Gléta : Station 63 kV AIS -- New control building, complete 63kV switchyard |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Bohicon : Substation 20 kV -- New building with 20kV switchgear to replace the existing<br>Parakou : Substation 33 kV -- New building and 33kV switchgear |
| | | (Cotonou Activity) | Number | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 6 | 6 | Gbèdjromèdé : Substation GIS 63/15 kV New<br>Croix-Rouge : Substation GIS 63/15 kV New<br>CIM Bénin : Substation GIS 63/15 kV New<br>Fidjrossè : Substation GIS 63/15 kV New<br>Aéroport : Substation GIS 63/15 kV New<br>Ancien pont : Substation GIS 63 kV -- Existing but completely modified nand extended |
| Output | Number of switchgear stations and substations rehabilitated | Total | Number | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 12 | 12 | The end of compact target revised in 2021 reflects amounts in the awarded construction contracts. Annual targets based on the Project Management Consultant's work plan are still pending. |
| | | (Regional Activity) | Number | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 7 | 7 | Bérecingou : Extension with one 161kV line feeder<br>Djougou : Extension ot 161kV with three line feeders and extension with new cells at 33kV<br>Bohicon : Extension with 161kV transformer<br>Vèdoko : Extension with new 161-63kV and 161- |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | 15kV transformers<br>Maria Gleta : Extension at 161kV -- New transformers 161-63kV to feed the new 63kV switchyad<br>Seme: Extension<br>Tannzoun: Extension |
| | | (Cotonou Activity) | Number | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 5 | 5 | Akpakpa : Rehabilitation of the station 63/15 kV AIS -- Extension with two 63kV line feeders<br>Godomey : Rehabilitation of the Substation for the dispatching SCADA/DMS<br>Carrefour 3 Banques : Rehabilitation of the Substation for the dispatching SCADA/DMS<br>Allada : Rehabilitation of the Substation for the dispatching SCADA/DMS<br>Lokossa : Rehabilitation of the Substation for the dispatching SCADA/DMS |
| Output | Kilometers of distribution lines upgraded or built. | Total | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 961.20 | 961.20 | 2021 revised targets reflect the construction contracts. |
| | | (63kV) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 46.30 | 46.30 | Lot B: 5.1+5.1+7.1+4.8 = 22.1<br>Lot C: 5+5.1+3.6+7.5+3=24.2<br>Lot B + Lot C = 46.3<br>Lot D cancelled for budgetary reasons: 18.9 + 14.1 |
| | | (33kV) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 894.90 | 894.90 | Underground: 12.6+27.2+5=44.8<br>Upgrade: 196+384+256=836<br>Aerial: 14.1<br>Total: 894.90 |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (15kV) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 20.00 | 20.00 | Lot B: 4.7+0.6km = 5.3<br>Lot C: 2.7+12km = 14.7<br>Total = 20 |
| | | (Regional) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 894.90 | 894.90 | |
| | | (Cotonou) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 66.30 | 66.30 | |
| Process | Kilometers of distribution line installed | Total | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 961.20 | 961.20 | This indicator is added to record effort done by MCA-Benin II for building distribution lines. It is distinct from common indicator P-10, which only counts lines as being completed when they are commissioned and energized. |
| | | (63kV) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 46.30 | 46.30 | |
| | | (33kV) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 894.90 | 894.90 | |
| | | (15kV) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 20.00 | 20.00 | |
| | | (Regional) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 894.90 | 894.90 | |
| | | (Cotonou) | Kilometers | Cumulative | 0 | 2017 | NA | NA | NA | NA | NA | 66.30 | 66.30 | |
| Output | National Dispatch Control Center constructed | None | Date | Date | | | | | | 16-Feb-21 | | | 16-Feb-21 | |
| Output | National Dispatch Control Center is equipped with furniture and office supplies | None | Date | Date | | | | | | | 22-Jun-22 | | 22-Jun-22 | Target source: Current end date of General Electric's contract for the NDCC IT system. |
| Output | Telecommunication system equipment installed | None | Date | Date | | | | | | 20-Jan-21 | | | 20-Jan-21 | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Output | Supervisory control data acquisition (SCADA) equipment installed | None | Date | Date | | | | | | 16-Feb-21 | | | 16-Feb-21 | |
| Output | Substations connected to SCADA/NDCC | None | Number | Level | 0 | 2017 | 0 | 0 | 0 | 0 | 0 | 55 | 55 | |
| Output | Back-up National Dispatch Control Center constructed | None | Date | Date | | | | | | 12-Jan-21 | | | 12-Jan-21 | |
| Output | Individuals trained in the NDCC system | Total | Number | Cumulative | 0 | 2018 | 0 | NA | NA | NA | NA | 30 | 30 | The 15 on-the-job trainees (OJTs) to which must be added the estimate of the SBEE staff having to work at the level of the stations connected to Dispatching. |
| | | (Male) | Number | Cumulative | 0 | 2018 | 0 | NA | NA | NA | NA | NA | NA | |
| | | (Female) | Number | Cumulative | 0 | 2018 | 0 | NA | NA | NA | NA | NA | NA | |
| Output | Number of AMR devices installed | Total | Number | Cumulative | 0 | 2020 | NA | NA | 560 | 560 | 560 | NA | 560 | - |
| | | (Grid monitors) | Number | Cumulative | 0 | 2020 | NA | NA | 80 | 80 | 80 | NA | 80 | |
| | | (Smart meters) | Number | Cumulative | 0 | 2020 | NA | NA | 480 | 480 | 480 | NA | 480 | |
| **Electricity Generation and Distribution Projects - Process** | | | | | | | | | | | | | | |
| Process | Value of signed power infrastructure feasibility and design contracts | None | US dollars | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | 25,111,271.60 | 25,111,271.60 | Targets for this indicator are provided by MCA-Benin II |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Process | Percent disbursed of power infrastructure feasibility and design contracts | None | Percentage | Level | 0 | 2015 | NA | NA | NA | 65% | 70% | 100% | 100% | - |
| Process | Value disbursed of power infrastructure feasibility and design contracts | None | US dollars | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | NA | NA | |
| Process | Value of signed power infrastructure construction contracts | None | US dollars | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | 192,667,545.64 | 192,667,545.64 | - |
| Process | Percent disbursed of power infrastructure construction contracts | None | Percentage | Level | 0 | 2015 | NA | NA | NA | 35% | 50% | 100% | 100% | - |
| Process | Value disbursed of power infrastructure construction contracts | None | US dollars | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | 192,667,545.64 | 192,667,545.64 | This indicator is not linked to the project logic result. It's a process indicator. |
| Process | Temporary employment generated in power | Total | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Male) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Female) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Local) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | infrastructure construction | (Foreign) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Skilled) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Semi-skilled) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Un-skilled) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |

## Off-Grid Energy Access Project

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Off-Grid Energy Access Project (Project-Wide)** | | | | | | | | | | | | | | |
| Outcome | Off-grid electricity consumption | Total | Kilowatt Hour | Cumulative | 0 | 2019 | 0 | 0 | 0 | 55,089 | 532,301 | 771,104 | 771,104 | The targets reflect MCC EA's mini-grid project ERR projections. Other project supported sources of off-grid electricity, including solar home kits, will not be measured because of the infeasibility of calculating their consumption levels. The targets are subject to change based on EA's expected ERR modification. |
| | | Male | Kilowatt Hour | Cumulative | 0 | 2019 | 0 | 0 | NA | NA | NA | NA | NA | |
| | | Female | Kilowatt Hour | Cumulative | 0 | 2019 | 0 | 0 | NA | NA | NA | NA | NA | |
| Outcome | Number of jobs created | Total | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Window 1) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Window 2) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Window 3) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Window 4) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| **Off-Grid Clean Energy Activity** | | | | | | | | | | | | | | |
| Outcome | Access to off-grid electricity | Total | Number | Cumulative | | | 0 | 0 | 5,054 | 17,465 | 47,976 | 66,104 | 66,104 | The targets were calculated by aggregating MCC EA's window two and three project ERR projections. OCEF projects falling under windows one and four were not included in the ERR calculation and have not been included here. |
| | | (Residential) | Number | Cumulative | | | NA | NA | NA | NA | NA | NA | NA | |
| | | (Male) | Number | Cumulative | | | NA | NA | NA | NA | NA | NA | NA | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (Female) | Number | Cumulative | | | NA | NA | NA | NA | NA | NA | NA | The targets are subject to change based on EA's expected ERR modification. Targets for the individual disaggregations will be calculated during a future M&E Plan revision. |
| | | (Commercial) | Number | Cumulative | | | NA | NA | NA | NA | NA | NA | NA | |
| | | (Public Entities) | Number | Cumulative | | | NA | NA | NA | NA | NA | NA | NA | |
| Output | Off-grid capacity | None | Megawatts | Cumulative | 0 | 2018 | 0 | 0 | 0 | 1 | 12 | 13 | 13 | The targets were calculated by aggregating OCEF windows two and three projects' projections. Window three projections were derived from EA's ERR models, and window two projections from the promotors' business plans. OCEF projects falling under windows one and four were not included in the ERR analysis and have not been included here. The targets are subject to change based on EA's expected ERR modification |
| Output | Number of OCEF-funded projects | Total | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | 16 | 16 | Source: co-financing agreements |
| | | (Window 1) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | 2 | 2 | |
| | | (Window 2) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | 8 | 8 | |
| | | (Window 3) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | 5 | 5 | |
| | | (Window 4) | Number | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | 1 | 1 | |
| Process | OCEF amount committed | Total | US dollars | Cumulative | 0 | 2018 | 0 | 0 | 20,894,813 | 31,533,515 | 31,533,515 | 31,533,515 | 31,533,515 | Source: co-financing agreements |
| | | (Window 1) | US dollars | Cumulative | 0 | 2018 | NA | NA | 1,208,568 | 1,208,568 | 1,208,568 | 1,208,568 | 1,208,568 | |
| | | (Window 2) | US dollars | Cumulative | 0 | 2018 | NA | NA | 13,992,083 | 24,630,785 | 24,630,785 | 24,630,785 | 24,630,785 | |
| | | (Window 3) | US dollars | Cumulative | 0 | 2018 | NA | NA | 4,694,258 | 4,694,258 | 4,694,258 | 4,694,258 | 4,694,258 | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (Window 4) | US dollars | Cumulative | 0 | 2018 | NA | NA | 999,904 | 999,904 | 999,904 | 999,904 | 999,904 | |
| Output | OCEF amount disbursed | Total | US dollars | Cumulative | 0 | 2018 | NA | NA | 160,409.00 | 4,110,492.30 | 22,409,652.35 | 31,533,515.00 | 31,533,515.00 | Source: DAF/MCA-Bénin II |
| | | (Window 1) | US dollars | Cumulative | 0 | 2018 | NA | NA | 0 | 388,618.00 | 936,296.00 | 1,208,568.00 | 1,208,568.00 | |
| | | (Window 2) | US dollars | Cumulative | 0 | 2018 | NA | NA | 0 | 1,595,805.30 | 17,022,929.60 | 24,630,785.00 | 24,630,785.00 | |
| | | (Window 3) | US dollars | Cumulative | 0 | 2018 | NA | NA | 160,409.00 | 1,926,088.00 | 3,650,503.75 | 4,694,258.00 | 4,694,258.00 | |
| | | (Window 4) | US dollars | Cumulative | 0 | 2018 | NA | NA | 0 | 199,981.00 | 799,923.00 | 999,904.00 | 999,904.00 | |
| Process | Project promoter committed amount | Total | US dollars | Cumulative | 0 | 2018 | NA | NA | 46,768,217 | 46,768,217 | 46,768,217 | 46,768,217 | 46,768,217 | Source: co-financing agreements<br>At the year 4 it was initially expected to reach 46 768 217;<br>but BBOXX Distribution Energy Service Company (DESCO) dropped out of OCEF on August 20, 2020. |
| | | (Window 1) | US dollars | Cumulative | 0 | 2018 | NA | NA | 1,178,116 | 1,178,116 | 1,178,116 | 1,178,116 | 1,178,116 | |
| | | (Window 2) | US dollars | Cumulative | 0 | 2018 | NA | NA | 36,816,817 | 36,816,817 | 36,816,817 | 36,816,817 | 36,816,817 | |
| | | (Window 3) | US dollars | Cumulative | 0 | 2018 | NA | NA | 6,898,334 | 6,898,334 | 6,898,334 | 6,898,334 | 6,898,334 | |
| | | (Window 4) | US dollars | Cumulative | 0 | 2018 | NA | NA | 1,874,950 | 1,874,950 | 1,874,950 | 1,874,950 | 1,874,950 | |
| Output | Project promoter disbursed amount | Total | US dollars | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | Source: Project Promoters |
| | | (Window 1) | US dollars | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Window 2) | US dollars | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Window 3) | US dollars | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| | | (Window 4) | US dollars | Cumulative | 0 | 2018 | NA | NA | NA | NA | NA | NA | NA | |
| **Enabling Environment for Off-Grid Electricity** | | | | | | | | | | | | | | |
| Outcome | Government staff working in off-grid energy sector | Total | Number | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | NA | NA | |
| | | (ARE) | Number | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | NA | NA | |
| | | (ABERME) | Number | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | NA | NA | |
| | | (ANM) | Number | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | NA | NA | |

| Indicator Level | Indicator Name | Disaggregation | Unit of Measure | Indicator Classification | Baseline | Baseline year | 2017-2018 Year 1 | 2018-2019 Year 2 | 2019-2020 Year 3 | 2020-2021 Year 4 | 2021-2022 Year 5 | 2022-2023 Year 6 | End of Compact Target | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outcome | Number of ABERME final notices on off-grid proposals | None | Number | Cumulative | 0 | 2015 | NA | NA | NA | NA | NA | NA | NA | |
| Outcome | Adoption of off-grid framework | None | Date | Date | | | 25-Jun-18 | | | | | | 25-Jun-18 | Source: Compact Annual Work Plan, 2018 |

# ANNEX III: M&E PLAN MODIFICATIONS

## M&E Plan Version 3 Approved December 2021

The MCC M&E Policy requires major modifications be documented in an annex to the revised M&E Plan. The types of modifications to be included are adding an indicator, deleting an indicator, modifying an indicator baseline, milestone, or target, modifying beneficiary information or major adjustments to the evaluation plan.

The third version of the M&E plan reflects revisions that are not detailed in this annex. These include:

- Correcting discrepancies between the French and English versions of the M&E plan;
- Revising project descriptions to increase their accuracy;
- Updating projected economic benefits to reflect progress made calculating Off Grid Energy Access Project's economic rate of return (ERR);
- Updating the evaluation plans and evaluation questions to reflect progress made defining the methodological approaches;
- Modifying indicator definitions to increase their specificity, clarity, and accuracy;
- Changing data sources; and,
- Changing disaggregation and the frequency of reporting based on what can actually be collected and what will be useful.

The major changes are documented on the following pages.

## Policy Reform and Institutional Strengthening (Project-Wide)

### *SBEE investments in new infrastructure*

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 25,963,000,000.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | Baseline data obtained through MCA-funded data collection in 2020. | |

### *SBEE investments in new infrastructure*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 75,000,000,000.00 | 147,000,000,000.00 | 100,000,000,000.00 | 46,501,888,000.00 | 233,103,627,000.00 | 250,306,418,000. | 250,306,418,000.00 |
| | **Previous Targets** | 51,000,000,000.00 | 166,000,000,000.00 | 246,000,000,000.00 | TBD | TBD | TBD | TBD |
| | **Justification:** | Corrections to erroneous data | | | | | | |
| | **Justification Description:** | Revised targets taken from SBEE's business plan, which was not previously available. | | | | | | |

### *SBEE investments in maintaining infrastructure*

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | 0.00 | 127,098,000.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

### *SBEE investments in maintaining infrastructure*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | 133,050,000.00 | 69,940,000.00 | 57,650,000.00 | TBD | TBD | TBD |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *SBEE investments in staff training*

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | | |
| Version 3 | **Change Description:** | Retire an indicator |
| | **Justification:** | Indicator has been added which is superior in measuring same variable |
| | **Justification Description:** | |

## Policy, Regulation, and Institutional Support Activity

### *Adoption rate for energy efficient appliances*

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 30.55 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

### *Adoption rate for energy efficient appliances*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 50.00 | 50.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Amount invested in energy efficiency measures*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

| | | |
|---|---|---|
| | **Justification:** | TBD replaced with target |
| | **Justification Description:** | Yearly targets to be provided considering industrial companies that benefited EE audits |

***Total generation output***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 646,350.00 | 1,061,090.00 | 1,411,750.00 | 1,475,010.00 | 1,475,010.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | This indicator did not have targets prior to this revision. Targets are from the relevant GoB entity (DGRE). | | | | | | |

***Total generation output***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 329,416.40 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | This indicator did not have baseline data prior to this revision. Data provided as baseline is from the relevant GoB entity (DGRE). | |

***Total generation output (PV)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 7,520.00 | 7,430.00 | 7,430.00 | 44,470.00 | 44,470.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | This indicator did not have targets prior to this revision. Targets are from the relevant GoB entity (DGRE). | | | | | | |

***Total generation output (PV)***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 5,334.60 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | This indicator did not have baseline data prior to this revision. Data provided as baseline is from the relevant GoB entity (DGRE). | |

***Total generation output (Hydro)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 118,210.00 | 71,930.00 | 87,260.00 | 87,260.00 | 87,260.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | This indicator did not have targets prior to this revision. Targets are from the relevant GoB entity (DGRE). | | | | | | |

***Total generation output (Hydro)***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 1,125.30 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | This indicator did not have baseline data prior to this revision. Data provided as baseline is from the relevant GoB entity (DGRE). | |

***Total generation output (Thermal)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 520,620.00 | 981,730.00 | 1,317,060.00 | 1,343,280.00 | 1,343,280.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | This indicator did not have targets prior to this revision. Targets are from the relevant GoB entity (DGRE). | | | | | | |

***Total generation output (Thermal)***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | |
| Version 3 | **Change Description:** | Baseline Modification |

| | | | |
|---|---|---|---|
| | **Change:** | Previous | Revised |
| | | TBD | 322,956.50 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | This indicator did not have baseline data prior to this revision. Data provided as baseline is from the relevant GoB entity (DGRE). | |

***Electricity saved***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Retire an indicator | |
| | **Justification:** | Cost of data collection for indicator outweighs usefulness | |
| | **Justification Description:** | There are no resources to measure this indicator and this is a relatively small investment. | |

***Amount invested in IPPs' projects***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 0.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Amount invested in IPPs' projects***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 50,000,000.00 | 50,000,000.00 | 50,000,000.00 | 50,000,000.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Targets were not previously available. The target amount is derived from the transaction advisor's business model for the IPP transactions. The timing of the targets is based on projections in the CBA model done for the 2019 Compact modification. | | | | | | |

***Operating cost-recovery ratio***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Operating cost-recovery ratio***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 152.00 | 173.00 | 274.00 | 170.00 | 111.00 | TBD | TBD |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Total revenue collected***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 455,000.00 | 505,000.00 | 821,000.00 | 502,000.00 | 342,000.00 | TBD | TBD |
| | **Previous Targets** | | | | | | | |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Total operating cost***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 299,000.00 | 293,000.00 | 300,000.00 | 295,000.00 | 307,000.00 | TBD | TBD |
| | **Previous Targets** | | | | | | | |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Financial self-reliance of ARE***

| | |
|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) |

| | | | |
|---|---|---|---|
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 0.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Financial self-reliance of ARE***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 65.00 | 67.00 | 61.00 | 61.00 | 61.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Targets added based on new information received from the regulator (ARE). | | | | | | |

***Number of notices provided by ARE in a given year***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This is a simple indicator that gives a general sense of how active the regulator is. Data for this indicator is easily obtainable through publicly available materials. |

***Generation capacity reached financial close***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | |

***Capacity installed by IPPs***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 0.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Capacity installed by IPPs***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 50.00 | 50.00 | 80.00 | 80.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Generation from new IPPs***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | The previous M&E plan did not have an indicator on actual output from the new IPPs. This indicator goes beyond capacity installed to look at how much the new plants are contributing to domestic energy supply. It was also important to include given that it is included in the CBA model. |

***PPAs signed***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | 1.00 | 1.00 | 1.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Updated information on the IPP transaction has allowed us to include a target for the number of PPAs. | | | | | | |

***Percentage of job positions filled in ARE***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | |

| | | |
|---|---|---|
| | **Justification:** | TBD replaced with baseline |
| | **Justification Description:** | |

***Percentage of job positions filled in ARE***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 79.49 | 92.31 | 100.00 | 100.00 | 100.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Targets added based on new information received from the regulator (ARE). | | | | | | |

***ARE staff trained on tariff regime***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This indicator captures an important component of the compact's support to the regulator. |

***Number of public entities and industrial companies audited***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | | 0.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Number of public entities and industrial companies audited***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 30.00 | 30.00 | 30.00 | 30.00 | 30.00 |
| | **Previous Targets** | | | 1,561,075,200.00 | | | | 1,561,075,200.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Targets taken from EE audit consultant report. The previous targets were for a different definition. The definition changed to reflect the new indicator focus on energy efficiency audits, rather than energy efficiency needs assessment. | | | | | | |

***Amount of private capital***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | |
| Version 3 | **Change Description:** | Retire an indicator |
| | **Justification:** | Indicator has been added which is superior in measuring same variable |
| | **Justification Description:** | |

***Grid Code developed***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.1 Policy, Regulation and Institutional Support Activity (0090) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Relevant due to change in Program,Project or Activity scope |
| | **Justification Description:** | Grid code development was not initially considered by the Compact, but was found to be necessary for the IPP sub-activity. The indicator is included given this result's relevance to the project logic. |

## Utility Strengthening Activity

***Continuity of service indicator (apart from external cause)***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Government net arrears to SBEE***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This indicator is directly related to a Compact CP and the utility's financial health. It is also being tracked by the MCA project team. |

***Training hours per staff***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |

| | | |
|---|---|---|
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Recovery rate per billing session (month M) and by category of consumers on date M+6***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 63.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | Baseline information became available in 2020/2021 with the management contractor's definition of KPIs. | |

***Recovery rate per billing session (month M) and by category of consumers on date M+6***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | 85.00 | | 99.33 | 99.33 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Target information became available in 2020/2021 with the management contractor's definition of KPIs. | | | | | | |

***On-time collection rate for low voltage private customers***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***On-time collection rate for medium voltage private customers***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***On-time collection rate for public sector customers***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Average time for consumers troubleshooting***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Quotation issuance for new connection***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Time to connect***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Customer satisfaction index***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 50.42 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | Baseline information recently available from MCA-managed survey. | |

***Customer satisfaction index***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 71.69 | 71.69 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Target information became available in 2020/2021 with the management contractor's definition of KPIs. | | | | | | |

***SBEE staff satisfaction index***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | 618.30 | 62.20 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | Disaggregation changed to simplify MIS reporting. | |

***SBEE staff satisfaction index***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***SBEE staff satisfaction index (Male)***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | 622.10 | 60.50 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***SBEE staff satisfaction index (Female)***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | 604.10 | 61.80 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Efficiency of the electrical distribution network***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Labor productivity***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Digitized stock***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***PTA adoption according to contract plan***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | | 0.00 |

| | | |
|---|---|---|
| | **Justification:** | TBD replaced with baseline |
| | **Justification Description:** | |

***PTA adoption according to contract plan***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | **Previous Targets** | 1,511,913,600.00 | | | | | | 1,511,913,600.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Targets added based on new definition. | | | | | | |

***Budget adoption in accordance with contract plan***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | | 0.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Budget adoption in accordance with contract plan***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | **Previous Targets** | 1,511,913,600.00 | | | | | | 1,511,913,600.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Targets added based on new definition. | | | | | | |

***Budget execution in accordance with contract plan***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | | 0.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Budget execution in accordance with contract plan***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***SBEE staff trained***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Transition to pre-paid metering system***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | Indicator included to align with the management contractor's KPIs. |

***Number of prepaid meters installed in public entities***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This indicator was added to capture the conditions precedent related to the installation of meters in public entities. |

***Maintenance system equipment***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Maintenance system equipment***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Number of outages observed at the substation HTA***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Relevant due to change in Program,Project or Activity scope |
| | **Justification Description:** | Better alignment with management contractor objectives and key performance indicators |

***Duration of outages observed at the substation HTA***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Relevant due to change in Program,Project or Activity scope |
| | **Justification Description:** | Better alignment with management contractor objectives and key performance indicators |

***Percentage of overloaded distribution stations***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Relevant due to change in Program,Project or Activity scope |
| | **Justification Description:** | Better alignment with management contractor objectives and key performance indicators |

***Management contract signed***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.2 Utility Strengthening Activity (0452) | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This indicator was included to document an important process milestone, especially that there was an indicator for transaction advisor installed, which is less significant. |

**Public Information and Education Activity**

***Tariff acceptance rate***

| | | | |
|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | |
| Activity: | 1.3 Public Information & Education Activity (0435) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 25.29 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | Baseline information recently available from MCA-managed survey | |

***Tariff acceptance rate***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.3 Public Information & Education Activity (0435) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Tariff awareness rate***

| | | |
|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | |
| Activity: | 1.3 Public Information & Education Activity (0435) | |
| Version 3 | **Change Description:** | Baseline Modification |

| | | | |
|---|---|---|---|
| | **Change:** | Previous | Revised |
| | | TBD | 1.61 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | Baseline information recently available from MCA-managed survey. | |

***Tariff awareness rate***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.3 Public Information & Education Activity (0435) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Awareness campaigns held on tariffs***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.3 Public Information & Education Activity (0435) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | 10.00 | 11.00 | 11.00 | | 19.00 | 19.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Target information recently available from MCA-managed survey | | | | | | |

***Awareness campaigns held on energy efficiency***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 1.Policy Reform & Institutional Strengthening Project | | | | | | | |
| Activity: | 1.3 Public Information & Education Activity (0435) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 0.00 | 2.00 | | 8.00 | 8.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Target information recently available from MCA-managed survey | | | | | | |

## Electricity Generation and Distribution Projects

***System Average Interruption Duration Index (SAIDI)***

| | | | |
|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | |
| Activity: | | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | 0.01 | 18.27 |
| | **Justification:** | Corrections to erroneous data | |
| | **Justification Description:** | Previous baseline data came from the willingness to pay survey. Its data did not align with the indicator definition. There also are no plans to repeat that survey. The new baseline information comes from smart meters, which will be the source of data moving forward. | |

***System Average Interruption Duration Index (SAIDI)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***System Average Interruption Frequency Index (SAIFI)***

| | | | |
|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | |
| Activity: | | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | 1.71 | 21.34 |
| | **Justification:** | Corrections to erroneous data | |
| | **Justification Description:** | Previous baseline data came from the willingness to pay survey. Its data did not align with the indicator definition. There also are no plans to repeat that survey. The new baseline information comes from smart meters, which will be the source of data moving forward. | |

***System Average Interruption Frequency Index (SAIFI)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |

| | | |
|---|---|---|
| | **Justification Description:** | |

### *Total electricity sold*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 1,076,695.01 | 1,145,025.54 | 1,123,292.08 | 1,196,789.31 | 1,160,098.10 | TBD | TBD |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Generation capacity added from new IPPs*

| | | |
|---|---|---|
| Project: | 3. Electricity Distribution Project | |
| Activity: | | |
| Version 3 | **Change Description:** | Retire an indicator |
| | **Justification:** | Irrelevant due to change in Program, Project or Activity scope |
| | **Justification Description:** | Indicator was removed and is now reflected under PRIS with "Generation Capacity Reached Financial Close" |

### *Total additional energy consumption from Grid Strengthening Activity*

| | | |
|---|---|---|
| Project: | 3. Electricity Distribution Project | |
| Activity: | | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This indicator is being included, because of its alignment with the CBA model. It is more specific to MCC's investments as opposed to overall electricity supply, which results from factors unrelated to MCC's investment. |

### *Total electricity demand*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 1,307,268.00 | 1,468,847.00 | 1,401,890.00 | 1,549,740.00 | 11,741,470.00 | 1,902,220.00 | 1,902,220.00 |
| | **Previous Targets** | 1,307,268.00 | 1,468,847.00 | 1,556,978.00 | 1,650,396.00 | 1,749,420.00 | 1,749,420.00 | 1,749,420.00 |
| | **Justification:** | Occurrence of exogenous factors | | | | | | |
| | **Justification Description:** | Targets reflect new demand projections from the GoB. | | | | | | |

### *Distribution system losses*

| | | | |
|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | |
| Activity: | | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | 23.00 | 18.80 |
| | **Justification:** | Corrections to erroneous data | |
| | **Justification Description:** | New baseline data taken from ERR model. | |

### *Distribution system losses*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 18.80 | 19.70 | 20.50 | 21.40 | 15.40 | 15.70 | 15.70 |
| | **Previous Targets** | 19.00 | 20.00 | 20.00 | 16.00 | 16.00 | 16.00 | 16.00 |
| | **Justification:** | Change maintains integrity of ERR | | | | | | |
| | **Justification Description:** | Targets changed based on revisions to the CBA model. | | | | | | |

### *Distribution network voltage*

| | | | |
|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | |
| Activity: | | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

### *Distribution network voltage*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Distribution substation capacity added*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 0.00 | 1,088.50 | | 1,088.50 |
| | **Previous Targets** | 0.00 | TBD | TBD | TBD | 1,088.50 | 1,088.50 | 1,088.50 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | New targets based on terms of reference of construction contracts. | | | | | | |

### *Distribution substation capacity added (Regional Activity)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 0.00 | 521.50 | | 521.50 |
| | **Previous Targets** | 1.00 | 0.00 | | | 143.00 | 143.00 | 143.00 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | New targets based on terms of reference of construction contracts. | | | | | | |

### *Distribution substation capacity added (Cotonou Activity)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 0.00 | 567.00 | | 567.00 |
| | **Previous Targets** | 2.00 | 0.00 | | | 945.50 | 945.50 | 945.50 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | New targets based on terms of reference of construction contracts. | | | | | | |

### *Number of switchgear stations and substations built*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 12.00 | 12.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | 12.00 | 12.00 | 12.00 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | New targets based on terms of reference of construction contracts. | | | | | | |

### *Number of switchgear stations and substations built (Regional Activity)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 6.00 | 6.00 |
| | **Previous Targets** | | | | | 3.00 | 3.00 | 3.00 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | New targets based on terms of reference of construction contracts. | | | | | | |

### *Number of switchgear stations and substations built (Cotonou Activity)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 6.00 | 6.00 |
| | **Previous Targets** | | | | | 9.00 | 9.00 | 9.00 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | New targets based on terms of reference of construction contracts. | | | | | | |

### *Number of switchgear stations and substations rehabilitated*

| | | |
|---|---|---|
| Project: | 3. Electricity Distribution Project | |
| Activity: | | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This indicator was added to distinguish what is built and what is rehabilitated. This breakdown gives a more precise picture of the works that MCC funded. |

### *Kilometers of distribution lines upgraded or built*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 961.20 | 961.20 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Previous Targets** | | | | | 979.58 | 979.58 | 979.58 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | The scope of the work has undergone modifications following the resumption of the design by the companies. The km of lines expected at the end are those entered. | | | | | | |

***Kilometers of distribution lines upgraded or built (63 kV)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 46.30 | 46.30 |
| | **Previous Targets** | | | | | 79.25 | 79.25 | 79.25 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | The scope of the work has undergone modifications following the resumption of the design by the companies. The km of lines expected at the end are those entered. | | | | | | |

***Kilometers of distribution lines upgraded or built (33 kV)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 894.90 | 894.90 |
| | **Previous Targets** | | | | | 887.61 | 887.61 | 887.61 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | The scope of the work has undergone modifications following the resumption of the design by the companies. The km of lines expected at the end are those entered. | | | | | | |

***Kilometers of distribution lines upgraded or built (15 kV)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 20.00 | 20.00 |
| | **Previous Targets** | | | | | 12.72 | 12.72 | 12.72 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | The scope of the work has undergone modifications following the resumption of the design by the companies. The km of lines expected at the end are those entered. | | | | | | |

***Kilometers of distribution lines upgraded or built (Regional Activity)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 894.90 | 894.90 |
| | **Previous Targets** | | | | | 909.50 | 909.50 | 909.50 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | The scope of the work has undergone modifications following the resumption of the design by the companies. The km of lines expected at the end are those entered. | | | | | | |

***Kilometers of distribution lines upgraded or built (Cotonou Activity)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 66.30 | 66.30 |
| | **Previous Targets** | | | | | 73.07 | 73.07 | 73.07 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | The scope of the work has undergone modifications following the resumption of the design by the companies. The km of lines expected at the end are those entered. | | | | | | |

***Kilometers of distribution line installed***

| | | |
|---|---|---|
| Project: | 3. Electricity Distribution Project | |
| Activity: | | |
| Version 3 | **Change Description:** | Creation of new indicator |
| | **Justification:** | Existing indicators do not sufficently meet adequacy criteria |
| | **Justification Description:** | This indicator is added to capture implementation progress before the lines are fully energized. This precedes P10 in the logic. Lines are installed, then they are energized. |

***National Dispatch Control Center is equipped with furniture and office supplies***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | 22-Jun-2022 | | 22-Jun-2022 |
| | **Previous Targets** | | | | | | | |

| | | |
|---|---|---|
| | **Justification:** | TBD replaced with target |
| | **Justification Description:** | |

### *Substations connected to SCADA/NDCC*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 55.00 | 55.00 |
| | **Previous Targets** | 0.00 | 0.00 | 0.00 | 0.00 | 55.00 | 55.00 | 55.00 |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Individuals trained in the NDCC system*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | | | | | 30.00 | 30.00 |
| | **Previous Targets** | 0.00 | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Individuals trained in the SCADA system*

| | | |
|---|---|---|
| Project: | 3. Electricity Distribution Project | |
| Activity: | | |
| Version 3 | **Change Description:** | Retire an indicator |
| | **Justification:** | Indicator has been added which is superior in measuring same variable |
| | **Justification Description:** | |

### *Number of AMR devices installed*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 560.00 | 560.00 | 560.00 | | 560.00 |
| | **Previous Targets** | TBD | TBD | 560.00 | | | | 560.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Number of AMR devices installed (Grid monitors)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 80.00 | 80.00 | 80.00 | | 80.00 |
| | **Previous Targets** | | | 80.00 | | | | 80.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Number of AMR devices installed (Smart Meters)*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 480.00 | 480.00 | 480.00 | | 480.00 |
| | **Previous Targets** | | | 480.00 | | | | 480.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

### *Value of signed power infrastructure feasibility and design contracts*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 25,111,271.60 | 25,111,271.60 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | Targets provided based on the compact's more recent projections. Targets not previously included. | | | | | | |

### *Percent disbursed of power infrastructure feasibility and design contracts*

| | | |
|---|---|---|
| Project: | 3. Electricity Distribution Project | |
| Activity: | | |
| Version 3 | **Change Description:** | Target Modification |

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
|---|---|---|---|---|---|---|---|
| **Revised Targets** | | | | 65.00 | 70.00 | 100.00 | 100.00 |
| **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| **Justification:** | Program, Project or Activity scope change | | | | | | |
| **Justification Description:** | Targets provided based on the compact's more recent projections. Targets not previously included. | | | | | | |

***Value disbursed of power infrastructure feasibility and design contracts***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | |
| Activity: | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Value of signed power infrastructure construction contracts***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | |
| Activity: | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 192,667,545.64 | 192,667,545.64 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | Targets provided based on the compact's more recent projections. Targets not previously included. | | | | | | |

***Percent disbursed of power infrastructure construction contracts***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | |
| Activity: | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | 35.00 | 50.00 | 100.00 | 100.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | Program, Project or Activity scope change | | | | | | |
| | **Justification Description:** | Targets provided based on the compact's more recent projections. Targets not previously included. | | | | | | |

***Value disbursed of power infrastructure construction contracts***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | |
| Activity: | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 192,667,545.64 | 192,667,545.64 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Temporary employment generated in power infrastructure construction***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project: | 3. Electricity Distribution Project | | | | | | |
| Activity: | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

## Off-Grid Energy Access Project (Project-Wide)

***Off-grid electricity consumption***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | |
| Activity: | | | | | | | |
| Sub-Activity: | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 55,089.00 | 532,301.00 | 771,104.00 | 771,104.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Yearly targets updated according to CBA model projections | | | | | | |

***Off-grid electricity consumption (Female)***

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | |
| Activity: | | | | | | | |
| Sub-Activity: | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Yearly targets updated according to CBA model projections | | | | | | |

***Off-grid electricity consumption (Male)***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | | | | | | | | |
| Sub-Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Yearly targets updated according to CBA model projections | | | | | | |

***Number of jobs created***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | | | | | | | |

***Number of businesses investing in off-grid electricity solutions***

| | | |
|---|---|---|
| Project: | Access to Electricity Project | |
| Activity: | | |
| Sub-Activity: | | |
| Version 3 | **Change Description:** | Retire an indicator |
| | **Justification:** | Cost of data collection for indicator outweighs usefulness |
| | **Justification Description:** | Indicator retired because it is not currently feasible to measure |

***Amount invested***

| | | |
|---|---|---|
| Project: | Access to Electricity Project | |
| Activity: | | |
| Sub-Activity: | | |
| Version 3 | **Change Description:** | Retire an indicator |
| | **Justification:** | Indicator quality is determined poorer than initially thought when included in plan |
| | **Justification Description:** | Indicator retired because it is already measured by indicator "project promotor amount disbursed" |

## Off-Grid Clean Energy Activity

***Access to off-grid electricity***

| | | | |
|---|---|---|---|
| Project: | Access to Electricity Project | | |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | | |

***Access to off-grid electricity***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 5,054.00 | 17,465.00 | 47,976.00 | 66,104.00 | 66,104.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Yearly targets updated according to CBA model projections | | | | | | |

***Off-grid capacity***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 0.00 | 1.00 | 12.00 | 13.00 | 13.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Yearly targets updated according to CBA model and project promotor workplan projections. | | | | | | |

***Number of OCEF–funded projects***

| | |
|---|---|
| Project: | Access to Electricity Project |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | 16.00 | 16.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | End of compact targets added from off-grid promotor co-financing agreements | | | | | | |

***OCEF amount committed***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 0.00 | 0.00 | 20,894,813.00 | 31,533,515.00 | 31,533,515.00 | 31,533,515.00 | 31,533,515.00 |
| | **Previous Targets** | 0.00 | 12,000,000.00 | 20,000,000.00 | | 32,000,000.00 | 32,000,000.00 | 32,000,000.00 |
| | **Justification:** | Corrections to erroneous data | | | | | | |
| | **Justification Description:** | Targets added from co-financing agreements | | | | | | |

***OCEF amount disbursed***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 160,409.00 | 4,110,492.30 | 22,409,652.35 | 31,533,515.00 | 31,533,515.00 |
| | **Previous Targets** | TBD | TBD | TBD | TBD | 32,000,000.00 | 32,000,000.00 | 32,000,000.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | Targets added from DAF/MCA-Benin II | | | | | | |

***Project promoter amount committed***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | 46,768,217.00 | 46,768,217.00 | 46,768,217.00 | 46,768,217.00 | 46,768,217.00 |
| | **Previous Targets** | | 12,000,000.00 | 20,000,000.00 | | 32,000,000.00 | 32,000,000.00 | 32,000,000.00 |
| | **Justification:** | Corrections to erroneous data | | | | | | |
| | **Justification Description:** | Targets added from co-financing agreements | | | | | | |

***Project promoter amount disbursed***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.1 Off-Grid Clean Energy Facility Activity (0460) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | 32,000,000.00 | 32,000,000.00 | 32,000,000.00 |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | The project promotors did not have projection targets for amount disbursed. | | | | | | |

## Enabling Environment for Off-Grid Electricity Activity

***Government staff working in off-grid energy sector***

| | | | |
|---|---|---|---|
| Project: | Access to Electricity Project | | |
| Activity: | 4.3 Enabling Environment for Off-Grid Electricity Activity (0462) | | |
| Version 3 | **Change Description:** | Baseline Modification | |
| | **Change:** | Previous | Revised |
| | | TBD | 0.00 |
| | **Justification:** | TBD replaced with baseline | |
| | **Justification Description:** | This baseline was not calculated. | |

***Government staff working in off-grid energy sector***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.3 Enabling Environment for Off-Grid Electricity Activity (0462) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |
| | **Justification Description:** | ABERME and ARE do not have projected targets for this indicator | | | | | | |

***Number of ABERME final notices on off-grid proposals***

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.3 Enabling Environment for Off-Grid Electricity Activity (0462) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | | | | | | | |
| | **Previous Targets** | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| | **Justification:** | TBD replaced with target | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Justification Description:** | | | | | | | |
| | | | | | | | | |
| ***Adoption of off-grid framework*** | | | | | | | | |
| Project: | Access to Electricity Project | | | | | | | |
| Activity: | 4.3 Enabling Environment for Off-Grid Electricity Activity (0462) | | | | | | | |
| Version 3 | **Change Description:** | Target Modification | | | | | | |
| | | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | End of Compact |
| | **Revised Targets** | 25-Jun-2018 | | | | | | 25-Jun-2018 |
| | **Previous Targets** | | | | | | | |
| | **Justification:** | Corrections to erroneous data | | | | | | |
| | **Justification Description:** | Previous M&E Plan had blank targets. | | | | | | |

# ANNEX III: M&E PLAN MODIFICATIONS

## M&E Plan Version 2 Approved June 2019

The MCC M&E Policy requires major modifications be documented in an annex to the revised M&E Plan. The types of modifications to be included are deleting an indicator, modifying an indicator baseline, milestone, or target, modifying beneficiary information or major adjustments to the evaluation plan. This annex additionally documents new indicators and changes to the Off-Grid Energy Access Project logics.

The second version of the M&E plan reflects a number of revisions that are not detailed in this annex. These revisions include:

- Correcting discrepancies between the French and English versions of the initial M&E plan;
- Revising project descriptions to increase their accuracy;
- Updating MCA/M&E's plan for further revising the M&E plan and conducting data quality reviews;
- Updating the estimated budget for the three independent evaluations;
- Updating the evaluation plans and evaluation questions to reflect the progress made in procuring independent evaluations and defining the methodological approaches;
- Modifying indicator definitions to increase their specificity, clarity, and accuracy;
- Changing data sources;
- Changing disaggregation and the frequency of reporting based on what can actually be collected and what will be useful; and,
- Adding assumptions to the Off-Grid Energy Access project logic.

Below are the major changes:

### *Policy Reform and Institutional Strengthening Project*

| ***SBEE investments in maintaining infrastructure*** | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project (Project Wide) | |
| Activity: | N/A | |
| June 2019 | **Change Description:** | New indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator is relevant to assess the effort made by SBEE in terms of maintaining its network. It is related to the Project's higher-level outcome of "Increased Capital for Utility Maintenance and New Capital Investment". |

| ***Amount invested in energy efficiency measures*** | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Policy, Regulation, and Institutional Support Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator assesses whether public and private sector entities benefiting from energy efficiency audits actually invest in energy efficiency measures. The only other indicator on energy efficiency adoption is more focused on individual energy users. |

| ***Electricity Saved*** | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Policy, Regulation, and Institutional Support Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Change in activity scope |
| | **Justification Description:** | This indicator was in the initial compact document as "kWh of electricity saved through public sector energy efficiency practices". It was omitted from the first version of the M&E plan. This is a key outcome following the adoption of energy efficiency measures. Per the indicator definition, this indicator covers all entities benefiting from MCA-funded energy efficiency audits, which includes industry as well. |

| ***Financial self-reliance of ARE*** | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Policy, Regulation, and Institutional Support Activity | |
| June 2019 | **Change Description:** | Revised Indicator |
| | **Previous Name:** | Rate of budget allocation |
| | **Revised Name:** | Financial self-reliance |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator relates to electricity sector regulator's financial independence, a key aspect of it being operational. Originally, it was thought that the regulator would receive all of its funding from the Government. Therefore, M&E anticipated looking at the extent to which ARE received its budget request from the Government Budget. However, it is now expected that the regulator will receive some share of its funding by levying fees on electricity sold and on private sector operators in Benin's electricity sector. The extent to which this is realized will be a good indicator for the regulator's financial independence. |

| ***Percentage of positions filled*** | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Policy, Regulation, and Institutional Support Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator is a simple way of quantitatively assessing the extent to which the regulator is operational. It is the number of ARE effective staff compared to the staff number in its official organizational chart. |

| ***ARE headquarters are built and in service*** | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Policy, Regulation, and Institutional Support Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This is a key output indicator, which was not previously included in the M&E plan. MCC will fund the construction of the sector regulator's new headquarters, which is a key aspect to the regulator being operational. |

| *Approval of Tariff Policy and Tariff Plan* | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Policy, Regulation, and Institutional Support Activity | |
| June 2019 | **Change Description:** | Data source |
| | **Previous Data Source:** | Direction Générale de l'Energie (DGE) |
| | **Revised Data Source:** | Autorité de Régulation (ARE) et Ministère de l'Energie (ME) |
| | **Justification:** | More details on the data source of this indicator. |
| | **Justification Description:** | DGE is removed from the Ministry and replaced by the DGRE (Direction Générale des Ressources Energetiques).<br>The ARE and Ministry will lead the approval process by the Government. |

| *Needs Assessment completed* | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Policy, Regulation, and Institutional Support Activity | |
| June 2019 | **Change Description:** | Data source |
| | **Previous Data Source:** | Survey |
| | **Revised Data Source:** | MCA-Benin II/ Audits SGS report |
| | **Justification:** | More details on the data source of this indicator. |
| | **Justification Description:** | Data on the indicator can be obtained from MCA-Benin II (Audits SGS report) |

| *SBEE Employee Net Promoter Score* | | |
|---|---|---|
| Project: | Policy Reform and Institutional Strengthening Project | |
| Activity: | Utility Strengthening Activity | |
| June 2019 | **Change Description:** | Baseline modification |
| | **Previous Baseline:** | TBD |
| | **Revised Baseline:** | 61.83% (2018) |
| | **Justification:** | The TBD has been revised to show results of this study conducted in 2018. New baseline information obtained and change in spatial division. |

## *Electricicty Generation Project and Electricity Distribution Project*

| *Generation capacity added from new IPPs* | | |
|---|---|---|
| Project: | Electricity Generation Project | |
| Activity: | PV Generation Activity | |
| June 2019 | **Change Description:** | Revised Indicator |
| | **Previous Indicator:** | Generation capacity added (P-6) |
| | **Revised Indicator:** | Generation capacity added from new IPPs |
| | **Justification:** | Changes to the Project scope |
| | **Justification Description:** | The change in wording reflects MCC's shift from a design-build approach to private sector transaction approach. |
| *Generation capacity added from new IPPs* | | |
| Project: | Electricity Generation Project | |

| | | |
|---|---|---|
| Activity: | PV Generation Activity | |
| June 2019 | **Change Description:** | Target modification |
| | **Previous Target:** | TBD |
| | **Revised Target:** | 50 MW |
| | **Justification:** | TBD updated with newly obtained target information |

| ***Distribution System Losses*** | | |
|---|---|---|
| Project: | Electricity Distribution Project | |
| Activity: | Electricity Distribution Project Wide | |
| June 2019 | **Change Description:** | Frequency of reporting |
| | **Previous Frequency:** | Annual |
| | **Revised Frequency:** | Quarterly |
| | **Justification:** | New baseline information obtained |
| | **Justification Description:** | Data on the indicator can be obtained from SBEE on quarterly basis |

| ***Kilometers of distribution lines upgraded or built (Cotonou)*** | | |
|---|---|---|
| Project: | Electricity Distribution Project | |
| Activity: | Cotonou Grid Strengthening Activity | |
| June 2019 | **Change Description:** | Target modification |
| | **Previous Target:** | TBD |
| | **Revised Target:** | 73.07 |
| | **Justification:** | TBD updated with newly obtained target information based on detailed design studies. |

| ***Kilometers of distribution lines upgraded or built (Regional)*** | | |
|---|---|---|
| Project: | Electricity Distribution Project | |
| Activity: | Regional Grid Strengthening Activity | |
| June 2019 | **Change Description:** | Target modification |
| | **Previous Target:** | TBD |
| | **Revised Target:** | 906.505 |
| | **Justification:** | TBD updated with newly obtained target information based on detailed design studies. |

| **Number of switchgear stations and substations built or rehabilitated** | | |
|---|---|---|
| Project: | Electricity Distribution Project | |
| Activity: | Regional Grid Strengthening Activity | |
| June 2019 | **Change Description:** | Target modification |
| | Previous Target: | TBD |
| | Revised Target | 3 |
| | **Justification:** | This target has been added in accordance with the final detailed design of the Regional Grid Strengthening Activity. |

| **Number of switchgear stations and substations built or rehabilitated** | | |
|---|---|---|
| Project: | Electricity Distribution Project | |
| Activity: | Cotonou Grid Strengthening Activity | |
| June 2019 | **Change Description:** | Target modification |

| | | |
|---|---|---|
| | Previous Target: | TBD |
| | Revised Target | 9 |
| | **Justification:** | This target has been added in accordance with the final detailed design of the Cotonou Grid Strengthening Activity. |

| **Distribution substation capacity added** | | |
|---|---|---|
| Project: | Electricity Distribution Project | |
| Activity: | Cotonou Grid Strengthening Activity | |
| June 2019 | **Change Description:** | Target modification |
| | Previous Target: | TBD |
| | Revised Target | 945.5 MVA |
| | **Justification:** | This target has been added in accordance with the final detailed design of the Cotonou Grid Strengthening Activity. |

| **Distribution substation capacity added** | | |
|---|---|---|
| Project: | Electricity Distribution Project | |
| Activity: | Regional Grid Strengthening Activity | |
| June 2019 | **Change Description:** | Target modification |
| | Previous Target: | TBD |
| | Revised Target | 143 MVA |
| | **Justification:** | This target has been added in accordance with the final detailed design of the Regional Grid Strengthening Activity. |

## *Off-Grid Electricity Access Project*

| ***Off-Grid Electricity consumption*** | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | NA | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the “adequacy” criteria for indicators |
| | **Justification Description:** | Off-grid electricity consumption is a key outcome indicator. |

| ***OCEF Amount Disbursed*** | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Off-Grid Clean Energy Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the “adequacy” criteria for indicators |
| | **Justification Description:** | This indicator is important to know whether the project was executed as planned. Previously, there was only indicator on the OCEF grant amount. However, now there are two separate indicators for amount committed and disbursed. |
| ***Project promoter disbursed amount*** | | |
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Off-Grid Clean Energy Activity | |
| June 2019 | **Change Description:** | New Indicator |

| | | |
|---|---|---|
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator provides a more complete picture of the amount of money being leveraged by the OCEF projects. |

| ***OCEF amount committed and OCEF amount disbursed*** | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Off-Grid Clean Energy Activity | |
| June 2019 | **Change Description:** | New Target |
| | **Previous Target** | TBD |
| | **Revised Target** | $32,000,000 |
| | **Justification:** | Corrections to erroneous data. |
| | **Justification Description:** | This target was not "TBD" as it was defined in the Compact document. |

| ***Project promoter committed and disbursed amount*** | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Off-Grid Clean Energy Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Previous Target** | TBD |
| | **Revised Target** | $32,000,000 |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator will measure the promoter's financial contribution performance. |

| ***Government staff working in off-grid energy sector*** | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Enabling Environment for Off-Grid Electricity Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator relates to the government's capability to manage the off-grid energy sector, a result added to the project logic during this M&E plan revision. |

| ***Number of ABERME final decisions on off-grid proposals*** | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Enabling Environment for Off-Grid Electricity Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator relates to the government's capability to manage the off-grid energy sector, a result added to the project logic during this M&E plan revision. |

| *Adoption of off-grid framework* | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Enabling Environment for Off-Grid Electricity Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator relates to the government's willingness to promote the sector and the market off-grid solutions, a result added to the project logic during this M&E plan revision. |

| *OCEF amount committed* | | |
|---|---|---|
| Project: | Off-Grid Electricity Access Project | |
| Activity: | Off-Grid Clean Energy Activity | |
| June 2019 | **Change Description:** | New Indicator |
| | **Justification:** | Existing indicators do not sufficiently meet the "adequacy" criteria for indicators |
| | **Justification Description:** | This indicator will measure OCEF funds performance. |

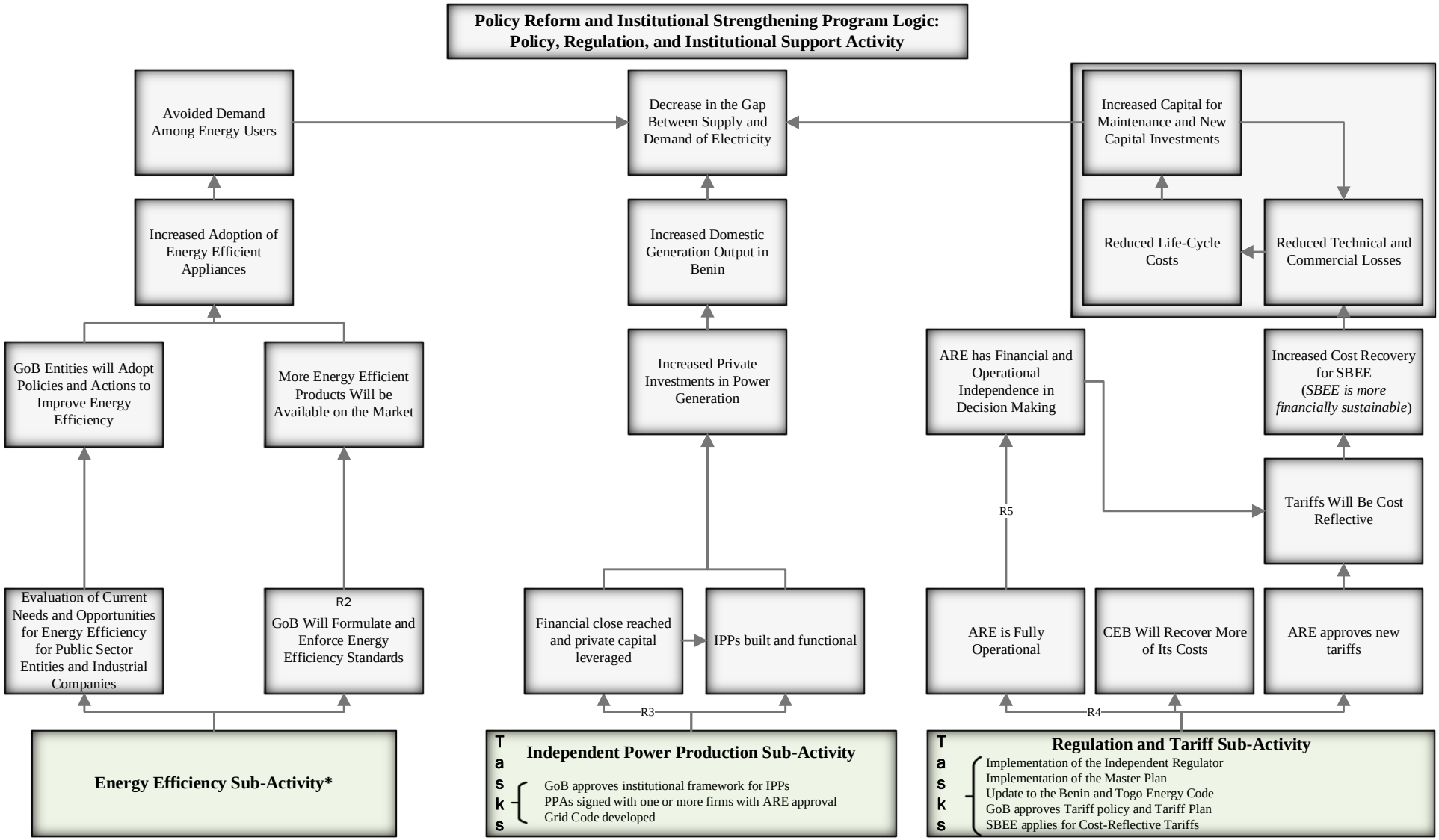
## Changes to Beneficiary Numbers

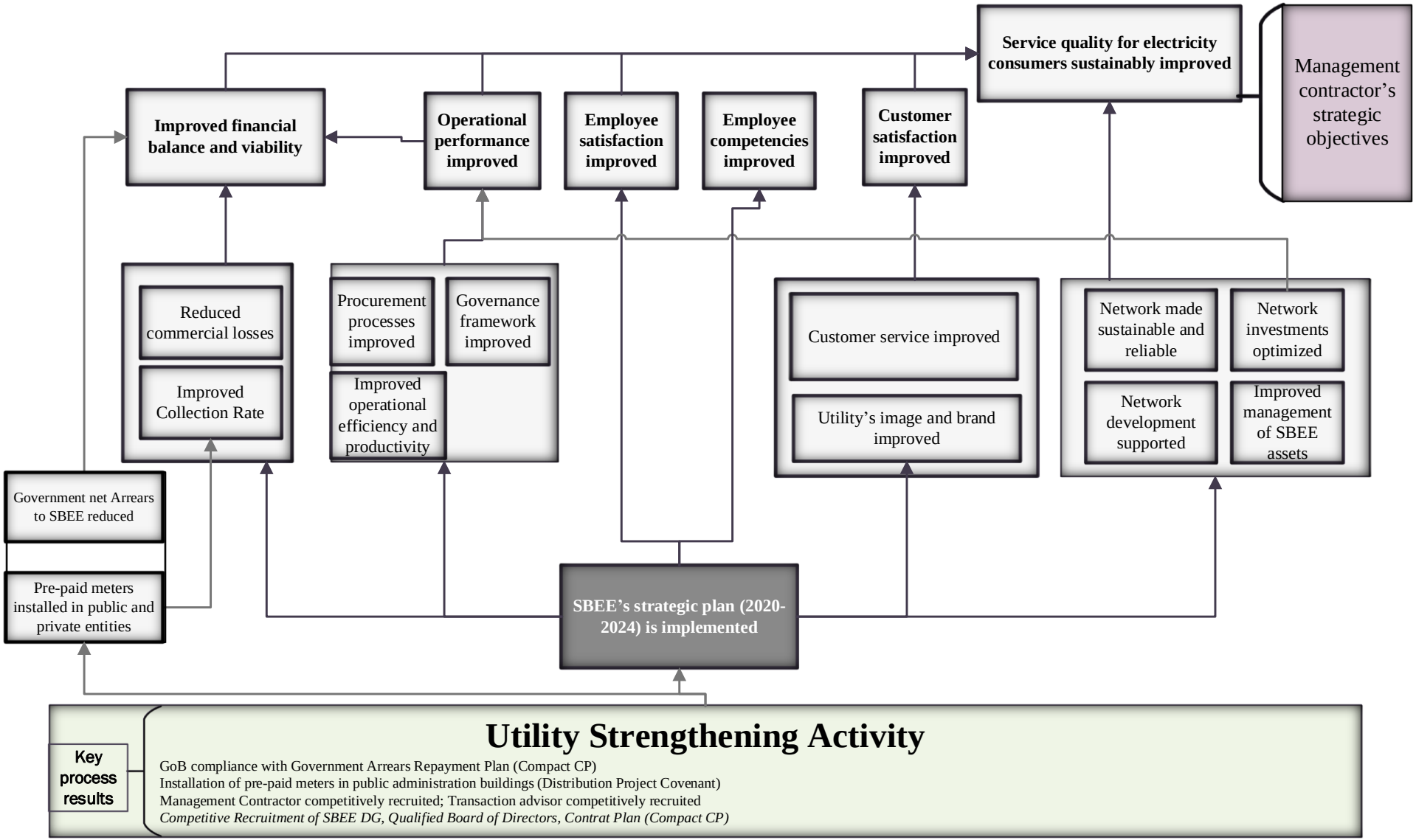
| Project: | Electricity and Generation Project, Policy Reform and Institutional Strengthening Project | | |
|---|---|---|---|
| Activity: | N/A | | |
| June 2019 | **Estimated Number of Beneficiaries:** | **Previous** | **Revised** |
| | | 9,800,000 | 10,600,000 |
| | **Justification:** | Changes to the program scope | |
| | **Justification Description:** | The compact began later than the Original CBA Model anticipated. As a result, applying the normal historic connection growth rate results in a higher number of expected connections to the grid in year 20 of the evaluation horizon. As all households connected to the grid are expected to benefit from the investment, this increases the number of expected beneficiaries. | |
| | | | |
| Project: | Off Grid Electricity Access Project | | |
| Activity: | Clean Energy Facility Activity - Pooled Call 1 Solar Home System Grants | | |
| June 2019 | **Estimated Number of Beneficiaries** | **Previous** | **Revised** |
| | | N/A | 182,000 |
| | **Justification:** | Changes to the activity scope | |
| | **Justification Description:** | The Call 1 Solar Home System Grants were previously undefined | |

**ANNEX**: **Improved project logic for the « Off-grid electricity access project »**

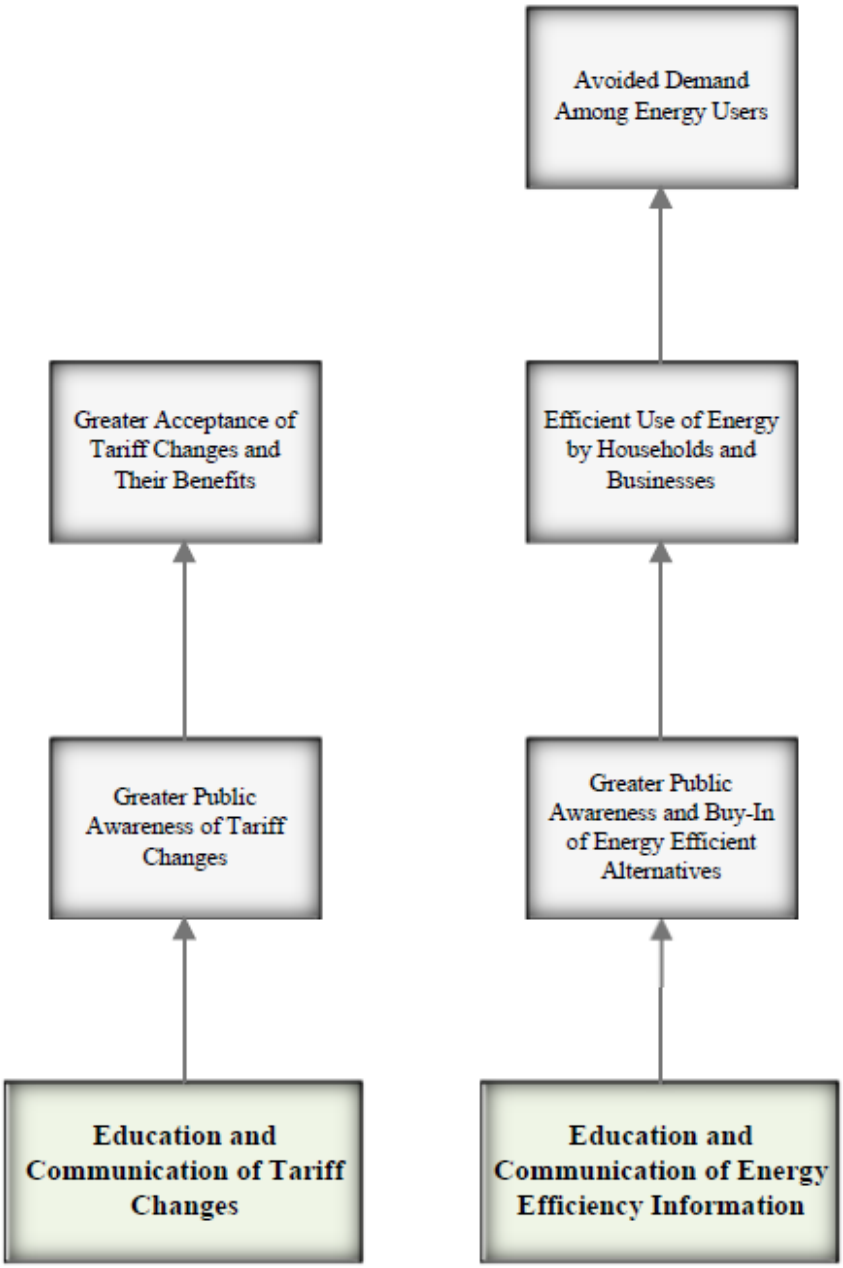
The Off-Grid Energy Access Project Logic is revised to better reflect intervention details. The changes include separating out the energy efficiency aspects into a distinct project logic, explicitly stating Government of Benin capability as an outcome in the logic, and articulating some additional assumptions.

# ANNEX IV: PROJECT LOGICS




Service quality for electricity consumers sustainably improved
Management contractor's strategic objectives
Improved financial balance and viability
Operational performance improved
Employee satisfaction improved
Employee competencies improved
Customer satisfaction improved
Reduced commercial losses
Improved Collection Rate
Procurement processes improved
Governance framework improved
Improved operational efficiency and productivity
Customer service improved
Utility's image and brand improved
Network made sustainable and reliable
Network investments optimized
Network development supported
Improved management of SBEE assets
Government net Arrears to SBEE reduced
Pre-paid meters installed in public and private entities
SBEE's strategic plan (2020-2024) is implemented
Utility Strengthening Activity
Key process results
GoB compliance with Government Arrears Repayment Plan (Compact CP)
Installation of pre-paid meters in public administration buildings (Distribution Project Covenant)
Management Contractor competitively recruited; Transaction advisor competitively recruited
Competitive Recruitment of SBEE DG, Qualified Board of Directors, Contrat Plan (Compact CP)

Policy Reform and Institutional Strengthening Program Logic: Public Information and Education Activity



Policy Reform and Institutional Strengthening Access Project Assumptions

**R2.**

1. Assumes that GoB will be able (and willing) to effectively enforce energy efficiency standards, despite porous land borders where smuggling is rife.

**R3.**

1. Assumes that an improved IPP framework will be sufficient for businesses to overcome other impediments to investing in Benin, particularly the constraints to the overall business environment that were identified in the constraints analysis.
2. Assumes that businesses will have sufficient assurance and trust that SBEE will pay for the electricity they produce.

**R4.**

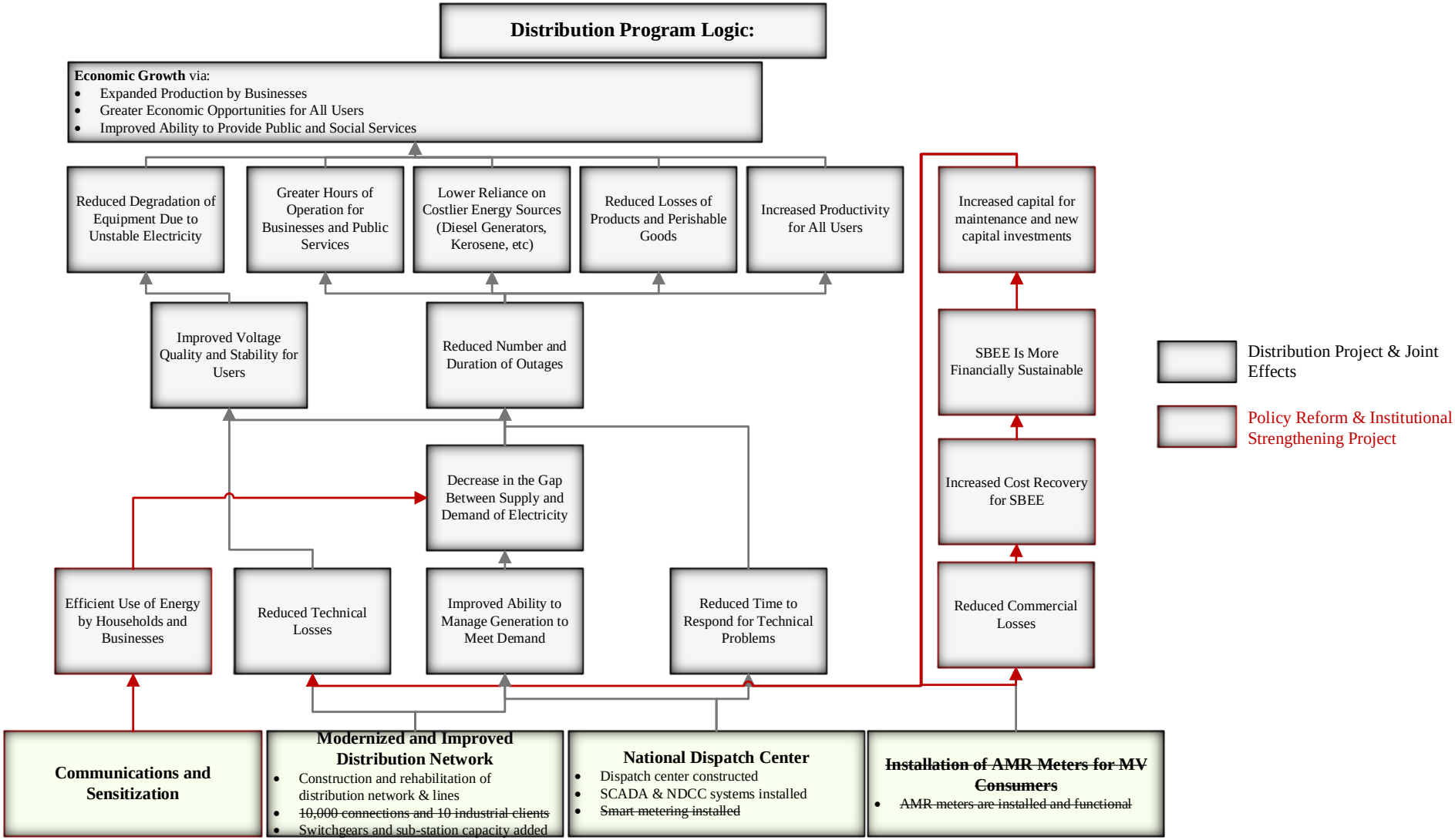
1. Assumes that the regulator will not only be implemented, but will be implemented in a way that maintains its independence from political and outside influence.

**R5.**

1. Assumes independence in energy sector governance will be not only be necessary, but also sufficient to improve the overall effectiveness of sector governance.

**R6.**

1. Assumes that all technical assistance and training will be fully implemented within SBEE, such that systems will be maintained and procedures followed even after the end of the compact, despite potential resistance from some actors within SBEE.




NOTE: Crossed out activities/outputs were initially envisioned but dropped during the design phase.

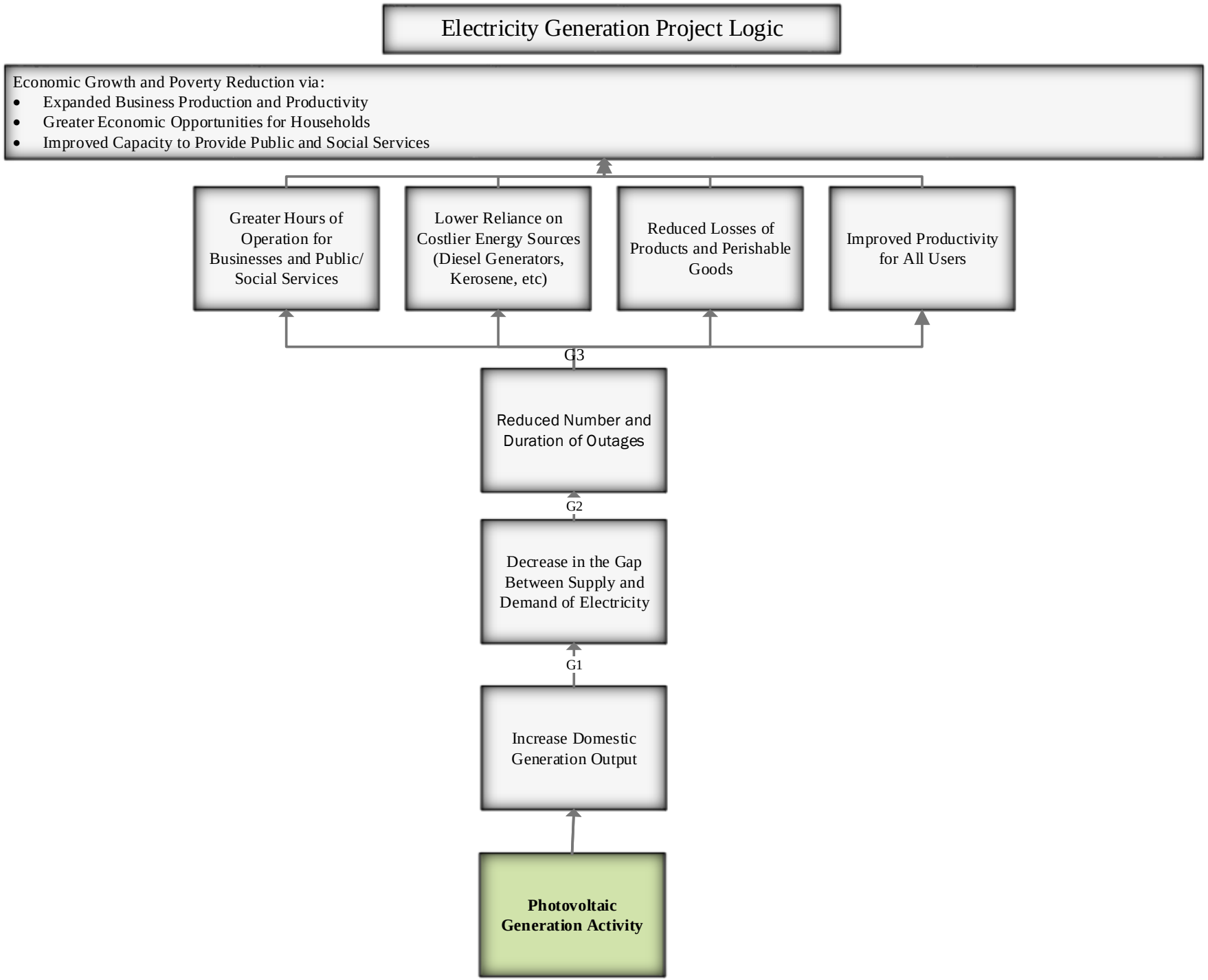
Distribution Project Assumptions

D1. From *Regional Strengthening Activity* AND *Cotonou Grid Strengthening Activity* AND *National Electricity Dispatch Activity* TO *Reduced Technical Losses and Increased Distribution Capacity* AND *Reduced Time of Response for Technical Problems* AND *Improved Ability to Manage Generation to Meet Demand*

1. Assumes that funding for Distribution Project Activities is available in full and on a timely basis.
2. Assumes that MCC-funded infrastructure is of sufficient technical quality to achieve its intended purpose.
3. Assumes that MCC-funded infrastructure will be properly maintained after the compact and that equipment will continue to function for the duration of its expected lifespan.
4. Assumes that tariffs will be cost-reflective prior to the end of the Compact such that MCC-funded infrastructure can be financially sustainable to operate.
5. Assumes that low grid capacity is a major cause of technical losses.
6. Assumes the NDCC will have adequate financial and human resources to fulfill its functions.

D2. From *Reduced Technical Losses and Increased Distribution Capacity* AND *Decrease in the Gap Between Supply and Demand* to *Improved Voltage Quality and Stability for Users AND* Reduced Number and Duration of Outages

1. Assumes that improvements in technical losses, swiftness in responding to technical problems, and increased ability for generation to meet demand will be sufficient to realize appreciable improvements in voltage quality and outages (even with the expected increase in demand and the existence of additional grid problems that MCC will not be addressing).
2. Assumes that the North-South connection being built by the World Bank will be completed prior to completion of MCC-funded investments. Currently, the Northern and Southern regions of the country are only connected by CEB lines traveling through Togo. Thus, in order for MCC investments to have the expected impact on all grid users, such that improvements in one region will benefit users in the other, this connection must be completed.


Electricity Generation Project Logic
Economic Growth and Poverty Reduction via:
• Expanded Business Production and Productivity
• Greater Economic Opportunities for Households
• Improved Capacity to Provide Public and Social Services
Greater Hours of Operation for Businesses and Public/ Social Services
Lower Reliance on Costlier Energy Sources (Diesel Generators, Kerosene, etc)
Reduced Losses of Products and Perishable Goods
Improved Productivity for All Users
G3
Reduced Number and Duration of Outages
G2
Decrease in the Gap Between Supply and Demand of Electricity
G1
Increase Domestic Generation Output
Photovoltaic Generation Activity

Generation Project Assumptions

G1. From *Increasing Domestic Generation Output* to *Decreasing the Gap Between Supply and Demand of Electricity*

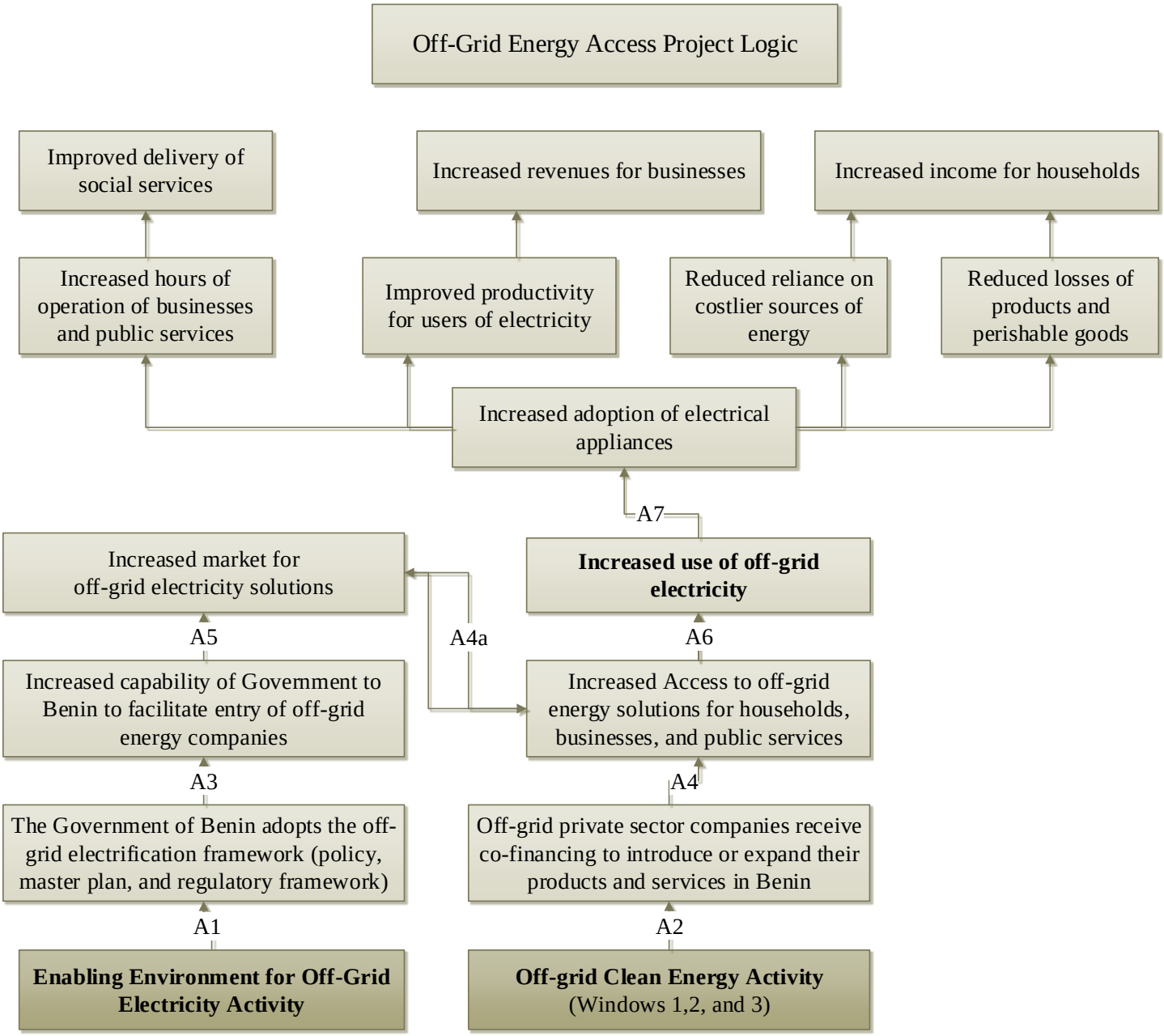
1. Assumes that compact activities (along with activities by other potential investors) will increase domestic generation more than demand will increase, resulting in a net decrease to the gap between supply and demand of electricity.
2. Assumes that energy imports will not decrease significantly.
3. Assumes that other donor or private sector investments in generation assets do not increase significantly.

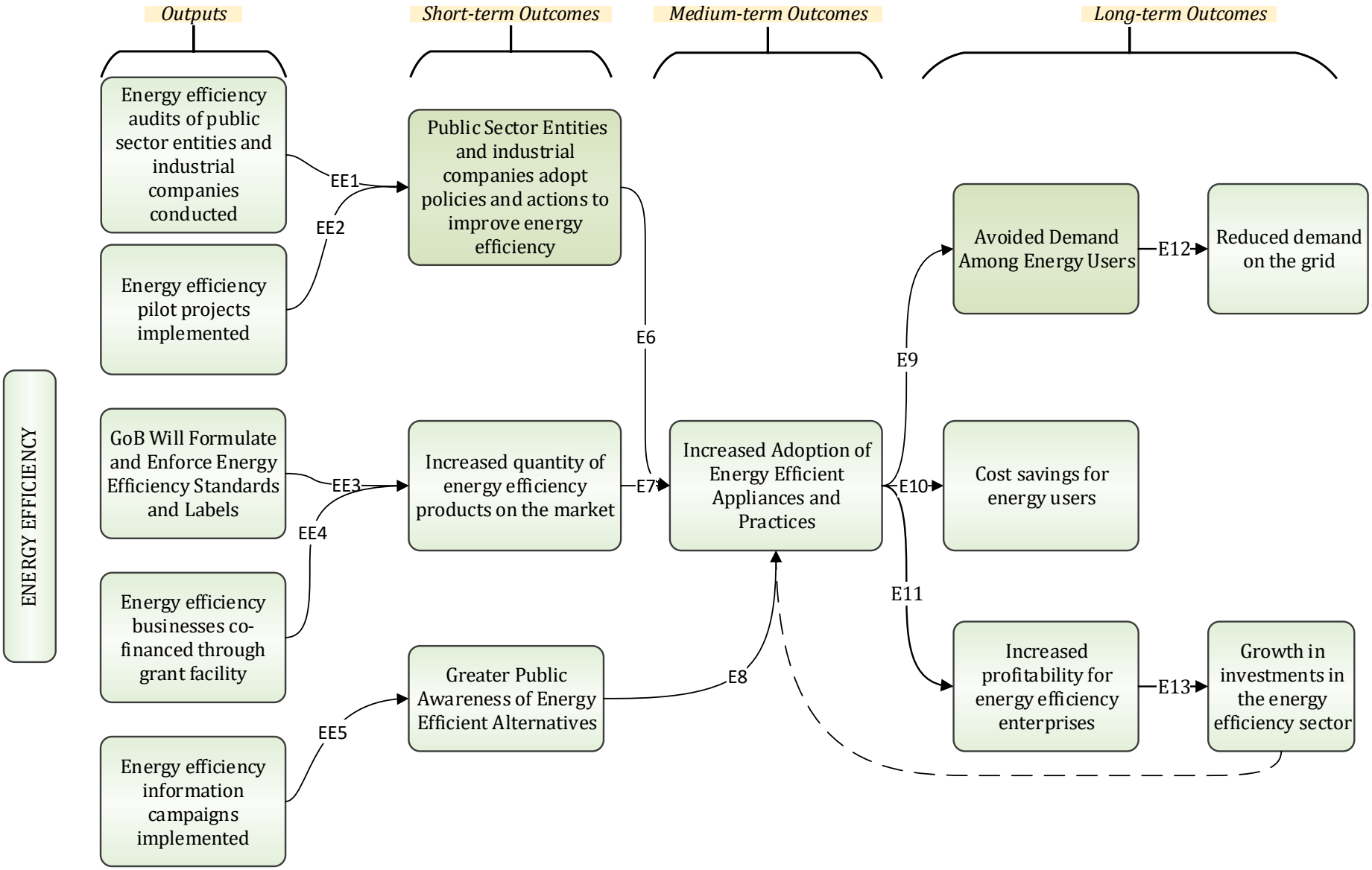
G2. From *Decreasing the Gap Between Supply and Demand of Electricity* and *Reduced Number and Duration of Outages*

1. Assumes that the compact activities will decrease the gap sufficiently to have a positive impact on the number and duration of outages (even when factoring in the expected increase in demand over time)
2. Assumes that one of the primary problems causing outages is the gap between supply and demand of electricity
3. Assumes that the North-South connection being built by the World Bank will be completed prior to completion of MCC-funded investments. Currently, the Northern and Southern regions of the country are only connected by CEB lines traveling through Togo. Thus, in order for MCC investments to have the expected impact on all grid users, such that improvements in one region will benefit users in the other, this connection must be completed. This line is currently under construction and is expected to be completed in 2016.
4. Assumes that the national distribution control center will effectively distribute generation resources on the grid.

G3. From *Reduced Number and Duration of Outages* to *Greater Hours of Operation for Businesses and Public Social Services* AND *Lower Reliance on Costlier Energy Sources (Diesel Generators, Kerosene, etc.)* AND *Reduced Losses of Products and Perishable Goods* AND *Improved Productivity for All Users*.

1. Assumes that, during outages, generators, flashlights, car batteries, kerosene, candles, and other costly energy sources are used purely as backup, and that these will not be needed when the grid power is available (as opposed to units that would still be used even during grid operation)
2. Assumes that the compact activities are able to reduce the frequency and duration of outages to the point that appreciable benefits accrue to beneficiaries.
3. Assumes that Businesses and Social Services are affected by grid-supplied power to the extent that they close or are not fully operational during outages.


Off-Grid Energy Access Project Logic
Improved delivery of social services
Increased revenues for businesses
Increased income for households
Increased hours of operation of businesses and public services
Improved productivity for users of electricity
Reduced reliance on costlier sources of energy
Reduced losses of products and perishable goods
Increased adoption of electrical appliances
A7
Increased market for off-grid electricity solutions
Increased use of off-grid electricity
A5
A4a
A6
Increased capability of Government to Benin to facilitate entry of off-grid energy companies
Increased Access to off-grid energy solutions for households, businesses, and public services
A3
A4
The Government of Benin adopts the off-grid electrification framework (policy, master plan, and regulatory framework)
Off-grid private sector companies receive co-financing to introduce or expand their products and services in Benin
A1
A2
Enabling Environment for Off-Grid Electricity Activity
Off-grid Clean Energy Activity
(Windows 1,2, and 3)




**Please Note**: This model is included to illustrate how the compact's different energy efficiency related outputs lead to the desired outcomes and will not necessarily be tracked by indicators in the indicator tracking table. Certain results are also found in reform project logic models, with corresponding monitoring indicators.

Off-Grid Electricity Access Project Assumptions

A1

There is political will for off-grid electrification in Benin.

A2 and A4

The grant facility manager must select high-quality proposals and effectively oversee implementation. The companies implementing the OCEF-funded projects must remain solvent during the co-financing agreement term. The OCEF-funded projects must implement their projects according to plan and achieve the disbursement milestones as detailed in the individual co-financing agreements. The grant facility manager must review and act upon disbursement requests in a timely manner. More detailed risks and assumptions related to successful implementation of OCEF-funded projects will vary per project. This could include being able to import equipment in a timely manner or having sufficient capacity to serve clients.

A3

ARE and ABERME must actively engage in and lead the process for operationalizing the off-grid electrification framework. They must have the human resources to review and make decisions on off-grid proposals. The technical assistance provided to ARE and ABERME must be high-quality. There is no political interference in ARE and ABERME's key functions of reviewing and approving off-grid electricity projects.

A4a

New customers will upgrade their systems or purchase new off-grid products.

A5

The improved regulatory and institutional frameworks will not only be necessary, but also sufficient for businesses to invest in the sector.

A6 – A7

On the supply-side, the off-grid electricity products must be functional and adapted to local conditions. There are a number of demand-side assumptions. There must be a strong demand for off-grid electricity products in Benin. Potential clients need to be willing and able to pay for off-grid products and electrical appliances, even though off-grid solutions may be more expensive than grid-based electricity. Vendors need to have credibility and targeted customers need to have a positive perception of the products being advertised to them. Those products are superior to those found on the informal market. Prices and payment modalities will be sufficiently attractive to targeted customers.

Program Risks and Mitigation Approaches

**Electricity Distribution Project:**

1. The principal risk to the sustainability of the Electricity Distribution Project relates to SBEE's ability to plan and implement a comprehensive maintenance regime.
2. This risk will be mitigated through the execution of the Utility Strengthening Activity, which specifically addresses operations and maintenance issues through its interventions, as well as through

the Policy, Regulation, and Institutional Support Activity, through its support of tariff reforms that are important to the financing of maintenance and other SBEE operations. Outputs from this intervention include an operations and maintenance management system satisfactory to MCC, addressing, among others, the availability of proper equipment, spare parts, training for SBEE staff and standard operating procedures.

**Off-Grid Electricity Access Project**

1. The primary risks to the sustainability of the Off-Grid Electricity Access Project are the unclear legal and regulatory framework that leads to limited off-grid investment, the low purchasing power of the majority of households in Benin and the lack of awareness or risk aversion to the adoption of new technologies.
2. The Enabling Environment for Off-Grid Electricity Activity is intended to address this risk. At the individual project level, the sustainability for mini-grids or household solar products will depend on the project developer/sponsor's ability to deliver a quality service for a price that is both affordable and profitable. The Facility Manager will be required to carefully examine the financial and business models for all proposed projects and to select only those that meet established standards established under the OCEF Operations Manual. Another mitigant is through the Public Information and Education Activity under the Policy Reform and Institutional Strengthening Project, which will educate consumers about solar and other technologies for lighting, cooking and other household needs.

# ANNEX V: BENIN POWER COMPACT ECONOMIC METHODOLOGY

The Benin II on-grid cost-benefit analysis model forecasts the discounted stream of benefits resulting from increased energy consumption and reduced utility cost per unit of energy served resulting from compact activities. In particular, increased load carrying capacity and reduced technical losses on the distribution network, and increased generation supply are expected to increase energy served to consumers and to reduce the cost to the utility per kWh served. Due to strong complementarities between the on-grid activities, the on-grid ERR was calculated taking into account all Benin II Compact costs and benefits, except for those of the Off-Grid Electricity Access Project, which are analyzed separately.[14] Costs for engineering design and construction have been obtained from feasibility studies, while administrative and M&E costs are an MCC estimation.

**Basic Structure of Benefit-Cost Analysis**

The ultimate output of the model is a stream of net benefits over time, with costs valued in real economic terms. Net benefits in year *t* are denoted $NB_t$, with t ranging from 1 to τ, the time horizon. The default time horizon for the model is 20 years from Entry into Force of the Compact, though this can be adjustable to assess sensitivity of economic returns to the time horizon.

Net benefits equal the difference in benefits minus costs resulting from a "with project" scenario and those resulting from a "without project" scenario (counterfactual). If we let B denote benefits, C denote costs, and the subscript m denote project status (m=1 is with project, m=0 is without project), then net benefits in a given year are:

$$NB_t = (B_{t[m=1]} - C_{t[m=1]}) - (B_{t[m=0]} - C_{t[m=0]})$$

The net benefit stream is then summarized in two ways: As the net present value (NPV), and as the economic rate of return (ERR). The NPV is calculated according to the following formula, where δ is the social discount rate (assumed to be 10%):

$$NPV = \sum_{t=1}^{\tau} \frac{1}{(1+\delta)^t} NB_t$$

The ERR is the discount rate at which the NPV equals zero (or, put another way, the discount rate at which discounted costs equal discounted benefits):

$$ERR = \delta \mid \sum_{t=1}^{\tau} \frac{1}{(1+\delta)^t} NB_t = 0$$

In the model, these are calculated using the built-in NPV and IRR functions in Microsoft Excel (the ERR is just an IRR calculated using economic accounting practices). The remainder of this section explains how B and C are calculated, breaking them down into component parts for each project.

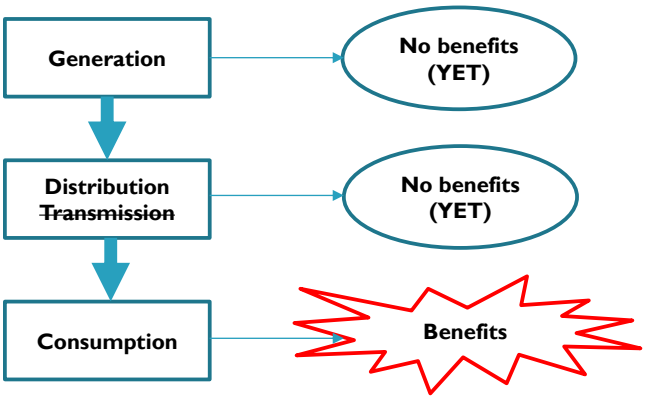
The relationships above define the basic structure of the cost-benefit analysis. The remaining questions are: What are the costs? What are the benefits? As noted above, benefits are captured starting with forecast energy sources (including those financed by the compact), which are tracked through the distribution system. The delivery of

[14] A detailed description of the Off-Grid Energy Access CBA models will be added when the assessment of all grant proposals is complete.

these sources to consumers is constrained both by technical losses, the load carrying capacity of the network, and consumer demand. Increased energy consumption is valued in dollar terms by the price difference between what consumers are willing to pay and the actual cost of delivering the energy. Willingness to pay was calculated using a nationwide survey conducted by Benin's national statistics agency in partnership with MCC. The cost to the utility of delivering energy is based on the compact supported tariff study analysis.

The figure below summarizes how increased energy consumption benefits are captured in the benefit-cost analysis model. The figure shows that both improved distribution and new generation are expected to increase energy availability. The benefits accrue only if the energy is consumed.

Benefits from Increased Energy Consumption




**Generation**

The flow of energy to be made available from the added generation capacity is calculated as follows:

$$GEG\ (KWh)_{tu} = \sum_{u=1}^{\mu} PG_{tu} * CF_{tu} * 8760 * 1000$$

Where,

$GEG(MW) = Gross\ energy\ Generation$

$t = the\ year\ t$

$u = unit\ u$

$PG_u = Generation\ by\ unit\ u$

$CF_u = Capacity\ factor\ for\ unit\ u$

A capacity factor of 20 percent is applied for the compact supported photovoltaic generation plants.[15]

**Distribution**

Transmission and distribution technical losses affect the amount of Gross Energy Generation that is available to consumers. The model estimates the reduction in energy available (EA) resulting from technical losses at 3 successive points on the grid: transmission, distribution substations, and distribution feeders. For each year *t* and stage *s*, the flow of energy continuing to the next stage is calculated as follows:

[15] The net *capacity factor* of a power plant is the ratio of its actual output over a period of time to its potential output if it were possible for it to operate at full nameplate *capacity* continuously over the same period of time.

$$EA\ (kWh)_{ts} = EA\ (kWh)_{t(s-1)} * (1 - \mathrm{r}_{ts})$$

$$r = loss\ rate\ (in\ percentage)$$

If the project is implemented as expected, it will reduce the distribution technical loss rate $r$ at the distribution substation and feeder stages. Note that, since (1 - $r$) is multiplied by energy available at the previous stage, the benefits from technical loss reduction at any given stage depend on the total Gross Energy Generation sent to the grid, as well as the size of technical losses on the grid at prior and subsequent stages. In the context of excess demand on the grid, reduced losses make additional power available to consumers and therefore increase benefits.

An additional benefit of technical loss reduction is a reduction in the utility's generation operations and maintenance cost per kWh delivered to consumers. If the tariff rate is not correspondingly reduced, this cost reduction is an economic gain captured by the utility. For each year *t* and stage *s*, the cost reduction captured by the utility is calculated as follows:

$$CR_{ts} = (\mathrm{r}_{wo\ ts} - \mathrm{r}_{w\ ts}) * \mathrm{GOM\ (USD)}_{wo} * EA(kWh)_{wo\ t(s-1)} * \prod_{i=s+1}^{3} (1 - \mathrm{r}_{wo\ ti})$$

for stages 1 (transmission) and 2 (distribution substations), and

$$CR_{ts} = (\mathrm{r}_{wo\ ts} - \mathrm{r}_{w\ ts}) * \mathrm{GOM\ (USD)}_{wo} * EA(kWh)_{wo\ t(s-1)}$$

for stage 3 (distribution feeders)

Where
$CR_{ts}$ = Total economic gain resulting from reduction in operations and maintenance cost per kWh consumed
$\mathrm{GOM\ (USD)}_{wo}$ = Generation Operations and Maintenance Cost per kWh without the project[16]
$EA(kWh)_{wo\ t(s-1)}$ = Total without project energy available at the prior stage
$\mathrm{r}_{wo\ ts}$ = Technical losses without the project in time *t* at stage *s*
$\mathrm{r}_{w\ ts}$ = Technical losses with the project in time *t* at stage *s*

**Consumption**

Electricity made available through improved distribution infrastructure and new generation is apportioned among three different consumer categories: consumers connected directly the low voltage (BT) SBEE line, consumers connected to SBEE low voltage (BT) lines through the secondary "spiderweb" market, and consumers directly connected to SBEE medium voltage lines (MT). The share of energy consumed by each consumer category is derived from the Willingness to Pay (WTP) survey.

Total consumption for each period and category is calculated as follows:

$$\mathrm{CONS}\ (KWh)_{tc} = AIC_c * NIC_c$$

Where,
$CONS(KWh)_{tc} = Total\ consumption\ for\ category\ in\ period\ t$

[16] Need source for generation operations and maintenance cost per kWh without the project – current assumption is .01 USD per kWh.

$AIC_c = Annual\ consumption\ in\ category\ c$
$NIC_c = Number\ of\ consumers\ in\ category\ c$
c= $Consumer\ Category$

Each consumer category is assumed to increases consumption proportionately its current consumption level when additional electricity becomes available. Baseline growth in the number of connections is assumed to continue even when increases in the number of consumers are detrimental to the functioning of the overall system when demand exceeds supply. The primary benefit in the model is the incremental energy consumed by each consumer type. The increased consumption is valued in dollar terms by the price differential between what consumers are willing to pay and the actual cost of delivering the energy. The total benefits are the sum of the benefits to the three consumer groups.

**The primary benefit in the model is the incremental energy consumed by each consumer type. The increased consumption is valued in dollar terms by the price differential between what consumers are willing to pay and the actual cost of delivering the energy.**

The additional consumption for each category in dollar terms is calculated as follow:

$$\text{Net CONS } (\$\ US)_{tc} = \text{CONS } (KWh)_{tc} * (WTP_c(\frac{CFA}{KWh}) - ET_c\ (\frac{CFA}{KWh})) * \frac{1}{exchrate})$$

Where,
$WTP_c = Category\ c\ consumer\ Willingness\ to\ Pay\ t = Year\ t$
$c = Category\ of\ consumers$
$ET_c = Epected\ cost\ of\ delivering\ energy\ for\ consummers\ category\ c$

Information on WTP values for different categories in the model were obtained from the February 2015 Willingness to Pay (WTP) survey for electricity conducted in Benin. The next section discusses the survey and some of the key results.

**Assumptions and Parameters Used in the Model**
The willingness to pay values and the expected tariffs used in the current model are presented in the table below.

**Willingness to Pay Values and Expected Tariffs for Different Categories of Consumers**

| | Primary Market | Secondary Market | Formal businesses | Benin Market |
|---|---|---|---|---|
| | FCFA/KWh | FCFA/KWh | FCFA/KWh | FCFA/KWh |
| Informal Businesses-Low voltage (1) | 149 | 204 | | 152 |
| Households-Low voltage (2) | 132 | 199 | | 139 |
| Average (1) and (2) | 136 | 203 | | 165 |
| Formal Businesses-Medium voltage | | | 190 | 190 |
| Focus Group Interview | 150 | 250 | 195 | 198 |
| | | | | |

*Source: Willingness to pay values were obtained from survey.*
*Expected tariffs were provided from Ministry of Energy.*

Other parameters and assumptions are summarized the table below.

**Table 61: ERR Assumptions and Parameters**

| Assumptions and Parameters | Baseline | With MCC project |
|---|---|---|
| Exchange Rate (CFA/$ US) | 602 | 602 |
| Normal growth of BT Consumers | 4% | 4% |
| Normal growth of LT Consumers | 5% | 5% |
| Transmission Losses | 5% | 5% |
| Distribution Substation Technical Losses | 7.5% | 4% |
| Distribution Feeder Technical Losses | 7.5% | 4% |
| Growth of Distribution Technical Losses | 7% but losses cannot exceed 18% | .2 percentage points per year after end of rehabilitation work |
| For each 1 KWh available on the grid[17] | 0.78 Kwh is consumed in primary market | 0.78 Kwh is consumed in primary market |
| For each 1 KWh available on the grid | 0.22 Kwh is consumed in secondary market | 0.22 Kwh is consumed in secondary market |

[17] *Based on the WTP survey*